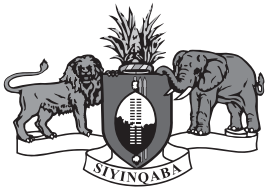
Standard Treatment Guidelines and Essential Medicines List of Common Medical Conditions in the Kingdom of Swaziland



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CONTENTS

Foreword ix
Preface xi
Acronyms xiii
Acknowledgments xvi
How To Use This Book xix

SECTION A: STANDARD TREATMENT GUIDELINES

1. CARDIOVASCULAR CONDITIONS 25
1.1 Hypertension 25
1.2 Acute rheumatic fever 28
1.3 Valvular heart disease 29
1.4 Congestive cardiac failure 30

2. CENTRAL NERVOUS SYSTEM 32
2.1 Epilepsy 32
2.2 Status epilepticus 35
2.3 Headache 40
2.4 Tension headache 41
2.5 Migraine 43

3. DENTAL AND ORAL CONDITIONS 45
3.1 Candidiasis, oral (thrush) 45
3.2 Dental conditions 46
3.3 Gingivitis 48
3.4 Herpes stomatitis, cold sore, fever blister 50
3.5 Canker sores, aphthous ulcers (mouth ulcers) 51

4. EAR, NOSE, AND THROAT DISORDERS 52
4.1 Otitis externa 52
4.2 Otitis media 53
4.3 Hearing impairment 54
4.4 Sinusitis 54
4.5 Rhinitis, allergic 56
4.6 Tonsillitis 57
4.7 Laryngitis 58
4.8 Nose bleed (epistaxis) 59

5. ENDOCRINE CONDITIONS 60
5.1 Diabetes mellitus 60
5.2 Goitre 63

6. EYE CONDITIONS 64
6.1 Conjunctivitis 64

Swaziland_FINAL press.indb 3 5/19/12 2:51 PM

6.2 Viral conjunctivitis 66
6.3 Conjunctivitis of the newborn (ophthalmia neonatorum) 67
6.4 Eye injury 68
6.5 Glaucoma, acute and chronic 70
6.6 Open-angle glaucoma 70
6.7 Trachoma 71
6.8 Vernal catarrh (spring catarrh) 72
6.9 Iritis 73
6.10 Stye (external hordeolum) 73

7. HAEMOTOLOGICAL CONDITIONS 75
7.1 Anaemia 75
7.2 Haemostatic and bleeding disorders 76
7.3 Sickle cell disease 78

8. GASTROINTESTINAL CONDITIONS 81
8.1 Diarrhoea 81
8.2 Dysentery 81
8.3 Anal conditions 83
8.4 Acute appendicitis 85
8.5 Peptic ulcer disease 86
8.6 Constipation 87

9. GYNAECOLOGY AND OBSTETRICS 89
9.1 Infertility 89
9.2 Abortion 89
9.3 Threatened abortion 90
9.4 Anaemia of pregnancy 91
9.5 Antepartum haemorrhage 92
9.6 Postpartum haemorrhage 92
9.7 Cracked nipples during breastfeeding 95
9.8 Breast abscess 95
9.9 Puerperal sepsis 96
9.10 Dysmenorrhoea 96
9.11 Ectopic pregnancy 97
9.12 Dysfunctional uterine bleeding 98
9.13 Postmenopausal bleeding 99
9.14 Pregnancy-induced hypertension—pre-eclampsia and eclampsia 99
9.15 Abnormal vaginal discharge 100
9.16 Pelvic inflammatory disease 102
9.17 Genital ulcer disease syndrome 103
9.18 Sexual assault 104
9.19 Family planning 105

Swaziland_FINAL press.indb 4 5/19/12 2:51 PM

10. PAEDIATRIC CONDITIONS 114
10.1 Immunisation 114
10.2 General danger signs in children 115
10.3 Emergency conditions 116
10.4 Diarrhoea 116
10.5 Child with a cough 120
10.6 Fever 122
10.7 Convulsions 122
10.8 Neonatal conditions 122

11. INFECTIONS AND INFESTATIONS 128
11.1 Brucellosis 128
11.2 Chicken pox 129
11.3 Herpes zoster (shingles) 130
11.4 HIV/AIDS 131
11.5 Malaria 137
11.6 Measles 139
11.7 Meningitis 140
11.8 Poliomyelitis 141
11.9 Acute rheumatic fever 145
11.10 Sexually transmitted infections 146
11.11 Septicaemia 147
11.12 Tetanus 148
11.13 Tuberculosis 151
11.14 Typhoid fever (enteric fever) 155
11.15 Helminthic infestations 157

12. MUSCULOSKELETAL CONDITIONS 163
12.1 Gouty arthritis 163
12.2 Osteoarthritis 164
12.3 Osteomyelitis 165
12.4 Pyomyositis 166
12.5 Rheumatoid arthritis 167
12.6 Septic arthritis (pyogenic arthritis) 168
12.7 Back strain 168

13. NUTRITIONAL CONDITIONS 170
13.1 Acute malnutrition 170
13.2 Micronutrient deficiencies 173

14. PSYCHIATRY 175
14.1 Anxiety 175
14.2 Depression 176
14.3 Psychoses 177
14.4 Alcoholism 180

Swaziland_FINAL press.indb 5 5/19/12 2:51 PM

15. RENAL AND URINARY TRACT CONDITIONS 182
15.1 Acute cystitis 182
15.2 Acute glomerulonephritis 183
15.3 Acute pyelonephritis 184
16. RESPIRATORY CONDITIONS 185
16.1 Asthma 185
16.2 Acute bronchitis 187
16.3 Chronic bronchitis and emphysema 188
16.4 Common cold and influenza 189
16.5 Pneumonia (pyogenic) 190
16.6 Pneumocystis carinii pneumonia 191
17. SKIN CONDITIONS 193
17.1 Acne vulgaris 193
17.2 Boil (abscess) 193
17.3 Impetigo 195
17.4 Erysipelas 196
17.5 Carbuncle 197
17.6 Cellulitis 197
17.7 Atopic eczema 198
17.8 Seborrhoeic eczema 200
17.9 Tinea pedis (athlete's foot) 201
17.10 Tinea corporis (ringworm of the body) 202
17.11 Scabies 203
17.12 Urticaria 205
18. PAIN MANAGEMENT AND PALLIATIVE CARE 206
18.1 Pain 206
18.2 Pain management strategy for adults 209
18.3 Pain management strategy for children 212
19. EMERGENCIES AND TRAUMA 214
19.1 Acute abdomen 214
19.2 Acute myocardial infarction 215
19.3 Acute pulmonary oedema 216
19.4 Hypoglycaemia and hypoglycaemic coma 217
19.5 Shock 218
19.6 Cardiac arrest 222
19.7 Bites and stings 229
19.8 Fractures 234
19.9 Burns 235
19.10 Head injuries 241
19.11 Poisoning 242
19.12 Sprains and strains 253

Swaziland_FINAL press.indb 6 5/19/12 2:51 PM

INDEX 255

SECTION B: ESSENTIAL MEDICINES LIST

THE ESSENTIAL MEDICINES LIST 261

How to Use the Essential Medicines List 261

MEDICINES INDEX 285

ANNEXES

Annex 1. Adverse Drug Reaction Form 293

Annex 2. Motion to Amend the STG/EML 295

Annex 3. Immunisation Schedules 298

Annex 4. Chart for Estimating Percentage of Total Body Surface Area (TBSA) Affected By Burns 300

Swaziland_FINAL press.indb 7 5/19/12 2:51 PM

FOREWORD

It gives me great pleasure to write the foreword to this maiden edition of the integrated standard treatment guidelines (STGs) and essential medicines list (EML) of common medical conditions in the Kingdom of Swaziland.

This document is an important tool in ensuring the population of Swaziland has universal access to essential, affordable, and quality curative health care services thereby fulfilling the objectives of the National Medicines Policy, which are to provide quality, safe, and efficacious essential medicines at affordable cost to the Swazi people and also ensure the rational use of these medicines. The fulfilment of the above objectives is part of the thrust of the National Health Sector Strategic Plan that guides the implementation of the national health policy. All these documents have been developed under the context of the National Development Strategy.

I would like to state that this document is a result of major collaborative effort and wide consultations with all stakeholders and interested parties in the public and private health sectors. Thus the STG/EML is a reflection of collectively owned and quality input from across Swaziland. The guidelines will be vital in guiding prescribers in effectively discharging their duties and will ensure discipline by ensuring selection of medicines recommended to be prescribed at certain levels and facilities.

Through these guidelines, we will have a standard approach to managing the priority medical conditions in Swaziland. Let me stress that for all practitioners to benefit from the use of this document, it must be widely circulated and should be available at all health facilities. It is envisioned that this document will also be used in preservice training of our health care workers and, as such, will be of benefit to students in our training institutions. The STG/EML will be reviewed on a regular basis to ensure that it stays abreast with changes in the medical field.

Finally I would like to commend the foresight of the Directorate: Health Services, particularly the STG/EML task team and the efforts of all those who worked on this document. Special mention and gratitude goes to the Strengthening Pharmaceutical Systems (SPS) project) funded by the USAID for providing sustained technical and financial support for the development of this important document.

I am proud to adopt this maiden edition and encourage you to use it.

Hon. Benedict Xaba
Minister of Health

Swaziland_FINAL press.indb 9 5/19/12 2:51 PM

PREFACE

The process of developing an integrated standard treatment guidelines (STG) and essential medicines list (EML) was commenced in earnest in 2004. A draft STG was developed with technical assistance from the Italian Corporation. In addition, the Nazarene Health Institutions (NHI) developed an STG for "common illnesses of children in Swaziland," and this booklet was distributed to all NHI facilities. Similarly, the Ministry of Health (MoH) worked on reviewing the EML in 2008–09 with technical assistance from the Strengthening Pharmaceutical Systems (SPS) program as funded by the USAID.

In 2010, I appointed a STG/EML task team chaired by Dr. Sithembile Nqeketho-Dlamini to consolidate these documents and come up with a comprehensive guideline and up-to-date EML. Key in the development of STGs was a wide consultation and evidence-based inclusion of medicines into the STG and ownership of the guidelines by all stakeholders. Technical experts in the various medical fields were consulted, and external consultants were engaged to give guidance in the process. At the same time, work on the Essential Health Care Package, and the Referral and Linkages documents was under way, and my ministry considered the STG/EML to be an important document to facilitate their implementation.

The product of all this work is the *Standard Treatment Guideline and Essential Medicines List of Common Medical Conditions in the Kingdom of Swaziland*. These systematically developed statements are designed to assist practitioners in making decisions about appropriate treatment for specific clinical conditions. They are meant to reflect expert consensus based on a review of current and published scientific evidence of acceptable approaches to diagnosis, management, or prevention of specific conditions.

It is enlightening to note that section A of the document contains the STG, and effort has been made to have the conditions commonly encountered in Swaziland classified according to systems. Written in simple, clear language, each section consists of a short definition followed by common symptoms and signs of the disease or condition and then management (pharmacological and nonpharmacological).

Section B is the EML derived from widely used medicines in Swaziland and also from recommendations from the STG. The medicines are clearly listed according to the Anatomical Therapeutic Chemical (ATC) classification system recommended by WHO, which is gaining international use. The ATC divides

Swaziland_FINAL press.indb 11 5/19/12 2:51 PM

medicines into different groups according to the organ or system on which they act and their chemical, pharmacological and therapeutic properties. This links seamlessly with the STG section of the document.

I am confident that this publication will prove to be of great assistance to all prescribers. It should be properly used to reduce misuse and eliminate irrational management and use of medicines in our country.

Dr. Steven Shongwe
Principal Secretary

MINISTRY OF HEALTH
PRINCIPAL SECRETARY
06 MAR 2012
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Swaziland_FINAL press.indb 12 5/19/12 2:51 PM

ACRONYMS

3TC	lamivudine
ABC	airway, breathing, circulation
ACE	angiotensin converting enzyme
AIDS	acquired immuno-deficiency syndrome
AMI	acute myocardial infarction
ANC	antenatal care
ANUG	acute necrotising ulcerative gingivitis
APH	antepartum haemorrhage
ART	antiretroviral therapy
ARV	antiretroviral
ASOT	antistreptolysin-O [blood test]
AZT	zidovudine
BCG	bacillus Calmette-Guérin [TB vaccine]
BMI	body mass index
BP	blood pressure
BPC	British Pharmaceutical Codex
BUN	blood urea nitrogen
C&S	culture and sensitivity
CBC	complete blood count
CCF	congestive cardiac failure
CMM	cervical mucous method
CMS	Central Medical Stores
CNS	central nervous system
COC	combined oral contraceptive
CSF	cerebrospinal fluid
CPR	cardiopulmonary resuscitation
CT *or* CAT	computerized axial tomography
DBS	dried blood spot
DIC	disseminated intravascular coagulation
dL	decilitre
DM	diabetes mellitus
DPT	diphtheria tetanus pertussis
DRTB	drug-resistant tuberculosis
DSM-IV	*Diagnostic and Statistical Manual of Mental Disorders* (4th ed.)
DST	drug sensitivity testing
DT	diphtheria, tetanus
DPT	diphtheria, tetanus, and acellular pertussis
ECG	electrocardiogram
EEG	electroencephalogram
EFV	efavirenz
EML	essential medicines list
ENT	ear, nose, and throat
EPI	Expanded Programme on Immunization [WHO]
ETO	ethionamide
FBG	fasting blood glucose
FBS	fasting blood sugar
FP	family planning
g	gram
GCS	Glasgow coma scale
GIT	gastrointestinal tract
HAART	highly active antiretroviral therapy
Hb	haemoglobin
HbA1AC	glycosylated haemoglobin
HBV	hepatitis B vaccine
HC	health centre

Swaziland_FINAL press.indb 13 5/19/12 2:51 PM

HCW	health care worker
HebB	hepatitis B
Hib	*Haemophilus* influenza B
HIV	human immunodeficiency virus
HT	hypertension
HTC	HIV testing and counselling
ICU	intensive care unit
IgE	immunoglobin E
IM	intramuscular
IMCI	Integrated Management of Childhood Illness
IU	international unit
IUD	intrauterine device
IV	intravenous
KS	Kaposi's sarcoma
LAM	lactational amenorrhoea method
LDL	low-density lipoprotein
LFT	liver function test
LFX	levofloxacin
LIP	lymphoid interstitial pneumonia
LOC	loss of consciousness
MCS	microscopy, culture, and sensitivity
MDR	multidrug resistant [TB]
mg	milligram
mL	millilitre
mm Hg	millimeters of mercury
mmol/L	millimole per litre
MO	medical officer
MoH	Ministry of Health
MRI	magnetic resonance imaging
MU	million units
NERCHA	National Emergency Response Committee on HIV/AIDS
NGT	nasogastric tube
NPH	neutral protamine Hagedorn [insulin]
NSAID	nonsteroidal anti-inflammatory drug
NVP	nevirapine
OPV	oral polio vaccine
ORS	oral rehydration salts
PAS	p-aminosalicylic acid
PCR	polymerase chain reaction
PMT	pharmaceutical management training
PAHO	Pan American Health Organization
PEF	peak expiratory flow
PEFR	peak expiratory flow rate
PEM	protein energy malnutrition
PEP	postexposure prophylaxis
PHU	Public Health Unit
PID	pelvic inflammatory disease
PMTCT	prevention of mother-to-child transmission
PO	*per os* (by mouth)
POP	progestogen-only pill
PPH	postpartum haemorrhage
PR	per rectum
PRN	*pro re nata* [as needed]
PTB	pulmonary tuberculosis
PV	per vaginum
PZA	pyrazinamide
RBC	red blood cell
RBG	random blood glucose
RBS	random blood sugar
RDT	rapid diagnostic testing
RIG	rabies immunoglobulin
RPR	rapid plasma reagent
RR	respiratory rate

Swaziland_FINAL press.indb 14 5/19/12 2:51 PM

RTI	respiratory tract infection
RV	rabies vaccine
SC	subcutaneous
SIADH	syndrome of inappropriate antidiuretic hormone hypersecretion
SLE	systemic lupus erythematosus
SOP	standard operating procedure
SPS	Strengthening Pharmaceutical Systems [Program]
STG	standard treatment guideline
STI	sexually transmitted infection
TB	tuberculosis
TBSA	total body surface area
TCA	tricyclic antidepressant
DT	diphtheria toxoid
TDF	tenofovir
TIG	tetanus immunoglobulin
TPHA	treponema pallidum hemagglutination assay
TRZ	triple nuceoside
TT	tetanus toxoid
U	unit
UEA	Ung Emulcificans Aqueosum
URT	upper respiratory tract
VDRL	Venereal Disease Research Laboratory
VSC	voluntary surgical contraception
WBC	white blood cell
WHO	World Health Organization
XDR	extremely drug resistant [TB]

Swaziland_FINAL press.indb 15 5/19/12 2:51 PM

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Swaziland_FINAL press.indb 16 5/19/12 2:51 PM

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Swaziland_FINAL press.indb 18 5/19/12 2:51 PM

HOW TO USE THIS BOOK

Following is a general overview of what this book contains and how to find it.

Sections of the Book

The standard treatment guidelines (STG) and essential medicines list (EML) of common medical conditions in the Kingdom of Swaziland is divided into two sections:

- Section A: The STG component
- Section B: The EML component

How to Use the Standard Treatment Guidelines

The STG content in section A is divided into 19 chapters that cover specific diseases by systems or conditions. For example, in chapter 1, "Cardiovascular System," you will find "1.1 Hypertension," and "1.4 Congestive Cardiac Failure."

Where applicable, each condition or disorder follows this format—

- **Name** of disease or condition
- **Definition** (World Health Organization [WHO] standard case definitions if possible) followed by a short description, introduction, or explanation
- **Causes** (including duration and risk factors)
- **Symptoms and signs** (indicating the danger signs)
- **Special investigations**
- **Management**
  - Indicating **nonpharmacological** and **pharmacological** management
  - Differentiating treatment according to level of facility
  - Indicating when to **REFER** ⚠
  - Advising according to age group
  - Mentioning side effects of certain medicines
  - Including important notes and precaution measures (see ***Caution*** notes)
- **Health promotion,** education, counselling, and follow-up (including dietary advice, follow-up dates, adherence checks, surveillance and contact tracing, rehabilitation advice, and complications, if applicable)

You will note that acronyms and abbreviations are not defined in the text of sections A and B. Please refer to the comprehensive list of acronyms in the frontmatter.

Swaziland_FINAL press.indb 19 5/19/12 2:51 PM

How to Use the Essential Medicines List

The EML content in section B is divided broadly into 15 primary sections according to the international Anatomical Therapeutic Chemical (ATC) classification system. Medicines are divided into groups according to the organ or system on which they act and their chemical, pharmacological, and therapeutic properties. The specific ATC codes, however, are not included because they are of no practical use for health workers. The medicines are listed according to their generic names.

Explanation of columns in the EML:

- **Column 1: Medicine.** This column contains the generic name of the medicine.
- **Column 2: Strength.** This column contains the different strengths of the preparations in the list. Combination strengths are illustrated by a + sign (e.g., rifampicin + isoniazid (150 mg + 75 mg) tablet.
- **Column 3: Dosage form.** This column describes the dosage form in which the medicines are available.
- **Column 4: Level.** This column describes at which level of care the medicine can be ordered and prescribed.
  - **A**—Indicates medicines that are distributed to all health care facilities as part of primary health care services. Both doctors and nurses can prescribe medicines from this class.
  - **B**—Indicates medicines that are distributed to health centres and hospitals. The prescribing of these medicines is restricted to medical doctors only.
  - **C**—Indicates medicines that are distributed to hospitals only. Medicines in this class can only be prescribed by medical doctors working in hospitals, following appropriate microbial or diagnostic test results.
  - **S**—Indicates medicines that are distributed on demand by specialist doctors.
  - **Asterisk** (*)—Indicates medicines that are distributed by (vertical) national programmes (e.g., tuberculosis, mental health, family planning, Expanded Programme on Immunization [EPI], and malaria control).

Swaziland_FINAL press.indb 20 5/19/12 2:51 PM

- **Column 5: VEN.** The VEN classification (used here as vital, essential, nonessential) describes the various medicines according to the importance of their therapeutic effect. It serves as a guide to prioritise medicine ordering in cases where budgets are insufficient to keep all EML medicines in stock.
  - **V**—These medicines are considered vital and should be in stock at the respective level at all times. These medicines are mostly used for life-threatening conditions and/or used for treatment that should not be stopped.
  - **E**—These medicines are essential for the health services. If at all possible, they should be available at the health facilities. They include medicine that are effective against less-severe but widespread illnesses
  - **N**—These medicines are nonessential. If they are not available for prescribing, however, no serious negative impact on the population's health is expected. In times of budgetary constraints, these medicines are of lowest priority

Feedback and Requests for Changes

Comments on and requests for changes to the STG or EML should be discussed in institutional Pharmacy Therapeutic Committees and forwarded with recommendations to the Pharmaceutical Services Department at the Ministry of Health.

Proposals for changes must be submitted using the appropriate form (refer to annex 2 of this document). It is important that sufficient evidence be submitted (preferably controlled clinical trials) to support any changes.

Swaziland_FINAL press.indb 21 5/19/12 2:51 PM

SECTION A

Standard Treatment Guidelines

1. CARDIOVASCULAR CONDITIONS

1.1 Hypertension

Definition

- Hypertension is three successive elevated systolic readings above 140 mm Hg and/or diastolic readings over 90 mm Hg.
- Diagnosis is made on the basis of persistently high blood pressure. It requires three sphygmomanometer measurements a week apart. If severe or if symptoms of organ damage are present, however, diagnosis may be given immediately and treatment started.
- Levels of hypertension are defined in table 1.1A.

Table 1.1A Levels of Hypertension in Adults

Level	Systolic mm Hg	Diastolic mm Hg
Mild	>140	>90
Moderate	>160	>99
Severe	>170–199	>100

Causes

- Mostly idiopathic
- Secondary to other diseases (e.g., renal and endocrine disorders)

Risk factors

- Family history
- Lifestyle (e.g., sedentary lifestyle, obesity, smoking)

Symptoms and signs

- Often asymptomatic
- Headache
- Palpitations
- Blurred vision
- Chest pains
- Shortness of breath
- Epistaxis

Nonpharmacological management

Lifestyle modification is required.

- Dietary change
  - Low-salt diet
  - Low-fat diet
  - High-fibre diet
  - No alcohol

Swaziland_FINAL press.indb 25 5/19/12 2:51 PM

- Behavioural change
  - Regular aerobic exercise (i.e., 30 minutes of exercise 3 times a week to the point of sweating)
  - No smoking
  - Stress management
  - Weight management to maintain an ideal BMI (18.5–25)

Pharmacological management

- Stepwise management (see table 1.1B)—assess:
  - Level of blood pressure (refer to table 1.1A)
  - Target organ damage (eyes, kidney, heart)
  - Presence of cardiovascular risk factors (DM, metabolic syndrome [BMI of >25], LDL cholesterol, and the risk factors listed above)
  - In the clinic or health centre, if a patient presents with suggestive end organ damage or major risk factors, **REFER** to the hospital. ⚠
- Relevant tests
  - Weight (monthly)
  - Height
  - Ophthalmoscopy (yearly)
  - Urine analysis (monthly)
  - Lipid profile
  - Waist circumference
- Contraindications
  - Hydrochlorothiazide; avoid in–
    - Gout
    - Dyslipidemia (diabetes-relative contraindications)
  - Beta-adrenergic blocking agent (e.g., atenolol); avoid in—
    - Heart failure
    - DM
    - Asthma and chronic obstructive airways disease
    - Peripheral vascular disease
    - Bradycardiac pulse rate less than 50 beats/minute
  - ACE inhibitors (e.g., hyperkalaemia); avoid in—
    - Pregnancy
    - Renal impairment
    - Persistent dry cough

Swaziland_FINAL press.indb 26 5/19/12 2:51 PM

Table 1.1B Stepwise Pharmacological Management of Hypertension

Step 1		
Entry to Step 1	**Treatment**	**Target**
Mild hypertension ▪ Without existing cardiovascular disease, major risk factors, and co-morbidities	Lifestyle modification	BP <140/90 mm Hg within 2 months
Step 2		
Entry to Step 2	**Treatment**	**Target**
Moderate hypertension ▪ Without existing cardiovascular diseases, major risk factors and co-morbidities ▪ Failure of lifestyle modification	Lifestyle modification **—PLUS—** **Hydrochlorothiazide** 12.5 mg PO daily **(A)**	BP <140/90 mm Hg within 3 months
REFER to hospital. ⚠		
Step 3		
Entry to Step 3	**Treatment**	**Target**
Failure to achieve target in steps 1 and 2 **—OR—** Severe hypertension	Lifestyle modification **—PLUS—** **Hydrochlorothiazide** 12.5–25 mg PO daily **(A)** **—PLUS—** ACE inhibitor [e.g., **captopril** 12.5 mg PO twice daily titrate up wto 50 mg three times daily **(B)**] **—OR—** Beta-adrenergic blocker: **atenolol** 50 mg PO daily **(B)**	BP <140/90 mm Hg within 3 months
Step 4		
Entry to Step 4	**Treatment**	**Target**
Failure of step 3 after 1 month of compliance	Lifestyle modification **—PLUS—** **Hydrochlorothiazide** 12.5–25 mg PO daily **(A)** **—PLUS—** ACE inhibitor [e.g., **captopril** 12.5 mg PO twice daily titrate up to 50 mg three times daily **(B)**] **—PLUS—** Beta-adrenergic blocker: **atenolol** 50 mg PO daily **(B)**	BP <140/90 mm Hg within 3 months
Step 5. REFER to specialist or expert panel. ⚠		

Swaziland_FINAL press.indb 27 5/19/12 2:51 PM

1.2 Acute rheumatic fever

Definition

Rheumatic fever is a disease or condition in which the body develops antibodies against its own tissues. It generally follows a streptococcal throat or upper respiratory tract infection, especially between the ages 3 and 15, but it can occur in patients up to 30 years old. It is a systemic disease that primarily affects the heart and joints, and is characterised as—

- Carditis
- Migratory polyarthritis
- Syndenham's chorea
- Subcutaneous erythema marginatum
- Minor
  - Elevated acute phase reactants
  - Fever and arthralgia

Symptoms and signs

- Fever
- Anorexia
- Flitting (migratory) joint pain
- Possible previous sore throat or skin infection
- Heart murmur
- Erythema marginatum (reddish rash at the extremities)
- Chorea (involuntary movement of limbs and face)
- Subcutaneous nodule

Diagnosis

- Modified Jones criteria
- All suspected cases should be **REFERRED**. ⚠

Nonpharmacological management

- Hot compress
- Bed rest

Pharmacological management

Adults—

- Treatment
  - **Phenoxymethylpenicillin** 500 mg PO every 8 hours for 7–10 days **(A)**
  - **Acetylsalicylic acid (aspirin)** 25 mg/kg body mass PO every 6 hours until fever has disappeared **(A)**
  - In severe carditis, give **prednisolone** 1–2 mg/kg PO daily for three weeks **(A)** and reduce dose gradually over 7 days.
-

Swaziland_FINAL press.indb 28 5/19/12 2:51 PM

- Prophylaxis
  - **Benzathine benzylpenicillin** 1.2 MU IM every 3 weeks for life **(A)**
    —OR—
  - **Phenoxymethylpenicillin** 250 mg PO every 12 hours for life **(A)**
- ***For patients who are allergic to penicillin—***
  - **Erythromycin** 500 mg PO every 12 hours daily for life **(A)**

Children—

- Treatment
  - **Phenoxymethylpenicillin** 125–250 mg PO every 6 hours for 7–10 days **(A)**
  - **Acetylsalicylic acid (aspirin)** 25 mg/kg body mass PO four times daily until fever has disappeared **(A)**. ***Caution:*** Contraindicated in children <8 years; the clinician should weigh benefit of aspirin use against the risk of Reye's syndrome.
  - In severe carditis, give **prednisolone** 1–2 mg/kg PO daily for 14 days, and then reduce dose gradually over 7 days **(A)**.
- Prophylaxis
  - **Benzathine benzylpenicillin** 600,000 IU IM every 3 weeks up to 21 years. For children over 30 kg, give adult dose **(A)**.
    —OR—
  - **Phenoxymethylpenicillin** 125–250 mg PO every 12 hours up to 21 years **(A)**
- ***For patients who are allergic to penicillin—***
  - **Erythromycin** 125–250 mg PO every 12 hours daily up to 21 years **(A)**

REFER all cases. ⚠

1.3 Valvular heart disease

Definition

Damage to heart valves commonly caused by rheumatic fever and occasionally by other causes; congenital heart defects; ischaemic heart disease

Common valvular heart diseases include—

- Aortic stenosis
- Mitral valve stenosis
- Mitral regurgitation
- Aortic regurgitation
- Mitral valve prolapse

Symptoms and signs

- Asymptomatic
- Features of CCF (see 1.4)
- Heart murmurs

Swaziland_FINAL press.indb 29 5/19/12 2:51 PM

Nonpharmacological management

- Recommend lifestyle modifications.
- Advise all patients with heart murmur to inform health care providers of the presence of the heart murmur before receiving medical or dental treatment.
- **REFER** all patients with heart murmurs for assessment. ⚠

Pharmacological management

- **REFER** for specialist treatment. ⚠

1.4 Congestive cardiac failure

Definition

CCF is a failure of the heart to pump blood forward at sufficient rates to meet the demands of the body (i.e., an inadequacy of the delivery of **oxygen**-rich blood to the body).

Symptoms and signs

- Symptoms
  - Progressive swelling of the body (generalised oedema)
  - Dyspnoea (shortness of breath)
  - Orthopnoea (shortness of breath while lying down)
  - Pitting oedema
  - Paroxysmal nocturnal dyspnoea (sudden shortness of breath at night in the orthopneic position)
  - Persistent productive cough (frothy)
  - Fatigue
  - Nocturia
- Signs—see table 1.4.
- Severity. Use the following functional classification from the New York Heart Association to determine how severe the CCF is.
  - *Class 1:* Dyspnoea only with greater than ordinary activities
  - *Class 2:* Dyspnoea with ordinary activity
  - *Class 3:* Dyspnoea with minimal activity
  - *Class 4:* Dyspnoea at rest

Diagnosis

- Mainly clinical diagnosis
- ECG
- Chest X-ray
- Echocardiogram

Swaziland_FINAL press.indb 30 5/19/12 2:51 PM

Table 1.4 Signs of Congestive Cardiac Failure

Right	Left	Global CCF
Raised jugular vein	Crepitations in both lungs	All signs for right and left
Rapid pulse	Cyanosis	
Pitting oedema	Heart gallop	
Enlarged and tender liver	Displaced apex beat	
Hepatojugular reflex		
Ascites		

Nonpharmacological management

- Lifestyle modification
  - Dietary changes
    - Low-salt diet
    - Restricted fluid intake
  - Behavioural changes
    - Ambulation according to ability
    - Smoking cessation
    - Health promotion
- Pre-referral treatment
  - **Oxygen**
  - Semi-Fowler's position
  - Restricted fluid intake

Pharmacological management

- **REFER** all cases. ⚠

Hospital management

- **Step 1.** Give an ACE inhibitor: **captopril** 12.5–25 mg PO daily, gradually increasing to twice daily **(B)**. Use caution if BP is low.
  —PLUS—
- A diuretic: **furosemide** 40 mg PO daily **(B)**
- **Step 2.** Add **spironolactone** 25 mg PO daily **(B)**—only if serum potassium can be monitored. ***Caution:*** Spironolactone can cause hypokalaemia. Do not use together with potassium supplements. Do not use in kidney failure.
- **Step 3. REFER** for specialist treatment. ⚠

Swaziland_FINAL press.indb 31 5/19/12 2:51 PM

2. CENTRAL NERVOUS SYSTEM

2.1 Epilepsy

Definition

Epilepsy is a condition characterized by recurrent, unprovoked seizures. To be diagnosed with epilepsy, an individual must have had two or more seizures in the last 12 months. Table 2.1A describes the types of epilepsy.

Table 2.1A Types of Epilepsy

Partial			
Simple Partial		**Complex Partial**	
Seizure on one side of the body with no loss of consciousness		Partial seizure associated with a loss of consciousness	
Generalised			
Generalised Tonic-Clonic	**Tonic**	**Myoclonic**	**Absence**
▪ Loss of consciousness preceded by— ▪ A brief stiff phase, which is followed by— ▪ Jerking of all the limbs	One or more limbs become stiff without jerking	Brief, usually generalized, jerks with retained awareness	▪ Occurs in childhood ▪ Sudden cessation of activity followed by a blank stare ▪ Usually no muscle twitching ▪ Some children will smack their lips

Diagnosis

Diagnosis of seizure is mainly based on history and clinical examination; therefore, it requires an accurate witness description of the epileptic seizures. It is important to take into consideration common differential diagnoses such as syncope and psychogenic non-epileptic seizures.

Supplementary assessment should include a physical assessment, including complete neurological examination, random blood glucose level, electrolytes (i.e., sodium, calcium, magnesium), and renal and liver functions. Important studies to be considered include an EEG and a neuroimaging exam (e.g., CT scan or MRI).

Swaziland_FINAL press.indb 32 5/19/12 2:51 PM

Nonpharmacological management

- Emphasize the need for family and community support; assign a treatment supporter.
- Instruct the patient to keep a seizure diary to record the date, time, and most important, the description of the seizures.
- Inform the patient that alcohol, illicit drugs, and herbal or traditional medicines can cause or worsen seizures.
- Advise epileptic patient against doing any of the following:
  - Driving of a vehicle if he or she has not been certified to be seizure-free (usually for a period of 6 months, but this is at the discretion of the certifying specialist)
  - Swimming alone
  - Working at heights
  - Ingesting alcohol
  - Operating machinery
  - Cooking by open fire alone

Pharmacological management

General pharmacological management guidelines include the following:

- Begin with monotherapy at lowest dosage range.
- If seizures are not controlled, incrementally increase dose to upper limit of dosage range or until side effects appear.
- If seizures are poorly controlled, change to a different medicine, gradually reducing the dose of the initial agent while simultaneously introducing the new one.
- Try three single medicines before resorting to a medicine combination, which is helpful in only a minority of cases.
- Treatment can be stopped only after 2 years of being seizure-free and after a full evaluation and discussion with patient.
- Regular compliance is the key to successful seizure control and counselling the patient is the most critical factor in compliance.
- Similar efficacy rates of most anti-epileptic medicines mean the adverse effect profile is often the determining factor in medicine selection.
- The most common adverse effects are dose-dependent and reversible.

Table 2.1B provides a summary of pharmacological management. Table 2.1C provides detailed pharmacological treatment instructions.

Swaziland_FINAL press.indb 33 5/19/12 2:51 PM

Table 2.1B Summary of Pharmacological Management of Epilepsy

Type of Seizure	Treatment
Generalized tonic–clonic, simple partial, and complex partial seizures	**Carbamazepine, phenobarbital, phenytoin,** and **valproic acid** are widely used in the treatment of these conditions. Each of these medicines is associated with dose-related and idiosyncratic adverse effects, however, and monitoring of haematological and hepatic functions is often advised, particularly for **carbamazepine** and **valproic acid.**
Absence seizures	Both **ethosuximide** and **valproic acid** are widely used in the treatment of absence (*petit mal*) seizures and are usually well tolerated. **Ethosuximide**, however, can (rarely) cause lupus erythematosus and psychoses, which call for immediate, but cautious, discontinuation. Moreover, because absence seizures are commonly associated with tonic–clonic seizures, **valproic acid** is often preferred since it is effective in both disorders.
Tonic seizures, atonic seizures, and atypical absence seizures	**Phenobarbital** and **phenytoin** are widely used for tonic seizures, and valproic acid for atonic seizures and atypical absence seizures.
Myoclonic seizures	**Valproic acid** is widely used and most effective for juvenile myoclonic seizures. Other myoclonic medications as listed may be preferable.

Special conditions

- Neonates and children—
  - Phenobarbital is the first choice medication in neonates.
  - Avoid using phenobarbitone because it can cause behavioural and cognitive dysfunctions.
  - As children grow, their medication should be titrated up. Weigh child, and **REFER** for review by MO at least every 6 months.
- Pregnancy—
  - When possible, women should have their epilepsy treatment reviewed before becoming pregnant.
  - Women of child-bearing potential should *not* be started on **valproate** without specialist's advice.
  - Pregnant women should take a **folate** supplement (**folic acid** 5 mg/day) and **oral phytomenadione (vitamin K)** (10 mg/day) in the last month of pregnancy.
  - Baby should be given **phytomenadione (vitamin K)** (1 mg IM) stat at birth **(A)**.

Swaziland_FINAL press.indb 34 5/19/12 2:51 PM

- Epilepsy with TB and/or HIV—
  - When patients are started on anti-epileptic medicines and ART or anti-TB therapy, they should be reviewed by an MO because of potential problems with drug interactions.
  - Sodium valproate is the first line for individuals on ART or TB treatment.

REFER: ⚠

- To an MO for initial evaluation to assess for epilepsy aetiology
- To an MO for medication change, evaluation of side effects, or poor seizure control

2.2 Status epilepticus

Definition

Status epilepticus is defined as a generalized convulsion lasting 5 minutes or longer, or repeated tonic-clonic convulsions occurring over 5 minutes. It is a medical emergency that carries a high mortality rate.

Diagnosis

- Diagnosis is based on history.
- ***Caution:*** If a patient is diagnosed with status epilepticus, start management before any laboratory tests.

Nonpharmacological management

- Start ABC (see tables 19.6.1 and 19.6.2)
  - **Airway**—secure airway; may need to intubate the patient
  - **Breathing**—give **oxygen**
  - **Circulation**—assess pulse and blood pressure, establish IV access, fluid resuscitation
- Check blood sugar level, and if RBS <2 mmol/L, give glucose [50 mL of **50% dextrose (B)**], and then follow guidelines for hypoglycaemia (see 19.4).

Pharmacological management

- Give **vitamin B1 (thiamine)** 100 mg IV **(A)**, if patient shows any sign of alcohol abuse.
- If patient is pregnant, consider eclampsia, and treat with **magnesium sulphate (B)** (see chapter 9).

REFER ⚠

- Management in the ICU is recommended.

Swaziland_FINAL press.indb 35 5/19/12 2:51 PM

Table 2.1C Medicines Used to Treat Epilepsy

Cautions	Interactions	Side Effects	Dosages
Sodium valproate (B*)—Indication: all forms of epilepsy. First choice when patient is on ART.			
▪ Liver toxicity, potentially fatal (especially in children <2 yrs) ▪ Blood or hepatic disorders (measure LFTs and CBC before starting therapy) ▪ Pancreatitis ▪ SLE ▪ Avoid abrupt withdrawal ▪ Renal impairment ▪ Pregnancy (spina bifida occurs in 1–2% of exposures 17–30 days after fertilisation) ▪ Breastfeeding	▪ May act as a hepatic enzyme inhibitor ▪ Zidovudine—serum levels are increased. Monitor closely for signs of toxicity ▪ Other antiepileptics—raises plasma concentrations of active metabolite of carbamazepine, phenobarbitone, and phenytoin (may also lower phenytoin) ▪ Does *not* reduce efficacy of oral contraceptive pill	▪ Common—nausea, vomiting, diarrhoea, and constipation. CNS effects (dose-related) include fatigue, sedation, and ataxia. ▪ Uncommon—skin rashes, hair loss, blood and liver disorders, and pancreatitis. Inform patients how to recognise (i.e., watch for fever, sore throat, rash, mouth ulcers, bruising or bleeding, abdominal pain)	**Adults—** ▪ Initially, give 300 mg every 12 hours, preferably after food. ▪ Increase by 100 mg every 12 hours, every 3 days. • Maximum: 2.5 g daily in divided doses • Usual maintenance dose: 1–2 g daily (20–30 mg/kg) **Children—** **Weight ≤20 kg** ▪ Initially, give 20 mg/kg daily in divided doses. ▪ Increase slowly to 40 mg/kg daily. **Weight >20 kg** ▪ Initially, give 400 mg daily in divided doses. ▪ Increase according to response. • Maximum: 35 mg/kg daily • Usual range: 20–30 mg/kg daily

Swaziland_FINAL press.indb 36 5/19/12 2:51 PM

Table 2.1C Medicines Used to Treat Epilepsy (continued)

Cautions	Interactions	Side Effects	Dosages
Phenobarbital (phenobarbitone) (B)—Indication: all forms of epilepsy except absence and myoclonic seizures			
▪ Diabetes ▪ Asthma ▪ Hyperthyroidism ▪ Elderly (may cause sedation or depression) ▪ Debilitated person ▪ Children (behavioural and learning problems may occur) ▪ Hepatic impairment ▪ Renal impairment ▪ Respiratory depression ▪ Pregnancy ▪ Breastfeeding	▪ ART medicines—avoid concurrent use (hepatic enzyme inducing) ▪ Other antiepileptics—often lowers plasma levels of carbamazepine, valproate, and phenytoin ▪ Alcohol—increased sedative effect ▪ Oestrogens + progestogens—accelerates metabolism	▪ Common—drowsiness (especially with initiation of therapy) ▪ Uncommon—ataxia, nystagmus, dizziness, psychomotor impairment ▪ Rare—skin reactions, including Stevens-Johnson syndrome, megaloblastic anaemia, which may be treated with folic acid **(A)**	**Adults—** 1. Start at 1 mg/kg/day—usually 2 tablets (60 mg) at bedtime. 2. After first 2 weeks, increase to 2 mg/kg/day—usually 4 tablets (120 mg) at bedtime. 3. Continue for next 4 weeks. Check compliance and side effects. 4. After an additional 4 weeks— a. If the patient has had no seizures, keep the same dosage. b. If the patient has had seizures, increase to 3 mg/kg/day—usually 6 tablets at bedtime. 5. Review after 4 weeks. If seizures persist— a. Check weight and recalculate dose at 3 mg/kg/day. b. Check compliance. c. If dosage and compliance are satisfactory, **REFER** to MO. d. If dosage is insufficient, increase dosage and repeat steps 3 and 4. **Children—** **(<15 yrs, <30 kg)** 1. Weigh child. 2. Calculate total final dose based on 5 mg/kg. 3. Start at half final dose at bedtime. 4. After first 2 weeks increase to total dose. 5. Continue for the next 4 weeks. 6. After an additional 4 weeks if patient has had additional seizures, increase dose to 8 mg/kg.

Swaziland_FINAL press.indb 37 5/19/12 2:51 PM

Table 2.1C Medicines Used to Treat Epilepsy (continued)

Cautions	Interactions	Side Effects	Dosages
Carbamazepine (B*)—Indication: first choice in partial, also use for primary and secondary generalized tonic-clonic seizures. Hepatic enzyme inducer.			
▪ History of kidney or liver disease ▪ Cardiac disease ▪ Skin reactions ▪ History of haematological reactions to other medicines ▪ Susceptibility to angle-closure glaucoma ▪ Pregnancy ▪ Breastfeeding	▪ ART medicines—avoid concurrent use (hepatic enzyme inducing) ▪ Isoniazid—may increase reactive intermediates causing hepatotoxicity ▪ Oral contraceptive—efficacy impaired ▪ Other antiepileptics—often lowers plasma concentration of valproate and phenytoin (may raise phenytoin level). May raise phenobarbitone levels.	▪ Common—sedation, dry mouth, dizziness, ataxia, nausea, vomiting (may subside spontaneously after 7–14 days treatment or dose reduction) ▪ Uncommon—skin reactions, including Stevens-Johnson syndrome; osteomalacia, SIADH, hepatotoxicity; agranulocytosis; thrombocytopenia; aplastic anaemia.	**Adults—** Initially, give 200 mg at bedtime. ▪ After first 2 weeks, increase to 200 mg every 12 hours. ▪ After 2 additional weeks, increase to 200 mg mane, 400 mg nocte. ▪ After another 2 additional weeks, increase to 400 mg every 12 hours; up to 1600 mg may be needed. **Children—** Below is total final dosage; increase gradually, as for adults: ▪ Up to 1 year: 100–200 mg ▪ 1–5 years: 200–400 mg ▪ 5–10 years: 400–600 mg ▪ 10–15 years: 600–800 mg

Swaziland_FINAL press.indb 38 5/19/12 2:51 PM

Table 2.1C Medicines Used to Treat Epilepsy (continued)

Cautions	Interactions	Side Effects	Dosages
Phenytoin (B*)—Indication: all forms of epilepsy except absence and myoclonic seizures			
▪ Impaired cardiac function ▪ Hepatic and renal impairment ▪ Pregnancy ▪ Breastfeeding	▪ ART medicines—avoid concurrent use (hepatic enzyme inducing) ▪ Other antiepileptics—often lowers plasma concentration of carbamazepine and valproate; often raises concentration of phenobarbitone.	*Chiefly related to plasma levels.* ▪ Common—nausea, vomiting, tremor, confusion, headache, dizziness, nystagmus, ataxia, diplopia, drowsiness, speech disturbance. Skin rashes (in up to 10%); discontinue if mild and re-introduce cautiously but stop immediately if recurrence. ▪ Uncommon—Stevens-Johnson syndrome, toxic epidermal necrolysis, acne, hirsutism, coarse facies. ▪ Rare—hepatotoxicity, blood disorders, lymphadenopathy, osteomalacia, peripheral neuropathy, dyskinesia	**Adults—** ▪ Initially, give 150–300 mg daily as a single dose or in divided doses. Maximum single dose: 300 mg. ▪ Increase by 50 mg/day, every 5–10 days, as required. Usual maintenance range: 5–7 mg/kg/day (200–500 mg) daily. **Children—** ▪ Initially, give 5 mg/kg daily in two divided doses. ▪ Increase gradually as required. ▪ Usual maintenance range: 5–8 mg/kg daily ▪ Maximum: 300 mg daily

Swaziland_FINAL press.indb 39 5/19/12 2:51 PM

2.3 Headache

Definition

Application of the term *headache* in practice is restricted to discomfort at the cranial vault. It is usually caused by traction, displacement, inflammation, vascular spasm, or distension of the pain-sensitive structures in the head and neck. New onset headaches and/or those different from any previous episodes could be a symptom of serious illness and, therefore, demand prompt evaluation.

Headaches can be classified into primary and secondary headaches.

- Primary headaches include cluster headache, migraine, and tension headache.
- Secondary headaches are those that arise from organic disorders such as infections, neuropathies, vascular insults, and tumours.

Diagnosis

It is of utmost importance to identify any life-threatening condition that might cause secondary headaches. Look for red-flag symptoms and signs, and/or conditions, and **REFER** the patient to a hospital for further assessment: ⚠

- Focal neurological signs (e.g., motor, sensory, visual disturbances, loss of balance)
- Consciousness
- Fever and chills
- Seizures
- Nuchal rigidity or other meningism
- Papilloedema, pre-retinal or retinal hemorrhage
- History of bleeding diathesis, hypercoagulable state, cancer, HIV/AIDS, autoimmune disorders, illicit drug abusers

Proper history taking:

- Location of the pain including migrating and radiating nature
- Pain characteristics
- Temporal nature: duration, seasonal/diurnal variations, frequency
- Severity of pain: interferes or not with daily activity, trigger and relieving factors
- Associated symptoms and signs
- Concurrent and recent medications
- Past medical history

Examinations:

- Complete neurological exam
- Blood pressure, temperature, and pulse rate

Swaziland_FINAL press.indb 40 5/19/12 2:51 PM

- Tender points, involving the temporal arteries, scalp, sinuses, neck and shoulder muscles
- Evaluation for papilloedema, retinal hemorrhage

Nonpharmacological management

- Relaxation techniques
- Stress avoidance
- Counselling or psychotherapy
- Identification and elimination of trigger factors

Pharmacological management

Adults—

- **Paracetamol** 500–1,000 mg PO every 6–8 hours **(A)**
  —OR—
- **Diclofenac** 25–50 mg PO every 8 hours **(B)**
  —OR—
- **Ibuprofen** 200–400 mg PO every 12 hours **(A)**

Children—

- **Paracetamol (A)**
  - 3 months to 1 year: 60–120 mg PO every 6–8 hours
  - 1–5 years: 120–250 mg PO every 6–8 hours
  - 6–12 years: 250–500 mg PO every 6–8 hours

REFER ⚠

- Patients presenting any of the previously mentioned red-flag symptoms or signs should be referred to a hospital for further assessment.
- If a primary headache is suspected, refer the patient to an MO. (See 2.4 and 2.5.)

2.4 Tension headache

Definition

Tension headache is the most common type of headache. It is usually bilateral, with occipitonuchal, temporal, or frontal predominance or diffuse extension over the top of the cranium. Usually described as dull and aching, but also as a fullness, tightness, or feeling that the head is swollen and may burst.

Diagnosis

Screen red-flag symptoms and signs to rule out a life-threatening condition:

- Focal neurological signs (e.g., motor, sensory, visual disturbances, loss of balance)
- Consciousness
- Fever and chills
- Seizures

Swaziland_FINAL press.indb 41 5/19/12 2:51 PM

- Nuchal rigidity or other meningism
- Papilloedema, pre-retinal or retinal hemorrhage
- History of bleeding diathesis, hypercoagulable state, cancer, HIV/AIDS, autoimmune disorders, illicit drug abuse

Differential diagnosis

A tension headache is basically a migraine without aura. Very commonly, waves of aching pain are superimposed, which may be interpreted as paroxysmal and throbbing, especially if the headache is more on one side, but absent the persistent throbbing quality, photophobia, and phonophobia of migraine. Most tension headaches do not seriously interfere with daily activities. No further investigations are needed if tension headache is the definitive diagnosis.

Nonpharmacological management

- Relaxation techniques
- Stress avoidance
- Counselling or psychotherapy
- Identification and elimination of trigger factors

Pharmacological management

Adults—

- **Paracetamol** 500–1000 mg PO every 6–8 hours **(A)**
  —OR—
- **Diclofenac** 25–50 mg PO every 8 hours **(B)**
  —OR—
- **Ibuprofen** 200–400 mg PO every 12 hours **(A)**

Children—

- **Paracetamol (A)**
  - 3 months to 1 year: 60–120 mg PO every 6–8 hours
  - 1–5 years: 120–250 mg PO every 6–8 hours
  - 6–12 years: 250–500 mg PO every 6–8 hours

Notes—

- Use topical analgesic medication (e.g., **methyl salicylate (A)** ointment) if focal tenderness is found.
- Avoid use of stronger analgesic medications.

REFER to an MO if the nursing personnel are uncertain about the diagnosis, or if there is a possibility of secondary headache. ⚠

Swaziland_FINAL press.indb 42 5/19/12 2:51 PM

2.5 Migraine

Definition

Migraine is defined as a primary headache characterized by periodic, commonly unilateral, often pulsatile pain. Migraines begin in childhood, adolescence, or early adult life and recur with diminishing frequency during advancing years.

Diagnosis

Two related clinical syndromes have been identified: migraine with aura (or classic migraine) and migraine without aura (or common migraine). The International Headache Society provides the following diagnosis criteria for migraine.

Without aura—

1. Headache attacks last 4–72 hours (untreated or unsuccessfully treated).
2. Headache has at least two of the following four characteristics:
   a. Unilateral location
   b. Pulsating quality
   c. Moderate or severe intensity, which inhibits or prohibits daily activities
   d. Aggravated by walking stairs or similar routine activity
3. During the headache, at least one of the two following symptoms occurs:
   a. Nausea and/or vomiting
   b. Photophobia and phonophobia
4. Patient has had at least five attacks fulfilling items 1–3.
5. The headache is not attributed to another disorder.

With aura—

1. Headache has at least three of the following four characteristics:
   a. One or more fully reversible aura symptoms indicating focal cerebral cortical and/or brain stem dysfunction
   b. At least one aura symptom develops gradually over more than 4 minutes, or two or more symptoms occur in succession
   c. No aura symptom lasts more than 60 minutes; if more than one aura symptom is present, accepted duration is proportionally increased
   d. Headache follows aura with a free interval of less than 60 minutes (it may also begin before or simultaneously with the aura)
2. At least two attacks fulfilling item 1.
3. The headache is not attributed to another disorder.

Nonpharmacological management

- Relaxation techniques
- Stress avoidance

Swaziland_FINAL press.indb 43 5/19/12 2:51 PM

- Counselling or psychotherapy
- Identification and elimination of trigger factors

Pharmacological management

Acute attack—

- Mild to moderate headache
  - **Paracetamol** 500–1000 mg PO every 6–8 hours **(A)**
    —OR—
  - **Diclofenac** 25–50 mg PO every 8 hours **(B)**
    —OR—
  - **Ibuprofen** 200–400 mg every PO 12 hours **(A)**
- Moderate to severe headache
  - **Sumatriptan** 6 mg SC **(A)**
    —OR—
  - 50–100 mg PO repeated in 2 hours if needed
    —OR—
  - **Ergotamine** 1–2 mg under the tongue **(B)**. Repeated every 30 minutes until headache is relieved or until a total of 8 mg has been administered.

Prophylaxis—

- Prophylaxis is indicated if
  - The headaches have a substantial impact on the patient's life despite the use of symptomatic medications.
  - The high frequency of attacks puts the patient at risk of a headache from overusing headache medicines.
  - The patient has more than three headache days a month when acute medications are not reliably effective.
  - The patient has more than eight headache days a month even if acute medications are effective (because of the risk of a headache from overusing headache medicines).
- Prophylaxis used is **propranolol** (40 mg tablet) **(B)**. Initially, give 40 mg PO 2–3 times daily, increased by same amount at weekly intervals if necessary. Usual maintenance dose is in the range of—
  - Adults: 80–160 mg PO daily
  - Children under 12 years: 20 mg PO 2–3 times daily

REFER ⚠

- For medication dosage adjustment or medication change, refer the patient to a specialist.
- If patient has a refractory migraine, refer him or her to a specialist.

Swaziland_FINAL press.indb 44 5/19/12 2:51 PM

3. DENTAL AND ORAL CONDITIONS

3.1 Candidiasis, oral (thrush)

Definition

An infection of the mouth and sometimes of the pharynx caused by a yeastlike fungus *candida albicans*. It is common in healthy babies up to 3 months of age. It also exists in healthy individuals, and only under certain conditions does it cause infection.

Symptoms and signs

- Painful creamy white patches
- Can be scratched off the tongue and buccal mucosae

Causes

- Poor hygiene
- Baby bottles sterilized with hypochloride
- Immunosuppression
- Prolonged use of antibiotics or corticosteroids
- Some chronic diseases (e.g., DM)
- Trauma (e.g., poorly fitting dentures)

Nonpharmacological management

- Advise patient to—
  - Gargle with warm salt water
  - Swab mouth with diluted vinegar solution
  - Gargle with crushed garlic in water

Pharmacological management

Adults—

- **Nystatin suspension** 100,000 IU/mL; 1 mL every 6 hours
  —OR—
- 2% **miconazole oral** gel every 12 hours

Infants—

- **Nystatin suspension** 100,000 IU/mL; 0.5–1 mL PO after each feeding for 7 days **(A)**
  —OR—
- 2% **miconazole** oral gel every 12 hours **(A)**

REFER ⚠

- If no improvement
- Difficult or painful swallowing
- Pharyngeal spread

Swaziland_FINAL press.indb 45 5/19/12 2:51 PM

3.2 Dental conditions

3.2.1 Dental abscess

Definition

Dental abscesses occur when teeth become decayed and infection spreads through the pulp due to trauma. There is generally a collection of pus around the affected tooth.

Symptoms and signs

- Fever
- Pain, especially when touching or brushing the tooth
- Swelling and redness of gums around tooth
- Possible lymph gland swelling or swelling in the side of the face
- Looseness of the tooth (after infection reaches the bone)
- Cheek or jaw swelling
- Restriction in mouth opening and difficulty in swallowing (dysphagia)

Nonpharmacological management

- Oral hygiene after each meal to remove plaque and food debris
- Frequent complete brushing of teeth
- Dental flossing at least once a day
- Salt-water gargle

Pharmacological management

Adults—

- **Amoxicillin** 250 mg PO every 8 hours for 5 days **(A)**
  —OR—
- ***For patients who are allergic to penicillin,*** **erythromycin** 500 mg PO every 6 hours **(A)**
  —PLUS—
- **Metronidazole** 400 mg PO every 8 hours for 5 days **(A)**. Take tablets with or after food and the suspension 1 hour before food. ***Caution:*** **Metronidazole** is contraindicated in the first trimester of pregnancy.
  —PLUS—
- **Paracetamol** 500 mg to 1 g PO every 4–6 hours, when needed, to a maximum of 4 doses daily **(A)**

Children—

- **Amoxicillin (A)**
  - Children 10–20 kg: 125 mg PO every 8 hours for 5 days
  - Children >20 kg: give 250 mg PO every 8 hours for 5 days
    —OR—
- ***For patients who are allergic to penicillin,*** **erythromycin (A)**
  - Children 10–15 kg: 125 mg PO every 6 hours (before meals) for 5 days

Swaziland_FINAL press.indb 46 5/19/12 2:51 PM

- Children >15 kg: 250 mg PO every 6 hours (before meals) for 5 days

—PLUS—

- **Metronidazole** 7.5 mg/kg per dose **(A)**. Take tablets with or after food and the suspension 1 hour before food.
  - Children 1–3 years: 50 mg every 8 hours for 5 days
  - Children 3–7 years: 100 mg every 8 hours for 5 days
  - Children 7–10 years: 100 mg every 8 hours for 5 days
  - Children over 10 years: 200 mg every 8 hours

—PLUS—

- **Paracetamol (A)** every 4–6 hours, when needed, to a maximum of 4 doses daily
  - Children 1–5 years: 5–10 mL (120 mg/5 mL syrup)
  - Children 5–12 years: ½–1 tablet (500 mg tablet)
  - Children >12 years and adults: 1–2 tablet(s)

REFER all cases to a dentist.

3.2.2 Dental caries

Definition

Dental decay that occurs when food is not removed

Symptoms and signs

- Pain
- Discoloured teeth
- A hole or black spot may be visible on any surface of the tooth
- Tenderness on percussion of the affected tooth
- Decay of teeth
- May have swollen, red gums

Nonpharmacological management

- Oral cleaning after every meal
- Dental flossing after every meal

Pharmacological management

Adults—

- **Paracetamol** 500 mg to 1 g PO every 4–6 hours, when needed, to a maximum of 4 doses daily **(A)**

—OR—

- **Ibuprofen** 200–400 mg PO daily **(A)**

Children—

- **Paracetamol** PO every 4–6 hours PO, when needed, to a maximum of 4 doses daily **(A)**
  - Children 1–5 years: 5–10 mL (120 mg/5 mL syrup)
  - Children 5–12 years: ½–1 tablet (500 mg tablet)

Swaziland_FINAL press.indb 47 5/19/12 2:51 PM

- Children >12 years and adults: 1–2 tablet(s)
  —OR—
- **Ibuprofen** 100–200 mg PO (5 mg/kg) every 4–6 hours **(A)**

REFER all case to a dentist. ⚠

3.3 Gingivitis

3.3.1 Gingivitis, uncomplicated

Definition

Gingivitis is an inflammation of the gums.

Symptoms and signs

- Pain in the mouth
- Foul breath
- Bleeding gums especially after brushing
- Swollen, red gums
- Much tartar on teeth
- Possible loose teeth
- Sometimes pus formation

Nonpharmacological management

Rinse the mouth using homemade salt mouthwash. Dissolve ½ teaspoon of table salt in a glass of lukewarm water; gargle for 1 minute twice daily.

Pharmacological management

- **Paracetamol** PO every 4–6 hours, when needed, to a maximum of 4 doses daily **(A)**
- **Chlorhexidine gluconate 0.20%** mouthwash **(B)**, 15 mL 2–4 times a day for 5 days. ***Caution:*** Prolonged use of chlorhexidine may cause darkening of teeth.

REFER all cases to the health centre. ⚠

3.3.2 Acute necrotising ulcerative gingivitis (Vincent's angina)

Definition

A noncontagious infection associated with the *fusiform bacilli* and a *spirochaete*. Also known as Vincent's angina, it is associated with heavy smoking, stress, poor oral hygiene, blood disorders, and nutritional deficiencies (vitamins B and C).

Symptoms and signs

- Symptom: painful bleeding gums
- Signs

Swaziland_FINAL press.indb 48 5/19/12 2:51 PM

- Sudden onset
- Greyish membrane between teeth on gums that can be removed
- Common in young adults
- Possible ulcers on gums (ulcerative gingivitis)
- No fever
- Halitosis

Nonpharmacological management

- Oral hygiene after each meal, to remove plaque and food debris
- Frequent complete brushing of teeth
- Dental flossing at least once a day
- Improved nutrition
- Gentle removal of the greyish membrane

Pharmacological management

Treatment depends on the type of gingivitis.

- **Amoxicillin** PO every 8 hours (before meals) for 5 days **(A)**
  - Children 10–20 kg: 125 mg per dose
  - Children >20 kg and adults: 250 mg per dose

  —OR—
- ***For patients who are allergic to penicillin***, **erythromycin** PO every 6 hours (before meals) for 5 days **(A)**
  - Children 11–15 kg: **erythromycin** 125 mg per dose
  - Children >15 kg: **erythromycin** 250 mg per dose
  - Adults: **erythromycin** 250 mg per dose

  —PLUS—
- **Metronidazole** PO for 5 days **(A)**. Take tablets with or after food and the suspension 1 hour before food.
  - Children 4–7 years: 100 mg every 12 hours
  - Children 7–10 years: 100 mg every 8 hours
  - Children >10 years and adults: 200 mg every 8 hours

  —PLUS—
- **Paracetamol** PO every 4–6 hours, when needed, to a maximum of 4 doses daily **(A)**
  - Children 1–5 years: 5–10 mL (120 mg/5 mL syrup)
  - Children 5–12 years: ½–1 tablet (500 mg tablet)
  - Children >12 years and adults: 1–2 tablet(s)
- Gargle with **glycerine thymol** mouthwash **(A)**.
- **Chlorhexidine gluconate 0.20%** mouthwash **(B)** after brushing and flossing; 15 mL as a mouthwash after brushing and flossing. ***Caution:*** Prolonged use of **chlorhexidine** may cause darkening of teeth.

REFER if no improvement in 5 days. ⚠

Swaziland_FINAL press.indb 49 5/19/12 2:51 PM

3.3.3 Periodontitis

Definition

Periodontitis is progressive gingivitis to the point at which the underlying bone is eroded. It is due to the same cause as gingivitis (see 3.3.1). It is also known as *pyorrhoea*.

Symptoms and signs

- May be painful
- Inflammation and swelling of gum margin
- Teeth may be loose in their sockets
- Often found in smokers
- Gum recession

Nonpharmacological management

- Advise patient to improve oral hygiene.
- Prevent further disease and preserve teeth.
- Identify cases and refer to dentist.

Pharmacological management

- **Chlorhexidine gluconate** 0.20% mouthwash 2–4 times a day for 5 days after brushing and flossing **(B)**; use 15 mL as a mouthwash after brushing and flossing. ***Caution:*** Prolonged use of chlorhexidine may cause darkening of teeth.

REFER all cases to a dentist. ⚠

3.4 Herpes stomatitis, cold sore, fever blister

Definition

Inflammation of the mouth area due to infection by herpes simplex virus type 1. It is a primary infection of what later can become recurrent fever blisters.

Symptoms and signs

- Shallow, painful ulcers on the lips, gums, and tongue
- Self limiting and usually clears within 10 days

Nonpharmacological management

- Advise the patient to—
  - Rinse the mouth using homemade salt mouthwash. Dissolve ½ teaspoon of table salt in a glass of lukewarm water; gargle for 1 minute twice daily.
  - Ensure adequate diet and hydration.
  - Avoid acidic drinks (e.g., orange juice or soft drinks) because they may cause pain.

Swaziland_FINAL press.indb 50 5/19/12 2:51 PM

Pharmacological management

Antipyretics may be indicated.

- **Paracetamol** every 4–6 hours PO, when needed, to a maximum of 4 doses daily **(A)**
- **Lidocaine gel 2%** may be indicated every 3-4 hours, for extensive oral herpes. Apply thin layer as required on the affected areas only; maximum one tube **(A)**.

REFER ⚠

- If the condition is severe
- If the patient is immunosuppressed
- If there is no improvement after 1 week of treatment

3.5 Canker sores, aphthous ulcers (mouth ulcers)

Definition

Acute painful ulcers on the lips or inside the mouth including the tongue can occur singly or in groups. The causes of the ulcers are generally unknown.

Symptoms and signs

- Pain at the site of the ulcer
- Shallow, yellowish ulcer with flat even borders; borders surrounded by redness
- Possible enlargement of regional lymph nodes

Nonpharmacological management

- Advise the patient to—
  - Rinse the mouth using homemade salt mouthwash. Dissolve ½ teaspoon of table salt in a glass of lukewarm water; gargle for 1 minute twice daily.
  - Brush the teeth twice a day.

Pharmacological management

- **Chlorhexidine gluconate** 0.20% mouthwash 2–4 times daily for 5 days **(B)**; use 15 mL as a mouthwash after brushing and flossing.

  —PLUS—
- **Paracetamol** PO every 4–6 hours, when needed, to a maximum of 4 doses daily **(A)**
- Gentian violet solution for the sores **(A)**

REFER ⚠

- If there is a recurrence
- If ulcers are widespread

Swaziland_FINAL press.indb 51 5/19/12 2:51 PM

4. EAR, NOSE, AND THROAT DISORDERS

4.1 Otitis externa

Definition

Otitis externa is the inflammation of skin of the external ear canal. There are many types of otitis externa according to the cause (see table 4.1).

Table 4.1 Types of Otitis Externa

Type	Description
Diffuse	Usually due to a mixed infection, involving one or more of the following organisms: staphylococcus, streptococcus, *Pseudomonas aeruginosa, Proteus species, Escherichia coli* Causes: ▪ Mixed infections ▪ Skin allergy (allergic dermatitis, often due to shampoo or soap) ▪ Scratching the ear with contaminated objects (e.g., ear-buds, matchsticks)
Furunculosis	Boils (furuncles) in the ear canal, caused by *Staphylococcus aureus;* presents as severe pain and swelling of the meatal wall
Malignant otitis externa	There is temporal bone involvement. *P. aeruginosa* and *S. aureus* are often involved. Needs surgical intervention; hence, **REFER** to a specialist. ⚠

Nonpharmacological management

- Advise the patient to—
  - Avoid getting the ear wet.
  - Do not put objects in the ear.
  - Perform aural toilet. Clean just the ear canal to remove debris.

Pharmacological management

Diffuse otitis externa—

- Apply acidifying solutions such as **hydrogen peroxide 6% (A)**.
- Apply **acetic acid 2% (A)** 3–4 drops every 6 hours for 5 days.
- If no improvement, give **ciprofloxacin** PO twice a day for 6 weeks **(C)**.
  - Adults: 250 mg
  - Children: 5–10 mg/kg per dose

Furunculosis—

- Give **flucloxacillin** every 6 hours for 5 days **(B)**.
  - Adults: 250–500 mg per dose
  - Children: 12–25 mg/kg per dose

Swaziland_FINAL press.indb 52 5/19/12 2:51 PM

- ***For patients who are allergic to penicillin***, use **erythromycin** every 6 hours **(A)**.
  - Adults: 250 mg per dose
  - Children: 10–15 mg/kg per dose

4.2 Otitis media

4.2.1 Acute otitis media

Definition

Acute otitis media is caused by infection in the middle ear usually associated with upper respiratory infections, especially in children.

Symptoms and signs

- Throbbing earache
- Fever
- Reduced hearing with or without discharge
- Loss of the light reflex
- Bulging of the ear drum

Nonpharmacological management

- Advise the patient to keep the ear dry.
- Do not instill anything in the ear.
- No need to plug the ear with cotton wool.

Pharmacological management

Antibacterial therapy will shorten the episode, but pain control is also important.

Adults—

- **Amoxicillin** 500 mg PO 3 times a day for 5 days; 250–500 mg per dose **(A)**
- —OR—
- ***For patients who are allergic to penicillin***, **erythromycin** PO every 6 hours for 5 days; 250 mg per dose **(A)**
- —PLUS—
- For pain relief, **paracetamol** 500 mg per dose PO every 4–6 hours, when needed, to a maximum of 4 doses daily **(A)**

Children—

- **Amoxicillin** 500 mg PO 3 times a day for 5 days **(A)**
  - <1 month: 25–30 mg/kg per dose PO every 8 hours for 5 days
  - 1–6 months (3.5–7 kg): 125 mg per dose
  - 6 months to 3 years (7–14 kg): 250 mg per dose
  - >3 years (>55 kg): 250–500 mg per dose

    —OR—

Swaziland_FINAL press.indb 53 5/19/12 2:51 PM

- ***For patients who are allergic to penicillin***, **erythromycin** 10–15 mg/kg per dose PO every 6 hours for 5 days **(A)**
  —PLUS—
- For pain relief, **paracetamol** 15 mg/kg per dose PO every 4–6 hours, when needed, to a maximum of 4 doses daily **(A)**

REFER

- Severe earache, fever, or vomiting
- No response to treatment after 72 hours
- Recurrent otitis media
- Painful swelling behind the ear or tenderness over the mastoid area
- Signs of meningeal irritation such as neck stiffness

4.2.2 Chronic suppurative otitis media

Definition

In chronic suppurative otitis media, pus drains from the ear for more than 2 weeks or the patient has a long history of on-and-off ear discharge. It is caused by multiple organism infection, which makes antibiotic treatment ineffective.

REFER all patients to an ENT specialist. ⚠

4.3 Hearing impairment

Sudden onset of hearing impairment may be due to occlusion of the external ear canal by wax or discharge or by effusion in the middle ear. If there are signs of infection such as meningitis, consider *Cryptococcal* or TB meningitis and treat accordingly. Certain medicines, such as streptomycin, can lead to hearing loss as a side effect.

Nonpharmacological management

Wax is removed by gentle lavage or by syringing the ear with water at 37°C.

Caution: Ear syringing must *not* be done in the following conditions:

- Previous ear drum perforation
- Previous chronic discharge

REFER all cases of hearing impairment to the audiologist. ⚠

4.4 Sinusitis

4.4.1 Acute sinusitis

Definition

Bacterial infection of one or more sinuses that occurs commonly following a viral infection of the URT or allergic rhinitis

Swaziland_FINAL press.indb 54 5/19/12 2:51 PM

Symptoms and signs

Sudden onset of—

- Nasal congestion
- Fever
- Headache or facial pain; tenderness over one or more sinuses
- Purulent nasal discharge

This condition is uncommon in children under 6 years because their sinuses have not fully developed.

Nonpharmacological management

Steam inhalation may be effective in liquefying and removing secretions that are blocking the nose.

Pharmacological management

Adults—

- **Amoxicillin** 500 mg PO 3 times a day for 10–14 days; 250–500 mg per dose **(A)**
  —OR—
- **Clindamycin** 150–300 mg PO every 6 hours for 10–14 days **(C)**
  —OR—
- ***For patients who are allergic to penicillin***, **erythromycin** 10–15 mg/kg PO every 6 hours for 5 days **(A)**
  —PLUS—
- **Paracetamol** 500 mg PO every 4–6 hours, when needed, to a maximum of 4 doses daily **(A)**
- **Oxymetazoline** nasal drops (0.05% solution) 2 drops in each nasal cavity every 6–8 hours for 5 days **(A)**
  —AND/OR—
- **0.9% sodium chloride (normal saline) (A)** nasal drops every 3–4 hours for 5 days

Children—

- **Amoxicillin** 500 mg PO 3 times a day for 10–14 days **(A)**
  - <6 months (<7 kg): syrup, 125 mg per dose
  - 6–18 months (7–11 kg): syrup, 250 mg per dose
  - >18 months: 250–500 mg per dose

  —OR—
- **Clindamycin** 150–300 mg PO every 6 hours for 10–14 days **(C)**
- ***For patients who are allergic to penicillin***, **erythromycin** 10–15 mg/kg PO every 6 hours for 5 days **(A)**
  —PLUS—
- **Paracetamol** 15 mg/kg PO every 4–6 hours, when needed, to a maximum of 4 doses daily **(A)**

Swaziland_FINAL press.indb 55 5/19/12 2:51 PM

- **Oxymetazoline** nasal drops (0.025% solution) 2 drops in each nasal cavity every 6–8 hour for 5 days **(A)**
  —AND/OR—
- **0.9% sodium chloride (normal saline) (A)** nasal drops every 3–4 hours for 5 days

REFER

- If not resolving after the above treatment
- Fever lasting longer than 48 hours
- Poor response after a week's treatment
- Presence of dental focus of infection
- Sinusitis proceeded by swelling over the forehead or periorbital swelling
- Recurrent sinusitis
- Signs of meningeal irritation or cortical cavernous thrombosis

4.4.2 Chronic sinusitis

Look for facial pain or headache, nasal congestion, and post-nasal drip. Offensive nasal discharge may last up to 3 months.

REFER such cases for further evaluation by ENT specialist. ⚠

4.5 Rhinitis, allergic

Definition

Recurrent inflammation of the nasal mucosal due to hypersensitivity to inhaled allergens such as pollen, house dust, cat and dog dander, fleas, cockroaches, grasses, and animal proteins.

Symptoms and signs

- Blocked or stuffy nose
- Watery nasal discharge
- Excessive and frequent sneezing
- Nasal itching and irritation
- Itchy eyes
- Oedematous pale pink or grey nasal mucosa
- Mouth breathing
- Snoring during sleep

Nonpharmacological management

Identification and control or removal of potential allergens is helpful.

Pharmacological management

Short-term symptomatic relief for adults—

- **Chlorpheniramine** 4 mg PO every 6–8 hours for 21 days **(A)**

Swaziland_FINAL press.indb 56 5/19/12 2:51 PM

Short-term symptomatic relief for children—

- **Chlorpheniramine** 0.1 mg/kg per dose PO every 6–8 hours for 21 days **(A)**

Long-term use in adults and older children—

- **Cetirizine** 10 mg PO once daily **(B)**
- Corticosteroid, 2 sprays in each nostril
- **Beclomethasone diproprionate** nasal spray for adults and children >12 years **(A)**

REFER ⚠

- Patients with chronic persistent symptoms
- Patients with severe symptoms

4.6 Tonsillitis

Definition

In most cases, tonsillitis is a viral infection and does not need antibiotics, especially if the following symptoms are present: runny nose, dry cough, or rash. Streptococcal pharyngitis or tonsillitis, however, may cause local suppurative complications such as infective endocarditis caused by rheumatic fever. The presence of both fever and tonsillar exudates warrant antibiotics.

Symptoms and signs

- Usually presents as a painful red throat and/or enlarged inflamed tonsils.
- Tender anterior cervical lymphadenopathy may be present.

Nonpharmacological management

- Advise patient to—
  - Rinse the mouth using homemade salt mouthwash. Dissolve ½ teaspoon of table salt in a glass of lukewarm water; gargle for 1 minute twice daily. ***Caution:*** Do not give to children under 8 years because they cannot gargle.
  - Ensure adequate hydration.
  - Avoid getting irritants into the nose.

Pharmacological management

Adults—

- **Benzathine benzylpenicillin** 1.2 MU stat IM, immediately as a single dose **(A)**

  —OR—
- **Phenoxymethylpenicillin** 500 mg per dose PO every 12 hours for 10 days **(A)**

  —OR—
- **Amoxicillin** 500 mg PO 3 times a day for 7 days **(A)**

  —OR—

Swaziland_FINAL press.indb 57 5/19/12 2:51 PM

- ***For patients who are allergic to penicillin,*** **erythromycin** 250–500 mg PO every 6 hours for 10 days **(A)**
  —PLUS—
- **Acetylsalicylic acid (aspirin)** 300–600 mg dissolved in half a glass of water gargles **(A)**
- **Paracetamol** 500 mg–1.0 g PO every 4–6 hours, when needed, to a maximum of 4 doses daily **(A)**

Children—

- **Benzathine benzylpenicillin** IM, immediately as a single dose **(A)**
  - <15 kg (2–3 years): 300,000 units stat
  - 15–30 kg (3–11 years): 600,000 units stat
    —OR—
- **Phenoxymethylpenicillin** PO every 12 hours for 10 days **(A)**
  - 2–11 years (11–35 kg): 250 mg per dose
  - 11–15 years (35–55 kg): 250–500 mg per dose
    —OR—
- **Amoxicillin** PO 3 times a day for 7 days **(A)**
  - 11–17 kg (2–5 years): 125 mg per dose
  - 17–35 kg (5–11 years): 250 mg per dose
    —OR—
- ***For patients who are allergic to penicillin,*** **erythromycin** 10–15 mg/kg per dose PO every 6 hours for 10 days **(A)**
  —PLUS—
- **Paracetamol** 15 mg/kg per dose PO every 4–6 hours, when needed, to a maximum of 4 doses daily **(A)**

REFER ⚠

- Tonsillitis accompanied by—
  - Difficulty in opening the mouth
  - Severe difficulty in breathing and muffled speech
- Suspected acute rheumatic fever
- Suspected glomerulonephritis
- Chronic or recurrent tonsillitis (i.e., three or more episodes of tonsillitis in a year)
- History of previous rheumatic fever or rheumatic heart disease
- Heart murmurs not previously diagnosed

4.7 Laryngitis

4.7.1 Acute laryngitis

Definition

An infection of the larynx, usually by viruses

Swaziland_FINAL press.indb 58 5/19/12 2:51 PM

Symptoms and signs

- Hoarseness of voice
- Sore throat
- Painful dry cough

Nonpharmacological management

- Advise the patient to—
  - Drink plenty of water
  - Rest the voice

Pharmacological management

If no improvement in 3 days, then start antibiotics.

- **Amoxicillin** 500 mg PO 3 times a day for 7 days **(A)**

4.7.2 Chronic laryngitis

Definition

If the symptoms, including hoarseness, persist for more than 1 month, direct laryngoscopy is required.

REFER to an ENT specialist. ⚠

4.8 Nose bleed (epistaxis)

Definition

Most bleeding occurs from an area anterior and inferior on the nasal septum (Kiesselbach's area) and may be caused by local or systemic diseases or local trauma. Always look for other conditions associated with nose bleeds, especially if recurrent (e.g., hypertension, bleeding tendency).

Nonpharmacological management

Most bleeding can be controlled by pinching the nasal wings (alae) together for 5–10 minutes. If this fails, the bleeding site must be found, and the patient must be **REFERRED**. ⚠

Pharmacological management

- Pack nose with cotton soaked in **adrenaline (A)**.
- For children, give **phytomenadione (vitamin K)** 2 mg IM **(A)**.
- For adults, check BP and **REFER.** ⚠

REFER urgently if— ⚠

- Patient has recurrent nose bleeds
- The attempt to stop the present bleed has failed
- The cause of the nosebleed is undetermined

Swaziland_FINAL press.indb 59 5/19/12 2:51 PM

5. ENDOCRINE CONDITIONS

5.1 Diabetes mellitus

Definition

DM is a group of metabolic disorders characterised by hyperglycaemia resulting from defects in insulin secretion, insulin action, or both. Chronic hyperglycaemia is associated with long-term damage, dysfunction, and failure of various organs.

Symptoms and signs

- Thirst
- Tiredness
- Hunger
- Unexplained weight loss or gain
- Ketoacidosis
- Polyuria
- Pins-and-pricks sensation in the feet or hands
- Impaired visual acuity

Diagnosis

- RBG >11 mmol/L
- FBG >7 mmol/L
- Glucose intolerance described by the range of 7–11 mmol/L of RBG

Investigations

- Blood glucose (monthly, self-monitoring report)
- CBC
- Urine MCS
- Urea and electrolytes
- Urine protein
- Urine ketones
- Lipid profile (initially then fasting cholesterol on subsequent visits)
- Fundoscopy
- Glycosylated haemoglobin (HbA1AC) after 3 months of treatment, then yearly subsequent monitoring

Monitor

- Urea and creatinine annually
- Glycosylated Hb quarterly
- Urine protein annually
- Lipid profile annually

Swaziland_FINAL press.indb 60 5/19/12 2:51 PM

Nonpharmacological management

- Advise the patient to—
  - Maintain a healthy diet (refer to the noncommunicable diseases guidelines).
    - Regular meals (at least three a day)
    - High-fibre diet
    - Low glycaemia index diet
    - Low-fat diet
  - Maintain an ideal BMI (18.5–25).
  - Exercise; do regular, simple exercise for 30 minutes, three times a week (a snack should be taken before the exercise).
  - Do regular home glucose monitoring, where possible.

5.1.1 DM type 1

Definition

Type 1 DM was formerly known as *insulin-dependent DM* or *juvenile-onset DM*.

Pharmacological management

- Managed with insulin injections that are adjusted according to each patient's individual needs.
- All patients with DM type 1 should be **REFERRED** at diagnosis for the initiation and stabilization of therapy. ⚠

Insulin—

- Insulin therapy should usually begin with teaching the patient the correct technique for subcutaneous injections because self-injections are to be strongly encouraged.
- Patients should be made aware of the different appearance of different kinds of insulin
  - Soluble or regular, which is fast acting = gin clear
  - NPH or Lente, which are intermediate acting = cloudy
  - Pre-mixed insulin preparations containing both soluble and NPH insulin = cloudy
- ***Caution:*** Cloudy insulins (intermediate acting or pre-mixed) can be given only subcutaneously and *should not* be injected IM or IV. Only soluble or regular insulin may be given by the IM or IV route during emergency treatment.
- Patients should be made aware of the strengths of insulin and the kind of syringes to be used. To avoid confusion, 100 U/mL insulin must be administered *only* with 0.3 mL, 0.5 mL, or 1 mL U-100 syringes calibrated for this strength of insulin.

Swaziland_FINAL press.indb 61 5/19/12 2:51 PM

- A regimen of two injections daily (before breakfast and dinner) of an intermediate-acting or pre-mixed insulin gives better blood glucose control than once daily injections. Older patients and those with kidney disease may sometimes manage adequately on a single daily injection.
- Two-thirds of the total daily insulin requirement is given before breakfast, and the remainder before the evening meal.
- For once-daily insulin injections (long-acting), ideal time is around 2200 hours.
- Insulin requirements vary from patient to patient irrespective of age and body weight.

Adults—

- In type 1 DM, when initiating treatment, the starting dose of insulin is 0.6 units/kg/day. Doses should be given about 30 minutes before meals.

Children—

- 0.5–1 units/kg/day

Alternatively, a "basal/bolus" regime can be used:

- Intermediate-acting insulin is taken at bedtime (basal).
- 6–8 units of soluble insulin are taken 3 times a day before meals (bolus).
- The soluble insulin dose can be varied depending on what is to be eaten and can be given at different times.

5.1.2 DM type 2

Definition

Type 2 DM was formerly known as *non-insulin dependent DM* .

Nonpharmacological management

See 5.1.1.

Pharmacological management

See table 5.1.2.

Complications

- Peripheral vascular disease (e.g., foot gangrene)
- Retinopathy
- Nephropathy
- Neuropathy
- Recurrent infections
- Acute complication: diabetic ketoacidosis

REFER ⚠

There are three levels of referral:

- Immediate, same-day referral for diabetic emergencies or acute diabetic complications as listed above

Swaziland_FINAL press.indb 62 5/19/12 2:51 PM

- Six-month or annual referral for assessment of progress (depending on the control of the DM and the complications)
- Automatic referral for certain conditions:
  - Pregnancy
  - Failure of step 2 care to control the diabetes mellitus
  - All type 1 diabetics

Table 5.1.2 Stepwise Management of Type 2 DM

Entry to Step 1	Management and Duration	Target
Typical symptoms: ▪ Thirst ▪ Urinary frequency ▪ Polyuria ▪ RBG >11 mmol/L	▪ Lifestyle modification for life ▪ Appropriate diet (see 5.1.1)	▪ RBG <10 mmol/L ▪ FBG 6–8 mmol/L ▪ HbA_{1AC} <6.5%
Entry to Step 2	**Management and Duration**	**Target**
▪ FBG >10 mmol/L **—OR—** ▪ Urine glucose >0.5% (++) **—PLUS—** ▪ After 3 months of compliance with treatment plan (e.g., weight loss)	▪ Lifestyle modification **—PLUS—** ▪ Initiate pharmacotherapy with **sulphonylurea** (**glibenclamide [B]** or **gliclazide [B]**) if underweight **—OR—** ▪ **Metformin (B)** if severely overweight	▪ RBG <10 mmol/L **—OR—** ▪ FBG 6–7 mmol/L **—OR—** ▪ Urine glucose 0–0.5% (negative to +) **—PLUS—** ▪ Ideal body weight (weight reduction may be a lengthy process)

5.2 Goitre

Definition

A goitre is a swelling of the neck due to an enlargement of the thyroid gland. It can be benign but may occasionally be malignant.

Symptoms and signs

- Asymptomatic
- Noisy breathing
- Difficulty in breathing
- Possible fatigue, weakness
- Visible swelling at the front of the neck, which moves upwards with swallowing
- Palpable enlarged thyroid, may have many nodules

REFER all cases. ⚠

Swaziland_FINAL press.indb 63 5/19/12 2:51 PM

6. EYE CONDITIONS

6.1 Conjunctivitis

Definition

Conjunctivitis is inflammation of the conjunctiva. Some of the causes are—

- Bacterial infection (in newborns, the most common cause of conjunctivitis is gonorrhea)
- Viral (usually presents with an upper respiratory infection, high fever)
- Allergic reaction (allergens)
- Chemical irritants
- Systemic infections (e.g., measles)

6.1.1 Allergic conjunctivitis

Definition

Inflammatory condition of the conjunctiva caused by—

- Allergens such as pollen, grasses, animal fur (i.e., hay fever conjunctivitis)
- Eye medication (e.g., chloramphenicol or sulphacetamide)
- Cosmetics, especially eye make-up

Symptoms and signs

- Burning sensation
- Normal visual acuity
- Itching, lacrimation, and photophobia
- Conjunctiva may appear normal or slightly red
- Chemosis (conjunctival swelling)
- Associated blepharitis (inflammation of eye lid margin) if the allergy is due to scratching

Nonpharmacological management

- Advise patient—
  - Not to rub the eyes
  - To use cold compresses

Pharmacological management

- **Antazoline + tetryzoline** (0.5 + 0.4) mg/ml 1- 2 drops every 6 hours **(A)**
  —OR—
- **Oxymetazoline** 0.05% eye drops instilled in the eyes every 6 hours for 7 days **(B)**
- **Chlorpheniramine** PO for severe cases **(B)**.
  - 6 months to 1 year: 1 mg twice daily
  - 1–5 years: 1–2 mg 3 times daily

Swaziland_FINAL press.indb 64 5/19/12 2:51 PM

- 5–12 years: 2–4 mg 3–4 times daily
- >12 years and adults: 4 mg 3–4 times daily
  Caution: This is an oral antihistamine. **Chlorpheniramine (B)** is not recommended because it decreases tear production but may be used in severe cases.
  —OR—

- **Sodium cromoglycate (A)**. ***Caution:*** Do not use in children younger than 2 years.

REFER

- Person using contact lenses
- Person who is nonresponsive after 5 days of treatment

6.1.2 Phlyctenular conjunctivitis

Definition

A circumscribed conjunctivitis accompanied by the formation of small red nodules of lymphoid tissue (phlyctenulae) on the conjunctiva

Causes

- Immunological response (cell mediated) to *Mycobacterium* TB elsewhere in the body.
- Most commonly seen in children with primary TB (noncavitating type)
- Hypersensitivity
- It may also occur as a reaction to—
  - Staphylococcal infection
  - Seborrhoeic dermatitis

Symptoms and signs

- Presents as a small, yellow or white nodule on the limbus
- Localized inflamed blood vessels radiate away from the nodule

Nonpharmacological management

- Try to confirm the diagnosis of tuberculosis based on—
  - History
  - Examination
- ***Caution:*** Do not do a PPD (Mantoux) test because this condition is a hypersensitivity manifestation of primary TB, and the PPD may lead to corneal ulceration and perforation.

Pharmacological management

Adults and children—

- **Sodium cromoglycate** 2–4% eye drops **(A)**, applied four times daily, then tapered off
  —OR—

Swaziland_FINAL press.indb 65 5/19/12 2:51 PM

- **Hydrocortisone** 1% eye drops **(B)**, applied four times daily, then tapered off
- Because phlyctenular conjunctivitis is strongly suggestive of TB—
  - Start anti-TB treatment unless there is good evidence of another cause for the phlyctenulum.
  - Follow TB guidelines.

REFER all cases for— ⚠
- TB investigation
- Chest X-ray to establish whether hilar glands are enlarged

6.2 Viral conjunctivitis

Definition

Inflammatory condition caused by a virus. Many upper respiratory tract viral infections are accompanied by conjunctivitis. These conditions are highly contagious and often spread through whole communities. Both eyes are affected.

Symptoms and signs

- Photophobia
- Watery eyes
- Sticky eyes, especially in the morning
- Conjunctivae reddened, swollen, and oedematious and may become haemorrhagic
- Palpebral conjunctivae also involved
- If watery discharge is yellow, a secondary bacterial infection has occurred
- Possible swelling of the eyelids
- The cornea, iris, and pupil are completely normal
- Normal visual acuity
- If unilateral, check for—
  - Iritis
  - Foreign body
  - Trauma
  - Phlyctenular conjunctivitis
  - Keratitis
  - Acute glaucoma

Nonpharmacological management

- Advise patient to—
  - Use sunglasses.
  - Practice good personal hygiene. Wash hands with clean water before touching the eye and after instilling medicine.

Swaziland_FINAL press.indb 66 5/19/12 2:51 PM

  - Not share a towel with anyone.
  - Wash face and cleanse the eyes frequently with clean water.
  - Not use home remedies such as milk, urine, saliva, or other substances because they will cause secondary infection.
  - Avoid spread of infection to the other eye and to other people.
- Teach patients and caregivers how to instill eye medication (i.e., ointment or drops).
- Instruct patients not to share eye drops with others.

Pharmacological management

- **Oxymetazoline 0.05 %** eye drops, 1–2 drops instilled in the eyes every 6 hours for 7 days **(B)**
- Topical corticosteroids: **tetracycline** eye ointment **(A)** to be applied into the eyes every 4–6 hours for 5 days (as a prophylaxis). ***Caution:*** Steroids should not be used on corneal ulcers.

REFER

- Unilateral disease
- Corneal ulceration
- Corneal opacification (clouding)
- Pupil irregularity
- Diminished vision
- Severe pain
- Poor or no response after 7 days

6.3 Conjunctivitis of the newborn (ophthalmia neonatorum)

Definition

Inflammation of the conjunctiva in the neonatal period, presenting with purulent discharge; inflamed conjunctiva with oedema. Most infections are acquired during delivery. It could be caused by gonococcal infection or chlamydial infection or reaction to application to the eye (e.g., silver nitrate). The condition is preventable if antibiotic eye drops are applied soon after birth.

Symptoms and signs

- The mother may complain that the baby's eyes are sticky, discharging, and oedematous.
- Features that suggest gonococcal infection are—
  - Maternal history of a purulent vaginal discharge
  - Onset within 4 days of birth
- Features that suggest chlamydial infection are—
  - Onset more than 4 days after birth
  - Slight watery or mildly purulent discharge

Swaziland_FINAL press.indb 67 5/19/12 2:51 PM

- Mildly inflamed conjunctivae
- Purulent conjunctivitis in the newborn

Nonpharmacological management

- Screen and treat all pregnant women at ANC for STIs.
- Clean and wipe the eyes with **0.9% sodium chloride (normal saline) (A)** using a clean cloth.

Pharmacological management

Prophylaxis—

- Routine administration of **1% chloramphenicol** eye ointment **(A)**

—OR—

- **Tetracycline 1%** ophthalmic ointment **(A)** at birth to all babies; apply medicine to both eyes

Treatment—

- **Spectinomycin** 25 mg/kg IM stat **(A)**
- **Erythromycin** 62.5 mg PO every 6 hours for 7 days **(A)**

REFER ⚠

- Any purulent conjunctivitis in the newborn

6.4 Eye injury

6.4.1 Chemical burns

Definition

Damage to the eye caused by contact with irritating chemical substance (e.g., acids, alkalis).

- Emergency treatment
- Irrigate liberally with water or **0.9% sodium chloride (normal saline) (A)**, and repeat several times.
- Instill **fluorescein 1%** eye drops **(S)** in the eyes for diagnosis of local or diffuse damage.
- If diffuse damage is found, instill **atropine 1%** eye drops **(B)** immediately, once only.
- Instill **chloramphenicol 1%** eye ointment **(A)** once only.
- Cover with eye pad, and **REFER** to the hospital. ⚠

6.4.2 Foreign body in the eye

Definition

A foreign body may be embedded in the conjunctiva, the cornea, or deeper. Conjunctival or eyelid foreign body may cause corneal abrasion and cause serious disturbance of vision.

Swaziland_FINAL press.indb 68 5/19/12 2:51 PM

Diagnosis

- Take proper history.
- Check visual acuity first, before testing with fluorescein.
- Stain with **fluorescein 1% (S)** for corneal foreign body or complication (abrasion). Fluorescein confirms—
  - An embedded foreign body or rust ring
  - Multiple foreign bodies
- Check visual acuity after removal of foreign body.

Nonpharmacological treatment

- Eye ointment may act as foreign body to abraded eye tissue.
- ***Caution:*** Do *not* use an eye pad with ecchymosis lid oedema.
- Allow free drainage.

Emergency treatment

- Remove foreign body by washing.
  —OR—
- Irrigate with clean water or **0.9% sodium chloride (normal saline) (A)** then **REFER**. ⚠

For superficial foreign bodies—

- Use tip of the needle with the bore facing up to remove the foreign body.
- Use **0.9% sodium chloride (normal saline) (A)** or clean water to irrigate the eyes.
- Instill **1% chloramphenicol** eye ointment 3–4 times daily **(A)**.
- Instill **1% atropine** ophthalmic drops immediately, once only **(B)**.
- Review daily, and **REFER** if pain persists. ⚠

For deeply embedded foreign bodies—

- Use **0.9% sodium chloride (normal saline) (A)** or clean water to irrigate the eyes.
- Instill **1% chloramphenicol** eye ointment **(A)**.
- Instill **1% atropine** eye drops immediately, once only **(B)**.
- Pad the eye, and **REFER**. ***Caution:*** Do *not* use an eye pad with ecchymosis lid oedema. ⚠

REFER ⚠

- Hyphaema (blood in the anterior chamber of the eye)
- Diffuse corneal damage after applying **1% atropine** ophthalmic drops
- Scleral and corneal laceration
- Lid oedema
- Subconjunctival bleeding persisting for more than 24 hours
- Posttraumatic dilatation of the pupil
- Persistent corneal defect or corneal opacity

Swaziland_FINAL press.indb 69 5/19/12 2:51 PM

6.5 Glaucoma, acute and chronic

Definition

Glaucoma is caused by increased pressure inside the eye. Usually glaucoma is a chronic disease and takes months to years before symptoms and signs show. Acute glaucoma, where symptoms and signs occur suddenly, is quite rare in Swaziland; however, chronic glaucoma is a common cause of blindness.

Symptoms and signs

- Acute glaucoma
  - Acute onset of extremely severe, bursting pain in one eye
  - Nausea and vomiting in severe cases
  - Blurred vision
  - A unilateral, temporal headache, after being exposed to a period of darkness (e.g., in the cinema)
  - Haloes around lights (bright rings)
  - Oedema of the conjunctiva with congestion around the cornea
  - Oedema of the cornea giving a hazy or cloudy appearance rather like steam behind a window
  - Congested blood vessels around the cornea (flare)
  - Anterior chamber depth decreased (i.e., shallow)
  - Pupil dilated and inactive
  - Eye feels hard, compared with the other eye, when measured with finger palpation
- Chronic glaucoma
  - Central vision normal, peripheral vision absent
  - Eyeball tense

Pharmacological management (acute and chronic glaucoma)

- Give **acetazolamide** 250–375 mg stat PO or IV **(B)**. ***Caution:*** **Acetazolamide** must never be given IM.
- Give glycerin (as glycerol) 1 mL/kg stat PO.
- If pupil is dilated, instill pilocarpine 4% drops every 15 minutes **(B)**, starting 1 hour after giving **acetazolamide**.

REFER immediately. ⚠

6.6 Open-angle glaucoma

Definition

Open-angle glaucoma is an extremely common cause of blindness in people over the age of 40. If it is diagnosed early, it can be treated effectively. Delay in diagnosis results in irreversible damage to the retina with progressive visual loss.

Swaziland_FINAL press.indb 70 5/19/12 2:51 PM

Symptoms and signs

- The disease has few or no symptoms. It is commonly only detected at an advanced stage.
- Patients are usually over 40 years old, but with black people, it may present earlier.
- The tension in the affected eye is increased and may sometimes be noticed on finger palpation.
- The patient is more likely to have open angle glaucoma if—
  - There is a family history of glaucoma
  - He or she has myopia or diabetes
- Early symptoms may be—
  - Early presbyopia (needs reading glasses at an early age)
  - Poor vision at night
- Later symptoms may be—
  - Bumping into objects due to loss of peripheral field vision
  - Complete visual loss

Nonpharmacological management

- If there is any suspicion of glaucoma, **REFER** patient for accurate testing. ⚠
- Patients over the age of 35 years should be encouraged to have their eye pressure tested routinely if possible (e.g., when going to opticians to buy glasses).
- Patients who have been put on maintenance therapy with specific medicines that decrease intraocular pressure (such as **acetazolamide**) must be encouraged to apply their treatment regularly.

6.7 Trachoma

Definition

A chronic infection of the outer eye caused by *Chlamydia trachomatis* (a very small Gram-negative bacterium)

Symptoms and signs

- In early stages—
  - Reddening of the eye
  - Itching
  - Follicles (grain-like growth) on the conjunctiva
- In the later stages—
  - Scar formation on the eyelids causing the upper eyelid to turn inwards (entropion) and causing the eyelashes to scratch the cornea
  - Scarring of the cornea leading to blindness

Swaziland_FINAL press.indb 71 5/19/12 2:51 PM

Differential diagnosis
Allergic conjunctivitis (chronic)

Nonpharmacological management
- Advise the patient to prevent trachoma by—
  - Good personal hygiene
  - Regular face washing
- Ensure clean infant deliveries.

Pharmacological management
Adults—
- Apply **tetracycline 1% (A)** eye ointment twice daily for 4–6 weeks (until the infection or inflammation has gone).
  —PLUS—
- **Co-trimoxazole** 960 mg PO every 12 hours for 14 days **(A)**
  —OR—
- **Erythromycin** 500 mg PO every 6 hours for 14 days **(A)**

Children—
- Apply **tetracycline 1% (A)** eye ointment twice daily for 4–6 weeks (until the infection or inflammation has gone).
  —PLUS—
- **Co-trimoxazole** 24 mg/kg PO every 12 hours for 14 days **(A)**
  —OR—
- **Erythromycin** 10–15 mg/kg per dose PO every 6 hours for 14 days **(A)**

REFER to a specialist if there are any complications. ⚠

6.8 Vernal catarrh (spring catarrh)

Causes
- This condition occurs mainly during the spring and summer months (September to February).
- It is common in children and teenagers.
- It has not been found to be related to any particular atmospheric allergen or pollutant.
- It is now believed to be caused by the rise in temperature associated with the spring and summer seasons.

Symptom and signs
- Severe itching and a thick, white discharge
- Conjunctivae may have a brownish or milky discoloration on the exposed parts.
- In severe cases, the exposed conjunctiva is thickened with patches of silvery scales.

Swaziland_FINAL press.indb 72 5/19/12 2:51 PM

- Round white nodules at the edge of the cornea are often seen.
- Papillae that give the conjunctiva a cobblestone appearance are seen.

Nonpharmaceutical management

- Reassure the patient or parent that the condition is not serious.
- Advise the patient to wear sunglasses when outside.

Pharmaceutical management

- **REFER** for **sodium cromoglycate** eye drops **(A)**, 1 drop 4 times daily ⚠
  - Give for 6 weeks initially.
  - If symptoms recur, this treatment must be continued for the remainder of the spring and summer season.
- Patients with severe itching will also need a short course of steroid eye drops: **fluorometholone**, 1 drop 3 times daily for 5 days **(B)**.

6.9 Iritis

Definition

Iritis is an inflammation of the iris of the eye. Usually only one eye is affected. Blindness will occur if not treated promptly.

Symptoms and signs

- Marked pain in one eye
- Photophobia
- Blurred vision
- Clear, watery discharge.
- Conjunctiva red, especially around cornea
- Clear cornea
- Small, irregular pupil; responds poorly to light

Pharmacological management

- Instill **atropine 1%** eye drops immediately **(B)**.
- Do not pad the eye.

REFER to eye centre. ⚠

6.10 Stye (external hordeolum)

Definition

Abscess of a sebaceous gland (internal stye) or a hair follicle (external stye) along the margin of the eyelid.

Symptoms and signs

- Pain in the eyelid. It is situated at the outer edge of the eyelid. It differs from a meibomian abscess, which is situated in the body of the eyelid.

Swaziland_FINAL press.indb 73 5/19/12 2:51 PM

- Red, tender swelling at margin of the eyelid (external stye).
- Red, tender swelling on the inside of the eyelid (internal stye or cyst).
- Pain when touching the swelling.

Nonpharmacological management

- Warm compresses

Pharmacological management

- If patient presents with hordeolum, give **amoxicillin** 500 mg PO every 8 hours **(A)**.
- Instill **tetracycline** or **chloramphenicol 1% (A)** eye ointment 3 times a day until abscess drains.

Swaziland_FINAL press.indb 74 5/19/12 2:51 PM

7. HAEMOTOLOGICAL CONDITIONS

7.1 Anaemia

Definition

Anaemia is defined as abnormally low concentration of haemoglobin (i.e., <12 g/dL in males, <11 g/dL in females, <11 g/dL in children, and <12 g/dL in the first week of life).

Causes

- Malaria
- Iron deficiency
- Blood loss (bleeding from haemorrhoids, peptic ulcers)
- Heavy menstrual bleeding
- Hookworm infestation
- Malnutrition
- **Vitamin K** deficiency in newborns
- Haemolysis (e.g., G6PD deficiency, sickle cell disease)
- Medicines (cytotoxics)
- Cancer
- **Vitamin B12** and **folic acid** deficiency

Symptoms and signs

- Easily fatigued
- Dizziness
- Shortness of breath on exertion
- Palpitations
- Pale mucous membranes and palms
- Spleen and liver may be palpable
- Signs of heart failure (in severe anaemia)

Diagnosis

- CBC and blood film comment
- Blood film for malaria parasites
- Examine the stool for eggs of hookworm (see 11.15.2)
- Sickling test; if positive, haemoglobin electrophoresis (see 7.3)

Investigate the cause of anaemia before initiating treatment. In an emergency, take all blood samples before treatment.

Nonpharmacological management

Advise patient to eat a balanced diet (i.e., plenty of leafy foods, beans, liver, meat, eggs, fish).

Swaziland_FINAL press.indb 75 5/19/12 2:51 PM

Pharmacological management

Adults—

- **Ferrous sulphate** 200 mg PO 3 times daily **(A)**

Children—

- **Ferrous sulphate** PO **(A)**
  - Up to 1 year (syrup [BPC], 300 mg/10 mL): 5 mL 3 times daily
  - 1–4 years (syrup [BPC], 60 mg/5 mL): 10 mL 3 times daily
  - 5–7 years (syrup [BPC], 60 mg/5 mL): 15 mL 3 times daily
  - 8–10 years (tablet): 200 mg daily
  - >10 years (tablet): 200 mg twice daily

Note: Continue treatment for 3 months after haemoglobin level normalizes to replenish iron stores.

In sickle cell disease patients, giving iron tablets may not be necessary, unless there is evidence of iron deficiency (see 7.3). Patients should, however, receive **folic acid**. Similarly, patients whose anaemia is possibly due to malaria should receive **folic acid** (see 11.5).

- **Folic acid** PO **(A)**
  - Adults: 5 mg daily for 30 days
  - Children: 2.5–5 mg daily for 30 days

If the anaemia is caused by hookworms, treat appropriately (see 11.15.2). Severe anaemia with signs of cardiac failure will need treatment of the heart failure in addition to blood transfusion with packed cells.

REFER ⚠

- Patients with recurrent, severe anaemia that is not caused by sickle cell disease (see 7.3)
- Patients with anaemia caused by uncontrolled bleeding
- Patients whose haemoglobin levels do not improve after two weeks on the above treatment
- Patients with heavy menstrual bleeding (refer to a gynaecologist)

7.2 Haemostatic and bleeding disorders

Definition

These are diseases characterised by excessive bleeding. They may be present from birth or acquired later in life. The bleeding may be due to defective blood vessels, platelet disorders, or clotting factor deficiency. A good history is important in distinguishing between the various causes. Past episodes of excessive bleeding (e.g., following circumcision), a family history of bleeding, and pharmacological therapy should be enquired about.

Swaziland_FINAL press.indb 76 5/19/12 2:51 PM

Common causes

- Liver disease
- **Vitamin K** deficiency, especially in newborns
- Drug-induced—herbal preparations, **prednisolone, NSAIDs** (e.g., **aspirin, ibuprofen**)
- Bone marrow malignancy (e.g., leukaemia)
- Haemophilia
- Severe septicaemia resulting in DIC

Bleeding may be spontaneous or may follow trauma or surgery. It may occur into the skin, gastrointestinal tract, brain, joints and muscles (haemophilia), or urine, or it may come from gums and nose. In newborns with **vitamin K** deficiency, spontaneous bleeding occurs from various sites (e.g., umbilical cord, gastrointestinal tract, scalp, or brain), and there is usually a history of failure to administer a **phytomenadione (vitamin K)** injection at birth.

Patients may be severely anaemic and in haemorrhagic shock if the bleed is large.

Diagnosis

- CBC, platelet count, and peripheral film comment
- LFTs
- Prothrombin time, partial thromboplastin time

Nonpharmacological management

- Apply pressure dressing to minimise bleeding where possible.

Pharmacological management

- In bleeding newborns, give **phytomenadione (vitamin K) (A)**, irrespective of history of **vitamin K** injection.
  - Full term: 1 mg (term) IV or IM
  - Preterm: 500 micrograms IV or IM
    Transfuse with fresh whole blood if patient is severely anaemic or in shock.
- In older children and adults, the following measures will help to arrest bleeding depending on cause:
  - Fresh frozen plasma or, if not available, fresh whole blood.
  - In cases of liver disease, give **phytomenadione (vitamin K) (A)** IM, IV preparation is preferred if available.
    - Adults: 10 mg
    - Children: 3–5 mg
- Stop any medications thought to be responsible for bleeding or which may aggravate bleeding (see "Common causes" above).

Swaziland_FINAL press.indb 77 5/19/12 2:51 PM

Prevention

- Avoid trauma in haemophiliacs.
- Avoid injections and unnecessary surgical procedures.
- Prophylactic administration of **vitamin K** (dosage as in "Pharmacological management" above) to all newborns at birth.

REFER ⚠

- After stabilisation, refer all patients to specialist for further evaluation.
- Refer any patients requiring surgery.

7.3 Sickle cell disease

Definition

Sickle cell disease is a hereditary disease characterized by the possession of two abnormal haemoglobins, one of which is haemoglobin S. It usually presents in children and young adults as seasonal joint pains, especially in cold weather, and jaundice. It is due to sickling of red blood cells caused by various factors.

There are various types including HbSS, HbS thalassaemia, and HbSC. The possession of one normal haemoglobin and an abnormal haemoglobin S does not constitute sickle cell disease. It is a trait.

Individuals with sickle cell disease may present with crises. Crises may be in the form of thrombotic crises (precipitated by cold, dehydration, infection, ischaemia, physical exertion), which cause pain often in the bones. Other types of crises may also occur. These include haemolytic, aplastic, and sequestration crises. In aplastic crises, there is anaemia with a low reticulocyte count. In sequestration crises, the spleen and liver enlarge rapidly due to pooling of blood in the spleen. Anaemia is quite severe in this case.

Symptoms and signs

- Joint and bone pain, especially during cold wet seasons
- Periodic jaundice
- Abdominal pain, especially in the splenic area
- Spontaneous sustained erection without sexual arousal in male patients (priapism) may occur
- Pallor
- Hepatomegaly
- Splenomegaly
- There may be old or recent scarification marks suggesting the long history of the illness.

Swaziland_FINAL press.indb 78 5/19/12 2:51 PM

Diagnosis

- CBC
- Sickling test
- Haemoglobin electrophoresis

Pharmacological management

The patient may present in crisis, in the steady state, or with complications.

Crisis—

- Make a prompt determination precipitating cause (e.g., infection, malaria), and begin treatment.
- Give IV fluid and electrolyte therapy (usually glucose in sodium chloride):
  - Adults: **5% dextrose** in **0.9% sodium chloride (normal saline) (A)**
  - Children: **4.3% dextrose** in **0.18% sodium chloride**
- Give pain relievers such as **paracetamol (A)** PO or suppository, every 6–8 hours or **ibuprofen (A)** PO every 8 hours. (See table 7.3.)
- **Pethidine** IM (if in severe pain) **(B)**. ***Caution:*** Do not give if the patient has difficulty breathing.
  - Adults: 25–100 mg repeated every 4 hours, as required.
  - Children: 0.5–2 mg/kg body weight repeated every 4 hours, as required.
- Blood transfusion when needed, but not routinely. (Transfusion will be necessary if haemoglobin level is <5 g/dL.)

Steady state—

- Advise patient to maintain a good nutritional state.
- Advise patient to seek prompt treatment of infections.
- Give daily **folic acid** supplements 5 mg; in children, under 1 year give 2.5 mg.
- Encourage drinking plenty of fluids.
- Encourage periodic check-ups at the sickle cell clinic.

Table 7.3 Pain Reliever Dosage for Sickle Cell Disease Patients in Crisis

Age of Patient	Paracetamol (A)	Ibuprofen (A)
Adults	500 mg–1 g	400–600 mg
Children		
▪ 3 months to 1 year	60–120 mg (2.5–5 mL syrup)	50–100 mg (from 9 months)
▪ 1–5 yrs	100–200 mg (5–10 mL syrup)	120–250 mg
▪ 6–12 yrs	250–500 mg	200–400 mg

Swaziland_FINAL press.indb 79 5/19/12 2:51 PM

Prevention

- Advise patient to avoid precipitating causes of crisis, if possible (e.g., malaria, pneumonia, exposure to cold weather, other infections).
- Educate patient to tell doctor he or she has sickle cell disease SC, SS, or other form.
- Encourage patient to get genetic counselling.

REFER all patients with complications such as bleeding into the eye, aseptic necrosis of the hip, priapism, haematuria, stroke, and osteomyelitis. ⚠

Swaziland_FINAL press.indb 80 5/19/12 2:51 PM

8. GASTROINTESTINAL CONDITIONS

8.1 Diarrhoea

Definition

Diarrhoea is a condition characterized by loose or watery stools, three or more time in a day. It is usually caused by a virus, a disturbance of normal flora, or both. Most acute diarrhoea in adults is self-limiting and can be managed by fluid replacement. (For diarrhoea in children, see also 10.4.)

Symptoms and signs

- Frequent loose or watery stools (three or more times in a day)
- Malaise and fatigue
- Associated vomiting
- Reduced urine output
- Dehydration

Nonpharmacological management

- Advise patient to—
  - Use home-based fluid replacement.
  - Keep surroundings clean.
  - Improve personal hygiene (e.g., hand washing after toilet).

Pharmacological management

- Fluid replacement with **ORS (A)**
- Adults—
  - 1000–2000 mL stat
    —PLUS—
  - 200–400 mL per every extra stool passed

Children—

  - 500–1000 mL stat
    —PLUS—
  - 100–200 mL per every extra stool passed

REFER any child with drowsiness following dehydration. Put in an IV drip, and refer a patient if condition does not improve or gets worse. ⚠

8.2 Dysentery

8.2.1 Amoebic dysentery

Definition

Amoebic dysentery is a condition characterized by loose stools or diarrhoea that is caused by protozoa, *Entamoeba histolytica*.

Swaziland_FINAL press.indb 81 5/19/12 2:51 PM

Symptoms and signs

- Loose stools or diarrhoea usually with—
  - Blood
  - Mucus
  - Unpleasant odour
- May alternate with constipation
- Usually no fever
- Tenesmus
- Small volume of stool
- Sick-looking
- May be dehydrated

Nonpharmacological management

- Advise the patient to—
  - Use home-based fluid replacement.
  - Keep surroundings clean.
  - Improve personal hygiene (e.g., hand washing after toilet).

Pharmacological management

- Fluid replacement with **ORS (A)**
- Adults—
  - 1000–2000 mL **ORS (A)** stat
    —PLUS—
  - 200–400 mL **ORS (A)** per every extra stool passed
    —PLUS—
  - **Metronidazole** 400 mg PO 3 times daily for 5 days **(A)**. ***Caution:*** **Metronidazole** is contraindicated in the first trimester of pregnancy.
    —OR—
  - **Tinidazole** 2 g PO stat **(A)**
- Children—
  - 500–1000 mL **ORS (A)** stat
    —PLUS—
  - 100–200 mL **ORS (A)** per every extra stool passed
    —PLUS—
  - **Metronidazole** 7.5 mg/kg PO every 8 hours for 5 days **(A)**
    —OR—
  - **Tinidazole** 50–75 mg/kg PO stat **(A)**

REFER all suspected cases unless confirmed by laboratory diagnosis. ⚠

8.2.2 Bacillary dysentery (shigellosis)

Definition

Dysentery is an inflammation of the colon and the rectum, and it is

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characterized by the frequent passage of loose stool with blood and a temperature above 39°C. The most common cause of dysentery in Swaziland is infection by *Shigella* organisms. Flies and contaminated food spread it.

Diagnosis

- Stool microscopy

Symptoms and signs

- Diarrhoea, often with blood
- Lower abdominal pain; cramping in nature
- Fever (frequently)
- Ill-defined lower abdominal tenderness

Nonpharmacological management

- Advise patient to—
  - Use home-based fluid replacement.
  - Keep surroundings clean.
  - Improve personal hygiene (e.g., hand washing after toilet).

Pharmacological management

- Fluid replacement with **ORS (A)**
- Adults—
  - 1000–2000 mL **ORS (A)** stat
    —PLUS—
  - 200–400 mL **ORS (A)** per every extra stool passed
    —PLUS—
  - **Ciprofloxacin** 500 mg PO every 12 hours for 3 days **(A)**
    —OR—
  - **Co-trimoxazole** 960 mg PO every 12 hours for 5 days **(A)**
- Children—See 10.4.

REFER all cases to the hospital for further investigation. ⚠

Note: If bacillary dysentery becomes an epidemic, report cases to the environmental health officers. Stress that the diarrhoea could not be stopped because health officers want to eradicate the microorganism.

8.3 Anal conditions

8.3.1 Anal fissures

Definition

An anal fissure is a crack in the skin lining the lower half of the anal canal. It is an extremely painful condition and is usually produced by the combination of straining and constipation.

Swaziland_FINAL press.indb 83 5/19/12 2:51 PM

Symptoms and signs

- Severe pain during and after defecation often associated with bright red streaks of blood on outside of the faeces
- Visible crack when the anal margins are gently separated
- Usually situated in the posterior midline, but may be anterior, especially in females
- A history of constipation
- May follow diarrhoea (laxative abuse)
- Often present in addition to a sentinel pile (an area of hypertrophied skin at the outer end of the fissure)

Nonpharmacological management

- Give dietary advice to promote soft stools.
- Encourage good personal hygiene.
- Advise against anal intercourse.

Pharmacological management

- **Liquid paraffin BP (A)** PO at bedtime may be indicated in some patients for short-term use (i.e., 3–5 days).
- Adults: 15–25 mL
- Children: 5 mL

REFER ⚠

- Severe pain
- Recurrent episodes
- Poor response to symptomic management
- Very tight anus (PR not possible)

8.3.2 Haemorrhoids

Definition

Haemorrhoids are enlarged veins in the rectum, which prolapse on defaecation. They are the most frequent cause of rectal bleeding.

Diagnosis

- Proctoscopy (the gold standard for diagnosis)
- CBC

Symptoms and signs

- Itching
- Small prolapse easily pushed back through anal sphincter
- Pain
- Bleeding—fresh blood seen on toilet paper

Swaziland_FINAL press.indb 84 5/19/12 2:51 PM

Nonpharmacological management

- Recommend a high-fibre diet to prevent constipation.
- Counsel against chronic use of laxatives.
- Advise patient to avoid straining at stool.

Pharmacological management

- **Liquid paraffin BP** 15–25 mL PO at bedtime for 3–5 days **(A)**
- **Bismuth subgallate compound** applied twice daily and after every stool passage **(B)**

REFER when a patient experiences severe pain, recurrent episodes, poor response to symptomatic treatment, and surgery. ***Note:*** Haemorrhoid surgery for pregnant women should be delayed until after delivery. ⚠

8.4 Acute appendicitis

Definition

Acute appendicitis is a severe rapid onset infection of the appendix. At first, the infection is confined to the appendix. If the appendix ruptures, however, the infection can spread to the rest of the abdomen resulting in generalized peritonitis. Inflammation of the appendix is a common problem in children and young adults. The cause is not clear, but appears to be related to a low-fibre diet.

Diagnosis

- CBC
- Ultrasound

Symptoms and signs

- Pain in the abdomen: first it may be noticed around the umbilicus and later the pain shifts to the lower right quadrant
- Pain worse when coughing or walking
- Nausea and vomiting
- Fever
- In time, the pain usually localizes to tenderness in the right lower quadrant (rebound tenderness may not be present).
- Bowel sounds present or diminished
- In babies, small children, pregnant women, and old people, the signs may not be typical.
- Constipation is usual.
- Tenderness on rectal exam may be present.

Nonpharmacological management

- None. This condition is an emergency and referral should be made immediately if appendicitis is suspected.

Swaziland_FINAL press.indb 85 5/19/12 2:51 PM

Pharmacological management

- **Pethidine** 50–100 mg IM stat **(B)**.
- Withhold oral fluids and food, and start an IV.
- **REFER** immediately to the hospital. ⚠

8.5 Peptic ulcer disease

Definition

The lining of the stomach or duodenum slowly begins to erode as a result of excessive acid secretion.

Causes

The causes of a peptic ulcer are emotional stress, medicine side effect(s) (e.g., from indomethacin and aspirin), smoking cigarettes, and infection (*Helicobacter pylori*). It varies with different people.

Diagnosis

- *H. pylori* antigen detection
- Endoscopy (upper GIT)
- X-ray (barium meal)

Symptoms and signs

- Epigastric pain 1–2 hours after eating, or with an empty stomach; acute epigastric pain, often radiating to shoulder; epigastric tenderness on palpitation
- Pain that awakens the person in the early hours of the night
- Pain relieved with food or antacid
- Coffee-ground appearance of vomitus
- Black stools (malaena)
- Shock—rapid feeble pulse, clammy skin, and low BP, if complicated by bleeding (see 19.5)
- Tenderness in the middle of the abdomen on palpation from the umbilicus to the epigastric area
- When perforated—
  - Sick-looking patient
  - Lying as still as possible
  - Elevated temperature
  - Abdomen—board-like rigidity, rebound tenderness
  - Absent bowel sounds

Nonpharmacological management

- Advise patient to—
  - Stop alcohol, coffee, tea, smoking, and soft drinks—they make the condition worse

Swaziland_FINAL press.indb 86 5/19/12 2:51 PM

  - Eat small meals frequently (e.g., 6 times a day)
  - Avoid spicy foods
- Discuss with family and friends any stress problems, and try to find a way to relieve them.

Pharmacological management

- **Magnesium trisilicate** suspension 10 mL PO 3 times daily or as required **(A)**
  —OR—
- **Ranitidine** 150 mg PO once daily as required **(B)**
  —OR—
- **Omeprazole** 20 mg PO once daily as required **(B)**

For eradication of *H. pylori*—

- **Clarithromycin** 500 mg PO twice daily for 7 days **(S)**
  —PLUS—
- **Amoxicillin** 1 g PO twice daily for 7 days **(A)**
  —PLUS—
- **Omeprazole** 20 mg PO for 7 days **(B)**
  —OR—
- **Metronidazole** 400 mg PO every 8 hours for 7 days **(A)**. ***Caution:*** **Metronidazole** is contraindicated in the first trimester of pregnancy.
  —PLUS—
- **Amoxicillin** 500 mg PO every 8 hours for 7 days **(A)**
  —PLUS—
- **Omeprazole** 20 mg PO for 7 days **(B)**

REFER immediately to the hospital when perforation or other complications are suspected. ⚠

8.6 Constipation

Definition

Constipation is a condition characterised by hardened faeces and difficulty emptying the bowels.

Causes

- Dietary: lack of roughage, inadequate fluid intake
- In infants: concentrated feedings
- Lack of exercise
- Bedridden patient—especially the elderly
- Certain medicines (e.g., narcotic analgesics)

Swaziland_FINAL press.indb 87 5/19/12 2:51 PM

Symptoms and signs

- Abdominal discomfort
- Small hard stools passed irregularly under strain

Investigations

- X-ray: after barium enema

Nonpharmacological management

- Advise a high-fibre diet.
- Recommend adequate fluid intake.

Pharmacological management

- Adults: **bisacodyl** 10 mg at night **(A)**
- Children (5–12 years): **bisacodyl** 5 mg at night **(A)**

Prevention

- Recommend a diet rich in roughage: plenty of vegetables and fruits.
- Advise patient to drink plenty of fluids with meals.
- Encourage increased exercise.

Swaziland_FINAL press.indb 88 5/19/12 2:51 PM

9. GYNAECOLOGY AND OBSTETRICS

9.1 Infertility

Definition

Infertility is defined as the inability to conceive after a year of regular unprotected intercourse. There are three main causes of infertility:

- No or low sperm count in males
- Failure to ovulate in females
- Blocked fallopian tubes in females

Diagnosis

- If a woman has a regular cycle with painful periods, this usually indicates ovulation.
- The prevalence of STIs makes tubal blockage the most common cause of infertility in women.
- The patency of tubes may be tested by a doctor.
- A sperm analysis may be done.

Nonpharmacological management

- Advise the couple to have sexual intercourse at least three times a week.
- **REFER** the woman to a gynaecologist and the man to a urologist for investigations if no pregnancy is achieved in 6 months. ⚠

9.2 Abortion

Definition

An abortion is defined as the expulsion of the products of conception before the 28th week of gestation. Abortion could be spontaneous (i.e., comes on by itself) or induced. In either case, there is the risk of infection, bleeding, or both.

Symptoms and signs

- History of missed period
- Vaginal bleeding accompanied by abdominal cramps
- If infection is present, there may be—
  - Fever and chills
  - Foul-smelling vaginal discharge
- Lower abdominal tenderness
- Signs of shock may be present (see 19.5)—
  - Cold, moist skin
  - Rapid pulse
  - Systolic BP <90 mm Hg

Swaziland_FINAL press.indb 89 5/19/12 2:51 PM

Nonpharmacological management

- Monitor vital signs (e.g., BP, pulse)
- CBC
- Counsel and support the patient
- **REFER** all women with vaginal bleeding. ⚠

Pharmacological management

- Treat for shock with plasma expanders. (See 19.5.)
- Give blood if indicated.
- Give **oxytocin** 5–10 IU IM **(B)**. ***Caution:*** Avoid using other myometrial hypertonic agents together with **oxytocin**.
  —OR—
- Give **oxytocin** 20–40 IU **(B)**, diluted in 1000 mL **5% dextrose (A)** in water, IV.
  - Administer at 5–20 drops per minute, depending on the frequency of contractions.
  - Contraction frequency should not exceed 5 in 10 minutes.
- If bleeding continues, repeat **oxytocin** after 30 minutes **(B)**.
- In Rh-negative mothers, administer **anti-D immunoglobulin** 100 micrograms IM **(C)** within 72 hours of delivery of the foetus.
- Treat infection with antibiotics:
  - **Amoxicillin** 500 mg PO every 6 hours for 7 days **(A)**
    —PLUS—
  - **Metronidazole** 400 mg PO every 8 hours for 7 days **(A)**.
    —OR—
  - ***For patients who are allergic to penicillin***, **erythromycin** 500 mg PO every 8 hours for 7 days **(A)**
- **REFER** all patients to facility where uterine evacuation can be performed. ⚠

9.3 Threatened abortion

Definition

Early vaginal bleeding without low abdominal pain, and foetus is not expelled. The uterus is the size expected by dates, and the cervix is closed.

Nonpharmacological treatment

- Advise the patient to take bed rest.
- Advise the patient to abstain from sex for at least 14 days.
- Continue observing the patient.

Swaziland_FINAL press.indb 90 5/19/12 2:51 PM

Pharmacological treatment

- **Paracetamol** 500 mg – 1 g PO every 6 hours for 5 days **(A)**
- **REFER** all patients to facility where uterine evacuation can be performed. ⚠

9.4 Anaemia of pregnancy

Definition

Anaemia in pregnancy is a common occurrence during pregnancy and arises out of the combination of several factors, among which the most important are—

- Decreased dietary intake of iron-containing foods
- Increased demand by the foetus
- Chronic blood loss (e.g., hookworm infestation; see 11.15.2)

Symptoms and signs

- Increased tiredness and weakness
- Pallor of the mucous membranes and nail beds
- If the anaemia is severe, oedema and signs of CCF may be present.

Pharmacological management

Prevention (all antenatal patients)—

- **Ferrous sulphate** 200 mg PO daily with food **(A)**.
  —PLUS—
- **Folic acid** 5 mg PO daily **(A)**
  —PLUS—
- **Vitamin C** daily **(A)**

Treatment—

- If Hb <11 g/dL, give **ferrous sulphate** 200 mg PO 3 times daily with food and for 1 month thereafter for prevention **(A)**.

REFER ⚠

- Hb <8 g/dL at any stage
- Hb <10 g/dL in patients over 34 weeks of gestation
- Unresponsive Hb—
  - A rise in the Hb of <1.5 g/dL over 2 weeks
  - <2 g/dL over 3 weeks in early pregnancy
- Pallor (anaemia) plus signs of chronic disease (e.g., suspicion of TB or the presence of hepatosplenomegaly)
- Evidence of cardiac failure

Swaziland_FINAL press.indb 91 5/19/12 2:51 PM

9.5 Antepartum haemorrhage

Definition

APH is defined as bleeding PV after the 28th week of pregnancy. APH is an emergency. Some of the more common causes of APH include the following:

- Placental
  - Placenta praevia
  - Abruptio placentae
- Nonplacental
  - Vaginal or cervical lesions (e.g., cancer)
  - Cervical infections
  - Trauma
  - Decidual bleeding
  - Unknown

Caution: Do *not* attempt to do a vaginal examination. You may precipitate torrential bleeding.

Symptoms and signs

See table 9.5.

REFER after setting up an IV line. ⚠

Table 9.5 APH Symptoms and Signs

Symptoms and Signs	Cause of Bleeding	
	Placenta Praevia	**Abruptio Placentae**
Bleeding	Always present Bright red	Not always present Dark red
Abdominal pains	Absent	++
Tender uterus	Absent	++
Presenting part	Not engaged	Engaged
Abdomen	Normal Easy-to-feel foetal parts	Larger than gestation age Foetal parts not palpable

9.6 Postpartum haemorrhage

Definition

PPH is defined as blood loss PV after delivery in excess of 500 mL—or less if it affects the general condition of the patient. The two types of PPH are—

- Primary PPH, which occurs in the first 24 hours
- Secondary PPH, which occurs between 24 hours and six weeks.

Causes—

- Failure of uterus to contract

Swaziland_FINAL press.indb 92 5/19/12 2:51 PM

- Damage to or rupture of the perineum, vagina, or uterus (tends to cause bleeding in the first 24 hours)
- Precipitated labour
- Infection in the uterus
- Retained placenta
- Full bladder

Clinical features—

- Bleeding, which is often >500 mL, occurs from the genital tract.
- The uterus may be still large, soft, and not contracted especially in primary PPH.
- In secondary PPH, there may be signs of infection (e.g., fever, abdominal tenderness).

Check for signs of shock if bleeding is severe or of any amount that causes worsening of the patient's condition (see 19.5).

Investigations

- If there is time (e.g., in secondary PPH), blood for Hb, clotting, and grouping

Nonpharmacological management

- Establish and treat the cause of the bleeding; look for local causes if bleeding continues.
- Check uterus to see is contracted.
- Check if placenta has been expelled. *If yes*, expel any clots in the birth canal.
- Ensure bladder is emptied.

Pharmacological management

- Start an IV infusion.
  - **Oxytocin** 10–40 IU IV **(B)**
    —OR—
  - **Misoprostol** 800 micrograms sublingually **(S)**
    —OR—
  - **Ergometrine** 0.2 mg/mL/ampoule; 0.2–0.4 mg IV or IM immediately
- **REFER** to higher level for further management. ⚠

If the placenta is retained—

- Carry out manual removal of the placenta under general anaesthesia, especially if bleeding is present.
- If manual removal is not possible, **REFER** for further management. ⚠

If there is infection—

- Give antibiotics
  - **Amoxicillin** 500 mg PO every 8 hours **(A)**
    —OR—

Swaziland_FINAL press.indb 93 5/19/12 2:51 PM

- ***For patients who are allergic to penicillin***, **erythromycin** 500 mg PO every 6 hours **(A)**
  —PLUS—
- **Metronidazole** 400 mg PO every 8 hours **(A)**

Prevention of PPH—

- Ensure active management of the third stage of labour and delivery by skilled staff and give—
  - **Oxytocin** injection 10 IU **(B)**
    —OR—
  - **Misoprostol** 600 micrograms PO **(S)**
- If the uterus is firmly contracted, set up an IV drip using **5% dextrose (A)** in **0.9% sodium chloride (normal saline) (A)** or any IV fluid available.
- Examine the placenta to see if it is complete.
- If the placenta is still inside and you have done a removal before, remove the placenta manually under a general anaesthesia, or **REFER** to a higher level centre. ⚠
- If you have not had previous experience at removal, **REFER** immediately to the hospital. ⚠
- If there is still bleeding, examine the cervix and vagina for lacerations. If any are present, suture.
- If you have been unable to suture any lacerations, pack the vagina, and **REFER**. ⚠
- If after doing the above, there is still bleeding, **REFER** immediately to the hospital after packing the vagina. ⚠
- If the bleeding has stopped, let the IV fluids continue for at least 24 hours, and give **ergometrine** PO **(A)** 1 tablet 3 times a day for 3 days.
- Continue to check for vaginal bleeding, contracted uterus, and full bladder and to monitor the vital signs.

Prolonged labour and other special circumstances—

- Give 5 days of prophylactic antibiotics in prolonged or obstructed labour or in presence of other risk factors (e.g., rupture of membranes, birth before arrival at health centre, retained placenta, instrument delivery).
  - **Amoxicillin** 500 mg PO every 8 hours **(A)**
    —OR—
  - ***For patients who are allergic to penicillin***, **erythromycin** 500 mg PO every 6 hours **(A)**
    —PLUS—
  - **Metronidazole** 400 mg PO every 8 hours **(A)**

Swaziland_FINAL press.indb 94 5/19/12 2:51 PM

9.7 Cracked nipples during breastfeeding

Definition

The areola and nipple are protected by the secretion of a lubricant from Montgomery's glands. Excessive mopping (e.g., with a towel), elaborate nipple exercise, and removal of the baby from the breast before suction is broken are causes of cracked nipples. The cracks may cause infection and abscess in the breast.

Nonpharmacological management

- Advise the patient to—
  - Clean with mild soap and water.
  - Use an emollient (e.g., hind milk or emulsifying ointment) between feedings, and remove by washing before feeding.
- If breastfeeding is too painful, the milk should be expressed, and the baby nursed on the other breast until the cracked nipple improves.

9.8 Breast abscess

Definition

Breast infections usually occur when a women is breastfeeding. The infection is caused by bacteria gaining entry through a cracked nipple. This can progress to abscess formation.

Symptoms and signs

- Pain in the affected breast
- Warm, tender, red swelling
- Infected area becomes fluctuant (filled with pus or soft in the centre)
- Fever and chills

Nonpharmacological management

- Apply warm, wet compresses for 15 minutes for 3 days.
- Express milk, and continue feeding.
- Empty the breast completely after feeding.

Pharmacological management

- **Phenoxymethylpenicillin** 500 mg PO every 6 hours for 5 days **(A)**
  —OR—
- ***For patients who are allergic to penicillin*, erythromycin** 500 mg PO every 6 hours for 5 days **(A)**
  —OR—
- **Cloxacillin** 500 mg PO every 6 hours for 5 days **(A)**
- **REFER** if there is no improvement or drainage of abscess. ⚠

Swaziland_FINAL press.indb 95 5/19/12 2:51 PM

9.9 Puerperal sepsis

Definition

Signs of infection during the first 42 days post-delivery are called *puerperal sepsis*.

Causes

- Ascending infection from contamination during delivery or abortion
- Bacteria include: *Staphylococcus aureus*, and Gram-negative bacteria from the gut, (e.g., *Escherichia coli*, Bacteroides, *Streptococcus pyogenes*).

Symptoms and signs

- Offensive PV discharge
- Fever
- Lower abdominal pain
- Continuous lochia (>7 days)

Nonpharmacological management

None. **REFER** to hospital. ⚠

Pharmacological management

- Parenteral antibiotic therapy—
  - **Ampicillin** 500 mg IV or IM every 6 hours **(A)**
    —OR—
  - ***For patients who are allergic to penicillin***, give **erythromycin** 500 mg PO every 6 hours **(A)**
    —PLUS—
  - **Gentamicin** 5–7 mg/kg IV or IM daily in 2 divided doses (every 12 hours) **(A)**
    —PLUS—
  - **Metronidazole** 500 mg IV every 8 hours for at least 3 doses **(A)**
- After clinical improvement—
  - Switch to **metronidazole** 400 mg PO every 8 hours **(A)**.
- **REFER** after first doses of antibiotics. ⚠

9.10 Dysmenorrhoea

Definition

Dysmenorrhoea is pain experienced during the menstrual period that interferes with the normal function. It is common (about 50% of women). Sometimes it is due to underlying infection (secondary dysmenorrhoea) in the pelvic organs (PID). Sometimes no cause can be found (primary dysmenorrhoea).

Swaziland_FINAL press.indb 96 5/19/12 2:51 PM

Symptoms and signs

- Intermittent pain and heaviness in lower abdomen associated with the menstrual period
- May be accompanied by—
  - Headache
  - Diarrhoea or constipation
  - Nausea or vomiting

Nonpharmacological management

- Advise and reassure women with primary dysmenorrhoea about the nature of the condition.
- Advise the woman to undertake regular exercise as a part of lifestyle modification.
- Apply heating pack over the lower abdomen and back.

Pharmacological management

Primary dysmenorrhoea—

- **Mefenamic acid** 250–500 mg PO every 8 hours for 2–3 days **(A)**

—OR—

- **Ibuprofen** 200–400 mg PO every 8 hours for 2–3 days **(A)**

Secondary dysmenorrhoea—

- Treat the underlying condition.

REFER ⚠

- Patients with a poor response to management of primary dysmenorrhoea
- Patients with secondary dysmenorrhoea

9.11 Ectopic pregnancy

Definition

Ectopic pregnancy is the implantation of a fertilized ovum outside the uterine cavity. The most common place (95%) is in the fallopian tubes.

Symptoms and signs

- Vaginal bleeding
- Pain in the lower abdomen
- Backache
- Dizziness and fainting
- Tenderness in the lower abdomen with or without rebound
- A tender mass may be felt in one adnexa on bimanual examination.
- Shock may be present if there is severe bleeding in the peritoneum (see 19.5).
- Cervical motion tenderness

Swaziland_FINAL press.indb 97 5/19/12 2:51 PM

Diagnosis

- Positive pregnancy test
- Pelvic sonography where available
- Culdocentesis

Nonpharmacological management

None. **REFER** to hospital as an emergency. ⚠

Pharmacological management

Pre-hospital—

- Secure IV line with wide-bore cannula (16–18G).
- Give **0.9% sodium chloride (normal saline) (A)**, or **Ringer's lactate (A)** to run fast.
- If signs of shock, see 19.5.

Hospital—

- Surgical intervention is needed.
- Draw blood sample and have grouping and cross matching.

9.12 Dysfunctional uterine bleeding

Definition

Dysfunctional uterine bleeding is abnormal uterine bleeding not related to any organic disease. Normal menses have a cycle of 21 to 35 days, each lasting 2 to 8 days with loss of up to 80 mL. Table 9.12 lists the causes of dysfunctional uterine bleeding.

Table 9.12 Common Causes of Abnormal Uterine Bleeding by Age

Age	Cause
Pre-puberty	Sexual assault
Reproductive age group	Pregnancy-related conditions
Postmenopausal	Malignancy of the genital tract

Pharmacological management

- **Mefenamic acid** 250–500 mg every 8 hours for 2–3 days **(A)**
  —OR—
- **Ibuprofen** oral 200–400 mg every 8 hours daily for 2–3 days **(A)**
- **Combined oral contraceptive (norgestrel 50 micrograms + ethinyl-estradiol 500 micrograms** [**A***]): three cycles and take only the active pills

REFER if bleeding is heavy and uncontrollable, resuscitate and refer to hospital where a full gynaecological examination and laboratory investigations can be done. ⚠

Swaziland_FINAL press.indb 98 5/19/12 2:51 PM

9.13 Postmenopausal bleeding

Definition

Postmenopausal bleeding is bleeding after the cessation of menses. It is usually due to malignancies and should be referred to a gynaecologist.

9.14 Pregnancy-induced hypertension—pre-eclampsia and eclampsia

Definition

Pregnancy-induced hypertension is hypertension at 20 weeks of gestation or more accompanied by:

- Proteinuria, oedema, or both
- BP of 140/90 mm Hg or higher

Eclampsia is the presence of seizures in patients with hypertension.

9.14.1 Severe pre-eclampsia

Definition

Severe pre-eclampsia is a hypertensive condition of pregnancy that may result in maternal convulsions.

Pharmacological management

Set up an IV drip, and give **magnesium sulphate** as follows **(B)**.

Loading dose—

- Give 4 g of **20% magnesium sulphate** solution IV over 5 minutes **(B)**.
- Follow promptly with 10 g of **50% magnesium sulphate** solution **(B)**: administer 5 g in each buttock deep IM with 1 mL of 2% **lignocaine (C)** in the same syringe.
- If convulsions recur after 15 minutes, give 2 g of 50% **magnesium sulphate** solution IV over 5 minutes **(B)**.

Maintenance dose—

- Give 5 g of 50% **magnesium sulphate** solution **(B)** with 1 mL of 2% **lignocaine (C)** in the same syringe by deep IM injection into alternate buttocks every 4 hours. Continue treatment for 24 hours after delivery or last convulsion, whichever occurs last.
  - If 50% solution is not available, give 1 g of **20% magnesium sulphate** solution IV every hour by continuous infusion **(B)**.
  - ***Caution:*** Monitor for signs of magnesium toxicity:
    - Respiratory rate
    - Patellar reflexes
    - Urinary output

Swaziland_FINAL press.indb 99 5/19/12 2:51 PM

- If signs of toxicity are present, give antidote for **magnesium sulphate**:
  - **Calcium gluconate** 1–2 g slow IV, and repeat as needed until respiratory rate increases **(A)**.

    —OR—

- If **magnesium sulphate** is not available, give **diazepam (B)** as an alternative, as follows:
  - Loading dose—
    - **Diazepam** 10 mg IV slowly over 2 minutes **(B)**
    - If convulsions recur after 15 minutes, repeat loading dose.
  - Maintenance dose—
    - **Diazepam (B)** 40 mg in 500 mL **0.9% sodium chloride (normal saline) (A)** or **Ringer's lactate (A)**.
    - ***Caution:*** Maternal respiratory depression may occur if dose exceeds 30 mg in 1 hour.
    - Assist respiration if necessary.
    - Do not give more than 100 mg in 24 hours.
  - Rectal administration of **diazepam (B)**—
    - Give a loading dose of 20 mg in 10 mL syringe.
    - If convulsions not controlled in 10 minutes, administer additional 10 mg. Be prepared to assist ventilation.

9.14.2 Eclampsia

Definition

Eclampsia is pregnancy-induced hypertension with convulsions.

Pharmacological management

- Treat as severe pre-eclampsia above (9.14.1).
- In hospital, if BP is >110 mm Hg diastolic or >160 mm Hg systolic:
  - Give **dihydralazine** 10 mg IV bolus, and repeat **dihydralazine** dose every 15 minutes until diastolic BP is down to 100 mm Hg, but not below 90 mm Hg **(B)**.

    —OR—
  - If **dihydralazine** is not available, give nifedipine 20 mg sublingually every 12 hours for 1–2 doses until delivery **(B)**.
- ***Note:*** Aim to deliver within 8 hours for unconscious patient; for conscious patients, aim for 12 hours.

9.15 Abnormal vaginal discharge

Symptoms and signs

In all cases, abnormal increase of vaginal discharge, described as follows—

- Normal discharge is small in quantity and white to colourless.

Swaziland_FINAL press.indb 100 5/19/12 2:51 PM

- *Gonorrhoea* produces a thin mucoid slightly yellow pus discharge with no smell.
- *Trichomoniasis* causes a greenish-yellow discharge with small bubbles, a fishy smell, and itching of the vulva.
- *Candida albicans* causes a very itchy, thick white discharge like sour milk.
- *Mycoplasma chlamydia* may cause a non-itchy, thin, colourless discharge.

Differential diagnosis

- Cancer of the cervix, especially in older women with many children (multiparous), causes a blood-stained smelly discharge.

Causes

Usually due to vaginal infection by *Trichomonas vaginalis*, *Candida albicans*, and bacterial vaginosis or *Chlamydia trachomatis*.

Diagnosis

- Speculum examination, especially in older multiparous women
- Pus swab: microscopy, Gram stain, C&S
- Blood: syphilis tests (RPR/VDRL)

Nonpharmacological management

- Counsel on compliance and risk reduction for transmission of STIs and HIV.
- Provide and promote use of condoms.
- Notify partners and contacts.

Pharmacological management

Nonpregnant woman with a vaginal discharge—

- **Ciprofloxacin** 500 mg PO immediately for suspected gonorrhea **(A)**
  —PLUS—
- **Doxycycline** 100 mg PO every 12 hours for 7 days **(A)**
  —PLUS—
- **Metronidazole** 2 g PO immediately **(A)**
  —OR—
- **Metronidazole** 400 mg PO every 12 hours for 7 days **(A)**

Pregnant woman with a vaginal discharge—

- **Spectinomycin** IM 2 g immediately for suspected gonorrhea **(A)**
  —PLUS—
- **Erythromycin** 500 mg PO every 6 hours for 7 days **(A)**
  —PLUS—
- **Metronidazole** 2 g PO immediately **(A)**
  —OR—
- **Metronidazole** 400 mg PO every 12 hours for 7 days **(A)**. ***Caution:*** **Metronidazole** is contraindicated in the first trimester of pregnancy.

Swaziland_FINAL press.indb 101 5/19/12 2:51 PM

Clinical evidence of vaginal candidiasis—

- **Clotrimazole** pessary inserted in the vagina, 500 mg at night as a single dose **(A)**
  —OR—
- **Nystatin** pessary 100,000 IU 2 times a day for 14 days **(B)**

9.16 Pelvic inflammatory disease

Definition

PID is an upper genital tract infection usually acquired sexually and is polymicrobial in nature. Common microorganisms include *Neisseria gonorrhoeae, C. trachomatis,* and anaerobes.

Symptoms and signs

- Abdominal pain
- Pain during sexual intercourse
- Abnormal vaginal discharge
- Abnormal uterine bleeding
- Pain during urination
- Fever
- Nausea and vomiting

Pharmacological management

- **Ciprofloxacin** 500 mg PO stat **(A)**
  —OR—
- **Spectinomycin** 2g IM stat **(A)**
  —OR—
- **Ceftriaxone** 250 mg IM stat **(A)**
  —PLUS—
- **Doxycycline** 100 mg PO every 12 hours for 14 days **(A)**. ***Caution:*** **Doxycycline** is contraindicated in pregnancy.
  —PLUS—
- **Metronidazole** 400 mg PO every 12 hours for 14 days **(A)**. ***Caution:*** **Metronidazole** is contraindicated in the first trimester of pregnancy.

REFER to a hospital if— ⚠

- A surgical emergency (e.g., appendicitis and ectopic pregnancy) cannot be excluded.
- A pelvic abscess is suspected.
- The patient is pregnant.

Swaziland_FINAL press.indb 102 5/19/12 2:51 PM

9.17 Genital ulcer disease syndrome

Definition

A genital ulcer is the loss of continuity of the skin and mucosa of the genitalia.

Causes

A number of conditions may produce genital sores in men and women.

- Syphilis—caused by *Treponema pallidum* bacteria
- Genital herpes—caused by *Herpes simplex* virus
- Granuloma inguinale—caused by *Donovania granulomatis*
- Chancroid—caused by *Haemophilus ducreyi*

Symptoms and signs

- Primary syphilis—the ulcer is at first painless and may be on the fold between labia majora and labia minora or on the labia themselves or on the penis
- Secondary syphilis—multiple, painless ulcers on the penis or vulva
- Herpes—small, multiple, usually painful blisters, vesicles, or ulcers.
- Granuloma inguinale—an irregular ulcer that increases in size and may cover a large area
- Chancroid—multiple, large, irregular ulcers with enlarged, painful suppurating lymph nodes

Investigations

- Swab: for microscopy
- Blood: for VDRL/RPR

Nonpharmacological management

- Advise patient on genital hygiene.

Pharmacological management

If blisters or vesicles are present—

- **Acyclovir** 200 mg PO every 5 hours for 5 days **(A)**
- If RPR test is positive, give **benzathine benzylpenicillin** 2.4 MU IM single dose **(A)**.
  —OR—
- ***For patients who are allergic to penicillin***, **erythromycin** 500 mg PO every 6 hours for 7 days **(A)**

If blisters or vesicles are absent—

- **Ciprofloxacin** 500 mg every 12 hours for 3 days **(A)**
  —PLUS—
- **Benzathine benzylpenicillin** 2.4 MU IM single dose **(A)**
  —OR—
- ***For patients who are pregnant or who are allergic to penicillin***, give **erythromycin** 500 mg PO every 6 hours for 7 days **(A)**

Swaziland_FINAL press.indb 103 5/19/12 2:51 PM

REFER for specialist management if— ⚠

- Ulcer persists for >10 days and partners were treated
- Blisters or vesicles persist
- ***Note:*** Genital ulcers may appear together with enlarged and fluctuating inguinal lymph nodes (buboes), which should be aspirated through normal skin and *never* incised.

9.18 Sexual assault

Definition

Conduct of any sexual act performed on another person without consent.

Clinical evaluation

- History of the event (date, time, location)
- Nature of the penetration
- Did the victim wash or douche?
- Was condom used?
- Number of assailants?
- Is the victim sexually active?
- Use of contraception?
- The last menstrual period?
- History of medical illnesses (e.g., HIV)?
- Physical examination to note any type of body injuries
- Emotional status
- Examination of the external genitalia (inspection for tears, ecchymosis, abrasions, swelling, redness)
- Speculum examination (vaginal or cervical swab for sperm analysis)
- Collect forensic specimen when applicable.

Baseline laboratory tests

- HIV
- RPR
- HBSAg
- Pregnancy test

Pharmacological management

- Start treatment of the patient with PEP without waiting for the police forms.
- Provide psychological support (counselling).
- Prevent pregnancy (i.e., emergency contraception within 72 hours or IUD within 5 days).
- Provide STI prophylaxis
  - Adult nonpregnant women—
    - **Ciprofloxacin** 500 mg PO stat **(A)**

Swaziland_FINAL press.indb 104 5/19/12 2:51 PM

—**PLUS**—
- **Metronidazole** 400 mg PO stat **(A)**

—**PLUS**—
- **Doxycycline** 100 mg PO every 12 hours for 7 days **(A)**

- Children and pregnant women—
  - **Erythromycin** 30–50 mg/kg per day **(A)**

    —**PLUS**—
  - **Spectinomycin** 20–50 mg/kg IM stat

    —**PLUS**—
  - **Metronidazole** 5–7.5 mg/kg per day PO every 8 hours for 7 days **(A)**. ***Caution:*** **Metronidazole** is contraindicative in the first trimester of pregnancy; however it can be used particularly for trichomoniasis or vaginosis.

- Provide HIV prophylaxis as soon as possible—
  - **Lamivudine** 150 mg **(B*)**

  —**PLUS**—
  - Zidovudine 300 mg in accordance to the victim's weight **(B*)**. (See to PEP guidelines for details.)
- **REFER** for completion of management. ⚠

9.19 Family planning

For further detailed information on FP and maternal health, please refer to the FP guidelines provided by the Ministry of Health of the Kingdom of Swaziland. The key objective of FP is to ensure that all citizens plan their families so that all children are born when wanted, expected, and welcome. The health benefits of FP also have a major role in protecting the lives of infants, children, women, and the family as a whole. To be successful, both partners should take responsibility for the health of their family. FP methods available are described below.

9.19.1 Condom (male)

Definition

- A sheath made of latex or other material that covers the penis during sexual intercourse **(A)**.

Indications

- Couples where one or both partners have HIV/AIDS even if using another FP method
- Couples needing an immediately effective method
- Couples waiting to rule out suspected pregnancy
- Couples who need protection against exposure to STIs including HIV/AIDS

Swaziland_FINAL press.indb 105 5/19/12 2:51 PM

- When a back-up method is needed, for example, when the woman starting or has forgotten to take oral contraceptives
- When this is preferred FP method

Advantages

- Protects against STI and HIV infection as well as pregnancy

Disadvantages

- Some men may have difficulty maintaining an erection with condom on.
- May cause insensitivity of the penis
- Occasional sensitivity to latex or lubricants

Management

- Ensure client understands correct use, storage, and disposal methods.

9.19.2 Condom (female)

Definition

- A soft plastic pre-lubricated sheath with an inner and outer ring which is inserted into the vagina before intercourse **(A)**.

Indications

- Same as for 9.19.1
- Women whose partners will not use the male condom

Advantages

- Can be inserted before intercourse and so does not interrupt sexual spontaneity
- Protects against STI and HIV infection

Disadvantages

- Requires special training and practice to use correctly

Management

- Ensure client understands correct use, storage, and disposal methods.

9.19.3 Combined oral contraceptive pill

Definition

The COC pill (**norgestrel** and **ethyestradiol** combinations) contains an oestrogen plus a progestogen (sex hormones).

Indications

- Women <35 needing highly effective FP method
- Non-breastfeeding clients or breastfeeding clients after 6 months postpartum
- Clients with dysmenorrhoea
- Clients with heavy periods or ovulation pain

Swaziland_FINAL press.indb 106 5/19/12 2:51 PM

Contraindications

- Diastolic BP >100 mm Hg
- Heart disease
- Thromboembolic disease
- Active liver disease
- Within 2 weeks of childbirth
- Known or suspected cervical cancer
- Undiagnosed breast lumps or breast cancer
- Pregnancy (known or suspected)

Risk factors for complications

If any two of the following are present, recommend progestogen only or nonhormonal FP method:

- Smoking (especially if >10 cigarettes per day)
- Age >35 years
- Diabetes

Disadvantages and common side effects

- Spotting, nausea, and vomiting within first few months
- May cause headaches, weight gain
- Suppresses lactation

Advantages

- Regular periods with light bleeding
- No dysmenorrhea

Pharmacological management

- Give 3 cycles of COC.
- Explain carefully how to take the tablets.

9.19.4 Progestogen-only pill

Definition

The POP (e.g., **medroxyprogesterone acetate**) is also known as the *mini-pill* **(A)**.

Indications

- Breastfeeding clients after 3 weeks postpartum
- Women who cannot take COC but prefer to use pills
- Women >40 years

Contraindications

- Breast or genital cancer (known or suspected)
- Pregnancy (known or suspected)
- Undiagnosed vaginal bleeding

Swaziland_FINAL press.indb 107 5/19/12 2:51 PM

Disadvantages and common side effects

- Spotting, amenorrhoea
- Unpredictable, irregular periods

Pharmacological management

- Give 3 cycles of POP.
- Explain carefully how to take the tablets and what to do if doses are missed or there are side effects.

9.19.5 Injectable progestogen-only contraceptive

Definition

A slowly absorbed medroxyprogesterone acetate depot IM injection that provides contraceptive protection for 3 months

Indications

- Proven fertile women requiring long-term contraception
- Breastfeeding postpartum women
- Known or suspected HIV-positive women who need an effective FP method
- Women who cannot use COC due to estrogen content
- Women awaiting surgical contraception

Contraindications

- Same as for POP (9.19.4)

  —PLUS—
- Women without proven fertility unless they have HIV/AIDS

Disadvantages and common side effects

- Amenorrhoea—often after first injection and after 9–12 months of use
- Can cause heavy prolonged vaginal bleeding during first 1–2 months after injection.
- Weight gain
- Loss of libido
- Delayed return to fertility—up to 10 months after stopping injection

Pharmacological management

- Give **medroxyprogesterone acetate** depot injection 150 mg deep IM into deltoid or buttock **(B)**.
- ***Caution:*** Do *not* rub the area. Doing so increases absorption and shortens depot effect.
- Rule out pregnancy before giving the next dose.

Swaziland_FINAL press.indb 108 5/19/12 2:51 PM

9.19.6 Intrauterine device

Definition

- An IUD is an easily reversible, long-term, nonhormonal FP method effective for up to 8 years. An IUD can be inserted as soon as 6 weeks postpartum (e.g., Copper T380A) **(B)**.

Indications

- Women in stable monogamous relationships wanting long-term contraception
- Breastfeeding mothers
- When hormonal FP methods are contraindicated

Contraindications

- Pregnancy (known or suspected)
- PID or history of PID in last 3 months
- Undiagnosed abnormal uterine bleeding
- Women at risk of STIs including HIV (e.g., women with, or whose partners have, multiple sexual partners)
- Reduced immunity (e.g., in DM or HIV/AIDS)
- Severe anaemia or heavy menstrual bleeding

Disadvantages and common side effects

- Mild cramps during first 3–5 days after insertion
- Longer and heavier menstrual blood loss in first 3 months
- Vaginal discharge in first 3 months
- Spotting or bleeding between periods

Management

- Insert the IUD closely following recommended procedures and explaining to the client as each step is undertaken.
- Carefully explain possible side effects and what to do if they should arise.
- Advise client—
  - To abstain from intercourse for 7 days after insertion
  - To avoid douching
  - Not to have more than one sexual partner
  - To use condoms if any risk of STIs including HIV
  - To report to the clinic promptly if she has any of the following—
    - Late period or pregnancy
    - Abdominal pain during intercourse
    - Exposure to STI
    - Feeling unwell with chills or fever
    - Shorter, longer, or missing strings
    - Feeling the hard part of IUD in vagina or at cervix

Swaziland_FINAL press.indb 109 5/19/12 2:51 PM

9.19.7 Progestogen-only subdermal implant

Definition

Flexible progestogen-releasing plastic rods surgically inserted under the skin of the woman's upper arm, which provide contraceptive protection for 5 years

Indications

Women wanting long-term highly effective but not permanent contraception where alternative FP methods are inappropriate or undesirable

Contraindications

Same as for POP (9.19.4)

Advantages

- Highly effective (1–3% failure rate)
- No delay in return to fertility after removal
- Long acting
- Low level of user responsibility

Disadvantages and common side effects

- Irregular bleeding, spotting, or heavy bleeding in first few months
- Amenorrhoea
- Possibility of local infection at insertion site
- Must be surgically inserted and removed by specially trained service provider
- May not be as effective in women >70 kg

Warning signs

Caution: The following require urgent return to clinic—

- Heavy vaginal bleeding
- Severe chest pain
- Pus, bleeding, or pain at insertion site on arm

Management

- Insert the implant subdermally under the skin of the upper arm following recommended procedures.
- Carefully explain warning signs and emphasise the need to return if they occur.
- Advise client to return—
  - After 2 weeks to examine implant site
  - After 3 months for first routine follow-up
  - Annually until implant removed for routine follow-up

Swaziland_FINAL press.indb 110 5/19/12 2:51 PM

9.19.8 Natural FP: Cervical mucus method

Definition

CMM is a fertility awareness-based method of FP that relies on the change in the nature of vaginal mucus during the menstrual cycle in order to detect the fertile time. During this time, the couple avoids pregnancy by changing sexual behaviour as follows:

Abstaining from sexual intercourse—avoiding vaginal sex completely (also called *periodic abstinence*)

- Using withdrawal—taking the penis out of the vagina before ejaculation (also called *coitus interruptus*)
- Using barriers methods (e.g., condoms)

Nonpharmacological management

- Show client how to complete the CMM chart.
- Advise client to always use condoms as well as CMM if there is any risk of exposure to STIs or HIV.

9.19.9 Natural FP: Lactational amenorrhoea method

Definition

LAM relies on the suppression of ovulation through exclusive breastfeeding as a means of contraception. Guidance on correct use of the method is available only at centres with trained service providers.

Nonpharmacological management

- Explain to client that she must—
  - Breastfeed her child on demand, on both breasts at least 10 times during day and night.
  - Not give the child any solid foods or other liquids apart from breast milk.
- Advise the client to use condoms as well as LAM if there is any risk of exposure to STIs or HIV.

9.19.10 Voluntary surgical contraception for men: Vasectomy

Definition

Vasectomy is a permanent VSC FP method that involves a minor operation carried out under local anaesthetic to cut and tie the two sperm-carrying tubes (vas deferens). It is available only at centres with specially trained service providers.

Swaziland_FINAL press.indb 111 5/19/12 2:51 PM

Indications

- Fully aware, counseled clients who have voluntarily signed the consent form
- Males of couples who have definitely reached their desired family size and want no more children
- Males of couples in which the woman cannot risk another pregnancy due to age or health problems

Management

- Ensure client understands how the method works and that it is—
  - Permanent and irreversible
  - Highly effective
- Explain to client that vasectomy is not castration and that sexual ability or activity is not affected.
- Explain to the client that he will need to use a condom for at least 15 ejaculations after the operation.

9.19.11 Voluntary surgical contraception for women: Tubal ligation

Definition

Tubal ligation is a permanent VSC FP method that involves a minor 15-minute operation carried out under local anaesthetic to cut and tie the two egg-carrying fallopian tubes. It is available only at centres with specially trained service providers.

Indications

Same as for vasectomy (9.19.10) but for females

Management

- Ensure client understands how the method works and that it is—
  - Permanent and irreversible
  - Highly and immediately effective
- Explain to client that the couple will need to use condoms if there is any risk of exposure to STIs or HIV

Swaziland_FINAL press.indb 112 5/19/12 2:51 PM

9.19.12 Postcoital contraception

Definition

Postcoital contraception (often called the *morning after pill*) is indicated for prevention of unwanted pregnancy after unprotected sexual intercourse.
Caution: The postcoital prevention must be taken as soon as possible, preferably within 12 hours, but not later than 72 hours after the sexual intercourse.

- Pharmacological management
- Use monophasic preparations formula: **norgestrel** 500 micrograms and **ethinylestradiol** 50 micrograms **(A*)**.
- Take 2 tablets within 72 hours of unprotected intercourse, and 2 tablets 12 hours later.
  —OR—
- Insert an IUD within 5 days of unprotected intercourse.

Caution: Must be used within 72 hours of unprotected intercourse.

Swaziland_FINAL press.indb 113 5/19/12 2:51 PM

10. PAEDIATRIC CONDITIONS

10.1 Immunisation

Immunisation saves lives, prevents the spread of diseases, is safe, saves money, and offers effective protection against preventable diseases.

Immunisation schedule

Immunisation is recommended for the following diseases according to the schedules in table 10.1A (see also annex 3 for information about administration, storage, and handling of vaccines):

- Tuberculosis
- Diphtheria
- Pertussis (whooping cough)
- Tetanus
- Hepatitis B
- Haemophillus influenza
- Measles
- Poliomyelitis

Table 10.1A Immunisation Schedule

Note: Check the child health card for insertion of schedule. See also the *Comprehensive Immunisation Schedule from the Swaziland Expanded Program on Immunisation* poster for information about possible side effects.

Age	Vaccine Dose[a]	Diseases
At birth	BCG, OPV (0)[b]	TB, polio
6 weeks	OPV (1), DPT/Hib (1), HepB (1)	Polio; diphtheria, tetanus, pertussis/*Haemophilus influenzae* B; hepatitis B
10 weeks	OPV (2), DPT/Hib (2), HepB (2)	Polio; diphtheria, tetanus, pertussis/*Haemophilus influenzae* B; hepatitis B
14 weeks	OPV (3), DPT/Hib (3), HepB (3)	Polio; diphtheria, tetanus, pertussis/*Haemophilus influenzae* B; hepatitis B
9 months	Measles vaccine (1)	Measles
18 months	Measles vaccine (2), OPV (4)	Measles; polio
5 years	OPV (5), DT	Polio; tetanus and diphtheria

[a] The number that follows the immunisation name—for example, HepB (3)—indicates the dose number of that immunisation. All vaccines are level A*.
[b] (0) refers to dose at birth.

Swaziland_FINAL press.indb 114 5/19/12 2:51 PM

The following vaccines will be introduced in Swaziland over the next few years:

- Pneumococcal vaccine
- Rotavirus vaccine

Consult the latest EPI schedule for further information.

Catch-up doses

Any child who is not immunized should be given a full schedule of immunizations.

Notes:

- BCG is given until 1 year of age provided HIV infection has been excluded by PCR.
- DPT/Hib combination given until 2 years of age (>2, give DT).
- If more than one vaccine is overdue, it is appropriate to give all the vaccines at one visit.
- For girls of childbearing age who have not previously been vaccinated, table 10.1B provides the schedule for vaccination with **tetanus toxoid (A*)**. (See also annex D.)

Table 10.1B Tetanus Course for Girls of Childbearing Age

Dose	Schedule
TT1	At first contact
TT2	At least 28 days after TT1
TT3	At least 6 month after TT2
TT4	At least 1 year after TT3
TT5	At least 1 year after TT4

10.2 General danger signs in children

A child with any of the following danger sign requires urgent attention. Complete the assessment, give pre-referral treatment immediately, and **REFER** urgently. ⚠

- Is not able to drink or breastfeed
- Is vomiting
- Has convulsions
- Is lethargic or unconscious
- Has chest indrawing
- Has difficulty breathing
- Has hypothermia
- Has shock (see 19.5)

Swaziland_FINAL press.indb 115 5/19/12 2:51 PM

10.3 Emergency conditions

Emergency conditions may include the following:

- Swallowed foreign objects
- Burns
- Shock
- Snake bites
- Poisoning
- Anaphylaxis
- Signs of sexual abuse
- Diabetic ketoacidosis

Emergency conditions require urgent attention.

- Step 1. Complete the assessment.
- Step 2. Give pre-referral treatment immediately.
- Step 3. **REFER** if necessary. ⚠

10.4 Diarrhoea

10.4.1 Acute diarrhoea

Definition

- Watery, frequent stool occurring more than three times a day, with no blood and lasting fewer than 14 days.
- Mostly associated with viral infection or unhygienic practices.

10.4.2 Dysentery

Definition

Passage of watery stools stained with blood with or without mucous

10.4.3 Persistent diarrhoea

Definition

Diarrhoea with or without blood of sudden onset and lasting for 14 days or longer. Infants or children with diarrhoea lasting 14 or more days with signs of dehydration have severe persistent diarrhoea and require hospital management.

Diagnosis

- Take history.
- Assess for dehydration according to table 10.4.3.

Swaziland_FINAL press.indb 116 5/19/12 2:51 PM

Table 10.4.3 Dehydration Assessment

Classification	Symptoms and signs
Severe dehydration	Two or more of the following signs ▪ Lethargy ▪ Sunken eyes ▪ Unable to drink or drinks poorly ▪ Skin pinch goes back very slowly (≥2 seconds)
Some dehydration	Two or more of the following signs ▪ Restlessness, irritability ▪ Sunken eyes ▪ Drinks eagerly, thirsty ▪ Skin pinch goes back slowly

Nonpharmacological management

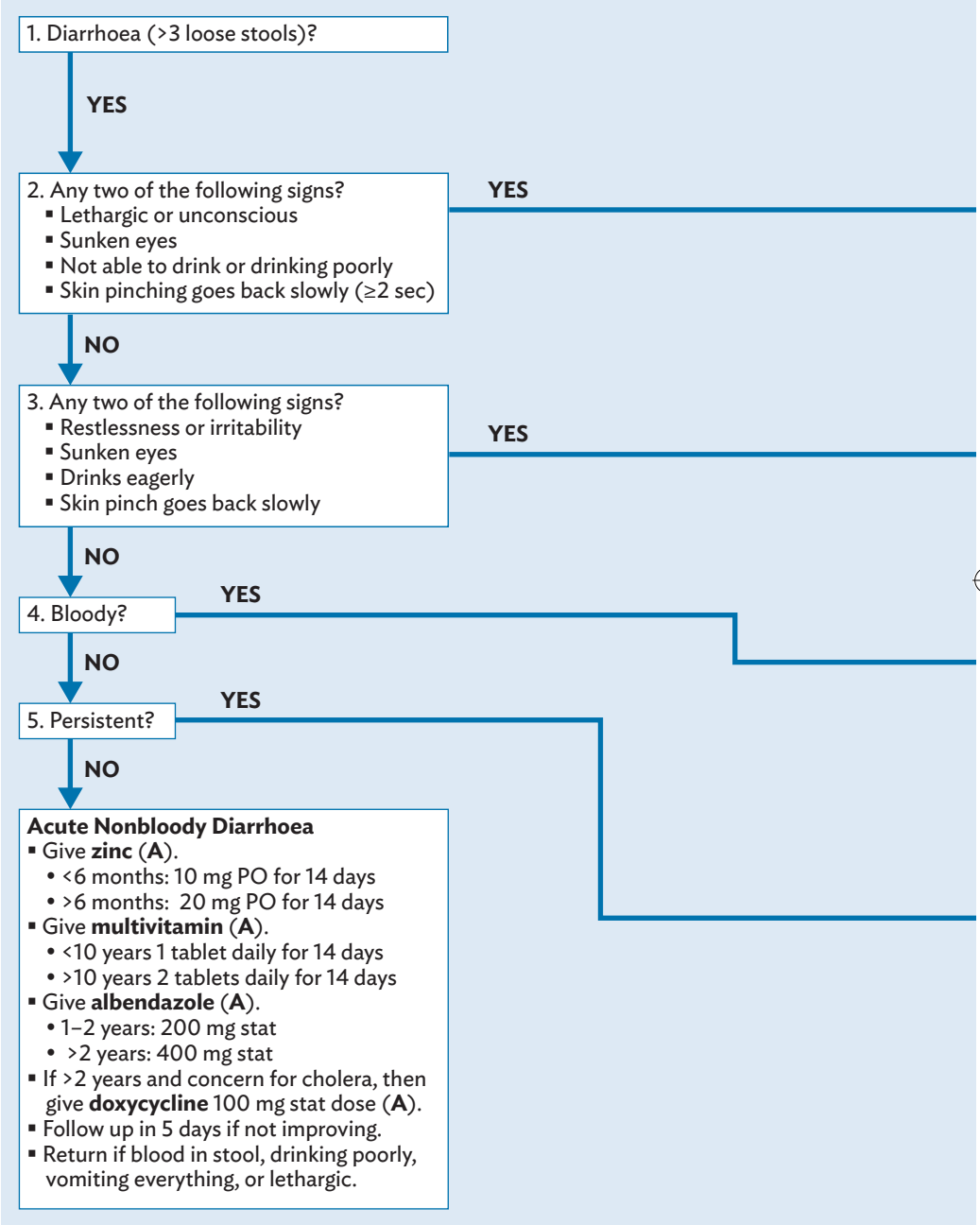
- Advise the caregiver to—
  - Give the child extra fluids (rice water, soup, sour milk, water).
  - Continue feeding.
- Educate and promote the following.
  - Hygienic practices
  - Use of safe boiled water and frequent feeding including breastfeeding
  - Nutritional counselling

Pharmacological management

Follow the algorithm in figure 10.4.3.

Swaziland_FINAL press.indb 117 5/19/12 2:51 PM

Figure 10.4.3 Diarrhoea algorithm (adapted from the Baylor algorithm)



Swaziland_FINAL press.indb 118 5/19/12 2:51 PM

Severe Dehydration
- Give IV fluids [**Ringer's lactate** (**A**) or **0.9% sodium chloride (normal saline)** (**A**)].
  - <12 months: 30 mL/kg over 1 hour, then 70 mL/kg over 5 hours
  - >12 months: 30 mL/kg over 30 minutes, then 70 mL/kg over 2.5 hours
- If severe malnutrition, give IV fluids (D5RL or D5½NS) 15 mL/kg over 1 hour or slower.
  - Go to question 4.
  - Admit in hospital.

Some Dehydration
- **ORS** (**A**) goal for first 4 hours = 75 mL/kg
- Small frequent sips of **ORS**. If child vomits, wait 10 minutes.
- Continue breastfeeding as child wants.
- Send home with 2 packets **ORS**. For each loose stool:
  - <2 years, give 50–100 mL
  - >2 years, give 100–200 mL
- Go to question 4.
- Follow up in 2 days if not improving.

Dysentry (Bloody Diarrhoea)
- Give **multivitamin** (**A**) and **zinc** (**A**).
- Give **ciprofloxacin** (10–15 mg/kg per dose) BID for 3–5 days (**C**)
- If <2 months and toxic, lethargic, having abdominal distension or tenderness, or seizures, then give **ceftriaxone** 50 mg/kg IV/IM stat (**B**), and admit to hospital.
- Follow up in 2 days. Consider **metronidazole** (**A**) if no improvement.

Persistent Nonbloody Diarrhoea
- Give **multivitamin** (**A**) and **zinc** (**A**) in same dosages as for acute nonbloody diarrhoea
- Give **vitamin A** (**A**).
  - <12 months: 100,000 IU,
  - >12 months: 200,000 IU
- Give **albendazole** (**A**) in the same dosages as for acute nonbloody diarrhoea.
- Give **metronidazole** (10–15 mg/kg per dose) every 8 hours for 7 days (**A**)
- Follow up in 5 days. If no improvement, consider side effects of ARV, HIV enteropathy, malabsorption, KS, or intestinal lymphoma.

Swaziland_FINAL press.indb 119 5/19/12 2:51 PM

10.5 Child with a cough

Nonpharmacological management

- Promote good health.
- Prevent low blood sugar.
- Provide fluids.
- Perform nasal suction.
- For continued feeding, insert NGT, if needed.
- Soothe throat with honey.

Pharmacological management

See figure 10.5.

Follow up in two days. If the child is not improving on **amoxicillin** or **erythromycin**, then consider TB, LIP, or asthma.

REFER ⚠

- Signs of severe pneumonia
- Patients not responding to the above treatment should consider HIV with atypical pathogens or TB.

Table 10.5 Dosages of Amoxicillin and Erythromycin for the Child with a Cough

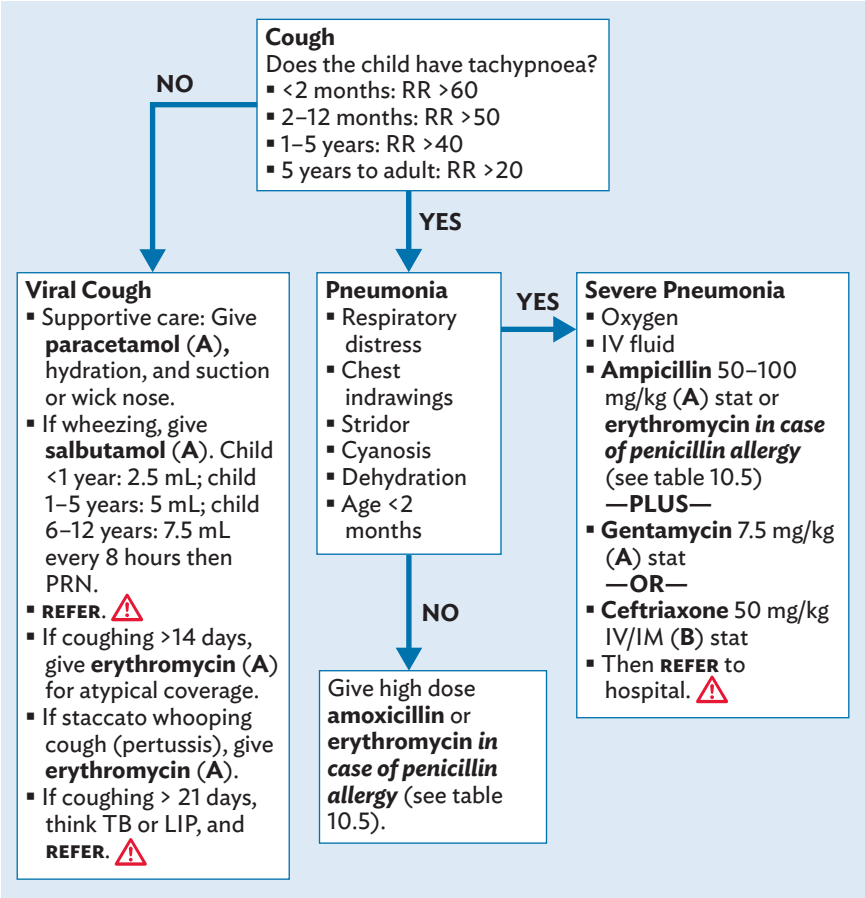
Weight (kg)	Amoxicillin (A) High dose (80–100 mg/kg/day)[a] Give every 12 hours for 5 days		Erythromycin (A) (30–50 mg/kg/day) Give every 8 hours for 5 days	
	Capsule (250 mg)	Suspension (125 mg/5 mL)	Capsule (250 mg)	Suspension (125 mg/5 mL)
<4	—	5 mL	—	2.5 mL
4 to <6	—	10 mL	—	2.5 mL
6 to <10	—	15 mL	—	5 mL
10 to <15	2 capsules	20 mL	1 capsule	10 mL
15 to <25	3 capsules	30 mL	1 capsule	10 mL
>25	4 capsules	—	2 capsules	—

[a] Give a high dose amoxicillin because of S. pneumoniae resistance.

Swaziland_FINAL press.indb 120 5/19/12 2:51 PM

Figure 10.5 Algorithm for the child with a cough

(adapted from Baylor COE Swaziland pneumonia guidelines)



Swaziland_FINAL press.indb 121 5/19/12 2:51 PM

10.6 Fever

Fever by history or elevated body temperature that is ≥37.5°C. See figure 10.6 on page 124.

Note: Measles and malaria are notifiable diseases in Swaziland. All cases should be reported. Call 977 immediately.

10.7 Convulsions

Definition

Abnormal neuronal discharge due to different reasons leading to seizures. Convulsions can be partial/focal or generalised. Febrile convulsions are the most common cause of seizures in children from 6 months to 6 years.

Pharmacological management

See figure 10.7.

10.8 Neonatal conditions

10.8.1 Sick newborn

Definition

At birth all well newborns are active with strong cry. Any baby born ill will show signs of inactivity and may be described as being "flat."

Causes

- Birth asphyxia
- Neonatal infections
- Congenital malformations (e.g., of heart and central nervous system)
- Prematurity
- Maternal sedation or analgesia during labour
- Metabolic (e.g., hypoglycaemia, hypocalcaemia)

Symptoms and signs

- Inability to cry or weak cry
- Difficulty in breathing or recurrent cessation of breathing
- Inactivity with reduced spontaneous movements or very floppy
- Refusal of feedings, vomiting
- Abdominal distension
- Pallor
- Respiratory distress
- Cyanosis
- Jaundice
- Bradycardia <100 beats/minute or tachycardia >140 beats/minute

Swaziland_FINAL press.indb 122 5/19/12 2:51 PM

Figure 10.7 Convulsions

(adapted from Swaziland IMCI guidelines)

Treatment for Ongoing Convulsions

- Give **diazepam** (**B**) to stop the convulsion: 0.5 mg/kg injection solution per rectum using a syringe without the needle or using a catheter (e.g., a tuberculin syringe). Use dosing chart below.
- Turn the child on his or her side, and clear the airway.
- Avoid putting anything in the child's mouth while he or she is convulsing.
- Check for blood sugar level. Treat (or prevent) aberrant level (see 19.4).
- If convulsions have not stopped after 10 minutes, repeat diazepam dose.
- Give oxygen, and refer.

Diazepam
0.5 mg/kg (10 mg/2 mL)

Weight	Dose	Weight	Dose
2 to <3 kg	1.0 mg = 0.2 mL	9 to <10 kg	4.5 mg = 0.9 mL
3 to <4 kg	1.5 mg = 0.3 mL	10 to <11 kg	5.0 mg = 1.0 mL
4 to <5 kg	2.0 mg = 0.4 mL	11 to <12 kg	5.5 mg = 1.1 mL
5 to <6 kg	2.5 mg = 0.5 mL	12 to <14 kg	6.0 mg = 1.2 mL
6 to <7 kg	3.0 mg = 0.6 mL	14 to <16 kg	7.0 mg = 1.4 mL
7 to <8 kg	3.5 mg = 0.7 mL	16 to <18 kg	8.0 mg = 1.6 mL
8 to <9 kg	4.0 mg = 0.8 mL	18 to <20 kg	9.0 mg = 1.8 mL

Give an intramuscular antibiotic.

- For children being referred to the hospital, give the first dose of intramuscular **ampicillin** 50 mg/kg and **gentamycin** 7.5 mg/kg and transport the child urgently to the hospital.
- If ampicillin and gentamycin are not available, give the first dose of **benzylpenicillin** (X-Pen), and **REFER** urgently. ⚠ Use dosing chart below.
- If referral is not possible, repeat the X-Pen injection every 6 hours.

Benzylpenicillin (X-Pen)
Dose: 50,000 units per kg

To a vial of 600 mg (1,000,000 units)

- Add 2.1 mL of sterile water = 2.5 mL at 400,000 units/mL

—OR—

- Add 3.6 mL of sterile water = 4.0 mL at 250,000 units/mL

Age (Weight)	400,000 units/mL	250,000 units/mL
2–4 months (4–6 kg)	0.5 mL	2.0 mL
4–12 months (6–10 kg)	1.6 mL	2.5 mL
12 months – 3 years (10–14 kg)	2.0 mL	3.5 mL
3–5 years(14–19 kg)	3.0 mL	4.5 mL

Note: For patients who are allergic to penicillin, give erythromycin following the dosages in table 10.5.

Swaziland_FINAL press.indb 123 5/19/12 2:51 PM

Figure 10.6 Fever algorithm

Does the child have fever?
(by history or feels hot or temperature 37.5°C[a] or above)

If yes:
- Has the child travelled to a malaria area in the past one month?
- Decide malaria risk—high, low, and no malaria risk

Then ask:
- For how long?
- If more than 7 days, has fever been present every day?
- Has the child had measles within the last 3 months?

Look and feel:
- Look or feel for stiff neck
- Look for runny nose.

Look for signs of measles:
- Generalized rash and
- One of these: cough, runny nose, or red eyes

If the child has measles now or within the last 3 months:
- Look for mouth ulcers. Are they deep and extensive?
- Look for pus draining from the eye
- Look for clouding of the cornea

If measles now or within last 3 months, classify

▪ Any general danger sign or ▪ Clouding of cornea or ▪ Deep or extensive mouth ulcers	**Severe complicated measles**[c]	▪ Give vitamin A. ▪ Give first dose of amoxicillin. ▪ If clouding of the cornea or pus draining from the eye, apply tetracycline eye ointment. ▪ **REFER** urgently to hospital.
▪ Pus draining from the eye or ▪ Mouth ulcers	**Measles with eye or mouth complications**[c]	▪ Give vitamin A. ▪ If pus draining from the eye, treat eye infection with tetracycline eye ointment. ▪ If mouth ulcers, treat with gentian violet or nystatin. ▪ Follow-up in 2 days.
▪ Measles now or within the last 3 months	**Measles**[d]	▪ Give vitamin A and advise parent or caregiver to watch for complications. ▪ If mouth ulcers, treat with gentian violet or nystatin. ▪ Follow-up in 2 days.

Classify fever

High malaria risk

Low malaria risk

No malaria risk

[a] These temperatures are based on axillary temperature.
[b] Other causes of fever include: flu, or other simple viral infections, HIV/AIDS, urinary infection, tuberculosis, typhoid
[c] Other important complications of measles: pneumonia, stridor, diarrhoea, ear infection and malnutrition are classified in other tables.
[d] Use a rapid diagnostic test if available and /or do a blood smear to confirm the diagnosis for notification purposes.

Swaziland_FINAL press.indb 124 5/19/12 2:51 PM

▪ Any general danger sign or ▪ Stiff neck	**Very severe febrile disease, meningitis or severe malaria**	▪ Give first dose of appropriate antimalarial for severe malaria. ▪ Give first dose of an appropriate antibiotic. ▪ Treat the child to prevent low blood sugar. ▪ Give one dose of paracetamol in clinic for high fever (38°C or above). [a] ▪ **REFER** urgently to hospital.
▪ Fever (by history or feels hot or temperature 37.5°C[a] or above)	**Malaria**	▪ Give appropriate oral antimalarial. ▪ Give one dose of paracetamol in clinic for high fever (38.5°C or above).[a] ▪ Advise parent or caregiver when to return immediately. ▪ Follow-up in 2 days if fever persists. ▪ **REFER** if fever is present every day for more than 7 days.
▪ Any general danger sign or ▪ Stiff neck	**Very severe febrile disease, meningitis or severe malaria**	▪ Give first dose of appropriate antimalarial for severe malaria. ▪ Give first dose of an appropriate antibiotic. ▪ Treat the child to prevent low blood sugar. ▪ Give one dose of paracetamol in clinic for high fever. ▪ **REFER** urgently to hospital and keep warm.
▪ Fever ▪ No runny nose and ▪ No other obvious cause of fever	**Malaria**	▪ Give appropriate oral antimalarial. ▪ Give stat dose of paracetamol for high fever. ▪ Advise parent or caregiver when to return immediately. ▪ Follow-up in 2 days if fever persists. ▪ **REFER** if fever is present every day for more than 7 days.
▪ Runny nose present or ▪ Measles present or ▪ Other cause of fever present	**Fever - malaria unlikely**	▪ Give one dose of paracetamol in clinic for high fever.[b] ▪ Treat the child for any cause identified. ▪ Advise parent or caregiver when to return immediately. ▪ Follow-up in 2 days if fever persists. ▪ **REFER** if fever is present every day for more than 7 days.
▪ Any general danger sign or ▪ Stiff neck	**Very severe febrile disease or meningitis (no malaria risk)**	▪ Give first dose of an appropriate antibiotic. ▪ Treat the child to prevent low blood sugar. ▪ Give the first dose of paracetamol for high fever. ▪ **REFER** urgently to hospital.
▪ Any fever	**Fever (no malaria)**	▪ Give the first dose of paracetamol for high fever. ▪ Treat other obvious causes of fever.

Swaziland_FINAL press.indb 125 5/19/12 2:51 PM

- Heart murmurs
- Raised body temperature
- Low body temperature

Nonpharmacological management

- Keep baby wrapped up in dry clothes to maintain temperature (keep warm).
- Give **oxygen (B)** by face mask or nasal prongs (2 L/minute), if available.

REFER patient urgently to the hospital for investigations and continued treatment. ⚠

10.8.2 Neonatal jaundice

Neonatal jaundice is important because of the consequences of excess hyperbilirubinaema on the brain of the newborn infant. This condition is called kernicterus and may cause death. Infants who survive may be handicapped with cerebral palsy and associated deafness, mental retardation, and lack of motor coordination.

Treatment

In mild cases of neonatal jaundice appearing after the second day (i.e., physiologic jaundice), phototherapy can be used. For brief periods in the midmorning, the baby could be exposed and placed outside in its cot; however, its eyes must be covered. Continue breastfeeding during this time.

REFER ⚠

- All babies who develop jaundice within 48 hours of life
- All babies who have severe jaundice, if exchange transfusion cannot be done at the facilities

10.8.3 Birth injuries

Definition

Birth injuries may result from difficult delivery including instrumental delivery and may cause—

- Extensive caput succedaneum
- Cephalhaematoma
- Subdural haemorrhage
- Nerve palsies
- Fractures

10.8.3.1 Extensive caput succedaneum

Definition

Diffuse swelling of the presenting part of the scalp that may extend beyond suture lines

Swaziland_FINAL press.indb 126 5/19/12 2:51 PM

Management

- Leave alone and reassure parents.
- It resolves spontaneously over 3–4 days.

10.8.3.2 Cephalhaematoma

Definition

A haemorrhage involving the skull bones, confined by suture lines. Usually unilateral but occasionally bilateral.

Management

- No specific treatment is required. Leave alone.
- ***Caution:*** Do *not* perform incision and drainage. It resolves with time.

Prevention

- **Phytomenadione (vitamin K)** 1 mg IM at birth **(A)**

10.8.3.3 Subdural haemorrhage

Definition

A swelling resulting from bleeding under the scalp. It may be extensive enough to distort shape of head and also cause severe pallor. Jaundice follows later.

Nonpharmacological management

- Give phototherapy if jaundice is severe.
- Transfuse with blood if Hb <12 g/L.
- Pharmacological management
- Give **phytomenadione (vitamin K)** 1 mg IM **(A)**, and **REFER** to hospital in severe cases.

10.8.3.4 Nerve palsies

Definition

Excessive traction may result in injuries to the brachial plexus of nerves. The types of nerve injuries are—

- Erb's palsy—Whole upper limb does not move. There is movement only in the fingers.
- Klumpke's palsy—Fingers of the affected arm do not move, but there is spontaneous movement in arm and forearm.

Treatment

Patient needs early and regular physiotherapy; **REFER** to hospital. ⚠

10.8.3.5 Fractures

Fractures can involve any bone in the body. If a fracture is suspected, **REFER** urgently. ⚠

Swaziland_FINAL press.indb 127 5/19/12 2:51 PM

11. INFECTIONS AND INFESTATIONS

11.1 Brucellosis

Definition

A bacterial infection of acute or insidious onset (also known as *undulant fever*, *Malta fever*, or *abortus fever*). It is common as an occupational disease among people working with infected livestock or handling associated fresh animal products, particularly when the worker has skin wounds. For example, butchers, farmers, abattoir workers, and veterinarians are at higher risk for this disease as well as those people who eat unpasteurized milk and cheese from infected livestock.

Causes

- *Brucella abortus* (cattle)
- *B. canis* (dog)
- *B. melitensis* (goats and sheep)
- *B. suis* (pigs)

Symptoms and signs

- Intermittent (fluctuating) fever
- Aches and pains
- Orchitis (inflammation of the testes)
- Osteomyelitis of the vertebrae (uncommon but characteristic)

Investigations

- Blood: for complement fixation test or agglutination test (where possible)
- Isolation of the infectious agent from blood, bone marrow, or other tissues by culture

Pharmacological management

Adults—

- **Doxycycline** 100 mg every 12 hours for 6 weeks **(A)**. ***Caution:*** **Doxycycline** is contraindicated in pregnancy.
  —PLUS—
- **Streptomycin** 1 g IM daily for 2 weeks **(B*)**
  —OR—
- **Gentamicin** 5–7 mg/kg IV daily for 2 weeks **(A)**. ***Caution:*** **Gentamicin** contraindicated in pregnancy.
  —OR—
- **Ciprofloxacin** 500 mg twice daily for 2 weeks **(A)**

Children >8 years—

- **Doxycycline** 2 mg/kg per dose **(A)**
  —PLUS—

Swaziland_FINAL press.indb 128 5/19/12 2:51 PM

- **Streptomycin** 15 mg/kg per dose **(B*)**
  —OR—
- **Gentamicin** 7.5 mg/kg daily in 1–3 divided doses **(A)**
  —OR—
- **Ciprofloxacin** 500 mg twice daily for 2 weeks **(A)**. ***Caution:*** Contraindicated in children younger than 12 years of age.

Children <8 years—

- **Co-trimoxazole** 24 mg/kg every 12 hours for 6 weeks **(A)**
  —PLUS—
- **Gentamicin** 7.5 mg/kg IV in 1–3 divided doses daily for 2 weeks **(A)**

Prevention

- Provide public health education on—
  - Drinking only pasteurised or boiled milk
  - Careful handling of pigs, goats, dogs, and cattle if a person has open wounds or cuts
- Provide veterinary services for domestic animals.

11.2 Chicken pox

Definition

Chicken pox is a contagious viral disease that presents 2–3 weeks after exposure to the organism (*Varicella zoster* virus).

Symptoms and signs:

- Fatigue then the rash appears
- Lack of appetite
- Headache
- Fever
- Rash that has the following characteristics:
  - Starts out as flat red areas
  - Develops into raised papules, and then changes to vesicles with crusts
  - Papules and vesicles may develop at the same time
  - Mucous membranes may be affected

Diagnosis is mainly based on symptoms and signs.

Nonpharmacological management

- Advise caregiver to—
  - Provide adequate hydration.
  - Cut patient's fingernails short, and discourage scratching.
  - Isolate infected person until all lesions have crusted.

Swaziland_FINAL press.indb 129 5/19/12 2:51 PM

Pharmacological management

Adults—

- Apply **calamine lotion** every 12 hours **(A)**.
- Give **paracetamol** 500 mg—1 g PO every 4–6 hours, when needed, to a maximum of 4 doses daily **(A)**.
- Give **chlorpheniramine** 4 mg PO every 12 hours **(A)**.
- If skin infection is present due to scratching, treat as for bacterial skin infection with **cloxacillin** 500 mg PO every 6 hours for 7 days **(A)**.
  —OR—
- ***For patients who are allergic to penicillin***, **erythromycin** 500 mg PO every 6 hours for 7 days **(A)**.
- Give **acyclovir** 400–800 mg PO within 24 hours of rash onset **(A)**.

Children—

- Give **paracetamol** PO **(A)**. ***Caution:*** Avoid the use of acetylsalicylic acid (aspirin) in children because of the risk of Reye's syndrome.
  - 3 months – 1 year: 2.5 mL (120 mg/5 mL syrup) every 4–6 hours
  - 1–5 years: 5–10 mL (120 mg/5 mL syrup) every 4–6 hours
  - 5–12 years: 250–500 mg every 6 hours
- Give **chlorpheniramine** PO **(A)**.
  - 6 months – 1 year: 1 mg twice daily
  - 1–5 years: 1–2 mg 3 times daily
  - 5–12 years: 2–4 mg 3–4 times daily
- If skin infection is present, treat as for bacterial skin infection with **cloxacillin** 125–250 mg PO **(A)**
  —OR—
- **Erythromycin** 125–250 mg PO every 6 hours for 7 days **(A)**

REFER ⚠

- Complications such as meningitis, encephalitis, or pneumonia
- Severely ill adults
- Babies under 6 months
- Pregnant women

11.3 Herpes zoster (shingles)

Definition

An acute infection involving primarily the dorsal root ganglia and characterised by a vesicular eruption in areas supplied by peripheral sensory nerves in the affected root ganglia

Cause

Varicella zoster virus, usually reactivated from the posterior root ganglia by reduced immunity

Swaziland_FINAL press.indb 130 5/19/12 2:51 PM

Sign and symptoms

- Chills, fever
- Malaise
- The above precede characteristic crops of vesicles, which are very painful, typically unilateral, and involve the side supplied by affected nerve

Differential diagnosis

- Chicken pox
- Herpes simplex

Investigations

- Clinical diagnosis is sufficient

Management

All ages (symptomatic and supportive treatment)—

- Clean the lesions with an antiseptic solution, for example
  - **Chlorhexidine solution 0.05% (A)**
    —OR—
  - **Hydrogen peroxide solution 6% (A)**
- Apply **calamine lotion** 2–3 times daily **(A)**.
- Give analgesics as necessary (see chapter 18).
- In the early stages, apply **acyclovir cream 5%** every 12 hours **(A)**.
- **Acyclovir** 800 mg PO every 5 hours for 7 days can be given **(A)**, especially if the disease is diagnosed very early or is disseminated.
- If pain is severe, give **amitriptyline** 25 mg **(B)** or **carbamazepine** 10–20 mg/kg daily in 2 divided doses **(B*)**. ***Caution:*** Avoid **carbamazepine** in patients on ART.

If the infection involves the eye—

- **REFER** to an eye specialist. ⚠

Prevention

Protect high-risk individuals (e.g., the immunosuppressed) from direct contact with the disease.

11.4 HIV/AIDS

Definition

HIV disease refers to an infection by the human immunodeficiency viruses, HIV-1 and HIV-2, which cause cytopathic effects either directly or indirectly to the human body. The hallmark of HIV disease is a profound immunodeficiency resulting primarily from a progressive quantitative and qualitative deficiency of the subset of T-lymphocytes referred to as *helper T cells* and the combination of viral pathogenic and immunopathogenic events that occurs during the course of HIV disease from the moment of initial

Swaziland_FINAL press.indb 131 5/19/12 2:51 PM

(primary) infection through the development of advanced-stage disease is varied. Advanced HIV disease is referred to as AIDS defined by the WHO clinical staging or use of CD4 cell count.

Symptoms and signs

Refer to WHO clinical staging (see http://www.who.int/hiv/pub/guidelines/clinicalstaging.pdf).

Diagnosis

- *Antibody testing.* Rapid tests detect antibodies to HIV used to diagnose adults and children 18 months of age or older: two positive results (one from a screening test and the other from a confirmatory test). Swaziland uses the Serial HIV Testing Algorithm using DetermineÒ as a screening test and ELISA as confirmatory test. UnigoldÒ is the alternative to ELISA.
- *Virologic testing.* DNA PCR HIV testing using the DBS technique detects viral DNA and can be used to definitively diagnose children younger than 18 months of age and as early as 4 weeks after birth.

Management

Comprehensive management is encouraged to—

- Improve the quality of life, health, and well-being of all people living with HIV, both those that have not yet initiated ART and those already receiving ART.
- Provide comprehensive clinical and psychosocial care and support services throughout the HIV continuum of care, from the time HIV is diagnosed through the person's entire life.
- Provide regular clinical and psychosocial follow-up of patients (including laboratory tests) in pre-ART care to monitor disease status and encourage rapid initiation of ART once eligible.
- Create awareness and uptake of non-ART–related HIV services in support of positive living.
- Actively support patient understanding of and participation in the care plan, including adherence to care and medications.
- Provide family-focused care and support, with a focus on testing and enrollment of patients' family members, including children and partners.
- Provide psychosocial support to patients and their families through facility- and community-based services.

Management of patients who have not yet initiated ART—

- **Nonpharmacological management**
  - Screen for TB.
  - Assess for opportunistic infections and conditions.
  - Provide health promotion education:

Swaziland_FINAL press.indb 132 5/19/12 2:51 PM

- Positive prevention
  - Condoms and FP
  - STI prevention, diagnosis, and treatment
  - Partner disclosure and testing
  - PMTCT
- Nutritional education and support
  - Relationship between nutrition and HIV
  - Nutritional assessment and nutritional needs of adults, pregnant women, and infants and children
  - Nutrition education and counseling
  - Providing vitamin and micronutrient supplements
  - Linkages to community nutrition resources
- Hygiene, sanitation, and safe water
  - Personal hygiene and infection prevention
  - Household hygiene and sanitation
  - Safe water

- Stage using WHO clinical staging.

- **Pharmacological management**
  - Treat all opportunistic infections and conditions.
  - Give prophylaxis—
    - **Co-trimoxazole** 960 mg PO daily **(A)**
      —OR—
    - ***If allergic***, **dapsone** 100 mg PO daily **(B)**
    - **Isoniazid** for 6 months if TB screening is negative **(B*)**
    - **Isoniazid** for 6 months after completion of a 6-month TB treatment course **(B*)**
  - Monitor CD4 every 3–6 months.

Management of patients on ART—

- **Nonpharmacological management**
  - ART preparation
    - Adherence counselling and preparation
    - Provision of treatment
    - Assessment of readiness to start ART
      - Baseline bloods: CD4, haemoglobin, creatinine, and BUN
      - TB screening
      - Assessment and treatment of all opportunistic infections and conditions
      - Staging according to WHO clinical staging
  - Indications to start ART
    - Adults and children >5 years
      - CD4 <350 cells irrespective of WHO clinical staging

Swaziland_FINAL press.indb 133 5/19/12 2:51 PM

    - WHO clinical stage 3 or 4 irrespective of CD4 cell count
    - All TB patients living with HIV should receive ART within 2–8 weeks of starting anti-TB treatment irrespective of CD4 cell count.
  - Children 2–5 years
    - CD4 <25% irrespective of WHO clinical staging
    - WHO clinical stage 3 or 4
  - Children <2 years
    - All who test positive for HIV
- **Pharmacological management**
  - Treat all opportunistic infections and conditions.
  - Start ART.
    - ARV regimen for adults in order of preference—
      - TDF+3TC+EFV **(B*)**
      - TDF+3TC+NVP **(B*)**
      - AZT+3TC+NVP **(B*)**—recommended combination for pregnant women
      - AZT+3TC+EFV **(B*)**
    - Prophylaxis—
      - Give **co-trimoxazole** 960 mg PO daily **(A)**.
        —OR—
      - ***If allergic***, give **dapsone** 100 mg PO daily **(B)**.
      - Give **isoniazid** 10 mg/kg PO for 6 months if TB screening is negative **(B*)**.
      - Monitor CD4 for 3 months after initiation, then every 6 months
      - On each visit, monitor adherence to care, and if necessary, identify barriers to adherence and address develop strategies to support adherence to care.
    - ARV regimen for children—
      - See the national guidelines.

Other components of comprehensive care for HIV disease
To assess and manage pain, refer to chapter 18, "Pain Management and Palliative Care."

11.4.1 Occupationally acquired HIV infection

HCWs are at risk of acquiring HIV infection at the work place because of contact with patients' body fluids, which may contain the virus. To prevent this from happening, HCWs need to adopt universal precautions in their dealings with all patients and also in the handling of all body fluids. This includes, among others, careful disposal of sharp objects (e.g., needles and scalpels) and the use of protective barriers (e.g., gloves and eye glasses).

Swaziland_FINAL press.indb 134 5/19/12 2:51 PM

Body fluids that have been implicated in the transmission of HIV include—

- Semen
- Vaginal secretions
- Breast milk
- Blood or other body fluids visibly contaminated with blood

Transmission of HIV through cerebrospinal, synovial, pleural, pericardial, and amniotic fluids has not been determined. Likewise, even though the virus has been found in urine, tears, sweat, and saliva, the infectiousness of these body fluids has not been determined. Nevertheless, these body fluids need to be handled with care.

Exposures at the work place that place HCWs at risk of HIV infection include the following:

- Percutaneous injury (i.e., a needle stick injury or cut with a sharp object)
- Contact of mucous membranes (e.g., eyes) with body fluids
- Contact of non-intact skin (i.e., chapped, abraded, or skin afflicted with dermatitis) with body fluids
- Contact of intact skin with body fluid when the duration of contact is prolonged

Other factors that put the HCW at risk of HIV infection include a deep injury with a sharp instrument on which there was visible blood, when the device has previously been placed in the source patient's vein or artery (e.g., after a venipuncture), and when the source patient dies of an AIDS-related illness.

Management of exposure

Not all exposures to HIV-contaminated body fluids end up infecting HCWs. It is estimated that the risk of transmission is 0.3% after percutaneous injury and 0.09% after a mucous membrane exposure. The risk after skin exposure to HIV-infected blood is <0.1%. The majority of exposures, therefore, do not lead to infection.

Thus, in the management of an exposed HCW, it is important to evaluate the type of exposure (e.g., percutaneous, mucous membrane, skin), source material (e.g., blood, peritoneal fluid, urine), the severity of exposure (e.g., deep injury, size of exposed surface, quantity of body fluid, integrity of skin), and HIV status of source material. The highest risk exposures are from a large volume of blood (e.g., deep injury with large diameter-hollow needle previously in source patient's vein or artery) and when the source patient is known to be HIV positive.

Health facilities need to keep a log book of records of such accidental exposures and periodically audit the records and plan preventive strategies to forestall such accidents.

Swaziland_FINAL press.indb 135 5/19/12 2:51 PM

Management of the exposed site includes the following:

- Washing wounds and skin sites that have been in contact with blood or body fluids with soap and water
- Flushing mucous membranes with water

There is no evidence that the use of antiseptics for wound care or expressing fluid by squeezing the wound further reduces the risk for HIV transmission. As mentioned previously, the only way of preventing occupationally acquired HIV infection by HCWs is the adoption of universal precautions at the work place.

11.4.2 Postexposure prophylaxis

Within 24–48 hours of exposure, ART may be able to prevent infection. It is important that ART be initiated as soon as possible after the exposure (preferably within 1–2 hours).

When the sero-status of the source patient is not immediately known, PEP is deemed necessary and should be started, pending HIV antibody testing of the source patient after appropriate counselling. If test results are negative, stop PEP. Otherwise, it should be continued for 4 weeks. Patients taking PEP need to be counseled on, among other things, adherence to treatment and the toxicity of the medicines used.

PEP needs to be initiated quickly when there is a recognized risk. Health facilities are, therefore, advised to keep emergency stocks of PEP medication and to designate a responsible official who can be called upon at all times to evaluate the risk, counsel the patient, and start PEP.

Assessment of exposure risk

Low-risk exposure is described as—

- Exposure to a small volume of blood or blood-contaminated fluids from an asymptomatic HIV-positive patient with a low viral load
- An injury with a solid needle
- Any superficial injury or mucocutaneous exposure

High-risk exposure is described as—

- Exposure to a large volume of blood or potentially infectious fluid
- Exposure to blood or blood-contaminated fluids from a patient with a high viral titre (i.e., in the AIDS phase or early sero-conversion phase of HIV)
- Injury with a hollow-bore needle
- Deep and extensive injury exposure

Investigations

- Baseline tests
  - CBC

Swaziland_FINAL press.indb 136 5/19/12 2:51 PM

  - Liver and renal function tests
  - Hepatitis B surface antigen
  - HIV serology/PCR if available
- Two weeks
  - CBC
  - Liver and renal function tests
- Six weeks
  - HIV serology
- Three and six months
  - HIV serology

Pharmacological management

Low-risk exposure—

- **Zidovudine** 300 mg PO twice daily for 28 days **(B*)**

  —PLUS—
- **Lamivudine** 150 mg PO twice daily for 28 days **(B*)**

High-risk exposure—

- **Zidovudine** 300 mg PO twice daily for 28 days **(B*)**

  —PLUS—
- **Lamivudine** 150 mg PO twice daily for 28 days **(B*)**

  —PLUS—
- **Nelfinavir** 750 mg PO every 8 hours (or 1250 mg twice daily) for 28 days

11.5 Malaria

Definition

Malaria is a parasitic infection spread by a bite of the female anopheles mosquito. Of the four types of malaria, *Plasmodium falciparum* is the main cause of malaria infection in Swaziland.

Note: Malaria is a notifiable disease in Swaziland. All cases should be reported. Call 977 immediately.

Symptoms and signs

See table 11.5A.

Diagnosis

- Confirm with RDT or microscopy.
- RDT should not be used to confirm treatment failure. Treat only cases that test positive.

Health promotion

- Residual homestead spraying
- Early treatment seeking

Swaziland_FINAL press.indb 137 5/19/12 2:51 PM

Table 11.5A Symptoms and Signs of Malaria

Uncomplicated	Complicated
▪ Fever and chills ▪ Headache ▪ Fatigue ▪ Sweating ▪ Elevated temperature ▪ Nausea and vomiting ▪ Diarrhoea and abdominal pain	▪ Anaemia ▪ Jaundice ▪ Splenomegaly ▪ Haemoglobinurea ▪ Pulmonary oedema ▪ Deep breathing ▪ Severe dehydration ▪ Shock ▪ Respiratory failure ▪ Bleeding tendencies ▪ Coma

Table 11.5B Dosing of Artemether (20 mg) + Lumefantrine (120 mg) (A) Tablets

Weight (kg)	Age (yrs)	Number of Tables and Timing of Dosage					
		0 hr	8 hrs	24 hrs	36 hrs	48 hrs	60 hrs
5–14	<3	1	1	1	1	1	1
14–25	≥3-8	2	2	2	2	2	2
25–34	≥8-14	3	3	3	3	3	3
≥34	>14	4	4	4	4	4	4

- Active health education to population in endemic areas about symptoms and signs
- Control of breeding sites
- Use of mosquito nets
- Chemo-prophylaxis

Nonpharmacological management

- For fever, tepid sponge with lukewarm water
- Discourage home treatment

Pharmacological management

Uncomplicated malaria—

- First-line treatment (including pregnant women in their second and third trimesters and lactating women), give **artemether + lumefantrine (A)**. (See table 11.5B for dosages.)
- First-line treatment for pregnant women in their first trimester, give **quinine** PO **(B)**. (See table 11.5C for dosages.)
- Second-line treatment, give **quinine** PO **(B)**.

Swaziland_FINAL press.indb 138 5/19/12 2:51 PM

Table 11.5C Dosage of Quinine Tablets (B)

Weight (kg)	Age	Number of Tablets and Timing of Dosage (Give dose every 8 hours for 7 days)						
		Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7
4–6	2–4 mos	—	—	—	—	—	—	—
6–10	4–12 mos	¼	¼	¼	¼	¼	¼	¼
10–12	1–2 yrs	⅓	⅓	⅓	⅓	⅓	⅓	⅓
12–14	2–3 yrs	½	½	½	½	½	½	½
14–19	3–5 yrs	½	½	½	½	½	½	½
20–24	5–7 yrs	¾	¾	¾	¾	¾	¾	¾
24–35	7–10 yrs	1	1	1	1	1	1	1
35–50	10–15 yrs	1½	1½	1½	1½	1½	1½	1½
≥50	>15 yrs	2	2	2	2	2	2	2

Complicated malaria—

- If at clinic level, administer **quinine** IV **(B)**, and then **REFER** to a health centre or hospital.

For further details, refer to the national malaria guidelines.

REFER ⚠

If the symptoms progress to severe or complicated malaria (i.e., sleepiness, unconsciousness or coma, convulsions, or shock), refer the patient to the next level.

11.6 Measles

Definition

An acute, highly communicable viral infection characterized by a generalised skin rash, fever, and inflammation of mucus membrane. It is caused by measles virus, which is spread by droplet infection and direct contact.

Note: Measles is a notifiable disease in Swaziland. All cases should be reported. Call 977 immediately.

Symptoms and signs

Catarrhal stage—

- Fever, runny nose, barking cough
- Misery, anorexia, vomiting, and conjunctivitis
- Koplik spots (diagnostic)
- Later, generalised maculopapular skin rash

Swaziland_FINAL press.indb 139 5/19/12 2:51 PM

Desquamation stage (later still)—
- Diarrhoea (common)
- Skin lesions peel off
- Rash fades
- Temperature falls

Complications
- Secondary bacterial RTI (e.g., bronchopneumonia)
- Laryngotracheobronchitis
- PEM, especially following diarrhoea
- Cancrum oris (from mouth sepsis)
- Otitis media
- Corneal ulceration and panophthalmitis (leads to blindness)
- Demyelinating encephalitis

Differential diagnosis
- German measles (Rubella)

Investigations
- Clinical diagnosis is sufficient though virus isolation is possible.
- Investigate complications.

Pharmacological management (symptomatic)
- Apply **tetracycline 1%** eye ointment every 12 hours for 5 days **(A)**.
- Increase fluid intake.
- Give **vitamin A** 200,000 IU **(A)**.
  - 1st dose: at diagnosis
  - 2nd dose: the next day
  - 3rd dose: 2–4 weeks later

Prevention
- Get measles vaccination.
- Avoid contact between infected and uninfected persons.

11.7 Meningitis

Definition
Meningitis is acute inflammation of the meninges. Meningitis is caused by bacterial (*Streptococcus pneumoniae; Haemophilus influenzae* serotype b, mainly in young children; and *Neisseria meningitides*), fungal (*Cryptococcus neoformans,* opportunistic infection in AIDS patients), and mycobacterial (TB, *Mycobacterium tuberculosis*) organisms.

Note: Meningitis is a notifiable disease in Swaziland. All cases should be reported. Call 977 immediately.

Swaziland_FINAL press.indb 140 5/19/12 2:51 PM

Symptoms and signs

- Rapid onset of fever
- Severe headache and neck stiffness or pain
- Photophobia
- Convulsions
- Altered mental state, confusion, coma
- Projectile vomiting in children

Differential diagnosis

- Viral meningoencephalitis
- Space-occupying lesions in the brain, including brain abscess

Investigations

- CSF for white cell count and type, protein, sugar, Indian-ink staining, Gram stain, C&S
- Blood for serological studies and haemogram
- Chest X-ray and ultrasound to look for possible primary site

Pharmacological management

See table 11.7.

11.8 Poliomyelitis

Definition

An acute viral infection characterised by acute onset of flaccid paralysis of skeletal muscles. It is transmitted primarily by person-to-person contact through the faecal-oral route.

Cause

- Polio virus (enterovirus) types I, II, and III

Clinical features

- Majority of cases are asymptomatic; only 1% result in flaccid paralysis
- Minor illness of fever, malaise, headache, and vomiting
- May progress to severe muscle pain
- Paralysis is characteristically asymmetric
- Paralysis of respiratory muscles is life threatening (bulbar polio)
- Aseptic meningitis may occur as a complication
- Strain and intramuscular injections precipitate and may worsen paralysis

Differential diagnosis

- Guillain-Barré syndrome

Swaziland_FINAL press.indb 141 5/19/12 2:51 PM

Table 11.7 Management of Meningitis

Note: **REFER** patient to centre where lumbar puncture can be done.

Type and Cause of Meningitis	Treatment	Notes
Cryptococcal meningitis *Cryptococcus neoformans*—Caused by a fungus; common opportunistic infection in immunosuppressed patients	**REFER.** ⚠	**REFER** patients to a referral hospital for treatment with **amphotericin B** infusion **(B)**. ⚠
Streptococcal meningitis *Streptococcus pneumonia*	Adults (10–14-day course)— ▪ **Benzylpenicillin** 3-4 MU IV or IM every 4 hours **(A)** **—OR—** ▪ **Ceftriaxone** 2g IV or IM daily in 1–2 divided doses **(C)** Children (10–14-day course)— ▪ **Benzylpenicillin** 100,000 IU/kg per dose IV or IM **(A)** **—OR—** ▪ **Ceftriaxone** 50–100 mg/kg IV or IM in 1–2 divided doses **(C)**	**REFER** if there is no improvement. ⚠

Swaziland_FINAL press.indb 142 5/19/12 2:51 PM

Table 11.7 Management of Meningitis (continued)

Type and Cause of Meningitis	Treatment	Notes
Haemophilus influenzae	Adults (7–10-day course)— ▪ **Ceftriaxone** 2g IV or IM every 12 hours **(C)** **—OR—** ▪ If not available, change to **chloramphenicol** 1 g IV every 6 hours **(A)** **—OR—** ▪ **Ampicillin** 2-3g IV every 4-6 hours **(A)** Children (7–10-day course)— ▪ **Ceftriaxone** 50–100 mg/kg per dose IV or IM **(C)** **—OR—** ▪ If not available, change to **chloramphenicol** 25 mg/kg per dose IV every 6 hours **(A)** **—OR—** ▪ **Ampicillin** 50 mg/kg per dose IV every 4–6 hours **(A)**	*For patient who is allergic to penicillin,* give **chloramphenicol**
Neisseria meningitidis	Adults (up to a 14-day course)— ▪ **Chloramphenicol** 1g IV every 6 hours (use IM if IV not possible) **(A)** ▪ Once clinical improvement occurs, change to 500–750 mg PO every 6 hours to complete the course Children (up to a 14-day course)— ▪ **Chloramphenicol** 25 mg/kg per dose IV every 6 hours **(A)** (use IM if IV not possible) ▪ Once clinical improvement occurs, change to 25 mg/kg per dose PO every 6 hours to complete the course	

Swaziland_FINAL press.indb 143 5/19/12 2:51 PM

Table 11.7 Management of Meningitis (continued)

Type and Cause of Meningitis	Treatment	Notes
TB meningitis[a] *Mycobacterium TB*	Treatment is in two phases: ▪ Intensive phase: • Give 2-month daily course of **streptomycin (B*)**, **isoniazid (B*)**, **rifampicin (B*)**, and **pyrazinamide (B*)**. **—OR—** • In case of a reaction to streptomycin, give **ethambutol (B*)**. ▪ Continuation phase: • Give 6-month daily course of **rifampicin (B*)** and **isoniazid (B*)**.	***Cautions:*** ▪ **Streptomycin:** The maximum dose in patients >50 years is 750 mg (not 1 g) because of a danger of deafness. ▪ **Streptomycin:** Avoid wherever possible in pregnancy because of a danger of deafness in ▪ neonates. ▪ **Ethambutol:** Use with caution in children <5 because of the risk of optic neuritis. **Prevention:** Avoid overcrowding.
Neonatal meningitis	—	Organisms causing neonatal meningitis are similar to those causing neonatal septicaemia and pneumonia (i.e., *S. pneumoniae,* group A and B streptococci, and enteric Gram-negative bacilli). As with neonatal pneumonia, **REFER** all cases. ⚠

[a] See 11.13.

Swaziland_FINAL press.indb 144 5/19/12 2:51 PM

11.9 Acute rheumatic fever

Definition

A systemic disease that primarily affects the heart and joints and that follows group C streptococcal upper respiratory infection, it is characterised by—

- Carditis
- Migratory polyarthritis
- Syndenham's chorea
- Subcutaneous erythema marginatum

Symptoms and signs

- Fever
- Flitting migratory joint pain
- Possible previous sore throat or skin infection
- Heart murmurs
- Erythema marginatum (reddish rash at the extremities)
- Chorea (involuntary movement of limbs and face)
- Subcutaneous nodule

Nonpharmacological management

- Hot compress
- Bed rest

Pharmacological management

Adults—

- **Phenoxymethylpenicillin** 500 mg PO every 8 hours for 7–10 days **(A)**
  —OR—
- ***For patients who are allergic to penicillin***, give **erythromycin** 500 mg PO every 6 hours for 7 days **(A)**.
- **Acetylsalicylic acid (aspirin)** 25 mg/kg body mass every 6 hours (until fever has disappeared) **(A)**
- **In severe carditis**
  - Use **prednisolone** 1–2 mg/kg daily for 3 weeks **(A)**, and then reduce dose gradually over 7 days.
  - Prophylaxis
    - **Benzathine benzylpenicillin** IM 1.2 MU every 3 weeks for life **(A)**
      —OR—
    - **Phenoxymethylpenicillin** 250 mg PO every 12 hours for life **(A)**
      —OR—
    - ***For patients who are allergic to penicillin***, give **erythromycin** 500 mg PO every 12 hours for life **(A)**.

Children—

- **Phenoxymethylpenicillin** 125–250 mg PO every 6 hours for 7–10 days **(A)**

Swaziland_FINAL press.indb 145 5/19/12 2:51 PM

- **Acetylsalicylic acid (aspirin)** 25 mg/kg body mass 4 times daily (until fever has disappeared) **(A)**. ***Caution:*** Aspirin is contraindicated in children <8 years.
- In severe carditis,
  - Give **prednisolone** 1–2 mg/kg PO daily for 14 days **(A)**, and then reduce dose gradually over 7 days.
  - Prophylaxis—
    - **Benzathine benzylpenicillin** 600,000 IU IM every 3 weeks up to 21 years of age **(A)**. For children over 30 kg give the adult dose.
      —OR—
    - **Phenoxymethylpenicillin** 125–250 mg PO every 12 hours for up to 21years of age **(A)**
      —OR—
    - ***For patients who are allergic to penicillin,*** give **erythromycin** 125–250 mg PO every 12 hours for up to 21 years **(A)**.

REFER all cases of suspected rheumatic fever. ⚠

11.10 Sexually transmitted infections

Definition

STIs are infections acquired through sexual activities. Different microorganisms are responsible for STIs: viral, bacterial, protozoal, and fungal

Diagnosis

There are three approaches to STI diagnosis:

- Clinical diagnosis
- Syndromic diagnosis
- Etiological diagnosis—RPR, VDRL, TPHA, DNA amplification, swabs—depending on the type of STI

Symptoms and signs

Depending on the sites and the type of STI (see national STI guidelines)—

- Urethral discharge
- Vaginal discharge
- Genital ulcer
- Dysuria
- Genital pruritus
- Genital warts

Nonpharmacological management

- Health education on
  - Risk reduction
  - Adherence and completion of treatment

Swaziland_FINAL press.indb 146 5/19/12 2:51 PM

- Condom promotion, demonstration and supply
- HIV testing and counselling (HTC)
- Male circumcision
- Notification and management of sexual partner(s)
- Follow-up visits where necessary

Pharmacological management

Refer to national STI guidelines.

REFER ⚠

- Poor response to treatment
- See national STI guidelines for complications needing referral.

11.11 Septicaemia

Definition

Blood infection due to various bacteria that may be associated with infection in specific sites (e.g., lungs, urinary tract, GIT), or there may be no specific focus. Common causative organisms include *Staphylococcus aureus*, *Klebsiella*, *Pseudomonas*, *Staphylococcus epidermidis*, fungal (*Candida spp.*), *Coliforms* and *Salmonella spp.*, *Pneumococci*, and *Proteus spp.*

Symptoms and signs

- Fever
- Hypotension
- Prostration (extreme tiredness)
- Sometimes anaemia
- Toxic shock is a complication.
- Occurs more commonly in the immunosuppressed

Investigations

- Look for possible source of infection
- Blood: for WBC count, C&S

Nonpharmacological management

- Ensure adequate hydration

Pharmacological treatment

Give a starting dose of antibiotics and **REFER**. ⚠

Adults—

- **Gentamicin** 5–7 mg/kg IV every 24 hours **(A)**. ***Caution:*** **Gentamicin** contraindicated in pregnancy.
  —OR—
- **Gentamicin** 1.5–2 mg/kg IV or IM every 8 hours **(A)**
  —PLUS—

Swaziland_FINAL press.indb 147 5/19/12 2:51 PM

- **Cloxacillin** 2 g IV every 4–6 hours **(A)**
  —OR—
- **Chloramphenicol** 750 mg IV every 6 hours **(A)**
  —OR—
- ***For patients who are allergic to penicillin,*** give **erythromycin** 500 mg PO every 6 hours **(A)**.

Children—

- **Gentamicin** 3.5–4 mg/kg IV every 8 hours **(A)**. Neonate: every 8–12 hours.
  —PLUS—
- **Ampicillin** 50 mg/kg IV every 8 hours **(A)**. Child <7 days old: every 12 hours.
  —OR—
- **Cloxacillin** 50 mg/kg IV every 4–6 hours **(A)**
  —OR—
- **Benzylpenicillin** 50,000 IU/kg IV every 4-6 hours **(A)**
  —OR—
- ***For patients who are allergic to penicillin***, give **erythromycin** 15 mg/kg PO every 6 hours **(A)**.

REFER to hospital. ⚠

Prevention of sepsis

- Protect groups at risk (e.g., immunosuppressed and post-surgical patients).
- Follow strictly aseptic surgical procedures.

11.12 Tetanus

Definition

Bacterial disease characterized by intermittent spasms (twitching) of voluntary muscles

Cause

- The exotoxin of *Clostridium tetani*
- Tetanus spores enter the body through deep, penetrating skin wounds; the umbilical cord of the newborn; ear infections; or wounds produced during delivery and septic abortions.

Symptoms and signs

- Stiff jaw (trismus)
- Generalised spasms induced by sounds, strong light characterised by grimace (risus sardonicus)
- Arching of back (opisthotonus) with the patient remaining clearly conscious

Swaziland_FINAL press.indb 148 5/19/12 2:51 PM

Differential diagnosis

- Meningoencephalitis, meningitis
- Phenothiazine side-effects
- Febrile convulsions

Nonpharmacological management

- Nurse patient intensively in a quiet isolated area.
- Maintain close observation and attention to airway (intubate if necessary), temperature, and spasms.
- Insert NGT for nutrition, hydration, and medicine administration.
- For neonates, have a mucous extractor or other suction available for use as required.
- Maintain fluid balance and adequate hydration, initially by IV if required, later by NGT.
- Prevent aspiration of fluid into the lungs.
- Maintain adequate nutrition. For the neonate, use expressed breast milk via NGT.
- Avoid IM injections as much as possible; use alternative routes (e.g., NGT, rectal)
- When possible—
  - Change from parenteral to oral medication as soon as possible.
  - Keep patient handling to a minimum to avoid provoking spasms.
  - Clean wounds and remove necrotic tissues.
  - For neonates, thoroughly clean umbilical area.

Pharmacological management

Adults—

- Give antibiotic: **benzylpenicillin** 1–2 MU every 6 hours for 10 days **(A)**.
  —OR—
- ***For patients who are allergic to penicillin***, give **erythromycin** 500 mg PO every 6 hours **(A)**.
  —PLUS—
- Control spasms: **chlorpromazine** 100 mg **(A)** alternating with **diazepam (B)** 2–3 mg by NGT every 4–6 hours.
- Neutralise toxin: give **tetanus immunoglobulin (TIG)** 150 IU/kg IM into multiple sites
  —OR—
- *Only if TIG is not available,* give **tetanus toxoid (TT)** give 20,000 IU as IV single dose (after test dose of 1,500 IU SC).

Children (other than neonates)—

- Give antibiotic: **benzylpenicillin** 50,000–100,000 IU/kg per dose every 6 hours for 10 days **(A)**.
  —OR—

Swaziland_FINAL press.indb 149 5/19/12 2:51 PM

- ***For patients who are allergic to penicillin***, give **erythromycin** 15 mg/kg PO every 6 hours **(A)**.
  —PLUS—
- Control spasms: **chlorpromazine** 12.5–25 mg **(A)** alternating with **diazepam (B)** 0.5–1 mg/kg by NGT every 4–6 hours
- Neutralise toxin: give **TIG** 150 IU/kg IM into multiple sites
  —OR—
- *Only if TIG is not available*, give **TT** 10,000 IU given IM or IV single dose (after test dose of 1,500 IU SC).

Prevent future tetanus: after recovery ensure full course of immunization with DPT vaccine.

Neonates—

- Give antibiotic: **benzylpenicillin** 100,000 IU/kg every 12 hours **(A)**
- Control spasms: **chlorpromazine** 12.5–25 mg **(A)** alternating with **diazepam (B)** 0.5–1 mg/kg by NGT every 4–6 hours.
- Neutralise toxin: give **TIG** 150 IU/kg IM into multiple sites
  —OR—
- *Only if TIG is not available*, give **TT** 10,000 IU given IM or IV single dose (after test dose of 1,500 IU SC).
- Prevent future tetanus: after recovery ensure full course of immunization with DPT vaccine

Tetanus prevention

- Ensure childhood immunisation. Immunise all children against tetanus during routine childhood immunisation. See tables 10.1A and 10.1B and annex D.
- Use prophylaxis against neonatal tetanus—
  - Immunise all pregnant women and women of childbearing age (15–45 years) against tetanus with **TT vaccine (A*)** 0.5 mL IM into the upper arm or upper outer thigh as outlined in table 11.12.
  - Ensure hygienic deliveries including proper cutting and care of umbilical cords.
- Use prophylaxis in patients at risk of tetanus as a result of contaminated wounds, bites, and burns.
  - General measures
    - Ensure adequate surgical toilet and proper care of wounds.
  - Passive immunization
    - Give **TIG:**
      - Child <5 years: 75 IU IM
      - Child 5–10 years: 125 IU IM
      - Child >10 years and adult: 250 IU IM
        —OR—
    - *Only if TIG is not available*, give **TT** 1,500 IU deep SC or IM

Swaziland_FINAL press.indb 150 5/19/12 2:51 PM

- Active immunization
  - For unimmunised or never fully immunised patients, give a full course of vaccination: three doses of **TT vaccine** 0.5 mL deep SC or IM at intervals of 4 weeks **(A*)**.
  - For fully immunised patients but last booster >10 years ago, give one booster dose of **TT vaccine** 0.5 mL deep SC or IM **(A*)**.

Table 11.12 Vaccine Recommended Timing for Women of Childbearing Age and Pregnant Women

Dose	Schedule
TT1 (1st dose)	At first contact with the woman (e.g., at the first antenatal visit, or as early as possible during pregnancy)
TT2 (2nd dose)	At least 4 weeks after TT1
TT3 (3rd dose)	At least 6 months after TT2 *or* as early as possible during a subsequent pregnancy
TT4 (4th dose)	At least 1 year after TT3 *or* as early as possible during a subsequent pregnancy
TT5 (5th dose)	At least 1 year after TT4 *or* as early as possible during a subsequent pregnancy

Table notes:
1. Refer to the immunisation schedule in annex D, for general information on administration, storage, and handling of vaccines.
2. Store TT at +2–8oC. ***Caution:*** Do not freeze TT.

11.13 Tuberculosis

Definition

Tuberculosis is a chronic, contagious disease due to infection by *Mycobacterium tuberculosis*. It primarily affects the lungs (pulmonary TB), but it can occur in the other parts of the body (extrapulmonary TB). It is transmitted through inhalation of the infectious droplets. A compromised immune system facilitates active disease. Swaziland has a high HIV/TB co-infection rate. TB has been declared a national emergency.

Note: TB a notifiable disease in Swaziland. All cases should be reported. Call 977 immediately.

11.13.1 Pulmonary tuberculosis

Symptoms and signs

- Cough
- Night sweats
- Fever
- Weight loss

Swaziland_FINAL press.indb 151 5/19/12 2:51 PM

- Haemoptysis
- Loss of appetite
- Fatigue
- Weakness
- Pallor
- Chronic pleuritic chest pain
- Dyspnoea on exertion

Diagnosis

- Sputum microscopy
- Chest X-ray (if available for negative sputum)
- Sputum smear
- Sputum TB culture
- DNA molecular test
- DST
- HIV testing (TB/HIV co-infection rate is high)
- All previously treated patients should have a culture and DST.

Nonpharmacological management

- Proper nutrition

Prevention of transmission and acquisition

- Good ventilation
- Isolation of TB patients
- Cough etiquette
- Personal protective masks

Pharmacological management for new patients

Refer to TB national guidelines for specific doses.

Adults—

- Initial phase: 2 months
  - **Rifampicin + isoniazid + pyrazinamide + ethambutol** 150 + 75+ 275+ 400 mg, dosing based on weight **(B*)**
- Continuation phase: 4 months
  - **Rifampicin + isoniazid** 150 + 75 mg, dosing based on weight **(B*)**

Children—

- Initial phase: 2 months

  Rifampicin + isoniazid + pyrazinamide + ethambutol, dosing based on weight **(B*)**
- Continuation phase: 4 months
  - **Rifampicin + isoniazid**, dosing based on weight **(B*)**

Swaziland_FINAL press.indb 152 5/19/12 2:51 PM

Pharmacological management for previously treated patients

Patients may have had treatment failure, TB relapse, or default. DOTS should be ensured. These patients should have DST before or when treatment is initiated. Where possible, rapid DST or line-probe assay is recommended. Patients returning after relapse or default who do not have MDR-TB should be treated as follows.

Adults—

- Intensive phase: 3 months
  - **Rifampicin + isoniazid + pyrazinamide + ethambutol** 150 + 75 + 400 + 275 mg **(B*)**, dosing based on weight
- Continuation phase: 5 months
  - **Rifampicin + isoniazid + ethambutol** 150 + 75 + 400 mg **(B*)**, dosing based on weight **(B*)**
- Patients whose previous treatment failed should be referred for empirical MDR-TB treatment while waiting for DST results.

Children—

- Intensive phase: 3 months
  - **Rifampicin + isoniazid + pyrazinamide + ethambutol,** dosing based on weight **(B*)**
- Continuation phase: 5 months
  - **Rifampicin + isoniazid + ethambutol,** dosing based on weight **(B*)**

Pharmacological management based on DST

For all HIV-positive patients give

- **Co-trimoxazole (A)**
- **Isoniazid (B*)** and **vitamin B6 (pyridoxine hydrochloride) (A)**
- ARVs (based on the national ART guidelines)
  - Note: EFV is preferred to NVP for patients taking TB medicines.

REFER ⚠

- Sputum-negative patients who are not improving clinically must be referred.
- Retreatment cases and high-risk groups (see national TB guidelines) must be referred for culture and DST.
- Symptomatic children must be referred.

11.13.2 Extrapulmonary TB

Symptoms and signs are the same as in PTB, but there could be specific symptoms and signs depending on the site of the infection such as—

- Abdominal pain for abdominal TB
- Swelling and pain in spine (spinal TB)

Swaziland_FINAL press.indb 153 5/19/12 2:51 PM

Treatment is also similar as in PTB, however there are exceptions such as—

- TB meningitis (for details refer to national TB guidelines)
- TB pericarditis (for details refer to national TB guidelines)
- TB in pregnancy

REFER all cases with suspected extrapulmonary TB. ⚠

11.13.3 Drug-resistant tuberculosis

DRTB is a chronic contagious disease due to infection by mycobacterium tuberculosis resistant to any first-line anti-TB medicines. There are five types of DRTB:

- Mono-drug resistant TB—resistance to any of the first-line medicines
- MDR-TB—resistance to isoniazid and rifampicin
- Poly-drug resistant TB—resistance to any first-line medicine except both rifampicin and ethambutol (but not both) (see WHO definition)
- Extensively drug-resistant (XDR) TB: MDR plus resistance to any of the following second-line medicines: fluoroquinolone and injectables (kanamycin, amikacin, and capreomycin)
- Totally drug resistant TB: resistance to all known TB medicines

Diagnosis includes laboratory tests

DRTB is a laboratory diagnosis based on the lack of susceptibility to one or a combination of the TB medications.

High-risk groups

- Contacts of XDR TB
- Patients returning with treatment failure
- Patients with TB complying with medication but deteriorating
- HIV patients who do not respond to first-line anti-TB medicines
- Sputum specimen for culture and first- and second-line DST
- Demonstration of sequences within the mycobacterium known to be resistant

Nonpharmacological management

Prevention of transmission

- Contact tracing and investigation
- DOTS
- Ventilation and isolation
- Proper nutrition (balanced diet)
- Cough etiquette
- Personal protective masks

Swaziland_FINAL press.indb 154 5/19/12 2:51 PM

Pharmacological management

Adults—

- MDR-TB—Treatment initiation should only be done at accredited MDR sites
  - Initial phase: 6–8 months
    - **Amikacin (B*) + levofloxacin (B*) + ethionamide (S*) + terizidone+ p-amino salicylic acid (B*) + pyrazinamide (B*)** 1 + 250 + 250 + 250 + 8 + 500 mg dosing based on weight
  - Continuation phase: 18–24 months
    - **Levofloxacin (B*) + ethionamide (S*) + terizidone + p-amino salicylic acid (B*) + pyrazinamide (B*)** 250 + 250 + 250 + 8 + 500 mg dosing based on weight
- **REFER** monoresistant , polyresistant, XDR, and totally drug-resistant TB patients. ⚠

Children—Refer to national TB guidelines.

REFER ⚠

- Culture-positive patients who are not improving clinically
- All DR-TB confirmed cases (see TB guidelines) for initiation
- Symptomatic children

11.14 Typhoid fever (enteric fever)

Definition

Bacterial infection characterised by fever and spread through contaminated food and water. Following treatment, about 10% of patients relapse and up to 3% become chronic carriers of the infection.

Causes

- Bacterial disease (*Salmonella typhi* and *S. paratyphi A* and *B)*

Symptoms and signs

- Gradual onset of chills and malaise, headache, anorexia, epistaxis, backache, and constipation usually occurring 10–15 days after infection
- Abdominal pain and tenderness are prominent features
- Temperature rises in steps
- Relative bradycardia
- Delirium and stupor
- Tender splenomegaly (common)

Investigations

- Stool: culture
- Blood: culture
- Widal agglutination reaction: check weekly for rising antibody titres

Swaziland_FINAL press.indb 155 5/19/12 2:51 PM

Note: A single positive screening does not indicate presence of infection.

Nonpharmacological management

- Ensure adequate rehydration.

Pharmacological management for new infection

Adults—

- **Co-trimoxazole** 960 mg every 12 hours for 3 days **(A)**
  —OR—
- **Chloramphenicol** 1g IM, IV, or oral every 6 hours for 10–14 days **(A)**
  —OR—
- **Ciprofloxacin** 500–750 mg every 12 hours for 5–14 days **(A)**. ***Caution:*** contraindicated in pregnancy.

Children—

- **Co-trimoxazole** 24 mg/kg per dose every 12 hours for 3 days **(A)**
  —OR—
- **Chloramphenicol** 25 mg/kg per dose IM, IV, or PO every 6 hours for 10–14 days **(A)**
  —OR—
- **Ciprofloxacin** 10–15 mg/kg per dose every 12 hours for 5–14 days **(A)**

Pharmacological management for chronic carriers

Treat for 4–6 weeks.

Adults—

- **Ciprofloxacin** 500–750 mg every 12 hours **(A)**. ***Caution:*** Contraindicated in pregnancy.
  —OR—
- **Amoxicillin** 250 mg every 8 hours **(A)**
  —OR—
- ***For patients who are allergic to penicillin***, give **erythromycin** 500 mg PO every 6 hours **(A)**.

Children—

- **Ciprofloxacin** 10–15 mg/kg per dose every 12 hours **(A)**
  —OR—
- **Amoxicillin** 25 mg/kg per dose (maximum: 250 mg) every 8 hours **(A)**
  —OR—
- ***For patients who are allergic to penicillin***, give **erythromycin** 15 mg/kg PO every 6 hours **(A)**.

Prevention

- Proper faecal disposal
- Use of safe clean water for drinking
- Good personal hygiene, especially hand washing
- Good food hygiene

Swaziland_FINAL press.indb 156 5/19/12 2:51 PM

11.15 Helminthic infestations

11.15.1 Roundworm (Ascariasis)

Definition

Roundworms are 20–30 cm long, pink or white in colour, and found in the GIT as intestinal parasites. They are spread from faeces to mouth. The worms in the lungs cause a cough. They are mostly common in school children and young adults.

Diagnosis

- Stool microscopy

Symptoms and signs

- Colicky abdominal pain
- Cough, fever, blood-tinged sputum if pneumonia develops while roundworms are in the lungs
- Worm seen in the sputum or stools
- Poor appetite, tired
- Diffuse mild abdominal pain (sometimes)
- Distension
- If pneumonia develops, elevated temperature, dullness to percussion at site of pneumonia, rales, occasional ulcers
- If the worm load is severe, the worms may form a mass in the right iliac fossa
- Intestinal obstruction

Nonpharmacological management

- Advise patients to—
  - Practice good personal hygiene (i.e., wash hands with soap and water after passing a stool, before working with food).
  - Keep fingernails short.
  - Wash fruits and vegetables well or cook.
  - Keep toilet seats clean.
  - Teach children to use toilets and to wash hands.
  - Do not pollute the soil with sewage or sludge.
  - Dispose of faeces properly.

Pharmacological management

- **Albendazole** 400 mg PO stat or 20 mL suspension stat **(A)**. ***Cautions:*** Anthelmintic medicines including mebendazole are not safe in pregnancy because they may cause congenital defects so delay treatment until after delivery.

Swaziland_FINAL press.indb 157 5/19/12 2:51 PM

REFER cases with abdomen tenderness, pain and vomiting, or if patient is pregnant. ⚠

11.15.2 Hookworm

Definition

A chronic parastic infestation of the intestines by hookworms. Hookworm larvae in the soil penetrate the skin.

Cause

- *Necator americanus*
- *Ancylostoma duodenale*

Symptoms and signs

- Dermatitis (ground itch)
- Cough and inflammation of the trachea (common during larvae migration phase)
- Iron-deficiency anaemia

Differential diagnosis

- Other causes of iron-deficiency anaemia

Investigations

- Stool examination for ova

Pharmacological management

Adults: **mebendazole** 500 mg single dose **(A)**. ***Caution:*** Not safe in pregnancy because it may cause congenital defects so delay treatment until after delivery.
Children <2 years: **mebendazole** 250 mg single dose **(A)**

Prevention

- Advise patients to—
  - Avoid walking barefoot.
  - Ensure proper faecal disposal.
- De-worm children regularly (every 3–6 months).

11.15.3 Taeniasis (tapeworm infestation)

Definition

Tapeworms are long, segmented worms that require a host in which to mature. Intestinal tapeworms can develop when humans ingest undercooked beef, pork, or fish that contains tapeworm larvae or food contaminated with their eggs.

Causes and types

- *Taenia saginata* (from undercooked beef)
- *T. solium* (from undercooked pork)
- *Diphyllobothrium latum* (from undercooked fish)

Swaziland_FINAL press.indb 158 5/19/12 2:51 PM

Symptoms and signs

- *T. saginata*
  - Usually asymptomatic but live segments may be passed in stool
  - Epigastric pain, diarrhoea, sometimes weight loss
- *T. solium*
  - Usually asymptomatic but live segments may be passed in stool
  - Heavy larvae infestation causes cysticercosis (muscle pains, weakness, or fever)
  - CNS involvement may cause meningoencephalitis or epilepsy
- *D. latum*
  - Megaloblastic anaemia may occur as a rare complication

Investigations

- Stool: for eggs, proglottids, and, in rare cases, scolex

Pharmacological management

Adults—

- **Mebendazole** 500 mg PO single dose **(A)**. ***Caution:*** Not safe in pregnancy because it may cause congenital defects so delay treatment until after delivery.

  —OR—
- **Niclosamide** 2 g PO single dose **(A)**
  - The tablet(s) should be chewed at breakfast.
  - Give a purgative (e.g., **bisacodyl**) 2 hours after the dose.
- **Bisacodyl** 10 mg PR **(A)**

Children—

- **Mebendazole** child <2 years: 250 mg **(A)**

  —OR—
- **Niclosamide (A)**
  - Dosages:
    - Child <2 years: 500 mg
    - Child 2–6 years: 1 g
    - Child >6 years: 2 g
  - The tablet(s) should be chewed at breakfast.
  - Give a purgative (e.g., **bisacodyl**) 2 hours after the dose.
- **Bisacodyl** 5 mg PR **(A)**

Prevention

- Avoid uncooked or undercooked pork, beef, or fish.

Swaziland_FINAL press.indb 159 5/19/12 2:51 PM

11.15.4 Trichuriasis (whipworm infestation)

Definition

Infestation of the human caecum and upper colon by *Trichuris trichiura* (whipworms)

Symptoms and signs

- May be symptomless
- Heavy infestation may cause bloody, mucoid stools and diarrhoea
- Complications include anaemia and prolapse of the rectum

Differential diagnosis

- Other worm infestations
- Other causes of bloody mucoid stools

Investigations

- Stool examination for ova
- Sigmoidoscopy, where facilities available

Pharmacological management

Adults—

- **Mebendazole** 500 mg PO single dose **(A)**. ***Caution:*** Not safe in pregnancy because it may cause congenital defects so delay treatment until after delivery.

Children—

- **Mebendazole** child <2 years: 250 mg PO single dose **(A)**

Prevention

- Advise patients to—
  - Ensure personal hygiene.
  - Ensure proper faecal disposal.
- De-worm children regularly (every 3–6 months).

11.15.5 Onchocerciasis (river blindness) and other filariasis

Definition

Onchocerciasis is a chronic filarial disease mainly affecting the skin and eyes.

Cause

- *Onchocerca volvulus* transmitted by a bite from a female black fly (*Simulium damnosum, S. naevi,* and *S. oodi*), which breeds in rapidly flowing and well-aerated water

Symptoms and signs

- Skin
  - Fibrous nodules usually in pelvic girdle and lower extremities (due to adult worms)

Swaziland_FINAL press.indb 160 5/19/12 2:51 PM

  - Intense itchy rash, altered pigmentation, oedema, and atrophy (due to microfilariae)
  - Loss of skin elasticity leading to hanging groin and sometimes hernia
- Eye
  - Visual disturbances and blindness

Differential diagnosis

- Other causes of skin depigmentation (e.g., yaws, burns, vitiligo)
- Other causes of fibrous nodules in the skin (e.g., neurofibromatosis)

Investigations

- Skin snip after sunshine to show microfilariae in fresh preparations
- Excision of nodules for adult worms
- Presence of microfilariae in the anterior chamber of the eye

Pharmacological management

- **Ivermectin** 150 micrograms/kg PO once yearly **(S)** (See also table 11.15.5.)
- ***Cautions:***
  - Not recommended in children <5 years or nursing mothers
  - No food or alcohol to be taken within 2 hours of a dose

Table 11.15.5 Ivermectin Dose Based on Height

Height (cm)	Dose
>158	12 mg
141–158	9 mg
120–140	6 mg
90–119	3 mg
<90	Do not use

11.15.6 Schistosomiasis (bilharziasis)

Definition

Disease of the large intestine and the urinary tract due to infestation by a *Schistosoma* (blood fluke).

Causes

- *Schistosoma haematobium* (urinary tract)
- *S. mansoni* (gut)
- *S. japonicum* (gut)

The larvae form (cercariae) of *Schistosoma* penetrate the skin from contaminated water.

Swaziland_FINAL press.indb 161 5/19/12 2:51 PM

Symptoms and signs

- *S. haematobium* (urinary tract)
  - Painless, blood-stained urine at the end of urination (i.e., terminal haematuria)
  - Frequency of urinating (i.e., cystitis and fibrosis)
- *S. mansoni* (GIT)
  - Abdominal pain
  - Frequent stool with blood-stained mucus
  - Palpable liver (hepatomegally); signs of portal hypertension and haematemesis

Differential diagnosis

- Cancer of the bladder (*S. haematobium*)
- Dysentery (*S. mansoni*)

Investigations

- Urine examination (for *S. haematobium* ova)
- Stool examination (for *S. mansoni* ova)
- Rectal snip (for *S. mansoni*)
- Bladder X-ray for calcification

Pharmacological management

- **Praziquantel** 40 mg/kg PO single dose **(A)**

Prevention

- Advise patient to avoid urinating or defecating in or near water.
- Advise patient to avoid washing or stepping in contaminated water.
- Ensure effective treatment of cases.

Swaziland_FINAL press.indb 162 5/19/12 2:51 PM

12. MUSCULOSKELETAL CONDITIONS

12.1 Gouty arthritis

12.1.1 Acute gouty arthritis

Definition

A condition of abnormal deposition of uric acid crystals in joints, kidneys, and musculoskeletal soft tissues.

Symptoms and signs

- Recurrent attacks of a characteristic acute pain in joints
- One joint (usually big toe)
- Extreme pain swelling, redness, and very hot
- Uric acid deposits in and around the joints and cartilages of the extremities (tophi)
- Occasional deformity due to uric acid deposits
- Interstitial renal disease; poor kidney function
- Uric acid kidney stones (nephrolithiasis)
- Increased serum uric acid concentration (above 0.5 mmol/L)

Nonpharmacological management

- Advise patient to—
  - Get bed rest
  - Increase fluid intake
  - Avoid alcohol
  - Avoid the use of acetylsalicylic acid (aspirin)

Pharmacological management

Initiate treatment as early as possible in an acute attack. The longer the attack continues, the less effective treatment becomes.

- Initiate therapy with **indomethacin** 800 mg PO **(A)** immediately.
  - Then give 200–400 mg PO every 6–8 hours (maximum dose 2400 mg per day) for 2–3 days.
  - Thereafter, if needed, give 200–400 mg every 8 hours until pain has subsided.
- If the patient does not respond to indomethacin, give **colchicine** 0.5–1 mg PO **(A)** immediately.
  - Then 0.5 mg PO every 2–3 hours until pain is relieved or gastrointestinal distress develops.
  - ***Cautions:***
    - Do *not* exceed a total daily dose of 6 mg.
    - Do *not* repeat a course within 3 days.

Swaziland_FINAL press.indb 163 5/19/12 2:51 PM

Prophylaxis

- **Colchicine** 0.5 mg PO **(A)** once or twice daily until uric acid lowering agents can be administered.
- ***Note:*** Colchicine is effective and specific for acute gout, but it is not easy to use optimally because of the development of gastrointestinal adverse effects. **Allopurinol** 300 mg PO **(A)** once or twice daily lowers serum uric acid levels, helps prevent recurrent attacks, and reduces tophaceous deposits.

REFER in cases of—

- Failure to respond
- Uncertain diagnosis
- Suspected chronic gout

12.1.2 Chronic gouty arthritis

Definition

Chronic gouty arthritis is gout with one or more of the symptoms and signs listed below.

Symptoms and signs

- Many acute attacks (more than four per year)
- Tophi
- Bony destruction
- Kidney stones
- Poor renal function
- Serum uric acid over 0.5 mmol/L

Investigations

- X-rays: periarticular erosions due to tophi
- Urate crystals in synovial fluid (hospital)

Nonpharmacological management

- Encourage controlled weight loss.
- Advise avoidance of substances that may trigger acute gout: alcohol, acetylsalicylic acid (aspirin), and certain foods (e.g., red meat).

REFER all patients with chronic gout.

12.2 Osteoarthritis

Definition

Osteoarthritis is a disease of people over age 50. It is caused by degeneration of cartilage and bones. It can occur in the neck, spine, hips, knees, and fingers, but more commonly in the weight-bearing joints (e.g., hips and knees).

Swaziland_FINAL press.indb 164 5/19/12 2:51 PM

Symptoms and signs

- Joint pain stiffness, which usually gets better with rest and worse with movement; usually worse during cold or rainy weather
- Pain usually mild
- Neck pain may radiate to the arms or cause weakness in the arms.
- Mild tenderness on palpation over affected joints
- Possible nodes on fingers—distal phalangeal joints
- Joints not hot or swollen

REFER all cases ⚠

Pharmacological management

- Give **acetylsalicylic acid (aspirin)** 600 mg PO **(A)** 4 times a day, as needed.
- Advise patient to keep joints warm.

12.3 Osteomyelitis

Definition

Osteomyelitis is an acute or chronic infection of the bone. It destroys bone, sometimes permanently.

Symptoms and signs

- Fever
- Pain on moving affected area of bone.
- Chills
- Weakness
- Elevated temperature (i.e., 39°C or higher)
- Redness, temperature, and swelling over area of affected bone, or in the nearby joint.

Nonpharmacological management

- Immobilize the affected area with splints.

Pharmacological management

- If referral is delayed, give antibiotics: **procaine penicillin** 900,000 IU IM twice a day **(A)**.
  —OR—
- ***For patients who are allergic to penicillin***, give **erythromycin (A)**.
  - Adults: 500 mg PO every 6 hours
  - Children: 15 mg/kg PO every 6 hours

REFER all cases ⚠

Swaziland_FINAL press.indb 165 5/19/12 2:51 PM

12.4 Pyomyositis

Definition

Inflammation of muscle, which may lead to pus formation and deep-seated muscle abscess

Causes

- Bacterial infection (commonly *Staphylococcus aureus*)
- Trauma

Symptoms and signs

- Most commonly localised in one muscle, usually a large striated muscle
- History of trauma
- Fever
- Painful swelling of the involved muscle
- Affected area is hot, swollen, and tender
- Fluctuation when pus forms

Differential diagnosis

- Cellulitis
- Boils
- Osteomyelitis

Investigations

- Blood: CBC, C&S
- Pus: C&S

Nonpharmacological management

- Elevate and immobilise affected limb (where relevant).
- Check frequently for pus formation.

Pharmacological management

Adults—

- **Cloxacillin** 2 g IV or IM every 6 hours for 5–10 days **(A)**
  - As soon as pus localizes
    - Carry out surgical incision and drainage of the abscess.
    - Leave the wound open.
  - Once clinical improvement occurs
    - Change to **flucloxacillin** 500 mg PO every 6 hours to complete the course **(B)**

      —OR—
- Alternative antibiotic—to be used only if above medicines are not available—**chloramphenicol** 500 mg every 6 hours for 5–10 days **(A)**

  —OR—
- ***For patients who are allergic to penicillin***, give **erythromycin** 500 mg PO every 6 hours **(A)**.

Swaziland_FINAL press.indb 166 5/19/12 2:51 PM

Children—

- **Cloxacillin** 12.5–25 mg/kg per dose IV or IM every 6 hours for 5–10 days **(A)**
  - As soon as pus localises
    - Carry out surgical incision and drainage of the abscess.
    - Leave the wound open.
  - Once clinical improvement occurs, change to **flucloxacillin** PO every 6 hours to complete the course **(B)**.
    - <2 years: 125 mg per dose
    - 2–10 years: 250 mg per dose

      —OR—
- Alternative antibiotic—to be used only if above medicines are not available—**chloramphenicol** 12.5 mg/kg per dose every 6 hours for 5–10 days **(A)**

  —OR—
- ***For patients who are allergic to penicillin***, give **erythromycin** 15 mg/kg PO every 6 hours **(A)**.

12.5 Rheumatoid arthritis

Definition

Rheumatoid arthritis is an inflammatory disease that affects many parts of the body (i.e., heart, lungs, spleen, and joints), but it is primarily a disease of the joints. The cause is unknown.

Symptoms and signs

Any or all of the following:

- Stiffness and pain of the joints especially in the morning when getting up; improves as the day goes on
- Weakness
- Weight loss
- Loss of appetite
- Low-grade fever
- Symmetrical joint swelling, tenderness, and redness, especially spindling on the fingers
- Nodules present over bony prominences such as fingers and elbows
- May have enlarged spleen
- May have lymph node enlargement
- Deformity of the fingers, toes, and spine
- Atrophy of the skin and muscles

Swaziland_FINAL press.indb 167 5/19/12 2:51 PM

Nonpharmacological management

- Daily rest helps to decrease pain and swelling.
- Daily exercise of all joints helps to keep them from stiffening.

Pharmacological management

- **Acetylsalicylic acid (aspirin)** 300–600 mg 4 times a day until pain and inflammation have stopped **(A)**. ***Caution:*** Contraindicated in children <8 years; the clinician should weigh the benefit of aspirin use against the risk of Reye's syndrome.

REFER all severe cases. ⚠

12.6 Septic arthritis (pyogenic arthritis)

Definition

A condition involving infection of one or more of the large joints. Infection is usually blood-borne, but may follow trauma to the joint. The course may be acute or protracted. A wide spectrum of organisms is involved, including *Staphylococci* and *Neisseria gonorrhoea*.

REFER ⚠

All patients with suspected septic arthritis should be referred immediately to confirm the diagnosis, initiate appropriate management, and prevent complications.

12.7 Back strain

Definition

Low-back strain comes from strain of the muscles and ligaments of the lumbosacral area. It is caused from straining during exercise, lifting, bending, or pulling on heavy objects.

Symptoms and signs

- Pain in the lumbosacral area made worse by lifting, bending, pulling, or sitting for a long period.
- Tender to pressure on palpation of lumbosacral area at site of pain.
- *None* of the following should be present:
  - Radiation of the pain into the leg
  - Pain at the flank
  - Dysuria
  - Abdominal pain
  - Purulent vaginal discharge
  - Elevated temperature
  - Abdominal pain on palpation

Swaziland_FINAL press.indb 168 5/19/12 2:51 PM

- Neurological changes (i.e., numbness or weakness in legs)
- Small amount of pain or no pain when patient lies on back and lifts legs

Nonpharmacological management

- Advise the patient to—
  - Apply heat to the back.
  - Rest.
  - Sleep on a hard mattress.
  - Use proper method to lift heavy loads: bend the knees and hips and keep the back straight.

Pharmacological management

- **Paracetamol** 500 mg – 1 g 4–6 times a day as needed for pain **(A)**

REFER if patient has any of the following: ⚠

- Numbness or weakness in the legs
- Localised spinal tenderness
- Pain that persists after 4 weeks of treatment

Swaziland_FINAL press.indb 169 5/19/12 2:51 PM

13. NUTRITIONAL CONDITIONS

13.1 Acute malnutrition

Definition

Acute malnutrition is caused by a significant imbalance in the nutritional intake and individual needs. The immediate causes are—

- Insufficient dietary intake
- Infections, infestations, and other diseases
- The term *acute malnutrition* is synonymous with *protein energy malnutrition* (PEM).

Table 13.1 Types of Acute Malnutrition

Type	In Adults	In Children
Severe acute malnutrition	▪ BMI <6 ▪ Mid-upper arm circumference of <19 cm ▪ Weight loss of >10% body weight in a month	▪ Weight for height <70% and/or mid-upper arm circumference of <11 cm ▪ Presence of pitting bilateral oedema
Moderate acute malnutrition	▪ BMI 16–18.5 ▪ Mid-upper arm circumference of 19–23 cm	▪ Weight for height <80% and/or a mid-upper arm circumference of <12 cm

There are four main causes of death from acute malnutrition:

- Hypoglycaemia
- Hypothermia
- Heart failure
- Missed infections

These deaths are preventable if the health team follows these 10 steps:

1. Treat or prevent hypoglycaemia.
2. Treat or prevent hypothermia.
3. Treat or prevent dehydration.
4. Correct electrolyte imbalance.
5. Treat or prevent infections.
6. Correct micronutrient deficiencies.
7. Start cautious feeding.
8. Give catch-up diet for rapid growth.
9. Provide loving care, play, and stimulation.
10. Prepare for follow-up and discharge.

Swaziland_FINAL press.indb 170 5/19/12 2:51 PM

Pharmacological management of hypoglycaemia

If the child is conscious:

- Give immediately:
  - 50 mL of **10% glucose solution**
    —OR—
  - 50 mL **F75** (milk formula 75)
    —OR—
  - 50 mL sugar solution (1 rounded teaspoon sugar in 3 tablespoons water)
- Follow with a feeding of **F75**.
- Feed **F75** every 2 hours for at least the first day.
- Keep the child warm.
- Start antibiotics immediately: **amoxicillin** 40 mg/kg IV per day **(A)**
  —OR—
- ***For patients who are allergic to penicillin***, give **erythromycin** 15 mg/kg PO every 6 hours **(A)**.

If the child is unconscious:

- Give **glucose** IV (5 mL/kg of 10% sterile glucose solution).
- If this cannot be done quickly, give 50 mL of **10% glucose** solution by NGT.
- Follow with a feeding of **F75** within 30 minutes.
- Feed **F75** every 2 hours for at least the first day.
- Keep the child warm.
- Start antibiotics immediately: **Amoxicillin** 40 mg/kg IV per day **(A)**.
  —OR—
- ***For patients who are allergic to penicillin***, give **erythromycin** 15 mg/kg PO every 6 hours **(A)**.

Prevention and treatment of dehydration and electrolyte imbalance

To prevent dehydration:

- After *every* watery stool, give—
  - 50–100 mL **ReSoMal** if under 2 years
  - 100–200 mL **ReSoMal** if over 2 years
- Continue feeding.
- Continue breastfeeding.

To treat dehydration:

- Rehydrate *slowly* to prevent fluid overload.
- Give 5 mL/kg **ReSoMal** every 30 minutes for 2 hours PO or by NGT.
- Then give 5–10 mL/kg in alternate hours for up to 10 hours (i.e., give **ReSoMal** and **F75** in alternate hours).
- Monitor progress carefully. During rehydration, check the following each time before giving **ReSoMal**:

Swaziland_FINAL press.indb 171 5/19/12 2:51 PM

  - Pulse and respiration rates to check for fluid overload. ***Caution:*** Increases in pulse rate of 25 beats per minute and respiratory rate of 5 breaths per minute are the danger signs.
  - Signs of improvement (signs of hydration): skin pinch not as slow, eyes less sunken, moist mouth, tears return, passing urine, less thirsty
  - Frequency of stools and vomiting
- Stop giving **ReSoMal** if—
  - There are three or more signs of hydration.
    —OR—
  - There are signs of fluid overload.
    —OR—
  - ReSoMal has been given for 12 hours.

To correct an electrolyte imbalance:

- Give extra potassium every day.
- Give extra magnesium every day.
- Limit sodium.
  - Use low-sodium fluids for IV and oral rehydration (ReSoMal).
  - Give a salt-free diet.
  - Do not add salt to cooked food.

Electrolyte imbalance leads to—

- Fluid retention (oedema) and risk of heart failure
- Weakened heart (risk of heart failure)
- Apathy, weakness
- Poor appetite

Nutritional management for PEM

Phase I (at an inpatient facility)

- Formula is used during this phase is **F75**.
- Weight gain at this stage is dangerous.

Transition phase

- The goal of this phase is to avoid a sudden change to the bulk of the patient's diet before physiological function is restored.
- Patients start to gain weight as **F100** is introduced.
- The quantity of **F100** given is equal to the quantity of **F75** given in phase I.

Phase II

- The patient has good appetite.
- The patient has no major medical complications.
- This phase can occur at inpatient or outpatient setting.
- **F100** (inpatient only) or ready-to-use therapeutic feeding is used during this phase.

Swaziland_FINAL press.indb 172 5/19/12 2:51 PM

Micronutrient management of severely malnourished patients

For detailed management, see WHO and UNICEF Integrated Management of Acute Malnutrition guidelines.

On day 1, give:

- **Vitamin A**
  - >12 months: 200,000 IU
  - 6–12 months: 100,000 IU
  - <6 months: 50,000 IU
  - ***Note:*** If the patient shows signs of eye of deficiency, repeat on days 2 and 15.
- **Folic acid**: 5 mg
- **Iron** (3 mg/kg/day) but *only* after transition to the rehabilitation (catch-up) phase. ***Note:*** Giving iron too early can make infections worse and can damage cell membranes.

13.2 Micronutrient deficiencies

13.2.1 Anaemia

See 7.1.

13.2.2 Vitamin A deficiency

Definition

A condition affecting the skin, mucous membranes, and the eyes. Most common in children ages 1–5 years. It is the most common cause of blindness in children in Africa if not identified and treated early. Clinical features include the following:

- Night blindness
- Dry eyes (xerophthalmia) with eventual ulceration and perforation of the cornea (keratomalacia)
- Small greyish triangular deposits near the cornea (Bitot's spots)

Pharmacological management

Treatment

- **Retinol (vitamin A)** PO **(A)**
  - <12 months: 100,000 IU immediately, and repeat 24 hours later and after 6 weeks
  - >12 months: 200,000 IU immediately, and repeat 24 hours later and after 6 weeks

Prophylaxis

- For children in communities where vitamin A deficiency is common, give **retinol (vitamin A)** PO **(A)**.
  - <12 months: 100,000 IU every 6 months
  - >12 months: 200,000 IU every 6 months

Swaziland_FINAL press.indb 173 5/19/12 2:51 PM

REFER ⚠

- Children with eye complications secondary to vitamin A deficiency
- Children with kwashiorkor and/or marasmus but no associated eye complications secondary to vitamin A deficiency
- Children with measles at present or during the past 3 months

13.2.3 Pyridoxine (vitamin B6) deficiency

Definition

Pyridoxine deficiency is related to—

- Malnutrition
- Alcoholism (see also 19.11.11)
- Malignancy

Symptoms and signs

- Symptoms and signs of anaemia (see 7.1)
- Signs of peripheral neuritis such as tingling sensation of the legs, leg pains, calf muscle cramps, and muscle weakness Note: Signs of peripheral neuritis may occur during TB treatment (i.e., with isoniazid); therefore, give **pyridoxine (vitamin B6)** 10 mg per day as prophylaxis **(A)**.

Pharmacological management

Adults—

- **Pyridoxine (vitamin B6)** PO for 3 weeks **(A)**—
  - *Deficiency:* 25 mg every 8 hours
  - *Drug-induced neuropathy:* 50–200 mg every 8 hours

Children—

- **Pyridoxine (vitamin B6)** PO in the morning for 3 weeks **(A)**—
  - *Deficiency:* 5 mg/kg every 8 hours
  - *Drug-induced neuropathy:* 5–10 mg/kg every 8 hours maximum 300 mg/day

REFER ⚠

- Convulsions
- Hallucinations
- Anaemia
- Seborrhoeic dermatitis around the eyes, nose, and mouth accompanied by stomatitis and glossitis

Swaziland_FINAL press.indb 174 5/19/12 2:51 PM

14. PSYCHIATRY

Note: Psychiatric illness management at primary care level should be undertaken only by HCWs that are trained as mental health providers.

14.1 Anxiety

Definition

Anxiety is a universal phenomenon in which the patient experiences attacks of fear; it is usually accompanied by physical signs. This reaction can be normal (e.g., in response to stress such as examinations or interviews), but sometimes it can be abnormal such as when anxiety adversely affects daily life or when one is anxious for undefined reasons (i.e., free-floating anxiety).

Symptoms and signs

In anxiety (panic disorder), four or more of the following symptoms develop abruptly and reach a peak within 10 minutes.

- Palpitations
- Sweating
- Trembling or shaking
- Shortness of breath
- Feeling of choking
- Chest pain or discomfort
- Nausea or abdominal distress
- Dizziness, unsteadiness, light-headedness, or fainting.

Patients suffer de-realisation (feeling of unreality) or depersonalization (detached from oneself). They have fear of losing control or going crazy; there is intense fear of dying.

Patients complain of paraesthesia (numbness or tingling), chills, or hot flashes. They have frightening dreams, headaches, frequent micturition, palpitations, and nail biting.

Differential diagnosis

- Toxic delirium due to fever and hyperthyroidism

REFER if there is high fever or hyperthyroidism. ⚠

Nonpharmacological management

- Counselling
- Lifestyle changes (avoid stimulants such as coffee)

Pharmacological management

Pharmacological management should be commenced only after nonpharmacological management has failed.

Swaziland_FINAL press.indb 175 5/19/12 2:51 PM

- Give **diazepam** 5–10 mg at bedtime depending on how nervous the patient looks, for 3–5 days **(B)**.
- Review after two weeks, and if symptoms persist, **REFER**. ⚠

14.2 Depression

Definition

In depression, the patient has a persistent feeling of sadness, lasting up to 2 months. The common forms are the following:

- *Reactive depression* usually the cause is known (e.g., bereavement). This type is often accompanied by anxiety and is generally short lived.
- *Endogenous depression* is usually hereditary. This usually comes on in late middle age and often triggered by trivial events or occurrences.

Major depressive disorder, or major depression, is characterized by a combination of symptoms that interfere with a person's ability to work, sleep, study, eat, and enjoy once-pleasurable activities. Major depression is disabling and prevents a person from functioning normally. Some people may experience only a single episode with their lifetimes, but more often a person may have multiple episodes. Depression is a common but serious illness. Most who experience depression need treatment to get better.

Symptoms and signs

Consider major depression if five or more of these symptoms present for more than 2 weeks (*DSM-IV* diagnostic criteria).

- Depressed mood
- Loss of interest or pleasure
- Significant weight gain or loss
- Insomnia or hypersomnia nearly every day
- Psychomotor agitation or retardation
- Fatigue or loss of energy
- Feelings of worthlessness
- Feelings of excessive or inappropriate guilt
- Diminished ability to think or concentrate or indecisiveness
- Recurrent thoughts of death or suicidal ideation

These symptoms lead to clinically significant distress or impairment of social, occupational activities, are not due to physiological effects of a substance, and are not accounted for by any occurrence (e.g., bereavement). The affected persons—

- Are sad
- Have no energy to do anything
- Have no interest in what is occurring at work or in the family
- Have no appetite for food or sex

Swaziland_FINAL press.indb 176 5/19/12 2:51 PM

- Have insomnia
- Are constipated

The patient usually exhibits psychosomatic presentations such as headaches, aches and pains, palpitations, and malaise.

Note: Rule out organic causes.

Nonpharmacological management

- Psychotherapy
- Counselling

REFER if no response to psychosocial management. ⚠

Pharmacological management

- Selective serotonin reuptake inhibitors are preferred.
  - **Fluoxetine** 20 mg daily **(B)**
    —OR—
  - **Amitriptyline** PO at bedtime **(B)**
- Dose:
  - Adults: initial dose of 50 mg nocte a day at 7–10 days intervals to a maximum of 150 mg. Consult if more than 150 mg is needed.
  - Elderly: initial daily dose 10 mg nocte a day increasing by 25 mg at 7–10 day intervals to a maximum of 100 mg.
- Duration of treatment: At least 6 months after symptoms have ceased in cases of first major depressive episodes; longer treatment is indicated after relapse, old age, or complicated cases.
- ***Cautions:***
  - Tricyclic antidepressants (TCAs) are contraindicated in suicidal patients. **Amitriptyline** is the most commonly prescribed TCA in Swaziland, but the cautions apply to all TCAs.
  - Do not issue more than 1 week's supply of **amitriptyline** at a time; it may not be effective to patients with suicidal ideation because if over-dosed, it has a fatal toxic effect on the heart.
  - Avoid **amitriptyline** in patients with urinary retention, glaucoma, or epilepsy.

REFER all cases to the National Psychiatric Hospital. ⚠

14.3 Psychoses

Definition

There are several labels attached to various types of mental illness such as *mania, manic depression* (or *bipolar mood disorder*), *hysteria schizophrenia*, or *cannabis-* or *alcohol-induced psychosis*.

Swaziland_FINAL press.indb 177 5/19/12 2:51 PM

14.3.1 Psychosis

Definition

Psychosis is a brief psychotic disorder in which one or more of the following are present (according to *DSM*-IV criteria).

- Delusions
- Hallucinations
- Disorganized speech
- Grossly disorganized or catatonic behaviour
- Usually lasting at least 1 day but less than a month with eventual full return to normal level of functioning

Note: Exclude substance abuse or general medical condition.

14.3.2 Schizophrenia

Definition

Schizophrenia is diagnosed when two or more occurrences of the criteria below occur during 1 month or less:

- Delusions
- Hallucinations
- Disorganized speech
- Grossly disorganized or catatonic behaviour
- Negative symptoms (i.e., affective, flattening, alogia, or avolition)
- Accompanied by social or occupational dysfunction

Symptoms and signs

Symptoms must be present for more than 6 months

- Shows self-neglect
- Has sudden changes in the mood—too happy at one time and shortly after is extremely sad
- Believes that people are trying to harm him or her
- Believes that he or she is Jesus Christ or King Mswati himself
- Hears voices or sees things that do not exist (hallucinations)
- Talks nonsense all the time
- Suddenly refuses to eat and speak or even move
- Is drinking too much alcohol or smoking too much dagga
- Has seizures only when people are looking and never wets him- or herself during the seizure

Note: Exclude organic causes.

Swaziland_FINAL press.indb 178 5/19/12 2:51 PM

Nonpharmacological management

- Psychosocial intervention including supportive psychotherapy and counselling
- Rehabilitative therapies (including occupational therapy, finding accommodation, and employment)

Pharmacological management

The management of acute psychosis includes the use of neuroleptics to tranquilise, sedate, and have a positive effect on hallucinations, delusions, and thought disorders.

Initial treatment—

- Give **chlorpromazine** 50 mg IM single dose **(A)**.
- **REFER.** ⚠
- ***Caution:*** Always consult with a doctor, preferably a psychiatrist where possible, when prescribing neuroleptic medicines to children, the elderly, or pregnant or lactating women.

Acute management of psychotic patients (including mania)—

- Give **lorazepam** 4 mg **(B*)** and **haloperidol** 15–20 mg **(C)** IM immediately, and then give:
  - **Lorazepam** 2–4 mg PO **(B*)**
    —PLUS—
  - **Haloperidol** 2–5 mg PO **(C)**. Haloperidol may be repeated at hourly intervals (normally every 4–8 hours) if required, up to a maximum 20 mg in 24 hours.
    —OR—
- **Zuclopenthixol acetate** IM 50–100 mg PO **(C)** may be used as an alternative to haloperidol in the acute phase. The dose may be repeated after 48–72 hours.

Long-term therapy—

- Give **haloperidol** 2–20 mg PO per day in 2–3 divided doses **(C)**.
  —OR—
- **Fluphenazine decanoate** 25 mg IM monthly **(C)**.
- Note: Long-term therapy should always be undertaken in consultation with a psychiatrist. Patients on long-term therapy should be assessed every 6 months.

Extrapyramidal side effects—

- If extrapyramidal side effects occur with neuroleptics, review choice of neuroleptic and reduce dose if abnormal movements occur (e.g., rolling of the eyes, tongue protrusions, ataxia). An anticholinergic agent such as **trihexyphenidyl** (Artane®) **(C)** can be co-prescribed.
- Give **trihexyphenidyl** 2 mg PO 1–3 times daily according to individual response **(C)**.

Swaziland_FINAL press.indb 179 5/19/12 2:51 PM

REFER ⚠

- First psychotic episode
- Failure to respond
- Poor social support
- Intolerance to medication
- High suicide risk
- Concurrent medical or other psychiatric illness
- Children
- The elderly
- Pregnant women

14.4 Alcoholism

Definition

There are two forms of alcoholism: acute and chronic. Acute alcoholism is a familiar sight and generally relates to one being drunk. Chronic alcoholism is the state in which a patient becomes dependent on alcohol to such a degree that it interferes with his or her physical and mental health and also impairs his or her professional ability and social relationships.

Alcohol addiction is an exaggerated form of alcoholism. In the state of addiction, the patient is likely to develop physical and psychological symptoms upon withdrawal.

Many factors play a part in the development of a chronic alcoholic. Some people may drink to relieve tension or to briefly escape the troubles of the day. Soon they become psychologically and then physically dependent on the alcohol. Some people may drink a lot because there is nothing to do; they are bored with community life.

Symptoms and signs

There is a pattern in clinical presentation of chronic alcoholism that can aid the diagnosis:

- Increased alcohol consumption
- Drinking during the day, especially at work
- Lying about one's alcohol consumption
- Having to have a drink before going to work

Some of the physical problems associated with chronic alcoholism include the following:

- Gastritis
- Cirrhosis
- Pancreatitis
- Neuritis

Swaziland_FINAL press.indb 180 5/19/12 2:51 PM

- Increased susceptibility to developing pulmonary TB
- Malnutrition
- Pellagra
- Impotence
- Dementia

Some of the psychiatric problems associated with chronic alcoholism are the following:

- *Delirium tremens.* The state of restlessness and impaired consciousness associated with tremors of the hands. The onset is usually on the withdrawal of alcohol. One may see things that are not there.
- *Alcoholic hallucinations.* A condition characterised by the patient hearing things and seeing frightening things (e.g., snakes or crawling insects) and followed by the development of a feeling that people are out to harm him (paranoid delusions). These are symptoms and signs of alcohol withdrawal.

Nonpharmacological management

REFER the patient to the National Psychiatric Hospital. ⚠

Pharmacological management

- Sedate the patient with **diazepam** 10 mg PO stat **(B)**.
- Give **chlorpromazine** 100 mg PO every 6 hours or more often if necessary **(A)**.
- Give weekly **vitamin B complex** IM 2 cc daily for 10 days **(A)**.
- Ensure that the patient drinks a lot of fluids and eats a balanced and highly nutritious diet.

Swaziland_FINAL press.indb 181 5/19/12 2:51 PM

15. RENAL AND URINARY TRACT CONDITIONS

15.1 Acute cystitis

Definition

This is an acute infection of the lower urinary tract by bacteria. *Escherichia coli* is the most common causative organism. Other microorganisms may be involved, especially in patients previously managed in hospitals. It occurs predominantly in women, especially sexually active women. Urine is turbid and/or bloodstained and tests positive for nitrites.

Symptoms and signs

- Burning or pain on passing urine (dysuria)
- Frequent passing of small amounts of urine
- In more severe cases there is lower abdominal pain and tenderness

Note: Exclude pelvic inflammatory disease.

Nonpharmacological management

- Encourage liberal fluid intake
- Reduce the stasis of urine in the bladder

Pharmacological management

Adults—

- **Co-trimoxazole** 80/400 mg PO, 2 tablets every 12 hours daily for 5 days **(A)**.
  —OR—
- **Amoxicillin** 250 mg PO every 8 hours for 5 days **(A)**
  —OR—
- ***For patients who are allergic to penicillin***, give **erythromycin** 500 mg PO every 6 hours **(A)**.

REFER ⚠

- All children
- All males
- Individuals who have recurrent infections
- Persons who have recently had urinary tract instrumentation
- Persons whose infection is not responsive to therapy (i.e., symptoms do not subside)

Swaziland_FINAL press.indb 182 5/19/12 2:51 PM

15.2 Acute glomerulonephritis

Definition

Acute inflammation of the renal glomeruli of the kidneys

Causes

- Immune reactions (usually 1–5 weeks after a streptococcal skin or throat infection)

Symptoms and signs

- Common in children >3 and adolescents
- Haematuria (passing smoky, red, or tea-coloured urine)
- Oedema: puffiness of the face and around the eyes; less common, generalized body swelling
- Discomfort in the kidney area (abdominal or back pain)
- May be anorexic
- General weakness (malaise)
- High BP, commonly presenting as headaches, visual disturbances, vomiting, and occasionally pulmonary oedema with dyspnoea
- Convulsions (in hypertensive crisis)
- Oliguria as renal failure sets in
- Evidence of primary streptococcal infection:
  - Usually as acute tonsillitis with cervical adenitis
  - Less often as skin sepsis

Investigations

- Urine: protein, microscopy for RBCs and casts, WBCs
- Blood: urea (uraemia) and creatinine levels, ASOT, electrolytes
- Ultrasound: kidneys
- Throat and skin swab (where indicated): for C&S

Nonpharmacological management

- Monitor urine output, BP, daily weight.
- Restrict fluid input (in oliguria).
- Restrict salt and protein in the diet (in oliguria).

Pharmacological management

Treat any continuing hypertension. Treat primary streptococcal infection (10-day course).

Adults—

- **Phenoxymethylpenicillin** 500 mg PO every 6 hours **(A)**
  —OR—
- **Amoxicillin** 500 mg PO every 8 hours **(A)**
  —OR—

Swaziland_FINAL press.indb 183 5/19/12 2:51 PM

- ***For patients who are allergic to penicillin***, give **erythromycin** 500 mg PO every 6 hours **(A)**.
- ***Caution:*** Ciprofloxacin, tetracycline, doxycycline, and co-trimoxazole are unsuitable and should not be used for treating primary streptococcal infection.

Children—

- **Phenoxymethylpenicillin** 10–20 mg/kg per dose PO every 6 hours **(A)**
  —OR—
- **Amoxicillin** 15 mg/kg per dose PO every 8 hours **(A)**
  —OR—
- ***For patients who are allergic to penicillin***, give **erythromycin** 15 mg/kg per dose PO every 6 hours **(A)**.
- ***Caution:*** Ciprofloxacin, tetracycline, doxycycline, and co-trimoxazole are unsuitable and should not be used for treating primary streptococcal infection

Prevention

- Treat throat and skin infections promptly and effectively.
- Avoid overcrowded places.
- Ensure adequate ventilation in dwellings.

15.3 Acute pyelonephritis

Definition

Infection of the kidney parenchyma. May be complicated by shock and septicaemia. Urine is turbid and/or bloodstained and tests positive for nitrites.

Symptoms and signs

- Often very ill
- Fever and rigors
- Backache
- Toxaemia
- Renal angle tenderness.

REFER all patients ⚠

Swaziland_FINAL press.indb 184 5/19/12 2:51 PM

16. RESPIRATORY CONDITIONS

16.1 Asthma

Definition

Asthma is a chronic condition of the lower airways characterised by chronic inflammation and hyper-responsiveness with exposure to a wide variety of stimuli; it is episodic in nature and includes obstruction with variable airflow limitation and with varying severity (i.e., mild, moderate, severe, and life threatening). (See tables 16.1A and 16.1B for distinctions between moderate and severe asthma attacks.)

Table 16.1A Recognition and Assessment of Severity of Asthma Attacks in Children

Measure	Moderate	Severe
Respiratory rate	>40 per minute	>40 per minute
Chest indrawing and recession	Present	Present
PEF (if >5 years old)	50–70% of predicted	Below 50% of predicted
Speech	Normal or difficult	Unable to speak
Feeding	Difficulty with feeding	Unable to feed
Wheeze	Present	Absent
Consciousness	Normal	Impaired

Table 16.1B Recognition and Assessment of Severity of Asthma Attacks in Adults

Measure	Moderate	Severe
Talks in—	Phrases	Words
Alertness	Usually agitated	Agitated, drowsy, or confused
Respiratory rate	20–30 per minute	Often more than 30 per minute
Wheeze	Loud	Loud or absent
Pulse rate	100–120 per minute	>120 per minute
PEF after initial nebulisation	Approximately 50–75%	Below 50%; may be too short of breath to blow in PEF meter

Swaziland_FINAL press.indb 185 5/19/12 2:51 PM

Symptoms and signs

- Difficulty in breathing (dyspnoea)
- Chest tightening
- Wheezing
- Cough

Diagnosis

- Auscultation: expiratory rhonchi
- PEFR

Nonpharmacological management

- Advise patient to avoid—
  - Known allergens
  - Smoking and polluted environment
  - Strenuous exercise

Pharmacological management

Adults—

- Inhaled **salbutamol** (short acting) 200 micrograms every 4–6 hours **(A)**
  —OR—
- **Salbutamol** 4 mg PO up to 4 times a day **(A)**
- Low-dose steroid: **beclomethasone** inhaler 200–400 micrograms 2 times a day **(B)**
- High-dose steroid: **beclomethasone** 400 micrograms 2–4 times a day **(B)**
- Oral steroid: **prednisolone** 2.5–10 mg 1–3 times a day **(A)** and reduce dose gradually over 7 days.
- **Theophylline anhydrous** 200 mg PO 2–3 times a day **(A)**

Children—

- Inhaled s**albutamol** (short acting) 200 micrograms via spacer every 4–6 hours **(A)**
- Low-dose steroid: **beclomethasone** inhaler 200–400 micrograms 2 times a day **(B)**
- High-dose steroid: **beclomethasone** 400 micrograms 2–4 times a day **(B)**

Management of acute attack

Adults—

- Give **oxygen** 8 L per minute via mask (40%) **(B)**.
- Ensure hydration.
- Nebulise with **salbutamol (A)**.
- Give **hydrocortisone** 100–200 mg/mL IM/IV **(B)**.
  —OR—
- Give **dexamethasone** 8 mg PO **(B)**.
- Give **prednisolone** 20 mg stat **(A)**.
- **REFER** urgently if no response in 3 hours. ⚠

Swaziland_FINAL press.indb 186 5/19/12 2:51 PM

Children (IMCI)—

- Give **oxygen** via nasal prong 2 L per minute.
- Ensure hydration
- Nebulise with **salbutamol (A)**.
- Give **hydrocortisone** 2 mg/mL IM or IV **(B)**.
- **REFER** urgently if no response. ⚠

REFER moderate to severe symptoms (see tables 16.1A and 16.1B) ⚠

16.2 Acute bronchitis

Definition

Acute bronchitis involves inflammation of the bronchi due to infection or irritation. It is initially a viral infection of the bronchi, which may be followed by secondary bacterial infection.

Symptoms and signs

- Acute onset of cough
- Purulent sputum production (sputum is green to yellow)
- Symptoms of upper respiratory tract infection
- Pyrexia

Diagnosis

- Based on symptoms and signs
- Chest X-ray to rule out pneumonia (if necessary)
- Cough lasts >2 weeks in adult
- Nasopharyngeal swab for culture or PCR

Nonpharmacological management

- Advise—
  - Bed rest
  - Adequate fluid intake
  - Honey and lemon in warm water or tea
- Discourage herbal smoke or steam inhalation, sedatives, and cough mixtures

Pharmacological management

Adults—

- Give **paracetamol** as required for pain **(A)**.
- Antibiotics are not indicated for uncomplicated bronchitis, but if purulent
  - Give **amoxicillin** 500 mg PO every 8 hours for 4 or more days **(A)**.
    —OR—
  - ***For patients with a penicillin allergy***, give **erythromycin** 500 mg PO every 6 hours for 5–7 days **(A)**.

Swaziland_FINAL press.indb 187 5/19/12 2:51 PM

Children—

- Give antibiotics only if the following indications are present: high temperature, nutritional deficiency, cardiac disease, previous pneumonia, or if the child is immunocompromised (e.g., AIDS)
  - Give **Amoxicillin** 250 mg every 8 hours for 7 days **(A)**.
    —OR—
  - ***For patients with a penicillin allergy or who are wheezing***, give **erythromycin (A)** (dosage according to age). (See table 10.5.)

REFER cases not responding to treatment. ⚠

16.3 Chronic bronchitis and emphysema

Definition

Chronic bronchitis and emphysema are conditions manifested by chronic cough with or without sputum production on most days and shortness of breath (dyspnoea). The onset is quite gradual with progressively worsening symptoms. Due to the large reserve capacity of the lungs, patients often present when there is considerable permanent damage to the lungs. The airway obstruction is not fully reversible.

Symptoms and signs

- Cough for a long period of time with production of sputum
- Shortness of breath; can have wheezing
- Rhonchi or wheezing, at later stages
- Laboured, loud breathing; decreased lateral movements of thorax
- Use of accessory muscles of respiration with pursing of the lips when breathing out
- Cough with or without sputum
- Manifestations of right-sided heart failure

Diagnosis

- Clinical manifestations based on symptoms and signs
- Chest X-ray to rule out pneumonia (if necessary)

Nonpharmacological management

- Advise to stop smoking (in smokers).
- Recommend physiotherapy.

Pharmacological management

Adults—

- Treat the exacerbation based on the suspected cause.
- If there is infection, give **Amoxicillin** 500 mg PO every 8 hours **(A)**.
  —OR—

Swaziland_FINAL press.indb 188 5/19/12 2:51 PM

- ***For patients with a penicillin allergy***, give **erythromycin** 500 mg PO every 6 hours for 5–7 days **(A)**.

Children—

- Treat the exacerbation based on the suspected cause.
- If there is infection, give **amoxicillin** 125–250 mg PO every 8 hours **(A)**.

—OR—

- ***For patients with a penicillin allergy or who are wheezing***, give **erythromycin (A)** (dosage according to age). (See table 10.5.)

REFER ⚠

- Infants
- Patients with respiratory failure

16.4 Common cold and influenza

Definition

Colds and influenza are self-limiting viral conditions and quite contagious; they begin to clear within 3 days for colds and 7 days for influenza but may last up to 14 days.

Diagnosis

- According to symptoms and signs
- Chest X-ray to rule out pneumonia (if necessary)

Symptoms and signs

- Headache
- Feeling of weakness
- Muscle pains
- Nonproductive cough
- Sore throat
- Runny nose
- Fever
- Red throat, usually no pus

Nonpharmacological management

- Advise patient to—
  - Use steam inhalations
  - Get bed rest, if feverish
  - Drink adequate amounts of fluid, which will prevent secretions from becoming thick and difficult to cough up
- Instruct patient to return to clinic if—
  - He or she develops an earache or tenderness or pain over sinuses
  - Cough persists for longer than a week
  - Fever persists

Swaziland_FINAL press.indb 189 5/19/12 2:51 PM

Pharmacological management

Adults—

- Antibiotics are not indicated.
- **Paracetamol** 500 mg PO every 4–6 hours, when needed, to a maximum of 4 doses daily **(A)**

Children—

- Antibiotics are not indicated.
- **Paracetamol** 20 mg PO every 4 hours, when needed, to a maximum of 90 mg in 24 hours in neonates **(A)**

REFER if there are severe complications. ⚠

16.5 Pneumonia (pyogenic)

Definition

Infection of the lung parenchyma by bacteria. It is usually caused by bacteria, viruses, fungi, or parasites. Onset is usually acute.

Symptoms and signs

- Cough, fever, and chills of sudden onset
- Crepitations
- Rapid or laboured breathing (intercostal retractions)
- Tiredness and weakness
- Anorexia or difficulty in breastfeeding
- Chest pain, sticking in character, and worse with coughing or breathing deep
- Dullness to percussion on the affected side
- Decreased breath sounds on the affected side

Diagnosis

- Based on symptoms and signs

Investigations

- Chest X-ray
- Sputum Gram stain
- C&S on sputum and/or blood

Nonpharmacological management

- Encourage high fluid intake

Pharmacological management

Adults—

- **Benzylpenicillin** 2 MU IM if not severely ill and suitable for home treatment **(A)**
  - Followed by **amoxicillin** 500 mg PO every 8 hours for 7 days **(A)**

Swaziland_FINAL press.indb 190 5/19/12 2:51 PM

—OR—

- ***For patients who are allergic to penicillin***, give **erythromycin** 500 mg PO every 6 hours for 10 days **(A)**.

- For severe pneumonia, give **ceftriaxone** 1–2 g/day IM or slow IV **(B)**.
- **Paracetamol** 1000 mg PO every 4–6 hours, when needed, to a maximum of 4 doses per day; for pain and fever **(A)**

Children—

- Refer to chapter 10.

Note: In children, use the Baylor COE Swaziland pneumonia guidelines. (See figure 10.5 and table 10.5)

REFER ⚠

- Moderate or severe respiratory distress
- Fever of 39.5°C or higher
- Confusion
- Respiratory rate 30 breaths per minute or more
- Heart rate 120 beats per minute or more
- Systolic BP less than 90 mm Hg; diastolic BP less than 60 mm Hg
- Cyanosis
- Age above 60
- Multilobar consolidation
- Concurrent severe illness (e.g., diabetes, heart failure, epilepsy)

16.6 Pneumocystis carinii pneumonia (also known as Pneumocystis jiroveci pneumonia)

Definition

PCP is a co-infection in immunosuppressed individuals due to HIV.

Pharmacological management

Standard regime—

- **Co-trimoxazole** 80 mg/kg PO every 6–8 hours for at least 14 days **(A)**. Extend duration to 21 days if necessary depending on response.

  —PLUS—

- **Prednisolone** 2 mg/kg PO daily in 3 divided doses for 5 days then reduce dose to complete 21 days treatment **(A)**. Ideally, start at the same time as the anti-PCP therapy above and certainly not more than 72 hours later.

Alternative regime (21-day course)—

- If the above is not available or tolerated, give **clindamycin** 300–450 mg PO every 6 hours **(C)**.
  - In very severe cases, give up to 600 mg per dose.
  - Discontinue treatment if diarrhoea occurs.

  —PLUS—

Swaziland_FINAL press.indb 191 5/19/12 2:51 PM

- **Primaquine** 15 mg PO every 6 hours

Prevention

- Give the following to all patients with history of PCP infection and consider also for severely immunocompromised patients: **co-trimoxazole** 960 mg daily or on alternate days **(A)**. If not tolerated, give **dapsone** 100 mg daily **(B*)**
- Continue until immunity recovers sufficiently.

Swaziland_FINAL press.indb 192 5/19/12 2:51 PM

17. SKIN CONDITIONS

17.1 Acne vulgaris

Definition

An inflammatory disease of the sebaceous glands. The sebaceous glands become infected and acne develops. It is the most common skin disease.

Causes

There is obstruction of the canal of the gland, due to increased growth of the canal lining (keratinisation). This produces the comedo (primary lesion). When the comedo is open, it forms blackhead; when closed, it forms a whitehead. Microorganisms and their enzymes play a role in making the condition worse.

Symptoms and signs

- Painful lesions
- Possible itching
- Psychological stress due to the presence of the acne
- Blackheads, whiteheads, pustules, and tender red bumps on the face, chest, back, or shoulders
- In severe cases, scarring

Nonpharmacological management

- Advise the patient to—
  - Reduce pilosebaceous duct obstruction by cleansing with soap and water or A3 lotion (25% acetone, 25% alcohol, 50% water) twice a day.
  - Avoid cosmetics and hair spray.
  - Not squeeze lesions

Pharmacological management

- If there are many pustules, apply 5% **benzoyl peroxide** gel at night **(A)**.
- For severe cases of nodular acne, give **doxycycline** PO 100 mg daily for 14 days then 50 mg daily for 3 months **(A)**. ***Caution:*** **Doxycycline** is contra-indicated in pregnancy.

REFER ⚠

- No improvement after 3 months
- Development of severe complications

17.2 Boil (abscess)

Definition

Localized painful infection of a hair follicle or dermis. Infections usually occur in hairy parts of the body with *Staphylococcus aureus*.

Swaziland_FINAL press.indb 193 5/19/12 2:51 PM

Symptoms and signs

- Pain
- Swelling
- Lesions vary in size from red papules to large red nodules
- Lesions tender, red, and surrounded by inflammation
- Lesions first firm, but then become soft, with yellow centre; open spontaneously

Nonpharmacological management

- Encourage general hygiene.
- Advise the patient to apply local hot compresses three times daily until the abscess starts draining.
- Drainage of abscess is treatment of choice; surgical incision should be performed only after the lesion is mature.

Pharmacological management

Adults—

- Exclude underlying precipitating factors, especially diabetes or immunosuppression.
- Give antibiotics if there are swollen lymph nodes or fever: **cloxacillin** 250 mg PO every 6 hours for 5 days **(A)**.

  —OR—
- ***For patients who are allergic to penicillin***, give **erythromycin** 250 mg PO every 6 hours before meals for 5 days **(A)**.

Children—

- Exclude underlying precipitating factors, especially diabetes or immunosuppression.
- Give antibiotics if there are swollen lymph nodes or fever: **cloxacillin** PO every 6 hours for 5 days **(A)** at the following dosages:
  - <2 years: 62.5 mg
  - 2–10 years: 125 mg
  - >10 years: 250 mg

  —OR—
- ***For patients who are allergic to penicillin***, give **erythromycin** PO every 6 hours before meals for 5 days **(A)** in the following forms and dosages:
  - 5–10 kg: 62.5 mg
  - 10–15 kg: 125 mg
  - >15 kg: 50 mg

REFER if no response to antibiotic therapy ⚠

Swaziland_FINAL press.indb 194 5/19/12 2:51 PM

17.3 Impetigo

Definition

Impetigo is a contagious infection of the skin due to *S. aureus* and *Streptococci* that occurs mainly in children. It may be contagious or follow minor trauma, eczema, or scabies. If untreated, it may lead to acute nephritis.

Symptoms and signs

- Itching
- Sores on the face or legs
- Often starts around the nose because many people carry staphylococci there
- Vesicles containing serous fluid that rapidly becomes purulent
- Vesicles surrounded by redness
- Pustules rupture and form yellow crusts which darken later
- The lesions enlarge and spread rapidly; the remains of the vesicles are usually visible around the edges of the crusts
- Other common sites are the scalp (often secondary to either ringworm or lice in the scalp), the buttocks (usually secondary to scabies), the arms, and the legs

Nonpharmacological management

- Advise patient to—
  - Keep breaks in the skin clean.
  - Cut fingernails short.
  - Wash and soak sores in soapy water to soften and remove crusts.

Pharmacological management

- **10% povidone iodine** solution; apply 3 times a day **(A)**
  —OR—
- **Zinc oxide** ointment **(A)**
- Antibiotic treatment is necessary only if the patient is severely ill, has fever, or has swollen lymph nodes.
  - Give **amoxicillin** PO every 8 hours for 10 days **(A)**
    - Infants 0–6 months: 62.5 mg
    - Children 6 months – 10 years: 125 mg
    - Children over 10 years and adults: 250 mg
      —OR—
  - For staphylococcal infection, give **cloxacillin** PO every 6 hours for 10 days **(A)**
    - Children under 2 years: 62.5 mg
    - Children 2–10 years: 125 mg
    - Children over 10 years and adults: 250 mg

Swaziland_FINAL press.indb 195 5/19/12 2:51 PM

—OR—

- ***For patients who are allergic to penicillin or pregnant***, give **erythromycin** PO every 6 hours for 10 days **(A)**
  - Children 5–10 kg: **erythromycin** 62.5 mg
  - Children 10–15 kg: **erythromycin** 125 mg
  - Children over 15 kg: **erythromycin** 50 mg
  - Adults: **erythromycin** 250 mg

REFER ⚠

- No improvement in 10 days
- Complications such as glomerulonephritis

17.4 Erysipelas

Definition

Erysipelas is an infection of the skin by streptococcal bacteria. It must be treated quickly because death can occur.

Symptoms and signs

- Weakness
- Pain
- Chills, fever, and vomiting
- Most common places for the lesions: cheek, arm, or leg.
- Red, swollen, tender hot area of the skin, with well-defined edges
  - Can be oedematous; pits when pressed
  - Enlarges each day
- Occasionally, a vesicle or blister on the surface of the infected skin

Nonpharmacological management

- Wet, hot packs applied for 15 minutes 4 times a day help to relieve the pain and stop the infection from spreading.

Pharmacological management:

Adults—

- Give **phenoxymethylpenicillin** 500 mg PO every 6 hours for 7 days **(A)**.

  —OR—
- ***For patients who are allergic to penicillin***, give **erythromycin** 500 mg PO every 6 hours for 7 days **(A)**.

Children—

- Give **phenoxymethylpenicillin** PO every 6 hours for 7 days **(A).**
  - 0–3 years: 5 mL elixir (1 teaspoon, or 125 mg)
  - 3–8 years: 10 mL elixir (2 teaspoons, or 250 mg)
  - >8 years: 500 mg (2 tablets)

  —OR—

Swaziland_FINAL press.indb 196 5/19/12 2:51 PM

- ***For patients who are allergic to penicillin***, give **erythromycin** PO every 6 hours for 7 days **(A)**.
  - 0–3 years: 5 mL suspension (1 teaspoon, or 125 mg)
  - 3–8 years 10 mL suspension (2 teaspoons, or 250 mg)
  - >8 years: 500 mg (2 tablets)

17.5 Carbuncle

Definition

Infection of several adjacent hair follicles producing multiple fistulous tracts.

Nonpharmacological management

Exclude underlying precipitating factors especially

- Diabetes
- Other causes of immunosuppression
- Poor hygiene

Pharmacological management

- **Erythromycin (A)** or **cloxacillin (A)** as in boils (see 17.2)

17.6 Cellulitis

Definition

Cellulitis is a diffuse, spreading infection of the skin, usually following some break or injury of the skin. This affects all the layers (i.e., epidermis, dermis, and subcutaneous tissue), and it does not have clear edges.

Symptoms and signs

- Pain
- Headache
- Swelling
- The affected area is usually warm, tender, and swollen.
- There is usually lymphadenitis.
- Fever is usually present.
- Area is tender, warm, red, and firm with an ill-defined border.
- ***Note:*** In a child, osteomyelitis must be excluded.

Nonpharmacological management

- Apply hot mops using a clean cloth in heated saline water for 20 minutes 4 times a day.
- Keep area of infection at rest and elevated.

Swaziland_FINAL press.indb 197 5/19/12 2:51 PM

Pharmacological management

Adults—

- Give **cloxacillin** 250 mg PO every 6 hours for 7 days **(A)**.
  —OR—
- ***For patients who are allergic to penicillin***, give **erythromycin** PO 250 mg every 6 hours for 7 days **(A)**.
  —OR—
- For a proven streptococcal infection, give **benzathine benzylpenicillin** 1.2 million IU IM as a single dose **(A)**.

Children—

- Give **cloxacillin** PO every 6 hours for 5 days **(A)** at the following dosages:
  - <2 years: 62.5 mg
  - 2–10 years: 125 mg
  - >10 years: 250 mg
  —OR—
- ***For patients who are allergic to penicillin***, give **erythromycin** PO every 6 hours before meals for 5 days **(A)** in the following forms and dosages:
  - 5–10 kg: 62.5 mg
  - 10–15 kg: 125 mg
  - >15 kg: 50 mg

REFER ⚠

- Severe cases; refer for parenteral antibiotics
- Recurrent cellulitis associated with underlying conditions, e.g., varicose ulcers
- Acute, severe, or fulminant cellulitis with systemic manifestations

17.7 Atopic eczema

Definition

Eczema is a chronic skin disease characterized by itching. The cause of eczema is unknown, but it usually causes itching of sensitive skin. It is often associated with asthma, hay fever, and urticaria. The serum IgE levels are raised. Relapses and recurrences are common, but most patients "outgrow" the eczema as they get older. The following may start or aggravate the itching:

- Dry skin
- Perspiration
- Irritating clothing
- Emotional stress

Other members of the family may have a history of eczema or asthma.

Swaziland_FINAL press.indb 198 5/19/12 2:51 PM

Symptoms and signs

- General—
  - Itching
- In infancy—
  - Dry, rough, red, papular, and often vesicular eruptions. If vesicles are present, lesions weep and then crust over.
  - Usually starts after 2 months of age
  - Seen commonly on cheeks, scalp, neck, elbow creases, and behind the knees
- In childhood—
  - Dry, papular, scaling lesions; less weeping and crusting; usually lesions hyperpigmented
  - Intensely itchy and scratched skin
  - Found at wrists, at the elbow creases, behind the knee, and on neck and eyelids
- In adolescence and adulthood—
  - Dry, thickened skin with accentuation of normal lines and folds; often hyperpigmented
  - Seen commonly at the elbow creases, behind the knees, neck, under the breasts, and on top of feet and hands.

Nonpharmacological management

- Advise patient to—
  - Avoid wearing clothes made from wool to prevent overheating
  - Cut fingernails short
  - Avoid scratching
  - Expose affected areas to sunlight
  - Avoid offending soaps

Pharmacological management

- **Aqueous cream** (UEA) to wash or bath and apply in dry areas as a moisturiser **(A)**
- **1% hydrocortisone** cream applied twice for severe eczema or no response within 7 days **(B)**

  —PLUS—
- Maintain treatment with **aqueous cream** (UEA)

REFER if no improvement. ⚠

Swaziland_FINAL press.indb 199 5/19/12 2:51 PM

17.8 Seborrhoeic eczema

Definition

In its simplest form, seborrhoeic eczema is dandruff, which tends to be rather oily. Pruritus may or may not be present, and vesicles are not uncommon. It may become quite extensive, particularly in infants and obese persons.

Often called *seborrhoeic dermatitis,* seborrhoeic eczema is sometimes started or made worse by infection. It is mostly a reddening and scaling of the skin but is sometimes acute and weeping, affecting the scalp and flexures.

Symptoms and signs

- Infantile type—
  - Soon after birth to about 6 months
  - Distribution "cradle cap," groins, axillae, neck, behind ears
  - Often moist and infected
- Scalp—
  - Diffuse or localized around hair margins
  - Dry or greasy scaling
- Face—
  - Found in eyebrows, nasolabial folds, and moustache area
  - Blepharitis present
  - Intertriginous eczema
  - Found in the skin folds of axillae, groins, behind the ears, in scrotum area; also found under the breasts and in the abdominal creases
- Sun-sensitive seborrhoeic eczema—
  - Middle-aged men
  - Mainly on the face
  - Cause unknown
- Otitis externa—
  - Associated with eczema of the ear lobe

Nonpharmacological management

- Advise patient to—
  - Avoid wearing clothes made from wool to prevent overheating
  - Cut fingernails short
  - Avoid scratching
  - Expose affected areas to sunlight
  - Avoid offending soaps

Pharmacological management

- **Aqueous cream** (UEA) **(A)**
  —OR—

Swaziland_FINAL press.indb 200 5/19/12 2:51 PM

- **Emulsifying ointment** used to moisturise the skin and help it retain water after bath **(A)**
- **1% hydrocortisone cream** applied 2–3 times daily until improved **(B)**
- **2% selenium sulphide suspension** is indicated for scalp itching, scaling, and dandruff **(A)**. Apply weekly by lathering on the scalp. Rinse off after 10 minutes.

17.9 Tinea pedis (athlete's foot)

Definition

This is ringworm of the feet caused by a fungal infection of the feet. The infection can spread to the groin or hands. It spreads by contact, including from floors.

Symptoms and signs

- Intense itching and burning in between the toes and on the sole of the foot
- Vesicles, scales, and fissures between the toes and on the sole of the foot; may also appear in the hands and groin
- Secondary infection: signs of redness, swelling, and purulent discharge
- The skin between the toes becomes soft, white, and moist

Nonpharmacological management

- Advise patient to—
  - Avoid the use of shared bathing or swimming areas until healed
  - Use own towels and toiletries
  - Keep feet dry:
    - Wear open shoes or sandals
    - Wear cotton socks (if socks are worn)
    - Wash socks daily with soap and water
    - Dry between toes after washing the feet or walking in water
    - Wash feet with soap and water before treatment application

Pharmacological management

Topical treatment: apply to the affected area after drying.

- **Gentian violet** three times a day for 3 weeks **(A)**

  —OR—
- If unsuccessful, **ketoconazole cream** twice daily for 4 weeks **(A)**
- If secondary infection occurs, give antibiotics
  - Adults—
    - **Cloxacillin** 500 mg PO every 6 hours for 7 days **(A)**.

      —OR—
    - ***For patients who are allergic to penicillin,*** **erythromycin** 500 mg PO every 6 hours for 7 days **(A)**.

Swaziland_FINAL press.indb 201 5/19/12 2:51 PM

- Children—
  - **Cloxacillin** 125–250 mg PO **(A)**
    —OR—
  - ***For patients who are allergic to penicillin,*** **erythromycin** 125–250 mg PO every 6 hours for 7 days **(A)**

REFER ⚠

- If no improvement after 4 weeks
- If involvement of the nails

17.10 Tinea corporis (ringworm of the body)

Definition

Tinea corporis is caused by a fungal infection. The lesions are often on exposed parts of the body such as the face but can be found anywhere on the body: arms and breasts, around the waist, buttocks, groin, and back.

Symptoms and signs

- Possibly slight itching
- Patches slowly grow bigger
- As the patch extends, a clear area develops in the centre
- Ringed, scaly, centrally clearing lesion
- Lesions usually on exposed surfaces such as the face and arms; usually on the trunk
- Raised borders
- More common in children but also occurs in adults
- Can be single or multiple

Nonpharmacological management

- Advise patients—
  - Not to share clothes, toilet articles, or towels
  - To wash skin well and dry before applying ointment

Pharmacological management

- Apply **6% benzoic acid** compound ointment **(A)**
  —PLUS—
- **3% salicylic acid** ointment 2–3 times daily for 4–6 weeks **(A)**. ***Caution:*** Do not apply in sensitive areas.
  —OR—
- Apply **gentian violet** 3 times a day **(A)**.
- In groin areas or if the above treatment is unsuccessful, apply **ketoconazole** or **clotrimazole** cream **(A)**.
- Continue using ointment for at least 2 weeks after lesions have cleared.
- For nail and scalp infection, give **griseofulvin** PO, once daily for a minimum of 8 tablets **(B).**

Swaziland_FINAL press.indb 202 5/19/12 2:51 PM

- Dosages:
  - Adults: 500 mg (1 tablet)
  - Children: 10 mg/kg (125 mg tablets)
- ***Note:*** Take with fatty meals or milk
- ***Cautions:***
  - *Do not* give women of childbearing age unless they are using an effective contraceptive.
  - Advise patient to avoid exposure to the sun.

REFER ⚠

- Severe infection
- Complications of infection of the scalp and face
- If infection is widespread
- No response to treatment after 4 weeks

17.11 Scabies

Definition

Scabies, a common dermatitis, is caused by a mite, *Sarcoptes scabiei*. The parasite burrows under the skin and lays its eggs. Sensitivity to the parasite results in severe pruritis. The disease is acquired from contact with infected persons, their clothing, or bed linen contaminated with the adult female mite, its eggs, larvae, or nymphs.

Symptoms and signs

- Patient has itching, usually most severe at night.
- Others in the family may have the same problem.
- Burrows appear in thin lines ending in papule or numerous papules.
- Locations of the lesion includes webs, wrists, elbows, genitalia, buttocks, and around the waist or belt area.
- With increasing pruritis, signs of scratching appear.
- With increased scratching, eczema may develop or a bacterial infection may occur (impetigo).
- The face and neck are seldom affected.
- In infants, it may present with bullous formation on the palms and soles.

Differential diagnosis

- Bugs, fleas, or flies may produce skin disorders.
- A useful diagnostic feature is that the bites occur usually in a line along the arm or leg and usually only occur in one area.

Nonpharmacological management

- All members of the household should be examined.
- Advise the patient to—

Swaziland_FINAL press.indb 203 5/19/12 2:51 PM

- Cut fingernails short, and keep them clean
- Wash all linen and underclothes in hot water
- Thoroughly wash the whole body with mild soap and water, scrubbing the affected areas with a brush or wash cloth; dry well with a clean towel
- Put on clean, washed clothes after medicine treatment

Pharmacological management

General—

- **25% benzyl benzoate** lotion **(A)**. ***Cautions:*** The lotion is toxic if swallowed. Avoid contact with eyes and broken skin or sores.
  - Apply to the whole body from the neck to the feet.
  - Avoid the eyes.
  - Allow the lotion to dry.
  - Leave on overnight, and wash off after 24 hours.
- Dosages:
  - Adults and older children: use undiluted and repeat after 3-4 days.
  - Children under 6 years: dilute lotion with an equal volume of water and repeat after 5 days.
- ***Notes:***
  - Itching may continue for 2–3 weeks after treatment.
  - Do not continue if rash or swelling develops.

For scabies with secondary infection—

- **Benzyl benzoate** is contraindicated in septic scabies and on open wounds. The infection must first be treated with systemic antibiotics such as **phenoxymethylpenicillin (A)** or, ***for patients who are allergic to penicillin,*** **erythromycin (A)** and antiseptic lotion.
- Once the infection has cleared, or has dried up benzyl benzoate can be applied as described above.

For scabies in infants—

- Advise the mother to scrub the bullae with a soft brush and soap and water.
- Then apply **2% sulphur** cream **(A)**.

For other parasites—

- Use a soothing application such as **aqueous cream (A)**.
- Avoid or destroy the insect causing the problem.

Swaziland_FINAL press.indb 204 5/19/12 2:51 PM

17.12 Urticaria

Definition

Urticaria is an acute, chronic, or recurrent inflammatory condition. It is characterised by itchy wheals (hives). There are many allergic, toxic, or physical causes. Allergic urticaria may be caused by medicines, plant pollen, insect bites, or foodstuffs (e.g., milk, eggs, meat). ***Note:*** Acetylsalicylic acid is commonly found in many patent medicines and may be the cause.

Symptoms and signs

- Itching
- Burning
- Stinging sensations
- Any or all parts of the body may be affected
- The wheals differ greatly in size and shape and usually appear suddenly.
- These are transient lesions lasting for a few minutes to several hours (usually less than 24 hours) then disappear spontaneously leaving no signs of them.

Nonpharmacological management

- Lifestyle adjustment
- Detailed history taking

Pharmacological management

Adults—

- **Chlorpheniramine** 4 mg PO 3–4 times daily for severe or refractory pruritus **(A)**
- **Calamine lotion** on the skin may help to relieve the itch of urticaria **(A)**.

Children—

- **Chlorpheniramine** PO for severe or refractory pruritus **(A)**
  - 6 months – 1 year: 1 mg twice daily
  - 1–5 years: 1–2 mg three times daily
  - 5–12 years: 2–4 mg 3–4 times daily
  - >12 years: 4 mg 3–4 times daily
- **Calamine lotion** on the skin may help to relieve the itch of urticaria **(A)**.

REFER ⚠

- If no improvement or response after 24 hours
- If progressive illness

Swaziland_FINAL press.indb 205 5/19/12 2:51 PM

18. PAIN MANAGEMENT AND PALLIATIVE CARE

Definition

Palliative care is an approach that improves the quality of life of patients and their families who are facing problems associated with life-threatening illness, through the prevention and relief of suffering, the early identification and impeccable assessment and treatment of pain, and the addressing of other physical, psychosocial, and spiritual problems.

18.1 Pain

Definition

Pain is an unpleasant sensory and emotional experience associated with actual or potential tissue damage, or described in terms of such damage. It is a common and debilitating symptom of disease, its consequence, treatment, or concurrent disorders, and its severity decreases the quality of life for people living with disease.

18.1.1 Types of pain

It is important to understand the pathophysiology of pain (i.e., nociceptive or neuropathic) because of therapeutic implications.

- Nociceptive pain is produced by stimulation of specific sensory receptors in the viscera and somatic structures through intact nerves. It is either somatic or visceral—
  - Somatic—presenting as sharp, well-localized pain or dull, localized pain from joints
  - Visceral—presenting as dull, poorly localized pain
- Neuropathic pain presents as a result of damage to central nerves, peripheral nerves, or both, and it presents as burning, shooting, or lancinating.

18.1.2. Concept of total pain

Physical pain does not occur in isolation. A patient's mood and sense of well-being financially, socially, and spiritually can all influence the pain experienced and thus how it affects his or her life. When assessing a patient's pain, incorporating the concept of total pain is essential, thereby ensuring that a holistic assessment is undertaken.

18.1.3 Pain assessment in adults

All patients should be evaluated for pain at every visit, supporting the claim that pain should be considered the fifth vital sign. Pain severity is best assessed by the patient self reporting.

Swaziland_FINAL press.indb 206 5/19/12 2:51 PM

Pain severity assessment maybe aided by—

- Visual analogue scales
- Numerical rating scales
- Faces scales

Pain is subjective and, therefore, a patient should be encouraged to describe his or her own pain. A thorough assessment of a client's pain is essential to establish the most likely cause, evaluate any contributing factors, and decide appropriate intervention. Tables 18.1.3A and 18.1.3B aid in pain assessment.

Table 18.1.3A Whole-Patient Pain Assessment

Type of Pain	Questions to Aid Assessment
Physical	▪ What is the likely cause of *this* pain in *this* patient at *this* time? ▪ What structural or functional abnormality would cause this pain pattern?
Psychological	▪ How is the patient coping with the pain? ▪ How much anxiety or depression is present? ▪ What are the patient's ideas, concerns, or expectations about pain and its management in this situation? ▪ What information does he or she need?
Social	▪ How is the pain affecting the family? ▪ How much family anxiety is present? ▪ What are the family's ideas, concerns, and expectations? (These may differ from the patient's.) ▪ How have family dynamics been affected by this illness? ▪ How is the pain limiting the usual role(s)?
Spiritual	▪ How much distress or suffering is this patient experiencing? ▪ What does the pain mean to him or her? ▪ What does the illness mean to him or her? ▪ What sustains this patient in difficult times?

Table 18.1.3B The PQRST Pain Assessment

Meaning		Example
P	Palliative, provocative	▪ What makes the pain better? ▪ What makes the pain worse?
Q	Quality	▪ What are the properties and characteristics of the pain? ▪ How would you describe the pain?
R	Radiation	▪ Where does the pain start and travel to?
S	Severity	▪ Rate the pain—on a scale of 0 to 5, how bad is your pain?
T	Temporal	▪ What are the patterns of the pain? ▪ Is it constant, or does is come and go?

Swaziland_FINAL press.indb 207 5/19/12 2:51 PM

18.1.4 Pain assessment in children

The body position often reflects pain. Observe the way in which the patient walks, holds his or her body, or moves, and the way the body is positioned when lying down. This is particularly important in young children, and those unable to verbalise their pain.

Children may not report pain for several reasons, including being—

- Frightened of talking to doctors
- Frightened of finding out they are sick
- Unwilling to disappoint or bother their caregivers
- Unwilling to receive an injection
- Unwilling to return to or delay discharge from hospital
- Unwilling to cope with the side effects of medication for pain

It is useful to—

- Question the child and his or her parents
- Use a pain-rating scale
- Evaluate behaviour and physiological changes

Note: A sleeping child, a very quiet child, even a child who is playing is not necessarily pain free. Movement might be painful, or the child might be too sick or too tired to move.

18.1.5 Health counselling for pain

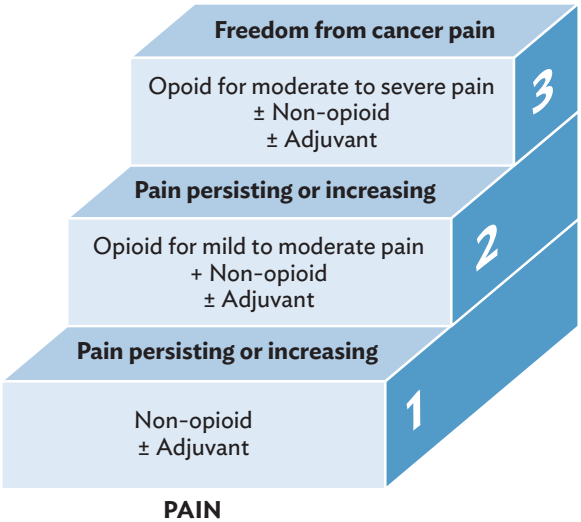
- Reassure the patient and the family that pain can be relieved.
- Explain that pain relief is not instantaneous.
- Explain that unpleasant side effects will wear off after 3 days.
- The goal of pain management is to ensure that the patient is—
  - Pain free at rest
  - Pain free at night
  - Pain free while active
- Use a step-by-step approach to pain relief according to the WHO analgesic ladder. (See figure 18.1.6.)
- The principles governing use of analgesics are that they should be given—
  - By mouth
  - By the clock
  - By the ladder (see figure 18.1.6)
  - By the patient
- Reassure the patient of regular visits and reassessment by health care professional.

Swaziland_FINAL press.indb 208 5/19/12 2:51 PM

18.1.6 The WHO three-step analgesic ladder

- Step 1. Non-opioid [e.g., **paracetamol (A)**, **acetylsalicylic acid (aspirin) (A)**] + adjuvant (antidepressant). If pain is not controlled by step 1 analgesics, move to step 2 by adding a weak opioid.
- Step 2. Opioid for mild to moderate pain [e.g., **codeine (B)**] + non-opioid + adjuvant. If an opioid for mild to moderate pain has been used to a maximum dose and the patient still has pain, then move to step 3 by changing to a stronger opioid.
- Step 3. Strong opioid [e.g., **morphine (B)**] + non-opioid + adjuvant].

Figure 18.1.6 WHO ladder of pain management



18.2 Pain management strategy for adults

- Determine the aim of treatment.
- Decide on which analgesics to use first.
- Determine any adjuvants (i.e., co-analgesics) that may be needed to counteract side effects of the analgesics.
- Refer to a social worker or other medical or nonmedical consultant if alternative techniques in managing spiritual, emotional, and social problems are warranted.

18.2.1 Pain management in adults

Tables 18.2.1A and 18.2.1B outline pain management for adults, including medications, dosages, side effects, and management of side effects.

Swaziland_FINAL press.indb 209 5/19/12 2:51 PM

Table 18.2.1A Pain Management in Adults

Step	Analgesic	Dosing
1. Non-opioid	**Paracetamol (A)**	1 g PO every 4 hours. Do not exceed 4 g in 24 hours.
	Acetylsalicylic acid (aspirin) (A) —OR—	600 mg PO every 4 hours. Do not exceed 4 g per day.
	Ibuprofen (A)	400 mg PO 3 times per day. Do not exceed 1200 mg per day.
2. Mild to moderate pain: opioid	**Codeine phosphate (B)**	In addition to NSAIDs, 30–80 mg PO every 4–6 hours. Give a laxative to prevent constipation.
	Tramadol HCL (B)	50–100 mg PO not more often than every 4 hours
3. Moderate to severe pain: strong opioid	**Morphine (B)**	2.5–5.0 mg PO every 4 hours. Dose can be increased by 50% or doubled after 24 hours if pain persists.

18.2.2 Adjuvant therapy for pain in adults

- Neuropathic pain—
  - **Amitriptyline** 10–75 mg PO at night **(B)**. Start with a low dose and increase as needed.
  - **Clonazepam** 0.5–2 mg once a day **(B)**
  - **Carbamazepine (B*)**. Start at 100 mg PO every 12 hours. Can be increased to 800 mg every 12 hours.
  - **Sodium valproate** 200 mg every 12 hours **(B*)**
- Muscle spasm (colicky abdominal pain)—
  - **Hyoscine butylbromide** 10 mg PO per day **(A)**. Can be increased to 40 mg 3 times per day.
- Anxiety-related pain—
  - **Diazepam** 5 mg PO 3 times per day **(B)**
- Bone pain, neuropathic pain, headache related to increased intracranial pressure—
  - **Dexamethasone** 2–4 mg PO per day **(B)**
  - Can give **prednisolone (A)**.
- Metastatic bone pain—
  - **REFER** to hospital. ⚠

Swaziland_FINAL press.indb 210 5/19/12 2:51 PM

Table 18.2.1B Management of Side Effects of Morphine or Other Opioids

If patient experiences this side effect—	Then manage as follows—
▪ Constipation	▪ Prevent by prophylaxis (unless doing so results in diarrhoea). ▪ Increase fluids and fibre-rich foods. ▪ Give stool softener plus a stimulant [**bisacodyl** 5–10 mg tablets **(A)**] at the time of prescribing opioids.
▪ Nausea or vomiting	▪ Give an antiemetic, if needed. • **Haloperidol** 1.5 mg PO daily for 3 days **(C)** **—OR—** • **Metoclopramide** 10 mg PO 3 times per day for 3 days **(B)** ▪ Usually, there is no need for a prophylactic antiemetic, however.
▪ Confusion or drowsiness (if due to opioid) ▪ Decreased alertness ▪ Trouble with decisions	▪ Usually occurs at the start of treatment or when dose is increased. Resolves within a few days but can occur at the end of life with renal failure. ▪ Halve dose or increase time between doses. ▪ Provide time with less analgesia when patient wants to be (or needs to be) more fully alert to make decisions.
▪ Twitching (myoclonus); if severe or bothers patient during waking hours	▪ If on high dose consider reducing dose or changing opioids. Consult or **REFER**. ⚠ ▪ Reassess the pain and its treatment. ▪ Give diazepam 5–10 mg PO 3 times per day until the effect subsides **(B)**.
▪ Somnolence (excessive sleepiness)	▪ Extended sleep can be from exhaustion due to pain. ▪ If it persists for more than 2 days after starting, reassess level, the type of pain, or both and then consider reducing the dose.
▪ Itching	▪ May occur with a normal dose. ▪ If present for more than a few days and hard to tolerate, give • **Chlorpheniramine** 4 mg PO every 8 hours **(A)** **—OR—** • **Promethazine** 10 mg PO every 8 hours **(A)**
▪ Urinary retention	▪ Insert urinary catheter to drain bladder. ▪ After drainage, remove catheter because this effect is rare.

Swaziland_FINAL press.indb 211 5/19/12 2:51 PM

18.3 Pain management strategy for children

General principles to be followed—

- Treat the underlying cause without increasing the pain.
- Use nonmedicinal support, such as—
  - Emotional support
  - Physical methods such as touching, stroking, massage, and applying ice or heat
  - Cognitive methods such as preparation for procedures, distraction with music or imagery, play
  - Non-harmful traditional practices
- Use medicines specific to the type of pain.
- Address psychosocial issues.
- Continue to assess the pain.

Note: Many doctors are over-cautious in using strong opioids in children; however, the WHO 3-step analgesic ladder approach should still be used, with preference for oral medications and regular administration not as necessary.

Respiratory depression with strong morphine is not a problem in children over 1 year old if treatment is started in standard doses and thereafter increased or reduced according to needs. In younger children, starting doses should be reduced.

18.3.1 Pain management in children

Children with HIV rarely need antiemetics and laxatives. Itching with opioids in the first few days is quite common and responds to antihistamines, if necessary. Many children are sleepy initially, and parents should be warned of this and reassured that their child's disease has not suddenly progressed. (See table 18.3.1 for dosages.)

Table 18.3.1 Dosages of Analgesic Medicines in Children

Medicine	Dosage
Paracetamol (A)	▪ 20 mg/kg PO every 4 hours ▪ Maximum dose 90 mg/kg over 24 hours in neonates
Ibuprofen (A)	5–10 mg/kg PO every 6–8 hours
Morphine (B)	Standard starting dose: 0.15–0.3 mg/kg PO every 4 hours ▪ Infants <1 month: 1/3 dose ▪ Children <50 kg: 0.3–1.5 mg/kg every 4 hours ▪ Children >50 kg: 5–10 mg ever 4 hours

Swaziland_FINAL press.indb 212 5/19/12 2:51 PM

18.3.2 Adjuvant therapy for pain in children

If analgesics are inadequate, adjuvant therapies are recommended.

- Neuropathic pain, **amitriptyline** 0.2–0.5 mg/kg PO at bedtime **(B)**. Increase dose by 25% every 2–3 days as needed.
- For itching, **chlorpheniramine** 0.1 mg/kg PO every 8 hours **(A)**.
- For muscle spasms, **diazepam** 0.2–0.5 mg/kg PO every 24 hours in 3–4 divided doses **(B)**.

Swaziland_FINAL press.indb 213 5/19/12 2:51 PM

19. EMERGENCIES AND TRAUMA

Note: The conditions described in this chapter are emergencies and must be treated as such. Medicines used for treatment must be properly secured and their use recorded (time, dosage, routine) on the patient's notes and on the letter of referral.

19.1 Acute abdomen

Definition

Acute abdomen is sudden onset of severe abdominal pain that is colicky in nature. Causes may be inflammation, perforation, intestinal obstruction, haemorrhage, colic, and pancreatitis, among others.

Diagnosis

- Ultrasound scan
- X-ray
- Note: PV, PR, and urine testing may often give valuable information

Symptoms and signs

- Pain of acute onset
- Nausea and vomiting
- Sick-looking
- Abdominal distension
- Rebound tenderness with guarding
- High-pitched abdominal sounds
- Shock may be present (See 19.5.)

Nonpharmacological management

- Pass an NGT and aspirate the stomach.
- Catheterize and monitor urine output.
- Monitor pulse and blood pressure.
- Re-examine patient frequently if the diagnosis is uncertain.

Pharmacological management

- Resuscitate with IV fluids.
- Start blood transfusion if there is anaemia.
- Medicate. ***Caution:*** Withhold analgesics until diagnosis is established.
  - Adults: **Pethidine** 50–100 mg IM every 8 hours (maximum: 400 mg/day) **(B)**
  - Children: **Pethidine** 0.5–2 mg/kg IM every 4 hours for 3 doses **(B)**

Swaziland_FINAL press.indb 214 5/19/12 2:51 PM

REFER immediately to hospital. ⚠

- Elevate feet.
- Give 1,000 mL of **0.9% sodium chloride (normal saline) (A)** or **Ringer's lactate (A)** every 4 hours while being transported
- Withhold oral fluids and food.
- Put in NGT if abdomen is distended or if the patient is vomiting.
- Inject **pethidine (B)**—
  - Adults: 50–100 mg IM stat
  - Children: 0.5–2.0 mg/kg IM stat

19.2 Acute myocardial infarction

Definition

AMI is caused by the complete or partial occlusion of a coronary artery and requires prompt treatment, hospitalisation, and intensive care management. The major clinical feature is severe chest pain with the following characteristics:

- Site: retro, sternal, or epigastric
- Quality: crushing or burning pain or discomfort that is not relieved by rest or nitroglycerin
- Radiation: to the neck, down the inner part of the left arm, or both
- Duration: at least 20 minutes lasting to several hours

This chest pain is associated with—

- Pallor
- Sweating
- Arrhythmias
- Pulmonary oedema
- A drop in BP

Symptoms and signs

- Sudden pain not relieved by rest
- Unbearable pain, crushing pain
- Shortness of breath
- Wheezing
- Orthopnoea
- Nausea and vomiting
- Apprehension
- Shock
- Systolic BP below 90 mm Hg
- Cold, clammy skin
- Weak pulse
- Crepitations in lungs

Swaziland_FINAL press.indb 215 5/19/12 2:51 PM

- Irregular heartbeat
- Sudden death can occur

REFER all suspected or diagnosed cases urgently to higher level (HC or hospital). ⚠

Emergency treatment where facilities are available before transfer—

- Cardiopulmonary resuscitation if necessary (see 19.6).
- **100% oxygen** continuously by nasal cannula **(B)**.
- **Morphine** for pain relief 10–15 mg IM **(B)**
  —OR—
- Small IV increments of 1 mg/minute and titrate for pain relief, maximum 10 mg. IV morphine must be diluted to 10 mL with **water (A)** or **0.9% sodium chloride (normal saline) (A)** for injection.
- **Acetylsalicylic acid (aspirin)**, soluble oral, 150 mg as a single dose **(A)**
- **Glyceryl trinitrate** sublingual 0.5 mg every 5–10 minutes for pain to a maximum of 5 tablets **(B)**
- ***Caution:*** Do not allow systolic BP to decrease by more than 10 mm Hg or pulse rate to increase to above 90 per minute. Monitor the following continuously including during transfer: pulse, BP respiration depth and rate (count for a full minute).

19.3 Acute pulmonary oedema

Definition

Acute pulmonary oedema is a condition in which fluids accumulate in the lungs. It leads to difficulty in breathing with wheezing, hence the name *cardiac asthma*. It becomes a life-threatening condition with abnormal accumulation of fluid in the lungs caused by—

- Acute heart failure (common cause)
- Drowning or near drowning
- Over-hydration with IV fluids
- Hypertensive crisis

Symptoms and signs

- Acute bronchospasm

Differential diagnosis

- It is important to distinguish this condition from an attack of acute bronchial asthma.
- ***Caution:*** Morphine is contraindicated in acute bronchial asthma.

REFER ⚠

- All cases urgently
- Administer oxygen therapy during transfer

Swaziland_FINAL press.indb 216 5/19/12 2:51 PM

Emergency treatment

- Place the patient in a sitting, high, or semi-Fowler's position.
- Administer **100% oxygen** by mask **(B)**:
  - Adults: 8 L
  - Children: 2 L
- **Furosemide** 20 mg IV to start diuresis in 15–20 minutes **(B)**.
  - If no response after 30 minutes, administer 40–80 mg.
  - If response is inadequate after 2–4 hours, follow with 20–40 mg.
- **Morphine** 1 mg/minute IV **(B)**

  —OR—
- **Glyceryl trinitrate** 5–10 mg IM **(B)**
  - **Glyceryl trinitrate** 0.5 mg sublingual every 6 hours may be highly effective in causing dilatation of the veins and redistributing blood volume away from the chest.
- Pulmonary oedema due to a hypertensive crisis or significant systolic hypertension may respond to a vasodilator **nifedipine (B)** 5 mg PO immediately, chewed, or the contents of a capsule squirted into the mouth.

19.4 Hypoglycaemia and hypoglycaemic coma

Definition

Hypoglycaemia, a low level of sugar glucose in the blood, can rapidly cause irreversible brain damage and/or death. Clinical features are the following:

- Sympathetic stimulation
- Pallor
- Sweating
- Tachycardia
- Abdominal pain
- Hunger
- Neuroglycopenic
- Headache
- Irritability
- Impaired concentration
- Confusion
- Delirium
- Coma
- Convulsions
- Transient aphasia (speech disorders)

There may be few or no symptoms if—

- The blood sugar is chronically low.
- The patient is very ill.
- The patient is malnourished.

Swaziland_FINAL press.indb 217 5/19/12 2:51 PM

- There is an impaired autonomic nervous system response (e.g., in the elderly, very ill, malnourished, or those with long-standing DM or who are on beta-blocker medication).
- The patient is at risk of hypoglycaemia, such as—
  - Neonates with low birth weight, ill in any way, not feeding well
  - Malnourished or sick children who have not eaten for over 8 hours
  - Shocked, unconscious, convulsing patients
  - Diabetic patients on treatment who are developing abnormal behaviour or symptoms

Emergency treatment

- Diagnose with testing strips for blood glucose
- Do not wait, but obtain blood for glucose determination if possible
- Conscious patient, able to feed—
  - Administer sweets, sugar, glucose by mouth
- Unconscious patient—
  - **50% dextrose** solution IV **(B)**
  - Immediately followed by **10% dextrose** solution **(B)**
  - If no access to veins, give the dextrose by NGT.

REFER all patients. ⚠

19.5 Shock

Definition

Shock is a state of circulatory collapse leading to reduction in delivery of oxygen and other nutrients to vital organs, which, if prolonged, leads to irreversible multiple organ failure.

Causes

- Excessive haemorrhage: trauma, peptic ulcer
- Excessive fluid loss: diarrhoea, vomiting, burns
- AMI

Symptoms and signs

- Feeling faint
- Palpitations
- Sweating
- Restlessness
- Clouding of consciousness
- Pallor
- Cold extremities
- Tachycardia
- Hypotension: systolic BP <90 mm Hg

Swaziland_FINAL press.indb 218 5/19/12 2:51 PM

Table 19.5 Types of Shock

Types of Shock	Description	Additional Symptoms
Hypovolaemic shock (see 19.5.2)	Most common type of shock. Primary cause is loss of fluid from circulation due to haemorrhage, burns, diarrhoea, or other condition.	Weak thready pulse, cold and clammy skin
Cardiogenic shock	Caused by the failure of heart to pump effectively (e.g., in myocardial infarction, cardiac failure)	Distended neck veins, weak or absent pulses
Septic shock	Caused by an overwhelming infection, leading to vasodilation	Elevated body temperature
Neurogenic shock	To the spinal cord, resulting in sudden decrease in peripheral vascular resistance and hypotension	Warm and dry skin
Anaphylactic shock (see 19.5.1)	Caused by severe allergic reaction to an allergen or medicine	Bronchospasm, angioedema, and/or urticaria

19.5.1 Anaphylactic shock

Definition

A severe allergic reaction that may occur after an injection or exposure to any allergen. Common causes are medicines, immunizations, snake bites, insect bites or stings, foods, pollen, and dust.

Symptoms and signs

- Collapse with shock
- Bronchospasm
- Laryngeal oedema

Emergency management

- Resuscitate (ABCD) immediately (see table 19.6.1).
- Assess the breathing.
  - If the patient is breathing, give **100% oxygen (B)**—
    - Adults: 4–6 L/minute via face mask
    - Children:4–6 L/minute via nasal cannula
  - If the patient is not breathing—
    - Secure an airway
    - Ventilate with Ambu Bag® or ventilator

Swaziland_FINAL press.indb 219 5/19/12 2:51 PM

- Assess the heartbeat.
  - If there is no heartbeat, perform CPR.
- If the patient is in shock
  - Lay the patient flat.
  - Administer IV solutions.
    - **0.9% sodium chloride (normal saline)** IV **(A)**
      —OR—
    - **Ringer's lactate** solution **(A)**. Adults: run IV fast.
      —OR—
    - **Half-strength Darrows (A)** with **5% dextrose** solution **(A)**. Children: run IV at 20 mL/kg in first 20–60 minutes

Pharmacological management

Adults—

- **Adrenaline 1:1000** IV, SC, or endobronchial is the mainstay of treatment and should be given immediately **(A)**.
  - If the patient is conscious, give **adrenaline 1:1000** SC, 0.5 mL undiluted immediately **(A)**. Repeat every 10–20 minutes as needed. Check that heart rate is not over 140 beats per minute.
  - If the patient is unconscious, give **adrenaline 1:1000** as slow IV **(A)**, 1 mL diluted with **0.9% sodium chloride (normal saline) (A)** to make 10 mL.
- Give **hydrocortisone** IV 100 mg immediately **(B)**.
- **Promethazine** 25–50 mg IM may be given additionally to counteract ongoing histamine release **(A)**

Children—

- **Adrenaline 1:1000** IV, SC, or endobronchial is the mainstay of treatment and should be given immediately **(A)**.
  - If the patient is conscious, give **adrenaline 1:1000** SC,
    - <2 years: 0.1 mL
    - 2–5 years: 0.2 mL
    - 6–12 years: 0.3 mL
    - >12 years: 0.5 mL
  - If the patient is unconscious, give **adrenaline 1:1000** as slow IV **(A)**, 1 mL diluted with **0.9% sodium chloride (normal saline) (A)** to make 0.1 mL/kg.
- Endobronchial through endotracheal tube for cardio-respiratory arrest (same dose). Repeat every 5 minutes when necessary for a maximum of three doses.
- Give **hydrocortisone** IV 100 mg immediately.
- **Promethazine** 0.25 mg/kg IM **(A)** may be given additionally to counteract ongoing histamine release.

Swaziland_FINAL press.indb 220 5/19/12 2:51 PM

REFER ⚠

- Run fluids and refer as soon as possible.
- A nurse or paramedic must accompany patient.

19.5.2 Hypovolaemic shock

Definition

This clinical picture arises from loss of body fluids resulting in an inadequate supply of blood to vital organs in the body. Common causes are severe burns, severe bleeding, severe reactions to medicines, severe dehydration with persistent vomiting and diarrhoea or cholera (epidemic), massive heart attacks, or severe infection in the blood stream (septicaemia or septic shock).

Symptoms and signs

- Primary signs—
  - Thirst
  - Feels cold
  - Fully conscious at first
  - Pallor
  - Pulse rapid and feeble
  - Blood pressure below the normal: 90/60 or less.
  - Skin cold and clammy
- Other signs, depending on the cause of the shock
  - Dehydration in gastroenteritis or cholera

Nonpharmacological management

- Ensure that the airway is clear.
- Stop any major bleeding.
- Assess the cardiac function.
- Place the patient in the anti-shock position: feet up with head down.
- Insert wide-bore IV cannula, and make sure it is running well.

Pharmacological management

Adults—

- If there is any wheezing present, give **adrenaline 1:1000** 1 mL immediately **(A)**.
- Determine the cause of the shock and treat accordingly.
- In infections, give **amoxicillin** 1 g IM every 6 hours **(A)** or, ***for patients who are allergic to penicillin***, **erythromycin** 500 mg PO every 6 hours **(A)**.

  —PLUS—
- **Gentamicin** 80 mg IM every 8 hours (if available) **(A)**. ***Caution:*** **Gentamicin** contraindicated in pregnancy.

Swaziland_FINAL press.indb 221 5/19/12 2:51 PM

Children—

- If there is any wheezing present, give **adrenaline 1:1000** IV immediately **(A)** at these dosages:
  - <2 years: 0.1 mL
  - 2–5 years: 0.2 mL
  - 6–12 years: 0.3 mL
  - >12 years: 0.5 mL
- In infections give **amoxicillin** 15 mg/kg IM every 6 hours **(A)** or, ***for patients who are allergic to penicillin***, **erythromycin** 10–15 mg/kg PO every 6 hours **(A)**.

  —PLUS—
- **Gentamicin** 7.5 mg IM every 8 hours (if available) **(A)**.

REFER all cases immediately. ⚠

19.6 Cardiac arrest

19.6.1 Cardiac arrest in adults

Definition

Cardiac arrest is the sudden and usually unexpected cessation of effective cardiac output. Irreversible brain damage can occur within 2–4 minutes.

Symptoms and signs

- Sudden loss of consciousness and collapse
- Absent carotid pulse
- Loss of spontaneous respiration
- Pupil dilatation

Emergency treatment

- Diagnose rapidly, and mentally note the time of starting.
- Commence resuscitation immediately.
- Call for skilled help.
- A precordial thump is recommended for immediate treatment where a defibrillator is not immediately available.
- Place the patient on a firm, flat surface.
- Initiate ABCD sequence of CPR (see table 19.6.1).
- If possible, get someone to document medication and progress.

  —OR—
- Collect all ampoules used and total them at the end.
- The cardinal objective is to stabilise the patient for immediate referral.

Swaziland_FINAL press.indb 222 5/19/12 2:51 PM

Table 19.6.1 The ABCD Sequence of CPR for Adults

Step	Actions	Notes
A: Airway	▪ Clear vomit or foreign body from the mouth. ▪ Manually tilt the head backwards with one hand on the forehead. ***Caution:*** Do *not* do this where a neck fracture is suspected. ▪ Lift the chin forward with the fingers of the other hand. ▪ Raise the shoulders to tilt the neck backwards. ***Caution:*** Do *not* do this where a neck fracture is suspected. ▪ Insert an artificial airway, if available. ▪ When the patient is breathing well, lay patient on his or her side to protect the airway and support the patient by bending the uppermost arm and leg.	***Caution:*** *No* ventilation is possible until the airway is open.
B: Breathing	▪ Check for breathing. ▪ If no breathing, then apply artificial respiration by— • Mouth-to-mouth **—OR—** • Mouth-to-nose **—OR—** • Ambu Bag® ▪ Continue until spontaneous breathing occurs. ▪ Oxygenate with 100% oxygen **(B)**. ▪ Endotracheal intubation is essential. • Use a tube of approximately the same diameter as the child's little finger or of a size that will just fit into the nostril. • Pre-oxygenate well before intubation. • If prolonged ventilation is required, intubation is the best method of securing the airway.	

Swaziland_FINAL press.indb 223 5/19/12 2:51 PM

Table 19.6.1 The ABCD Sequence of CPR for Adults (continued)

Step	Actions	Notes
C: Circulation	▪ Check for carotid or other large pulse. ▪ If no pulse, give a single precordial thump or defibrillate. ▪ Initiate CPR if there is no pulse or no breathing. ▪ Continue until the return of the pulse, respiration, or both.	
D: Drip, doctor, drugs	▪ Put up IV fluid with— • **0.9% sodium chloride (normal saline) (A)** **—OR—** • **Ringer's lactate** solution **(A)** ▪ Summon the doctor without stopping CPR. ▪ Start initial emergency medicine treatment. **Adrenaline 1:1000** IV, SC, or endobronchial is the mainstay of treatment and should be given immediately **(A)**. • **Adrenaline 1:1000** IV 1 mL diluted with **0.9% sodium chloride (normal saline) (A)** from the drip to make 10 mL **—OR—** • Endobronchial through endotracheal tube for cardio-respiratory arrest (same dose). Repeat every 5 minutes when necessary for a maximum of three doses. **—OR—** • SC (adults): 0.5 mL undiluted immediately. Repeat every 10–20 minutes as needed. Check that heart rate is not over 140 beats per minute. ▪ Doctor-initiated medication: • **2% lidocaine** 50–100 mg IV for ventricular tachycardia **(B)** **—OR—** • **Atropine** 0.5–1 mg diluted for bradycardia reassess every minute until the patient shows signs of recovery **(A)**. Continue until transfer to hospital.	Consider stopping resuscitation attempts and pronouncing death if— ▪ Further resuscitation is clearly inappropriate clinically (e.g., incurable underlying disease) ▪ No success after all ABCD procedures have been carried out for 30 minutes or longer *But* consider carrying on for longer especially when— ▪ The patient is young. ▪ Hypothermia and drowning has occurred. ▪ An electrolyte imbalance is assumed.

Swaziland_FINAL press.indb 224 5/19/12 2:51 PM

19.6.2 Cardiac arrest in children

Definition

The most common underlying cause of cardiac arrest in children is respiratory failure and hypoxia resulting from lung or airway disease or injury. The following conditions may cause hypoxia in children and thus may lead to cardiac arrest:

- Croup
- Bronchiolitis
- Asthma
- Pneumonia
- Birth asphyxia
- Inhalation of foreign body
- Pneumothorax

Hypoxia is the most common cause of bradycardia or cardiac arrest in children. Asystole is the most common cardiac arrest rhythm in infancy and childhood, usually preceded by bradycardia. Cardiac arrhythmias are unusual in children, unless due to severe electrolyte abnormalities or drug overdose.

Emergency treatment

- Diagnose rapidly and mentally note the time of starting.
- Commence resuscitation immediately.
- Summon skilled help.
- Start cardiac massage for immediate treatment.
- Place the patient on a firm, flat surface.
- Initiate ABCD sequence of CPR (see table 19.6.2).
- If possible, get someone to document medication and progress.
  —OR—
- Collect all ampoules used and total them at the end.
- The cardinal objective is to stabilise the patient for immediate referral.

Swaziland_FINAL press.indb 225 5/19/12 2:51 PM

Table 19.6.2 The ABCD Sequence of CPR for Children

Step	Actions	Notes
A: Airway	▪ Ensure the airway is patent (open). ▪ Child over 5 years— • Make a fist with one hand. • Place immediately below the child's xiphisternum. • Grasp the child with the other hand. • Apply force (1–6 times) in the direction of the upper thoracic spine. ▪ Child under 5 years— • Place the child face-down on one arm of the health worker. • Deliver 1–4 sharp blows to the lower thoracic back with the hand.	***Caution:*** *No* ventilation is possible until the airway is open.
B: Breathing	▪ Check for breathing. ▪ If no breathing, then apply artificial respiration.	***Caution:*** Cardiac massage is useless unless there is an airway and the lungs are being filled with air.
C: Circulation	▪ Check the heartbeat. • Carotid in the older child **—OR—** • Femoral **—OR—** • Brachial pulse ▪ If there is no pulse, start cardiac compressions or massage. • Rate of compressions: 80–100 beats per minute • Continue with ventilation in between chest compressions. • Initiate CPR if there is no pulse or no breathing. ▪ Keep patient covered and warm while resuscitating. ▪ Ventilate if there is a pulse, but no breathing. ▪ Continue until return of the pulse, respiration, or both.	

Swaziland_FINAL press.indb 226 5/19/12 2:51 PM

Table 19.6.2 The ABCD Sequence of CPR for Children (continued)

Step	Actions	Notes
D: Drip, doctor, drugs	▪ Put up IV fluid: either **0.9% sodium chloride (normal saline) (A)** or **Ringer's lactate (A)** solution. ▪ Call for assistance (the doctor or another nurse) without stopping CPR. ▪ Initial emergency medicine treatment: **Adrenaline 1:1000**, initially 10 micrograms/kg IV or via endotracheal tube • **Adrenaline 1:1000**, 1 mL diluted to 10 mL from the drip • Dosage: 0.1 mL/kg. For following and subsequent doses, a 5–10 fold increase is recommended. Repeat every 3 minutes when needed for 3–4 doses. ▪ Bradycardia or slow heart rate— • Hypoxia is the most common cause of bradycardia, so adequate ventilation or oxygenation is usually all that is needed • **Atropine** 0.02 mg/kg IV to a maximum of 1 mg **(A)**. Alkalising agents (e.g., **sodium bicarbonate**) have not been shown to be useful during acute resuscitation. **—PLUS—** • After the first dose of adrenaline, administer medication down the endotracheal tube within 2–3 minutes. Adrenaline dose via this route is 10 times the standard dose. **Atropine** can also be given via the endotracheal tube. ▪ Fluid therapy— • Administer a bolus of 5–20 mL of **0.9% sodium chloride (normal saline) (A)** to follow the IV or intraosseous injection of any medicine used in resuscitation, especially if the injection is peripheral. • Sick children, especially infants, may be hypoglycaemic. Look for evidence during resuscitation. Treat proven hypoglycaemia with **10% dextrose solution (B)** 5 mL/kg IV.	

Swaziland_FINAL press.indb 227 5/19/12 2:51 PM

Table 19.6.2 The ABCD Sequence of CPR for Children (continued)

Step	Actions	Notes
D: Drip, doctor, drugs (continued)	▪ Medicine administration route— • IV via a free-running drip: Use 60 drops per mL administration sets for all drips unless hypovolaemia is thought to be responsible for the cardiac arrest. • Intraosseous route: Resuscitation medicines, fluids, and blood can be safely given by this route. – Medicines rapidly reach the heart. – Access is safe, simple, rapid. – Can be use on children of all ages and adults. – Tibial technique: 2–3 cm below the knee.	

Swaziland_FINAL press.indb 228 5/19/12 2:51 PM

19.7 Bites and stings

19.7.1 Wounds caused by teeth or jaws

Causes

Can be inflicted by animals or reptiles (e.g., dog, human, or snakes). Specific treatment will depend on the type of bite (see sections below). General instructions are given here.

Nonpharmacological management

Give first aid—

- Social toilet: clean the wound thoroughly with plenty of clean soap and water immediately.
- Remove any dirt or foreign bodies.
- Stop excessive bleeding where necessary.
- Rinse the wound and allow it to dry.
- Apply an antiseptic: **chlorhexidine solution 0.05% (A)**
  —OR—
- **Hydrogen peroxide solution 6% (A)**
  —OR—
- **Povidone iodine solution 10% (A)**.
- ***Caution:*** Do not suture bite wounds.

Give supportive therapy—

- Treat shock if any or if swelling is significant
- Give **analgesics as needed**
- Reassure and immobilise the patient

Pharmacological management

Give tetanus prophylaxis—

- Giving TIG or TT vaccine **(A*)** to a fully immunised person may cause an unpleasant reaction, (e.g., redness, itching, swelling, fever), but with a severe injury this is justified

Give (prophylactic) antibiotic—

- Give *only* for infected or high-risk wounds including the following:
  - Moderate to severe wounds
  - Presentation >8 hours delayed
  - Puncture wounds unable to be adequately debrided
  - Wounds on hands, feet, or face
  - Wounds with underlying structures involved
  - Wounds in immunocompromised patients
- Base the choice of treatment on C&S test results.

Swaziland_FINAL press.indb 229 5/19/12 2:51 PM

- Adults—
  - **Benzylpenicillin** 1.5 MU IM daily for 5 days **(A)**
  - Followed by **amoxicillin** 500 mg PO every 8 hours for 5 days **(A)**
    —OR—
  - ***For patients who are allergic to penicillin***, give **metronidazole** 400 mg every 12 hours for 5 days **(A)**. ***Caution:*** **Metronidazole** is contraindicated in the first trimester pregnancy.
    —PLUS—
  - **Doxycycline** 100 mg daily **(A)**. ***Caution:*** **Doxycycline** is contraindicated in pregnancy.
    —OR—
  - **Co-trimoxazole DS** 960 mg PO every 12 hours **(A)**
- Children—
  - **Benzyl penicillin** 50,000 IU/kg per dose IM daily for 5 days **(A)**
  - Followed by **amoxicillin** 15 mg/kg per dose every 8 hours for 5 days **(A)**
    —OR—
  - ***For patients who are allergic to penicillin***, give **metronidazole** 10–12.5 mg/kg per dose every 12 hours for 5 days **(A)**.
    —PLUS—
  - **Doxycycline** (child >8 years) 2 mg/kg per dose daily **(A)**
    —OR—
  - **Co-trimoxazole** 24 mg/kg per dose every 12 hours **(A)**

19.7.2 Snake bite

Symptoms and signs

- Puncture wounds
- Bleeding (e.g., haematuria, oozing from the site, haematemesis) usually mild but may be uncontrollable
- Pain, swelling
- Paralysis
- Excessive salivation
- Other features will depend on the type of snake and poison (i.e., haemolytic, necrotoxic, neurotoxic).

Nonpharmacological management

- Give first aid, tetanus prophylaxis, supportive therapy, antibiotics as in 19.7.1.
- Give **chlorpheniramine** 2-4 mg PO stat **(A)**.
- Venom in eyes—
  - Irrigate eyes with plenty of water
  - Apply **chloramphenicol eye ointment 1% (A)**
  - Cover with eye pads

Swaziland_FINAL press.indb 230 5/19/12 2:51 PM

- Venom on skin—
  - Wipe away excess venom
  - Assess wound for fang penetration
  - Clean wound
  - Apply firm crepe bandage to entire limb to ensure constant pressure
  - Immobilise limb with a splint

Pharmacological management

Note: 90% of snake bites do not require antivenom. Use antivenom only in patients who really need it.

Criteria for referral for administration of antivenom—

- Signs of systemic poisoning
- Local damage
- Swelling of hand or foot (site of most bites) within 1 hour of bite
- Swelling of elbow or knee within 3 hours of bite
- Swelling of groin or chest at any time
- Associated bleeding disorder
- Snake size or recognition of venomous snake
- Significant swelling of head or neck
- Muscle weakness or breathing difficulty

If one or more of the above criteria are satisfied—

- **REFER** urgently for administration of **antivenom polyvalent (B)**. ⚠
  - Check package insert for IV dosage details.
  - Ensure the solution is clear.
  - Check that patient has no history of allergy.

Administration of antivenom—

- Ensure that the antivenom solution is clear.
- Check that the patient has no history of allergy.
- If there is a history of allergy and signs of systemic poisoning, still administer antivenom *but* prepare to treat possible reactions with **hydrocortisone (B)** and **adrenaline** (see 19.5.1) **(A)**.
- Give **antivenom polyvalent (B)** in a slow IV infusion for adults and children: 100 mL in 300 mL of **0.9% sodium chloride (normal saline) (A).**
- Administer slowly for the first 15 minutes because most allergic reactions will occur within this period.
- Increase the flow rate gradually until the infusion is completed within 1 hour.
- Repeat if there is no clinical improvement after the infusion.
- Black mamba bites may require up to 200 mL or more to reverse respiratory paralysis.

REFER all cases. ⚠

Swaziland_FINAL press.indb 231 5/19/12 2:51 PM

19.7.3 Insect bites and stings

Causes

- Bees, wasps, hornets, and ants: venom is usually mild but may cause anaphylactic shock in previously sensitized persons.
- Spiders and scorpions: most are non-venomous or only mildly venomous.

Symptoms and signs

- Swelling, discolouration, burning sensation, pain at the site of the sting
- Headache, dizziness
- May be signs of anaphylactic shock (see 19.5.1)

Management

- Give first aid and supportive therapy if required (e.g., if bite is from highly venomous species). See 19.7.1.
- If the stinger remains implanted in the skin, remove carefully with a needle or knife blade.
- If severe local reaction occurs, give **chlorpheniramine (A)** until swelling subsides.
  - Adults—4 mg PO every 6 hours (maximum: 24 mg daily)
  - Children—
    - 1–2 years: 1 mg PO every 12 hours
    - 2–5 years: 1 mg PO every 6 hours (maximum: 6 mg daily)
    - 6–12 years: 2 mg PO every 6 hours (maximum: 12 mg daily).
- Apply **calamine lotion** PRN every 6 hours **(A)**.
- If bite or sting causes severe pain (e.g., scorpion), infiltrate 2 mL of **lignocaine 2%** around the area of the bite **(C)**.

Prevention

- Advise patient to—
  - Clear overgrown vegetation around the home.
  - Cover exposed skin while moving in the bush.

REFER if systemic manifestations are present. ⚠

19.7.4 Animal bites

The most serious sequela from domestic or wild animal bites is rabies infection; however, the wound can be treated as for general wounds. Give treatment for prevention of rabies infection. If the animal can be identified and caught, quarantine and feed it for 10 days (domestic animals). If no signs of rabies infection appear within this period, release the animal. If it shows signs of rabies infection, kill the animal, remove its head, and send the head to the Veterinary Department for verification of the infection.

Swaziland_FINAL press.indb 232 5/19/12 2:51 PM

Management

For further details, refer to *Rabies Post-Exposure Treatment Guidelines,* Veterinary Public Health Unit, Community Health Dept, Ministry of Health, September 2001.

Give first aid, tetanus prophylaxis, supportive therapy—

- Give antibiotics as detailed in 19.7.1.
- ***Caution:*** Thorough and prompt local treatment of all bite wounds and scratches that may be contaminated with rabies virus is very important because elimination of the rabies virus at the site of infection by chemical and physical means is the most effective method of protection.
- The combination of local wound treatment
  —PLUS—
- Passive immunization with **rabies immunoglobulin** (RIG) **(C)**
  —PLUS—
- Vaccination with **rabies vaccine** (RV) is recommended for *all severe exposures* to rabies **(A*)**

Since prolonged rabies incubation periods are possible, persons who present for evaluation and treatment even months after having been bitten should be treated in the same way as if the contact occurred recently.

Treatment with **RIG** and **RV**—

- As part of local treatment in all cases of possible exposure, carefully infiltrate **RIG** (if available) in and around the wound **(C)**. For dose information, refer to *Rabies Post-Exposure Treatment Guidelines.* Inject IM any remaining **RIG** at a site distant from the site of **RV** inoculation **(A*)**.
- If it is not possible to give **RIG** at the start of **RV** vaccination, it may still be given up to 7 days later even when the wound has started to heal.
- Do not suture the wound.
- Avoid contact with the patient's saliva and vomitus, which is potentially infective. Observe strict hygiene, and if possible, wear eye protection because patients may spit and infection through the conjunctiva can occur.

If the Veterinary Department confirms rabies infection or if the animal cannot be identified or tested, give **RV (A*)** with or without **RIG (C)** as per the recommendations in table 19.7.4.

Notes:

- Consumption of properly cooked rabid meat is not harmful.
- The 10-day observation period applies only to domestic dogs and cats. Except for threatened or endangered species, all other domestic or wild animals should be killed humanely and tissues tested for rabies using appropriate veterinary laboratory techniques.

Swaziland_FINAL press.indb 233 5/19/12 2:51 PM

Table 19.7.4 Recommendations for Rabies Vaccination

Nature of Exposure	Condition of Animal		Recommended Action
	At Time of Exposure	10 Days Later	
Saliva in contact with skin, but no skin lesion	Healthy	Healthy	Do not vaccinate.
		Rabid	Do not vaccinate.
	Suspect	Healthy	Do not vaccinate.
		Rabid	Do not vaccinate.
Saliva in contact with skin that has lesions; minor bites on trunk or proximal limbs	Healthy	Healthy	Do not vaccinate.
		Rabid	Vaccinate.
	Suspect	Healthy	Vaccinate, but stop course if animal healthy after 10 days.
		Rabid	Vaccinate.
		Unknown	Vaccinate.
Saliva in contact with mucosa, serious bites (e.g., on face, head, or fingers), or multiple bites	Domestic or wild rabid animal or suspect	Rabid	Vaccinate and give RIG.
		Unknown	Vaccinate and give RIG.
	Healthy domestic animal	Healthy	Vaccinate, but stop course if animal remains healthy after 10 days.
		Rabid	Vaccinate.

19.8 Fractures

Definition

A fracture is a complete or incomplete break in a bone.

Causes

- Trauma (e.g., road traffic accident, assault, falls)
- Bone weakening by disease (e.g., cancer, TB, osteomyelitis, osteoporosis)

Symptoms and signs

- Pain, tenderness
- Swelling

Swaziland_FINAL press.indb 234 5/19/12 2:51 PM

- Inability to use or move the affected part
- Deformity
- May be open (with a cut) or closed

Investigations

- X-ray: 2 views to enable comparison with normal side.

Management

- Simple fractures—
  - Ensure airway is clear.
  - Treat shock.
  - Elevate any fractured limb.
  - Immobilise the affected part with a splint, with special attention to neck or spinal injuries.
  - Give an **analgesic** to relieve pain.
  - ***Caution:*** Do *not* give **pethidine** or **morphine** for rib fractures and head injuries because they cause respiratory depression.
  - **REFER** for further management. ⚠
- Compound fractures—
  - Manage in the same way as simple fractures but also—
    - Stop any bleeding.
    - Carry out surgical toilet.
- All fractures—
  - Give prophylaxis against tetanus (i.e., if not fully immunised or if the wound is suspected to be contaminated). (See 11.12.)
  - If there is anaemia, manage accordingly. (See 7.1.)

19.9 Burns

Definition

Tissue injury caused by thermal, chemical, electrical, or radiation energy.

Causes

- Thermal (e.g., hot fluids, flame, steam, hot solids, the sun)
- Chemical (e.g., acids, alkalis, and other chemicals)
- Electrical (e.g., domestic low-voltage transmission or high-voltage lightning)
- Radiation (e.g., exposure to excess radiotherapy or radioactive materials)

Symptoms and signs

- Pain, swelling
- Skin changes (hyperaemia, blisters, singed hairs)
- Skin loss (eschar formation, charring)
- Reduced use of the affected part

Swaziland_FINAL press.indb 235 5/19/12 2:51 PM

Table 19.9A Classification of the Severity of Burns

Criterion	Description
Depth of the burn—a factor of temperature, of agent, and of contact with the skin	▪ First-degree burns • Superficial epidermal injury with no blisters • Main sign is redness of the skin • Tenderness or hypersensitivity with intact two point discrimination ▪ Second-degree burns. A partial thickness burn is a dermal injury that is subclassified as superficial or deep. • In superficial second-degree burns— – Blisters result – The pink wound is extremely painful • In deep second-degree burns— – A thin eschar is formed – The pale moist wound is painful ▪ Third-degree burns • Full-thickness skin destruction • Leather-like rigid eschar • Painless on palpation or pinprick ▪ Fourth-degree burns • Full-thickness skin plus fascia, muscle, or bone destruction • Lifeless body part
Percentage of TBSA	Small areas are estimated using the open palm of the patient to represent 1% TBSA. Large areas estimated using the "rules of nines" or a Lund and Browder chart (annex A).[a]
Body part injured	Burns to the face, hands, feet, and perineum are considered severe.
Age and general condition of the patient	In general, children and the elderly fare worse than young adults and need more care. A person who is sick or debilitated at the time of the burn will be more affected than one who is healthy.

[a] The "rules of nine" is a method used to calculate body surface area and is based on the following assumptions:

- Head = 9%
- Chest (front) =9%
- Abdomen (front) = 9%
- Upper, middle, and lower back and buttocks = 18%
- Each arm = 9%
- Each palm = 1%
- Groin = 1%
- Each leg = 18% total (front = 9%, back = 9%)

Swaziland_FINAL press.indb 236 5/19/12 2:51 PM

Table 19.9B Management of Burns

Type of Burn	Treatment Measures	Explanation
Mild or moderate burn	Perform first aid.	▪ Stop the burning process and move the patient to safety. Roll patient on the ground if clothing is on fire. ▪ Pour or shower the affected area with cold water especially in the first hour after the burn (this may reduce the depth of injury if started immediately). ▪ May cleanse the wound with **saline solution** or dilute antiseptic solution, Savlon® **(A)** or Dettol® **(A)**. ▪ Cover the wound with a clean dry cloth and keep the patient warm
	Give hospital or health centre treatment (i.e., pharmacological management).	
	Give medications.	▪ Give **analgesics** IV or PO as required. ▪ If wound is infected, apply **silver sulphadiazine 1%** cream daily **(A)**. ***Caution:*** Contraindicated in pregnancy and breastfeeding. ▪ Dress the wound with **paraffin gauze** dressing **(B)**. Place enough dry gauze on top to prevent soiling. ▪ Give **TT** as prophylaxis against tetanus (i.e., if not fully immunised or if the wound is suspected to be contaminated) **(A*)**.
	Replace fluids.	▪ Give **ORS (A)** and/or **IV fluids** as needed depending on the degree of dehydration. ▪ Give as much as the patient can take.
	Care for wounds.	▪ Leave blisters alone. Do not puncture (except if non-adherent sterile dressing is possible). ▪ Continue to apply antiseptic cream (e.g., **silver sulphadiazine 1%** cream) if wound is infected **(A)**. ***Caution:*** Contraindicated in pregnancy and breastfeeding. ▪ Apply layers of gauze moistened with a saline solution. Place enough dry gauze on top to prevent seepage to outer layers, and creep bandage to hold dressings.

Swaziland_FINAL press.indb 237 5/19/12 2:51 PM

Table 19.9B Management of Burns (continued)

Type of Burn	Treatment Measures	Explanation
	Care for wounds. (continued)	▪ Small, superficial, 2" burns may be dressed with **paraffin gauze** dressing **(B)**. ▪ Change the dressings after 1–2 days and as necessary thereafter.
	Take other measures as needed	▪ Give appropriate physiotherapy to joints affected (especially the hand). ▪ Provide nutritional support to boost healing. ▪ Provide counselling and psychosocial support to patient and relatives. ▪ Provide health education on burn prevention (e.g., epileptic control).
Severe burn	Treat as mild or moderate burn but take the following revisions and additions.	
	Replace fluids.	▪ Give IV fluid replacement in a total volume per 24 hours according to the calculation in table 19.9C. Use only crystalloids [i.e., **Ringer's lactate (A)** or **0.9% sodium chloride (normal saline) (A)** and **5% dextrose (A)**]. ▪ Give these solutions in a ratio of 2:1 [i.e., 2 units of **Ringer's lactate (A)** (or **normal saline**) followed by 1 unit of **dextrose 5%**]; repeat until total required daily volume is reached.
	Treat infected burns.	▪ Apply **silver sulphadiazine cream 1%** daily **(A)**. ***Caution:*** Contraindicated in pregnancy and breastfeeding. ▪ Give an antibiotic.
	REFER for surgery, if needed. ⚠	Consider surgery if any the following is required— ▪ Escharotomy and fasciotomy for circumferential limb or tarsal bums. ▪ Escharotomy to excise dead skin. ▪ Skin grafting to cover dean deep bum wounds. ▪ Eye protection (temporary tarsorrhaphy).

Swaziland_FINAL press.indb 238 5/19/12 2:51 PM

- Systemic effects in severe burns include shock, low urine output, generalised swelling, respiratory insufficiency, deteriorated mental state.

Classification of the severity of burns

Burn injury may be described as mild, moderate, or severe depending on the—

- Depth of the burn
- Percentage of total body surface area (TBSA) burned (see annex A)
- The body parts injured
- Age or general condition of patient at the time of the burn

Using the criteria outlined in table 19.9A, a burn patient may be categorised as follows:

- Minor or mild burn:
  - Adult with <15% TBSA affected
  - Child or elderly person with <10% TBSA affected
  - Full-thickness burn with <2% TBSA affected with no serious threat to function
- Moderate (intermediate) burn:
  - Adult with partial thickness burn and 15–25% TBSA
  - Child or elderly person with partial thickness burn and 10–20% TBSA
  - All of the above with no serious threat to function and no cosmetic impairment of eyes, ears, hands, feet, or perineum.
- Major (severe) burn:
  - Adult with—
    - Partial thickness burn and >25%

      —OR—
    - Full-thickness burn and >10% TBSA
  - Child or elderly person with—
    - Partial thickness burn >10%

      —OR—
    - Full thickness burn of >5% TBSA affected
  - Irrespective of age—
    - Any burns of the face, eyes, ears, hand, feet, or perineum with cosmetic or functional impairment risks
  - Chemical, high-voltage, inhalation burns

Management

See table 19.9B.

Transferring burn patients

Severe burns will require long-term special care and should be managed in a suitable hospital (i.e., a burn unit). Always endeavour to transfer burn cases within 24 hours of the burn. Transfer with the following precautions:

Swaziland_FINAL press.indb 239 5/19/12 2:51 PM

Table 19.9C Calculation and Administration of IV Fluid Replacement

Objective	Volume Needed	Normal Urine Output
To maintain normal physiology as shown by— ▪ Urine output ▪ Vital signs ▪ Mental status	The total volume of IV solution required in the first 24 hours of the burns is— ▪ 4 MU × weight (kg) × % TBSA burned **—PLUS—** ▪ The normal daily fluid requirement. Give 50% of this the first 8 hours, and 50% in the next 16 hours. The fluid input is balanced against the urine output.	The normal urine output is— ▪ Children (<30 kg wt): 1 mL/kg per hour ▪ Adults: 0.5 mL/kg per hour (or approximately 30–50 mL per hour).

Notes:
- The basis of fluid replacement is that fluid is lost from the circulation into the tissues surrounding the burns, and some is lost through the wounds.
- Fluid loss is excessive within 18–30 hours of burns.
- Low intravascular volume results in tissue circulatory insufficiency (shock) with results such as kidney failure and deepening of the burns.

- For a short, easy journey—
  - Commence resuscitation
  - Make clear summary of records
  - Send with medical attendant
- For a prolonged or delayed journey—
  - Resuscitate and transfer when patient stable
  - Keep the patient warm and covered during journey
  - Continue management already started

Prevention of burns

- Ensure that the public is aware of burn risks and knows the first-aid method of using water to cool burned skin.
- Advocate construction of raised cooking fireplaces as a safety measure.
- Ensure the safe handling of hot water and food, keeping everything well out of the reach of children.
- Ensure that high-risk persons (e.g., children, epileptic patients, or alcohol or drug abusers) take particular care near fires.
- Encourage the use of solar lamps.

Swaziland_FINAL press.indb 240 5/19/12 2:51 PM

19.10 Head injuries

Definition

Damage to the head tissue causing swelling with or without a wound and with or without a fracture

Causes

- Road traffic accident
- Assault, fall, or a blow to the head

Symptoms and signs

- May be closed (without a cut) or open (with a cut)
- Headache pain
- Swelling or cut wound on the head
- Fracture of the skull (e.g., depressed area of the skull, brain matter may be exposed)
- Altered level of consciousness if brain tissue is involved, including coma
- Haematoma

Management

Caution: Do not sedate any patient with a head injury.

Management of head injury is based on classification of the head injury using the Glasgow coma score (GCS) to rate loss of consciousness (LOC) as shown in table 19.10.

Table 19.10 Classification of Head Injury According to the GSC

Classification	Definition	Treatment
Simple	No LOC GCS = 15	▪ Give any necessary first aid. ▪ Monitor LOC and GCS. ▪ If satisfactory, send patient home with analgesics.
Concussion	LOC <6 hours GCS = 13–15	▪ Keep under observation for 24 hours. ▪ If no deterioration, send patient home. ▪ If condition deteriorates, **REFER** to hospital immediately for specialist management. ⚠
Contusion	LOC >6 hours GCS = 8–12	Treat as for cerebral oedema below.
Haemorrhage	Lucid intervals GCS may be up to 15 but drops off with increasing LOC	Treat as for cerebral oedema below.

Swaziland_FINAL press.indb 241 5/19/12 2:51 PM

In all cases—

- Give any necessary first aid.
- If patient able to swallow, give oral analgesic for the pain.
- Avoid narcotic analgesics because of sedative effects.

If there are signs of cerebral oedema—

- Give supportive treatment.
  - Nurse in a semi-prone position.
  - Keep a head injury chart to record the GSC, pupil size, and neurological signs.
  - Withhold IV fluids or use with caution.
- Give **oxygen** if available.
- **REFER** to hospital as soon as possible for specialist management. ⚠

Open head injury—

- **REFER** immediately to a specialist after giving first aid and an initial dose of antibiotic as in meningitis (see 11.7) prior to referral. ⚠

Closed head injury—

- Treat as for cerebral oedema above.

Prevention of head injuries

- Careful (defensive) driving to avoid accidents.
- Use of safety belts by motorists.
- Wearing of helmets by cyclists, motorcyclists, and people working in hazardous environments.

19.11 Poisoning

Definition

The entry into the body of toxic substances in amounts that cause dysfunction of body systems.

Causes

- Microorganisms (food poisoning)
- Fluids and gases (organic) (e.g., agricultural chemicals, petrol, paraffin, carbon monoxide)
- Metal poisoning (inorganic) (e.g., lead, mercury, copper)
- Alcohol and medicines (in excessive amounts)

Swaziland_FINAL press.indb 242 5/19/12 2:51 PM

Management

If possible, **REFER** all patients who show signs of poisoning to hospital. Send a note of what is known and what treatment has been given. Also **REFER** patients who have taken slow-acting poisons even if they appear well. Slow-acting poisons include— ⚠

- Aspirin
- Iron
- Paracetamol
- Tricyclic antidepressants (e.g., amitriptyline, imipramine)
- Paraquat®

Even though it may not be possible to identify the poison and the amount taken, it is usually not important because—

- Only a few poisons have specific antidotes
- Few patients need active removal of the poison

Most patients must be treated symptomatically. Knowledge of the poison, however, will help HCWs anticipate the likely effects on the patient.
Take the following general measures for poisoning:

- Airway—often impaired in unconscious patients
  - Ensure the airway is cleared and maintained; insert an airway if available.
  - Depending on the presentation of symptoms, position patient semi-prone to minimise risk of inhalation of vomitus.
- Breathing—
  - Assist ventilation if necessary.
  - Give **oxygen** to correct hypoxia.
- Circulation—
  - Hypotension is common in severe poisoning with CNS depressants. A systolic BP <70 mm Hg may cause irreversible brain or renal damage.
    - Depending on the presentation of symptoms, carry the patient head down on the stretcher, and nurse in this position in the ambulance.
    - Set up an IV infusion.
  - Fluid depletion without hypotension is common after prolonged coma and after aspirin poisoning because of vomiting, sweating, and hyperpnoea.
  - Hypertension is less common but may be associated with sympathomimetic poisoning (e.g., amphetamines, cocaine).
  - Cardiac conduction defects and arrhythmias may occur in acute poisoning, especially with tricyclic antidepressants but these often respond to correction of any hypoxia or acidosis.

Swaziland_FINAL press.indb 243 5/19/12 2:51 PM

- Body temperature—
  - Hypothermia may develop in patients with prolonged unconsciousness, especially after overdose of barbiturates or phenothiazines (e.g., chlorpromazine, trifluoperazine).
  - Cover the patient with a blanket.
- Seizures—
  - Do not treat a single brief convulsion.
  - If convulsions are prolonged or recur frequently, give
    - **Diazepam (B)**
      - Adults: 10 mg PR repeated if necessary
      - Children: 400 micrograms (0.4 mg)/kg per dose PR

        —OR—
    - **Diazepam (B)**
      - Adults: 10 mg slow IV repeated if necessary (maximum: 30 mg)
      - Children: 200 micrograms (0.2 mg/kg). Do not give IM. If IV route is not possible, remove the needle of the syringe, and give the dose PR.

19.11.1 Removal and elimination of the poison

- *Remove poison from the stomach.* Balance the dangers of attempting to empty the stomach with the likely toxicity of any swallowed poison as determined by the type of poison and amount swallowed.
  - Perform gastric lavage (only useful if done within 2 hours of poisoning).
  - ***Cautions:***
    - Do not attempt gastric lavage in drowsy or comatose patients because of the risk of inhaling stomach contents.
    - Do not attempt gastric lavage with corrosive or petroleum products.
  - Induce vomiting (emesis).
    - ***Caution:*** Consider using emetics only in the following situations:
      - In fully conscious patients
      - If poison is not corrosive or a petroleum product
      - If poison is not absorbed by activated charcoal
      - If gastric lavage is inadvisable or impossible
    - Give **ipecacuanha syrup 0.14% (A)**. ***Caution:*** **Ipecacuanha** may cause respiratory depression. Do not use, therefore, with paraffin poisoning or in unconscious patients.
      - Adults: 30 mL followed by 200 mL water
      - Children: 6–18 months: 10 mL followed by water
      - Older children: 15 mL followed by water
    - Repeat once, if no response after 20 minutes.
    - Vomiting usually occurs within 15–45 minutes of the first dose.

Swaziland_FINAL press.indb 244 5/19/12 2:51 PM

- *Prevent absorption of the poison.* Oral **activated charcoal** can bind many poisons in the stomach and so reduce their absorption **(A)**. It is safe and especially useful for poisons toxic in small amounts (e.g., antidepressants).
  - Grind charcoal tablets into a fine powder before mixing with 100–200 mL of water.
  - Give **activated charcoal** PO **(A)**.
    - Adults: 50 g
    - Children: 25 g (50 g if severe)
  - If patient unable to swallow the charcoal and water mixture (slurry), give by gastric lavage tube.

19.11.2 Acute organophosphate poisoning

Definition

Organophosphates are ingredients of some pesticides and insecticides intended for agricultural and household use. Poisoning occurs by ingestion, inhalation, or absorption through the skin.

Causes

Acute organophosphate poisoning may be accidental (e.g., rat poison), intended (i.e., suicidal or homicidal), or occupational hazard (e.g., agricultural workers).

Symptoms and signs

- Patient may smell of the chemicals
- Constricted pupils
- Cold sweat, anxiety, restlessness
- Abdominal pain, diarrhoea, and vomiting
- Twitching, convulsions
- Bradycardia
- Excessive salivation, difficulty in breathing

Nonpharmacological management

- Remove contaminated clothing.
- Wash contaminated skin with lots of cold water.
- Establish and maintain the airway. Artificial respiration with air or **oxygen** may be required during the first 24 hours after poisoning **(B)**.
- Perform gastric lavage if the poison was ingested.

Pharmacological management

- **Atropine (A)**

  Dosages:
  - Adults: 2 mg IM or IV (according to the severity of the poisoning)
  - Children: 20 micrograms/kg per dose

Swaziland_FINAL press.indb 245 5/19/12 2:51 PM

- Repeat dose every 20–30 minutes until signs of atropinization occur (i.e., pupil dilatation, hot dry skin, dry mouth, fast pulse).

  —PLUS—

- In moderate to severe poisoning *only* and if not responding to atropine:
  - **Pralidoxime mesylate (B)**
    - Adults: 30 mg/kg IM
    - Children: 20 mg/kg IM
  - Follow by 1–2 more doses at 4–6 hour intervals depending on the severity of the poisoning and response to treatment.
  - ***Note:*** **Pralidoxime** is effective only if given within 24 hours of poisoning
- Give **IV fluids** as needed for dehydration, hypovolaemia, and shock.

Prevention

- Label agricultural and domestic pesticides properly
- Store such products away from children
- Wear protective clothing when using the products

19.11.3 Paraffin and petroleum products poisoning

Definition

Includes paraffin, petrol, paint thinners, organic solvents

Cause

- Accidental or intentional ingestion

Symptoms and signs

- Patient may smell of paraffin or other petroleum product
- Burning sensation in mouth and throat
- Vomiting, diarrhoea
- Cough, dyspnoea

Management

Treatment is supportive and symptomatic. The main danger is damage to lung tissue.

Caution: Avoid gastric lavage or use of an emetic because they may lead to inhalation of the gastric contents causing pneumonitis.

- Give plenty of oral fluids (preferably milk).
- **Activated charcoal (A)** may be used: 50 g; repeat PRN every 4 hours.
- **REFER** if complications occur (e.g., pulmonary oedema, pneumonia).

Prevention

- Store paraffin and other products safely (e.g., in a locked cupboard).

Swaziland_FINAL press.indb 246 5/19/12 2:51 PM

19.11.4 Aspirin poisoning

Symptoms and signs

- Hyperventilation
- Tinnitus, deafness
- Vasodilation
- Sweating
- Coma (if very severe poisoning)
- Complex acid-base disturbances

Management

- Gastric lavage is worthwhile up to 4 hours after poisoning because stomach emptying is delayed.
- **Activated charcoal** 50 g repeated as needed every 4 hours to delay absorption of any remaining salicylate **(A)**.
- Monitor and manage fluids and electrolytes to correct acidosis, hyperpyrexia, hypokalaemia, and dehydration.
- If hypoglycaemia occurs, give
  - **Dextrose 50%** as IV bolus **(A)**
    - Adults: 20 mL
    - Children: 1 mL/kg
- Anticipate and treat convulsions
  - **Diazepam** IV or PR as in 19.10 **(B)**.

19.11.5 Paracetamol poisoning

Symptoms and signs

- History of ingesting paracetamol tablets, accidentally or intentionally. As few as 10–15 g (20–30 tablets) may cause severe hepatic and renal damage.
- Nausea and vomiting (usually settle within 24 hours)

Nonpharmacological management

- If poisoning took place <2 hours before, empty the stomach to remove any remaining medicine using gastric lavage or an emetic.
- **REFER** urgently to hospital despite few significant early symptoms. Maximal liver damage occurs 3–4 days after poisoning. ⚠

Pharmacological management

- If poisoning took place <12 hours before, give **methionine** 2.5 g IM **(A)**. Repeat 3 times at 4-hour intervals.

Swaziland_FINAL press.indb 247 5/19/12 2:51 PM

19.11.6 Iron poisoning

Symptoms and signs

- Most common in children who accidentally ingest iron tablets.
- Nausea, vomiting, abdominal pain, diarrhoea
- Haematemesis
- Rectal bleeding
- Later: hypotension, coma, hepatic necrosis

Pharmacological management

- **Desferrioxamine (A)** 15 mg/kg/hour by continuous IV infusion in **0.9% sodium chloride (normal saline) (A)**
  —OR—
- **5% dextrose (A)** infusion (maximum dose: 80 mg/kg/24 hours)
- Dissolve initially in **water for injections (A)** (500 mg in 5 mL) then dilute with infusion fluid.

19.11.7 Carbon monoxide poisoning

Definition

Usually due to inhalation in confined spaces of smoke, car exhaust, or fumes caused by incomplete combustion of fuel gases (e.g., use of charcoal stoves in unventilated rooms).

Symptoms and signs

- All due to hypoxia
  - Headache, nausea, vomiting
  - Weakness, collapse, coma, death

Management

- Remove person to fresh air.
- Clear the airway.
- Give **oxygen 100%** as soon as possible **(A)**.
- Give artificial respiration as required. Continue until adequate spontaneous breathing starts.
- In severe poisoning, anticipate cerebral oedema and treat with **mannitol 20%** 1 g/kg by rapid IV infusion **(A)**.
- **REFER** to hospital because of possibility of delayed complications. ⚠

Swaziland_FINAL press.indb 248 5/19/12 2:51 PM

19.11.8 Barbiturate poisoning

Symptoms and signs

- Respiratory depression
- Coma

Nonpharmacological management

- Monitor vital signs.
- Perform gastric lavage.

Pharmacological

- **Ipecacuanha** can be given to induce vomiting (see 19.10.1) **(A)**. ***Caution:*** **Ipecacuanha** may cause respiratory depression. Do *not* use, therefore, in paraffin poisoning or in unconscious patients.
- **Activated charcoal** may be used to adsorb the poison (see 19.10.1) **(A)**.

19.11.9 Narcotic analgesic poisoning

Causes

Poisoning by morphine, pethidine, codeine, and other opioids

Symptoms and signs

- Respiratory depression
- Pinpoint pupils
- Coma

Nonpharmacological management

Use ABCD as in 19.10. (See also tables 19.6.1 and 19.6.2.)

Pharmacological management

- Give **naloxone (A)**.
  - Adults: 0.8–2 mg IV
  - Children: 10 micrograms/kg IV
- If respiratory function does not improve:
  - Adult: repeat dose every 5 minutes to a maximum of 10 mg total dose
  - Children: give one subsequent dose of 100 micrograms/kg

19.11.10 Warfarin poisoning

Definition

Warfarin is an ingredient in some rat poisons.

Management

- Empty the stomach with **ipecacuanha** as in 19.10.1 or gastric lavage **(A)**. ***Caution:*** **Ipecacuanha** may cause respiratory depression. Do *not* use in unconscious patients.
- Give **activated charcoal** to absorb any remaining poison **(A)**.

Swaziland_FINAL press.indb 249 5/19/12 2:51 PM

- If there is major bleeding, give **phytomenadione (vitamin K)** 5 mg IV **(A)**. Give very slowly.

19.11.11 Alcohol (ethanol) poisoning

Alcohol poisoning may be acute or chronic.

19.11.11.1 Acute alcohol poisoning

Definition

Symptoms of alcoholic poisoning following ingestion of large amounts of alcohol over a short period of time

Cause

- Deliberate consumption of excessive alcohol in a short period of time
- Accidental ingestion (may occur in children)

Symptoms and signs

- Smell of alcohol on the breath
- Excessive sweating
- Dilated pupils
- In later stages, stupor and coma develop
- As coma deepens, the following appear:
  - Thready pulse and falling BP
  - Fall in body temperature
  - Noisy breathing

Investigations

- Blood: alcohol content, glucose level
- Urine: for glucose and protein
- Lumbar puncture

Management

- Maintain a clear airway.
- Take measures to reduce the special hazard of aspiration of stomach contents.
- Check blood glucose level.
  - If indicated, treat hypoglycaemia. Give **dextrose 50%** IV bolus **(A)**.
    - Adults: 20–50 mL IV bolus
    - Children: 1 mL/kg
  - Assess clinical and biochemical response over the next 15 minutes, and repeat **dextrose 50%** IV PRN.
  - Monitor hourly blood glucose levels.
  - Repeat **dextrose 50%** IV as needed until the patient wakes up.
  - Once patient wakes up, continue with **oral glucose** or **sugar solution** as required, until the patient can eat a meal.

Swaziland_FINAL press.indb 250 5/19/12 2:51 PM

19.11.11.2 Chronic alcohol poisoning

Cause

- Heavy habitual drinking combined with poor nutrition

Symptoms and signs

- Features of malnutrition
  - Weight loss
  - Dry scaly skin
  - Brittle discolored hair
  - Pale mucous membranes
- Features of cerebral damage
  - Memory loss
  - Hallucinations
  - Tremors
- Features of liver disease
  - Poor appetite
  - Fluid in the abdomen (ascites) as a result of cirrhosis

Pharmacological management

- For delirium, give **diazepam** 10–30 mg PR every 12 hours as needed **(B)**.
- Anticipate and treat hypoglycaemia.

REFER to hospital for further management including— ⚠

- Bed rest
- Proper diet
- Treatment of thiamine (vitamin B1) deficiency (see 13.2.5)
- Psychiatric assistance and counselling on alcohol, withdrawal, abstinence, and lifestyle adjustment

19.11.12 Methyl alcohol (methanol) poisoning

Definition

Methanol is used as an industrial solvent and is an ingredient of methylated spirits.

Symptoms and signs

- Similar to alcohol intoxication or poisoning but milder
- Symptoms do not usually appear until 12–24 hours after ingestion and may include headache, dizziness, nausea, vomiting, vasomotor disturbances, CNS depression, and respiratory failure.
- Toxic metabolites may cause severe acidosis and retinal or optic nerve damage.

Swaziland_FINAL press.indb 251 5/19/12 2:51 PM

Management

- Gastric aspiration and lavage, but only of use if done within 2 hours of ingestion.
- Correct metabolic acidosis with **sodium bicarbonate solution 5%** (baking soda) PO. Leave the solution in the stomach.
- In severe cases—
  - Give **sodium bicarbonate 8.4%** 50 mL by slow IV. Monitor plasma pH.
  - Give 30–35 mL of **alcohol 40%** (e.g., whisky, brandy) in 100 mL of water every 3 hours until the acidosis has been corrected. This delays oxidation of methanol to toxic metabolites.
  - Keep the patient warm.
  - Protect the eyes from strong light.

REFER to hospital for further management. ⚠

19.11.13 Other chemical or medicine poisoning

Management

- For ingested poisons—
  - Induce vomiting by giving **ipecacuanha** syrup **(A)**. ***Caution:*** **Ipecacuanha** may cause respiratory depression. Do *not* use, therefore, in paraffin poisoning or in unconscious patients.
  - Carry out nasogastric suction and gastric lavage.
  - Give **activated charcoal (A)**.
  - Provide symptomatic treatment as necessary (e.g., for pain, dehydration).
- **REFER** patient for further management if the condition deteriorates. ⚠

19.11.14 Food poisoning

Definition

Illness caused by consumption of food or water contaminated by certain pathogenic microorganisms. Food poisoning usually affects large numbers of people, after ingestion of communal food in homes, hospitals, hotels, and parties.

Causes

Can be infective or toxic—

- Infective: by bacteria (e.g., *Salmonella typhimurium*, *Campylobacter jejuni*, *Bacillus cereus*)
- Toxic: (e.g., by toxins from *Staphylococcus aureus* and *Clostridium botulinum*)

Swaziland_FINAL press.indb 252 5/19/12 2:51 PM

Symptoms and signs

- Nausea, vomiting
- Intermittent abdominal pain (colic) with associated diarrhoea
- Fever (especially if poisoning is the infective type)
- May be self-limiting; features disappear without specific treatment
- Botulism—
  - Paralysis of skeletal, ocular, pharyngeal, and respiratory muscles
  - **REFER** to hospital for further management. ⚠

Investigations

- Good history and examination is important for diagnosis
- Stool: examination for C&S

Management

- Establish the cause and treat accordingly.
- Give oral or IV **fluids** for rehydration as required.

19.12 Sprains and strains

Definition

Overt or unnoticed soft tissue injuries affecting the joints. Sites include joints, near joints, parts of limbs, back, or neck.

Causes

- Sports injuries
- Slips
- Twists
- Overuse of muscles
- Abnormal posture

Symptoms and signs

- Pain, especially on movement
- Tenderness on touch
- Limited movement
- No bruising or swelling

Emergency treatment

- Immobilise with firm bandage and/or temporary splinting
- Give **ibuprofen (A)**
  - Adults: 200-400 mg PO every 6–8 hours
  - Children over 12 years and adults: 200–400 mg. Children under 12, use paracetamol.

    —OR—

Swaziland_FINAL press.indb 253 5/19/12 2:51 PM

- **Paracetamol (A)**
  - Adults: 500 mg–1 g every 4–6 hours, when needed, to a maximum of 4 doses daily
  - Children: the following dosages every 4-6 hours, when needed to a maximum of 4 doses daily—
    - 3 months–1 year: 2.5 mL (120 mg/5 mL syrup)
    - 1–5 years: 5–10 mL
    - 5–12 years: ½–1 tablet (500 mg tablet)
    - >12 years: 500 mg–1 g

REFER if there is— ⚠

- Severe progressive pain
- Progressive swelling
- Extensive bruising
- Deformity
- Joint tenderness

Swaziland_FINAL press.indb 254 5/19/12 2:51 PM

INDEX

Abdomen, acute, 214
Abnormal vaginal discharge, 100
Abortion, 89
Abortion, threatened, 90
Abscess. *See* boil
Abscess, breast, 95
Acne vulgaris, 193
Acute abdomen, 214
Acute appendicitis, 85
Acute bronchitis, 187
Acute cystitis, 182
Acute glaucoma, 70
Acute glomerulonephritis, 183
Acute malnutrition, 170
Acute myocardial infarction, 215
Acute pulmonary oedema, 216
Acute pyelonephritis, 184
Acute rheumatic fever, 28, 145
AIDS, HIV, 131
Alcoholism, 180
Allergic rhinitis, 56
Anaemia , 75
Anaemia of pregnancy, 91
Anal conditions, 83
Antepartum haemorrhage, 92
Anxiety, 175
Aphthous ulcers (mouth ulcers), canker sores, 51
Appendicitis, acute, 85
Arthritis, gouty, 163
Arthritis, rheumatoid, 167
Arthritis, septic, 168
Asthma, 185
Athlete's foot. *See* tinea pedis
Atopic eczema, 198

Back strain, 168
Bites and stings, 229
Bleeding disorders, haemostatic and, 76
Bleeding, dysfunctional uterine, 98
Bleeding, postmenopausal, 99
Boil (abscess), 193
Breast abscess, 95
Breastfeeding, cracked nipples during, 95
Bronchitis, acute, 187
Bronchitis, chronic and emphysema, 188
Brucellosis, 128
Burns, 235
Burns, chart for estimating percentage of total body surface area affected by burns (annex 4), 292

Candidiasis, oral (thrush), 45
Canker sores, aphthous ulcers (mouth ulcers), 51
Carbuncle, 197
Cardiac arrest, 222
Cardiac failure, congestive, 30
Cardiovascular conditions, 25
Catarrh, vernal (spring catarrh), 72
Cellulitis, 197
Central nervous system, 32
Chicken pox, 129
Child with a cough, 120
Children, general danger signs in, 115
Chronic bronchitis and emphysema, 188
Chronic glaucoma, 70
Common cold and influenza, 189
Cold sore, 50
Congestive cardiac failure, 30
Conjunctivitis, 64
Conjunctivitis, newborn, 67
Conjunctivitis, viral, 66
Constipation, 87
Convulsions, paediatric, 122
Cough, child with, 120
Cracked nipples during breastfeeding, 95
Cystitis, acute, 182

Danger signs in children, general, 115
Dental and oral conditions, 45
Depression, 176
Diabetes mellitus, 60
Diarrhea, 81
Diarrhea, paediatric, 116

Swaziland_FINAL press.indb 255 5/19/12 2:51 PM

Discharge, abnormal vaginal, 100
Dysentery, 81
Dysfunctional uterine bleeding, 98
Dysmenorrhoea, 96

Ear, nose, and throat disorders, 52
Eclampsia, 99
Ectopic pregnancy, 97
Eczema, atopic, 198
Eczema, seborrhoeic, 200
Emergencies and trauma, 214
Emergency conditions, paediatric, 116
Emphysema. *See* chronic bronchitis
Endocrine conditions, 60
Enteric fever. *See* typhoid fever
Epilepsy, 32
Epilepticus, status , 35
Epistaxis (nose bleed), 59
Erysipelas, 196
External hordeolum (stye), 73
Eye conditions, 64
Eye injury, 68

Family planning, 105
Fever, paediatric, 122
Fever, typhoid, 155
Fever blister, 50
Fractures, 234

Gastrointestinal conditions, 81
General danger signs in children, 115
Genital ulcer disease syndrome, 103
Gingivitis, 48
Glaucoma, acute and chronic, 70
Glaucoma, open-angle, 70
Glomerulonephritis, acute, 183
Goitre, 63
Gouty, arthritis, 163
Gynaecology and obstetrics, 89

Haemorrhage, antepartum, 92
Haemorrhage, postpartum, 92
Haemostatic and bleeding disorders, 76
Haemotological conditions, 75
Head injuries, 241
Headache, 40
Headache, tension, 41
Hearing impairment, 54
Heart disease, valvular, 29
Helminthic infestations, 157
Herpes stomatitis, cold sore, fever blister, 50
Herpes zoster (shingles), 130
HIV/AIDS, 131
Hypertension, 25
Hypertension, pregnancy-induced, pre-eclampsia and eclampsia, 99
Hypoglycaemia and hypoglycaemic coma, 217

Immunization (paediatric), 114
Impetigo, 195
Infections and infestations, 128
Infertility, 89
Influenza. *See* common cold
Iritis, 73

Laryngitis, 58

Malaria, 137
Malnutrition, acute, 170
Measles, 139
Meningitis, 140
Micronutrient deficiencies, 173
Migraine, 43
Musculoskeletal conditions, 163
Myocardial infarction, acute, 215

Neonatal conditions, 122
Newborn conjunctivitis, 67
Nipples, cracked, during breastfeeding, 95
Nose bleed (epistaxis), 59
Nose, ear, and throat disorders, 52
Nutritional conditions, 170

Obstetrics, gynaecology and , 89
Open-angle glaucoma, 70
Ophthalamia neonatorum, 67
Osteoarthritis, 164
Osteomyelitis, 165

Swaziland_FINAL press.indb 256 5/19/12 2:51 PM

Otitis externa, 52
Otitis media, 53

Paediatric conditions, 114
Pain, 206
Pain management and palliative care, 206
Pain management strategy for adults, 209
Pain management strategy for children, 212
Pelvic inflammatory disease, 102
Peptic ulcer disease, 86
Pneumocystis carinii pneumonia, 191
Pneumonia (pyogenic), 190
Poisoning, 242
Poliomyelitis, 141
Postpartum haemorrhage, 92
Pre-eclampsia, 99
Pregnancy, anaemia of, 91
Pregnancy, ectopic, 97
Pregnancy-induced hypertension—pre-eclampsia and eclampsia, 99
Psychiatry, 175
Psychoses, 177
Puerperal sepsis, 96
Pulmonary oedema, acute, 216
Pyelonephritis, acute, 184
Pyogenic arthritis. *See* septic arthritis
Pyomyositis, 166

Renal and urinary tract conditions, 182
Respiratory conditions, 185
Rheumatic fever, acute, 28, 145
Rheumatoid arthritis, 167
Rhinitis, allergic , 56
Ringworm of the body. *See* tinea corporis

Scabies , 203
Seborrhoeic eczema, 200
Sepsis, puerperal, 96
Septic arthritis (pyogenic arthritis), 168
Septicaemia, 147
Sexual assault, 104
Sexually transmitted infections, 146
Shingles, 130
Shock, 218
Sickle cell disease, 78
Sinusitis, 54
Skin conditions, 193
Sprains and strains, 253
Spring catarrh (vernal catarrh), 72
Status epilepticus, 35
Stings, bites and, 229
Stye (external hordeolum), 73

Tension headache, 41
Tetanus, 148
Threatened abortion, 90
Throat, ear, and nose disorders, 52
Thrush (oral candidiasis), 45
Tinea corporis (ringworm of the body), 202
Tinea pedis (athlete's foot), 201
Tonsillitis, 57
Trachoma, 71
Trauma, emergencies and, 214
Tuberculosis, 151
Typhoid fever (enteric fever), 155

Ulcer, genital, 103
Urinary tract (and renal) conditions, 182
Urticaria, 205
Uterine bleeding, dysfunctional , 98

Vaginal discharge, abnormal, 100
Valvular heart disease, 29
Vernal catarrh (spring catarrh), 72
Viral conjunctivitis, 66

Swaziland_FINAL press.indb 257 5/19/12 2:51 PM

Swaziland_FINAL press.indb 258 5/19/12 2:51 PM

SECTION B

Essential Medicines List

Swaziland_FINAL press.indb 260 5/19/12 2:51 PM

THE ESSENTIAL MEDICINES LIST

How to Use the Essential Medicines List

The essential medicine list (EML) content in section B is divided broadly into 14 primary sections according to the international Anatomical Therapeutic Chemical (ATC) classification system. Medicines are divided into groups according to the organ or system on which they act and their chemical, pharmacological, and therapeutic properties. The specific ATC codes, however, are not included because they are of no practical use for health workers. The medicines are listed according to their generic names.

Explanation of columns in the EML:

- **Column 1: Medicine.** This column contains the generic name of the medicine.
- **Column 2: Strength.** This column contains the different strengths of the preparations in the list. Combination strengths are illustrated by a + sign (e.g., rifampicin + isoniazid (150 mg + 75 mg) tablet. All strengths are for adults unless otherwise indicated.
- **Column 3: Dosage form.** This column describes the dosage form in which the medicines are available.
- **Column 4: Level.** This column describes at which level of care the medicine can be ordered and prescribed.
  - **A**—Indicates medicines that are distributed to all health care facilities as part of primary health care services. Both doctors and nurses can prescribe medicines from this class.
  - **B**—Indicates medicines that are distributed to health centres and hospitals. The prescribing of these medicines is restricted to medical doctors only.
  - **C**—Indicates medicines that are distributed to hospitals only. Medicines in this class can only be prescribed by medical doctors working in hospitals, following appropriate microbial or diagnostic test results.
  - **S**—Indicates medicines that are distributed on demand by specialist doctors.
  - **Asterisk (*)**—Indicates medicines that are distributed by (vertical) national programmes (e.g., tuberculosis, mental health, family planning, EPI, and malaria control).
- **Column 5: VEN.** The VEN classification describes the various medicines according to the importance of their therapeutic effect. It serves as a guide to prioritise medicine ordering in cases where budgets are insufficient to keep all EML medicines in stock.

Swaziland_FINAL press.indb 261 5/19/12 2:51 PM

- **V**—These medicines are considered vital and should be in stock at the respective levels at all times. These medicines are mostly used for life-threatening conditions and/or for treatment that should not be stopped.
- **E**—These medicines are essential for the health services. If at all possible, they should be available at the health facilities. They include medicine that are effective against less severe, but nevertheless widespread, illnesses.
- **N**—These medicines are nonessential. If they are not available for prescribing, however, no serious negative impact on the population's health is expected. In times of budgetary constraints, these medicines are of lowest priority.

Feedback and Requests for Changes

Comments on and requests for changes to the STG or EML should be discussed in institutional Pharmacy Therapeutic Committees and forwarded with recommendations to the Pharmaceutical Services Department at the Ministry of Health.

Proposals for changes must be submitted using the appropriate form (refer to annex 2 of this document). It is important that sufficient evidence be submitted (preferably controlled clinical trials) to support any changes.

Swaziland_FINAL press.indb 262 5/19/12 2:51 PM

Medicine	Strength	Dosage Form	Level	VEN
ALIMENTARY TRACT AND METABOLISM				
Oral and mouth preparations, stomatological medicines				
Chlorhexidine gluconate	0.20%	Liquid	B	N
Gentian violet	0.50%	Solution	A	E
Glycerine thymol	10% + 0.05%	Liquid	A	E
Lidocaine	2%	Dental cartridge	A	E
Lidocaine	2%	Gel	A	E
Miconazole	2%	Gel	A	E
Nystatin	100,000 IU/mL	Oral suspension	A	E
Nystatin	100,000 IU	Tablet	S	E
Antacids, antiflatulents				
Magnesium hydroxide	425 mg/5 mL	Suspension	B	E
Magnesium trisilicate	—	Suspension	A	E
Magnesium trisilicate	—	Tablet	A	E
Antipeptic ulcerants				
Omeprazole	10 mg	Capsule or entero-coated tablet	B	E
Omeprazole	20 mg	Capsule or entero-coated tablet	B	E
Ranitidine	50 mg/2 mL	Injection	B	E
Ranitidine	150 mg	Tablet	B	E
Antispasmodics and anticholinergics				
Hyoscine butylbromide	10 mg	Tablet	A	E
Hyoscine butylbromide	20 mg/mL	Injection	A	E
Antiemetics and antinauseants				
Cyclizine	50 mg	Tablet	B	N
Metoclopramide	10 mg	Tablet	B	E
Metoclopramide	5 mg/mL	Injection (2 mL)	B	E
Ondansetron	4 mg	Tablet	S	E
Prochlorperazine	12.5 mg/mL	Injection (2 mL)	B	E
Prochlorperazine	5 mg	Tablet	B	E
Promethazine	5 mg/mL	Syrup	A	E

Swaziland_FINAL press.indb 263 5/19/12 2:51 PM

Medicine	Strength	Dosage Form	Level	VEN
Promethazine	25 mg/mL	Injection (2 mL)	A	V
Promethazine	10 mg	Tablet	A	E
Laxatives				
Bisacodyl	5 mg	Tablet	A	E
Bisacodyl	10 mg	Suppository	A	N
Glycerine BP	100%	Liquid	A	N
Glycerine, adult	1.698 mL/2.4 g	Suppository	B	N
Glycerine, paediatric	0.891 mL/1.26 g	Suppository	B	N
Sennosides A + B	20 mg (total)	Tablet	B	E
Antihaemorrhoidals				
Anugesic (pramocaine + bismuth subgallate + bismuth oxide + bismuth subiodide + resorcinol + balsam peru + benzyl benzoate + zinc oxide + boric acid)	—	Suppository	B	N
Bismuth subgallate compound (bismuth subgallate + bismuth oxide + zinc oxide)	59 mg + 24 mg + 296 mg	Suppository	B	E
Liquid paraffin BP	—	Liquid	A	N
Antidiarrhoeals, intestinal anti-inflammatory, and anti-infective agents				
Loperamide	2 mg	Tablet	A	E
Oral rehydration salts	—	Powder	A	V
Sulphasalazine	250 mg	Tablet	S	E
Insulins				
Insulin, isophane	100 units/mL	Injection	B	V
Insulin, soluble	100 units/mL	Injection	B	V
Insulin, zinc	100 units/mL	Injection	B	V
Insulin + isophane (30/70)	100 units/mL	Injection	B	V
Oral antidiabetics				
Glibencalmide	5 mg	Tablet	B	E
Gliclazide	80 mg	Tablet	B	E
Metformin	500 mg	Tablet	B	E
Metformin	850 mg	Tablet	B	E

Swaziland_FINAL press.indb 264 5/19/12 2:51 PM

Medicine	Strength	Dosage Form	Level	VEN
Vitamins				
Vitamin A (retinol)	100,000 IU	Capsule	A	V
Vitamin B1 (thiamine)	100 mg	Tablet	A	E
Vitamin B1 (thiamine)	100 mg/mL	Injection	A	N
Vitamin B12 (cyanocobalamin)	1,000 micrograms/ mL	Injection	S	E
Vitamin B6 (pyridoxine hydrochloride)	25 mg	Tablet	A	E
Vitamin B complex	—	Injection	A	N
Vitamin B complex	—	Tablet	A	N
Vitamin C (ascorbic acid)	100 mg	Tablet	A	N
Cod liver oil (vitamin A + vitamin D)	—	Capsule	B	N
Multivitamin	—	Tablet	A	N
Multivitamin	—	Syrup	A	N
Nicotinamide	50 mg	Tablet	A	E
Mineral supplements				
Calcium gluconate	10%	Injection	A	E
Calcium gluconate	300 mg	Tablet	A	E
Magnesium sulphate	50%	Injection	B	V
Potassium chloride	20%	Injection	B	V
Potassium chloride	600 mg	Slow-release tablet	B	E
Sodium bicarbonate	4%	Injection	A	V
Sodium bicarbonate	8.4%	Injection	A	V
Sodium bicarbonate	4.2%	Infusion	A	V
Sodium chloride	20%	Injection	A	E
Zinc (as sulphate)	20 mg	Tablet	A	E
Total parenteral nutrition				
Pre-filled 3-chamber total parenteral nutrition bag with electrolytes	—	—	S	E
BLOOD AND BLOOD-FORMING ORGANS				
Blood substitutes				
Albumin	4%	Injection	S	E
Albumin	20%	Injection	S	E
Dextran	70%	Injection	B	V

Swaziland_FINAL press.indb 265 5/19/12 2:51 PM

Medicine	Strength	Dosage Form	Level	VEN
Anticoagulants				
Acetylsalicylic acid (aspirin)	150 mg	Tablet	A	E
Enoxoparin sodium SC	40 mg/mL	Injection	S	E
Heparin	5,000 IU/mL	Injection (5 mL)	C	V
Warfarin	5 mg	Tablet	B	V
Anti-anaemics				
Erythropoietin	4,000 IU/mL	Injection	S	E
Ferric hydroxide sucrose complex	100 mg/mL	Infusion	B	E
Ferrous fumarate + folic acid	200 mg + 100 micrograms	Tablet	A	E
Ferrous sulphate	200 mg (iron)	Tablet	A	E
Ferrous sulphate	300 mg/10 mL	Syrup	A	E
Folic acid	5 mg	Tablet	A	E
Antihaemorrhagics				
Phytomenadione	10 mg/mL	Injection	B	E
Phytomenadione	2 mg/mL	Injection	A	V
Phytomenadione	10 mg	Tablet	A	V
Tranexamic acid	250 mg/mL	Injection	B	E
Tranexamic acid	500 mg	Tablet	B	N
IV solutions				
Darrows	Half-strength with 5% dextrose 200 mL	Infusion	A	V
Dextrose	5%	Infusion	A	V
Dextrose	10%	Infusion	B	V
Dextrose	50%	Infusion	B	V
Dextrose + sodium chloride	5% + 0.9%	Infusion	A	V
Maintenance solution + 10% glucose (Maintelyte®)	1,000 mL	Infusion	B	V
Mannitol	20%	Infusion	A	E
Neolyte	—	Infusion	B	V
Pentastarch	6%	Infusion	B	V
Pentastarch	10%	Infusion	B	V
Plasmalyte B	1,000 mL	Infusion	B	V
Polygeline (Haemaccel®)	—	Infusion	B	V

Swaziland_FINAL press.indb 266 5/19/12 2:51 PM

Medicine	Strength	Dosage Form	Level	VEN
Sodium chloride 0.9%	200 mL	Solution	A	V
Sodium chloride 0.9%	1,000 mL	Solution	A	V
Ringer's lactate	1,000 mL	Solution	A	V
Water				
Water for injection	10 mL	Injection	A	V
CARDIOVASCULAR SYSTEM				
Cardiac therapy				
Adrenaline	1 mg/mL	Injection	A	V
Amiodarone	200 mg	Tablet	B	E
Atropine	0.5 mg/mL	Injection	A	V
Digoxin	0.5 mg/2 mL	Injection	S	E
Digoxin	0.0625 mg	Tablet	S	E
Digoxin	0.25 mg	Tablet	S	N
Glyceryl trinitrate	0.5 mg	Tablet	B	V
Isosorbide dinitrate	5 mg	Tablet	B	E
Lidocaine	2%	Injection	B	V
Quinine	300 mg	Tablet	B	N
Antihypertensives and antihypotensives				
Dihydralazine	20 mg/mL	Injection	B	V
Methyldopa	250 mg	Tablet	S (pregnancy HT)	V
Diuretics				
Furosemide	20 mg/2 mL	Injection	B	V
Furosemide	40 mg	Tablet	B	E
Hydrochlorothiazide	25 mg	Tablet	B	V
Spironolactone	25 mg	Tablet	B	E
Spironolactone	100 mg	Tablet	B	N
Beta-blocking agents				
Atenolol	50 mg	Tablet	B	E
Carvedilol	12.5 mg	Tablet	B	E
Propranolol	10 mg	Tablet	B	E
Propranolol	40 mg	Tablet	B	E
Calcium channel blockers				
Amlodipine	50 mg	Tablet	B	E
Diltiazem	60 mg	Tablet	B	N

Swaziland_FINAL press.indb 267 5/19/12 2:51 PM

Medicine	Strength	Dosage Form	Level	VEN
Nifedipine	10 mg	Tablet	B	E
Nifedipine	20 mg	Slow-release tablet	B	E
Agents acting on the renin-angiotensin system				
Captopril	12.5 mg	Tablet	S (paediatric only)	E
Enalapril	5 mg	Tablet	B	E
Enalapril	20 mg	Tablet	B	E
Irbesartan	150 mg	Tablet	B	E
Lipid modifying agents				
Atorvastatin	10 mg	Tablet	B	E
Simvastatin	10 mg	Tablet	B	E
DERMATOLOGICALS				
Antifungals for dermatogical use				
Benzoic acid	6%	Ointment	A	N
Clotrimazole	1%	Cream	A	E
Ketoconazole	2%	Cream	A	E
Selenium sulphide	2%	Suspension	A	N
Sulphur	2%	Cream	A	N
Emollients and protectives				
Aqueous cream	—	Cream	A	N
Emulsifying ointment (emulsifying wax + white soft paraffin + liquid paraffin)	30% + 50% + 20%	Ointment	A	N
Zinc oxide	15%	Ointment	A	N
Antipruritics				
Calamine	15%	Lotion	A	N
Antipsoriatics				
Salicylic acid	3%	Ointment	A	N
Antibiotics and chemotherapeutics for dermatological use				
Acyclovir	5%	Cream	A	E
Podophyllin	15%	Paint	A	E
Silver nitrate (caustic pencil)	40%	Pencil	A	E
Silver sulphadiazine	1%	Cream	A	E
Trichloroacetic acid	80–90%	Solution	A	E

Swaziland_FINAL press.indb 268 5/19/12 2:51 PM

Medicine	Strength	Dosage Form	Level	VEN
Corticosteroids for dermatological use				
Beclomethasone	0.10%	Cream	B	E
Hydrocortisone	1%	Cream	B	E
Antiseptics and disinfectants				
Cetrimide + chlorhexidine (Savlon®)	(3 g + 0.3 g)/100 mL	Solution	A	N
Chloroxylenol (Dettol®)	4.8%	Solution	A	N
Chlorhexidine gluconate	5%	Solution	A	E
Chlorhexidine gluconate	20%	Solution	A	E
Ethanol	95–98%	Solution	A	E
Glutaraldehyde (Cidex)	2.4%	Solution	B	E
Glutaraldehyde (G-Cide)	3.4%	Solution	A	E
Glycerine BP	99.5%	Liquid	A	N
Hydrogen peroxide	6%	Solution	A	N
Methylated spirit	95%	—	A	E
Povidone iodine	10%	Cream	A	E
Povidone iodine	10%	Solution	A	E
Povidone iodine	7.50%	Scrub	A	N
Sodium hypochlorite (sterilising fluid)	1%	Solution	A	E
Anti-acne preparations				
Benzoyl peroxide	5%	Gel	A	N
Salicylic acid	3%	Ointment	A	N
Medicated dressings				
Soft paraffin	—	Gauze	B	N
Other dermatological preparations				
Lubricating jelly	—	Ointment	A	N
Methyl salicylate	50%	Ointment	A	N
GENITOURINARY SYSTEM AND SEX HORMONES				
Gynaecological anti-infectives and antiseptics				
Clotrimazole	500 mg	Vaginal tablet	A	E
Miconazole	200 mg	Vaginal pessary	A	E
Nystatin	100,000 IU	Vaginal pessary	B	E
Potassium citrate	30%	Solution	B	N
Oxytocics				
Ergometrine	0.5 mg/mL	Injection	A	V

Swaziland_FINAL press.indb 269 5/19/12 2:51 PM

Medicine	Strength	Dosage Form	Level	VEN
Ergometrine + oxytocin	0.5 mg + 5 IU/mL	Injection	A	V
Misoprostol	200 micrograms	Tablet	S	N
Topical contraceptives, barrier methods				
Condoms (latex, female)			A	V
Condoms (latex, male)			A	V
Intrauterine [contraceptive] device (IUD)	260 mg Cu		B	E
Modulators of the genital system				
Clomiphene	50 mg	Tablet	B	E
Hormonal contraceptives, systemic				
Levonorgestrel + ethinylestradiol	150 micrograms + 30 micrograms	Tablet	A*	E
Norethisterone	5 mg	Tablet	B	E
Norethisterone enanthate	200 mg/mL	Injection	A*	E
Norgestrel + ethinylestradiol	500 micrograms + 50 micrograms	Tablet	A*	E
Estrogens				
Conjugated estrogen	0.625 mg	Tablet	B	E
Progestogen				
Medroxyprogesterone acetate	150 mg	Injection	B	E
Norethindrone	300 mg	Tablet	B	E
Prostaglandins				
Dinoprostone	0.5 mg	Gel	B	E
SYSTEMIC HORMONES, excluding SEX HORMONES				
Pituitary and hypothalamic hormones				
Oxytocin	5 IU/mL	Injection	B	V
Oxytocin	10 IU/mL	Injection	B	E
Systemic corticosteroids				
Dexamethasone	4 mg	Tablet	B	E
Dexamethasone	4 mg/mL	Injection	B	V
Hydrocortisone	100 mg	Injection	B	V
Prednisolone	5 mg	Tablet	A	V
Thyroid preparations				
Carbimazole	5 mg	Tablet	C	E
Levothyroxine sodium	50 micrograms	Tablet	C	E

Swaziland_FINAL press.indb 270 5/19/12 2:51 PM

Medicine	Strength	Dosage Form	Level	VEN
GENERAL ANTI-INFECTIVES, SYSTEMIC				
Cephalosporins				
Cefaclor	375 mg	Tablet	B	E
Cefaclor	187 mg/5 mL	Suspension	B	E
Cefazoline	1 g	Injection	B	E
Cefixime	400 mg	Tablet	C	V
Ceftriaxone	250 mg	Powder for injection	B	V
Ceftriaxone	1 g	Powder for injection	C	E
Cefuroxime	250 mg	Powder for injection	A	V
Penicillins				
Amoxicillin	250 mg	Capsule	A	V
Amoxicillin	500 mg	Capsule	A	V
Amoxicillin	125 mg/5 mL	Syrup	A	V
Amoxicillin	500 mg	Injection	A	V
Amoxicillin + clavulanic acid	125 mg + 31 mg	Suspension	B	E
Amoxicillin + clavulanic acid	500 mg + 125 mg	Tablet	B	E
Amoxicillin + clavulanic acid	250 mg + 125 mg	Tablet	B	E
Ampicillin	250 mg	Powder for injection	A	V
Ampicillin	500 mg	Powder for injection	A	V
Benzathine benzylpenicillin	2.4 million IU	Powder for injection	A	V
Benzylpenicillin	1 million IU	Powder for injection	A	E
Benzylpenicillin	5 million IU	Powder for injection	A	E
Cloxacillin	125 mg/5 mL	Syrup	A	E
Cloxacillin	250 mg	Capsule	A	E
Cloxacillin	500 mg	Powder	A	E
Flucloxacillin	250 mg	Capsule	B	N
Flucloxacillin	125 mg/5 mL	Suspension	B	N
Phenoxymethylpenicillin	250 mg	Tablet	A	V

Swaziland_FINAL press.indb 271 5/19/12 2:51 PM

Medicine	Strength	Dosage Form	Level	VEN
Phenoxymethylpenicillin	125 mg/5 mL	Suspension	A	V
Procaine penicillin	3 g (3 million IU)	Powder for injection	A	V
Tetracyclines				
Doxycycline	100 mg	Capsule	A	V
Amphenicols				
Chloramphenicol	1 g	Powder for injection	A	E
Chloramphenicol	125 mg/5mL	Suspension	A	E
Chloramphenicol	250 mg	Capsule	A	E
Sulphonamides with anti-infectives in combination				
Co-trimoxazole (trimethoprim + sulfamethoxazole)	100 mg + 20 mg	Tablet	A	V
Co-trimoxazole	400 mg + 80 mg	Tablet	A	E
Co-trimoxazole	(200 mg + 40 mg)/ 5 mL	Suspension	A	E
Co-trimoxazole	400 mg + 80 mg	Injection	B	V
Co-trimoxazole DS	800 mg +160 mg	Tablet	A	V
Macrolides, lincosamides, and streptogramins				
Azithromycin	1 g	Tablet	A	V
Clarithromycin	125 mg/5 mL	Suspension	B	V
Clarithromycin	250 mg	Tablet	S	V
Clindamycin	600 mg/4 mL	Injection	C	E
Clindamycin	150 mg	Capsule	C	E
Clindamycin	75 mg/5 mL	Suspension	C	E
Erythromycin	125 mg/5 mL	Syrup	A	V
Erythromycin	250 mg	Tablet	A	V
Aminoglycosides				
Gentamicin	10 mg/mL	Injection	A	V
Gentamicin	40 mg/mL	Injection	A	V
Spectinomycin	2 g	Injection	A	E
Streptomycin	1 g	Injection	B*	V
Vancomycin	1 g	Injection	C	E
Quinolone antibacterials				
Ciprofloxacin	500 mg	Tablet	A	V
Ciprofloxacin	250 mg	Tablet	C	V

Swaziland_FINAL press.indb 272 5/19/12 2:51 PM

Medicine	Strength	Dosage Form	Level	VEN
Ciprofloxacin	2 mg/mL	Injection	C	V
All other antibacterials				
Nitrofurantoin	100 mg	Tablet	C	E
Systemic antimycotics				
Amphotericin B	50 mg	Powder for injection	B	V
Fluconazole	200 mg	Tablet	B	E
Fluconazole	50 mg/5 mL	Suspension	B	E
Fluconazole	2 mg/mL	Injection	B	E
Griseofulvin	125 mg	Tablet	A	E
Griseofulvin	500 mg	Tablet	A	E
Tuberculostatics, excluding streptomycin				
Amikacin	250 mg	Injection	B*	V
Capreomycin	1 g	Injection	S*	V
Clofazimine	100 mg	Tablet	S*	V
Cycloserine	250 mg	Capsule	S*	V
Ethambutol	100 mg	Tablet	B*	V
Ethambutol	400 mg	Tablet	B*	V
Ethionamide	250 mg	Tablet	S*	V
Isoniazid	100 mg	Tablet	B*	V
Isoniazid	300 mg	Tablet	B*	V
Kanamycin	1 g	Injection	S*	V
Levofloxacin	250 mg	Tablet	B*	V
Moxifloxacin	400 mg	Tablet	S*	V
Ofloxacin	250 mg	Tablet	S*	V
p-amino salicylic acid	4 g	Sachet	B*	V
Pyrazinamide	500 mg	Tablet	B*	V
Rifampicin	100 mg/5 mL	Syrup	B*	V
Rifampicin	150 mg	Capsule	B*	V
Rifampicin	450 mg	Tablet	B*	V
Rifampicin + isoniazid	60 mg + 30 mg	Tablet	B*	V
Rifampicin + isoniazid	150 mg + 75 mg	Tablet	B*	V
Rifampicin + isoniazid + pyrazinamide	60 mg + 30 mg + 150 mg	Tablet	B*	V
Rifampicin + isoniazid + pyrazinamide + ethambutol	150 mg + 75 mg + 400 mg + 275 mg	Tablet	B*	V
Terizidone	250 mg	Capsule	B*	V

Swaziland_FINAL press.indb 273 5/19/12 2:51 PM

Medicine	Strength	Dosage Form	Level	VEN
Leprostatics				
Clofazimine	100 mg	Capsule	S*	V
Dapsone	100 mg	Tablet	B*	V
Antivirals for systemic use				
Acyclovir	400 mg	Tablet	A	E
Ganciclovir	500 mg/vial	Injection	S	N
Antiretrovirals				
Abacavir	300 mg	Tablet	B*	V
Abacavir	20 mg/mL	Solution	B*	V
Abacavir + lamivudine	60 mg + 30 mg	Tablet	B*	V
Didanosine	25 mg	Tablet	B*	V
Didanosine	125 mg	Tablet	B*	V
Didanosine	200 mg	Tablet	B*	V
Didanosine	250 mg	Tablet	B*	V
Didanosine	400 mg	Tablet	B*	V
Efavirenz	50 mg	Capsule or tablet	B*	V
Efavirenz	200 mg	Capsule or tablet	B*	V
Efavirenz	600 mg	Caplet	B*	V
Indinavir	200 mg	Capsule	B*	V
Indinavir	400 mg	Capsule	B*	V
Lamivudine	150 mg	Tablet	B*	V
Lamivudine	50 mg/5 mL	Solution	B*	V
Lopinavir + ritonavir	100 mg + 25 mg	Tablet	B*	V
Lopinavir + ritonavir	200 mg + 50 mg	Tablet	B*	V
Lopinavir + ritonavir	(80 mg + 20 mg)/ 1 mL	Solution	B*	V
Nelfinavir	250 mg	Tablets	B*	V
Nevirapine	200 mg	Tablet	B*	V
Nevirapine	10 mg/mL	Solution	B*	V
Nevirapine	50 mg/5 mL	Syrup	B*	V
Ritonavir	100 mg	Tablet	B*	V
Saquinavir	200 mg	Capsule	B*	V
Stavudine	15 mg	Capsule	B*	V
Stavudine	20 mg	Capsule	B*	V
Stavudine	30 mg	Capsule	B*	V

Swaziland_FINAL press.indb 274 5/19/12 2:51 PM

Medicine	Strength	Dosage Form	Level	VEN
Stavudine + lamivudine	12 mg + 60 mg	Tablet	B*	V
Stavudine + lamivudine	30 mg + 150 mg	Tablet	B*	V
Stavudine + lamivudine + nevirapine	12 mg + 60 mg + 100 mg	Tablet	B*	V
Stavudine + lamivudine + nevirapine	30 mg + 150 mg + 200 mg	Tablet	B*	V
Tenofovir	300 mg	Tablet	B*	V
Tenofovir + lamivudine	300 mg + 300 mg	Tablet	B*	V
Tenofovir + lamivudine + efavirenz	300 mg +300 mg + 600 mg	Tablet	B*	V
Zidovudine	50 mg/5 mL	Syrup	B*	V
Zidovudine	100 mg	Tablet	B*	V
Zidovudine	300 mg	Tablet	B*	V
Zidovudine + lamivudine	60 mg + 30 mg	Tablet	B*	V
Zidovudine + lamivudine	300 mg + 150 mg	Tablet	B*	V
Zidovudine + lamivudine + efavirenz	300 mg + 150 mg + 600 mg	Tablet	B*	V
Zidovudine + lamivudine + nevirapine	300 mg + 150 mg + 200 mg	Tablet	B*	V
Zidovudine + lamivudine + nevirapine	60 mg + 30 mg + 50 mg	Tablet	B*	V
Immune sera and immunoglobulins				
Anti-D (RH) immunoglobulin	200 mg	Injection	C	V
Antivenom polyvalent	—	Injection	B	V
Rabies immunoglobulin (human)	300 IU/2 mL	Injection	C	V
Vaccines and tests				
BCG	—	Injection	A*	V
Diphtheria + pertussis + tetanus	—	Injection	A*	V
Diphtheria + tetanus	—	Injection	A*	V
Hepatitis B	—	Injection	A*	V
Measles	—	injection	A*	V
Pentavalent combination vaccine (DPTw-HB/Hib)	—	Injection	A*	V
Poliomyelitis	—	Oral with a dropper	A*	V

Swaziland_FINAL press.indb 275 5/19/12 2:51 PM

Medicine	Strength	Dosage Form	Level	VEN
Rabies (purified Vero rabies vaccine)	—	Injection	A*	V
Tetanus immunoglobulin	250 IU/2 mL	Injection	A*	V
Tetanus toxoid	40 IU/5 mL	Injection	A*	V
Tuberculin, Mantoux test (diagnostic)	—	Injection	A*	E
Tuberculin, TINE test (screening)	—	Dry powder	A*	E
Typhoid	—	Injection	A*	V
Yellow fever	—	Injection	A*	V
ANTINEOPLASTICS AND IMMUNOMODULATING AGENTS				
Cytostatic agents				
Adriamycin	50 mg/5 mL	Injection	S	E
Bleomycin	15,000 IU	Powder for injection	S	E
Cyclophosphamide	25 mg	Tablet	S	E
Cyclophosphamide	500 mg/vial	Injection	S	E
Dacarbazine	200 mg/vial	Injection	S	E
Fluorouracil	50 mg/mL	Injection	S	E
Methotrexate	25 mg/mL	Injection	S	E
Methotrexate	2.5 mg	Tablet	S	E
Vinblastine	10 mg/mL	Injection	S	E
Vincristine	2 mg/mL	Injection	S	E
Endocrine therapy				
Tamoxifen	10 mg	Tablet	S	E
Immunosuppressants				
Azathioprine	50 mg	Tablet	S	E
Cyclosporine	25 mg	Capsule	S	E
Cyclosporine	50 mg/5 mL	Injection	S	E
MUSCULOSKELETAL SYSTEM				
Anti-inflammatory and antirheumatic products (including paracetamol)				
Acetylsalicylic acid (aspirin)	300 mg	Tablet	A	E
Diclofenac	75 mg	Injection	A	E
Diclofenac	1%	Gel	S	E
Diclofenac	50 mg	Tablet	B	E
Diclofenac	25 mg	Suppository	B	E

Swaziland_FINAL press.indb 276 5/19/12 2:51 PM

Medicine	Strength	Dosage Form	Level	VEN
Ibuprofen	200 mg	Tablet	A	E
Ibuprofen	400 mg	Tablet	A	E
Ibuprofen	100 mg/mL	Syrup	A	E
Indomethacin	25 mg	Capsule	A	E
Mefenamic acid	500 mg	Capsule	A	E
Paracetamol	500 mg	Tablet	A	E
Paracetamol	125 mg/5 mL	Syrup	A	E
Muscle relaxants				
Alcuronium chloride	10 mg/2 mL	Injection	B	V
Pancuronium bromide	4 mg/2 mL	Injection	B	V
Suxamethonium	100 mg/2 mL	Injection	B	E
Anti-gout preparations				
Allopurinol	300 mg	Tablet	A	E
Colchicine	0.5 mg	Tablet	A	N
NERVOUS SYSTEM				
General anaesthetics				
Enflurane	250 mL	Liquid	B	E
Etomidate	2 mg/mL	Injection	S	E
Fentanyl	500 micrograms/mL	Injection	B	E
Halothane	250 mL	Liquid	B	V
Isoflurane	100 mL	Liquid	B	E
Isoflurane	250 mL	Liquid	B	E
Ketamine	50 mg/mL	Injection	B	E
Nitrous oxide	100%	Gas	B	V
Propofol	10 mg/mL	Injection	B	E
Thiopental sodium	1 mg/10 mL	Injection	B	E
Local anaesthetics				
Bupivacaine hydrochloride	5 mg/mL	Injection	B	V
Ephedrine	50 mg/mL	Injection	B	E
Ethyl chloride	100 mL	Spray	A	N
Lignocaine	20 mg/mL	Injection	C	V
Lignocaine	10%	Spray	C	N
Lignocaine-epinephrine	20 mg/mL	Dental cartridge	B	E
Opioid analgesics				
Codeine phosphate	30 mg	Tablet	B	E

Swaziland_FINAL press.indb 277 5/19/12 2:51 PM

Medicine	Strength	Dosage Form	Level	VEN
Methadone	2 mg/5 mL	Syrup	A	E
Morphine	15 mg/mL	Injection	B	V
Morphine	10 mg	Slow-release tablet	B	E
Morphine	5 mg/5 mL	Powder for solution	B	E
Paracetamol + codeine phosphate	500 mg + 8 mg	Tablet	B	E
Pethidine	50 mg/mL	Injection	B	E
Pethidine	100 mg/mL	Injection	B	E
Tramadol hydrochloride	50 mg	Tablet	B	N
Tramadol hydrochloride	50 mg/mL	Injection	B	N
Anti-migraine preparations				
Ergotamine + caffeine	2 mg + 100 mg	Tablet	B	N
Sumatriptan	4 mg/0.5 mL	Injection	A	N
Sumatriptan	6 mg/0.5 mL	Injection	A	N
Sumatriptan	25 mg	Intranasal solution	A	N
Sumatriptan	50 mg	Intranasal solution	A	N
Sumatriptan	5 mg	Tablet	A	N
Sumatriptan	20 mg	Tablet	A	N
Sumatriptan	100 mg	Tablet	A	N
Anti-epileptics				
Carbamazepine	100 mg/5 mL	Suspension	B*	E
Carbamazepine	200 mg	Tablet	B*	V
Carbamazepine	200 mg	Controlled-release tablet	B*	E
Clonazepam	0.5 mg	Tablet	B	N
Clonazepam	2 mg	Tablet	B	N
Ethosuximide	250 mg	Capsule	B	E
Phenobarbitone	15 mg/5 mL	Syrup	B	E
Phenobarbitone	15 mg	Tablet	B	E
Phenobarbitone	30 mg	Tablet	B	E
Phenobarbitone	200 mg/mL	Injection	B	E
Phenytoin	125 mg/5 mL	Suspension	B*	E
Phenytoin	250 mg/5 mL	Injection	B*	E

Swaziland_FINAL press.indb 278 5/19/12 2:51 PM

Medicine	Strength	Dosage Form	Level	VEN
Phenytoin	100 mg	Tablet	B*	V
Sodium valproate	50 mg/5 mL	Solution	B*	N
Sodium valproate	200 mg	Tablet	B*	N
Sodium valproate	500 mg	Tablet	B*	N
Sodium valproate	400 mg	Injection	B*	N
Antiparkinsons agents				
Biperiden	2 mg	Tablet	B	E
Biperiden	5 mg	Injection	B	E
Bromocriptine	2.5 mg	Tablet	B	N
Carbidopa + levodopa	25 mg + 100 mg	Tablet	S	E
Carbidopa + levodopa	50 mg + 200 mg	Tablet	S	E
Orphenadrine	50 mg	Tablet	B*	E
Trihexyphenidyl (benzexhol)	2 mg	Tablet	B*	E
Trihexyphenidyl (benzexhol)	5 mg	Tablet	B*	E
Anti-psychotic agents				
Chlorpromazine	50 mg	Tablet	A	E
Chlorpromazine	100 mg	Tablet	A	E
Chlorpromazine	100 mg	Injection	A	E
Flupenthixol	20 mg/mL	Injection	B*	E
Fluphenazine decanoate	25 mg/mL	Injection	C	V
Haloperidol	1.5 mg	Tablet	C	E
Haloperidol	5 mg	Tablet	C	E
Haloperidol	5 mg	Injection	C	E
Lithium carbonate	400 mg	Tablet	S*	E
Olanzapine	5 mg	Tablet	B*	E
Olanzapine	10 mg	Tablet	B*	E
Risperidone	2 mg	Tablet	B*	E
Risperidone	4 mg	Tablet	B*	E
Sulpiride	100 mg	Capsule	B*	E
Trifluoperazine	5 mg	Tablet	B*	E
Zuclopenthixol decanoate	200 mg	Injection	C	E
Anxiolytics				
Diazepam	5 mg	Tablet	B	E
Diazepam	10 mg/mL	Injection	B	V

Swaziland_FINAL press.indb 279 5/19/12 2:51 PM

Medicine	Strength	Dosage Form	Level	VEN
Lorazepam	2.5 mg	Tablet	B*	E
Lorazepam	4 mg/mL	Injection	B*	V
Antidepressants				
Amitriptyline	25 mg	Tablet	B	V
Fluoxetine	20 mg	Tablet	B	E
Gabapentin	300 mg	Capsule	S*	E
Imipramine	25 mg	Tablet	B*	E
Sertraline	50 mg	Tablet	B*	E
Psychostimulants				
Methylphenidate	10 mg	Tablet	S*	N
Other nervous system agents				
Neostigmine	2.5 mg/mL	Injection	S*	V
ANTIPARASITIC PRODUCTS, INSECTICIDES, AND REPELLANTS				
Antiprotozoal				
Metronidazole	500 mg/100 mL	Injection	B	V
Metronidazole	200 mg	Tablet	A	V
Metronidazole	125 mg/mL	Suspension	A	V
Tinidazole	500 mg	Tablet	A	N
Antimalarials				
Artemether + lumefantrine	20 mg + 120 mg	Tablet	A	V
Atovaquone	750 mg/5 mL	Suspension	B	N
Chloroquine	200 mg	Tablet	S	N
Mefloquine	250 mg	Tablet	A	N
Primaquine	15 mg	Tablet	A	E
Proguanil	100 mg	Tablet	A	E
Quinine	600 mg	Infusion	A*	V
Quinine sulphate	300 mg	Tablet	A*	V
Antihelmintics				
Albendazole	20 mg/mL	Suspension	A	E
Albendazole	200 mg	Tablet	A	E
Ivermectin	50 micrograms	Tablet	S	N
Mebendazole	100 mg	Tablet	A	E
Niclosamide	500 mg	Tablet	A	E
Praziquantel	600 mg	Tablet	A	V
Ectoparasiticides, including scabicides				
Benzyl benzoate	25%	Lotion	A	E

Swaziland_FINAL press.indb 280 5/19/12 2:51 PM

Medicine	Strength	Dosage Form	Level	VEN
Gamma benzene hydrochloride	1%	Lotion	B	N
RESPIRATORY SYSTEM				
Nasal decongestants and other decongestants for topical use				
Beclomethasone diproprionate	50 micrograms/ dose	Nasal spray	A	N
Fluticasone	50 micrograms/ dose	Nasal spray	B	N
Oxymetazoline	0.025%	Nasal drops	A	N
Oxymetazoline	0.05%	Nasal drops	A	N
Anti-asthmatics				
Aminophylline	250 mg/10 mL	Injection	B	V
Beclomethasone	50 micrograms	Inhaler	B	E
Beclomethasone	100 micrograms	Inhaler	B	E
Salbutamol	100 micrograms	Inhaler solution	A	E
Salbutamol	2 mg/5 mL	Syrup	A	E
Salbutamol	4 mg	Tablet	A	V
Salbutamol + ipratropium bromide	—	Nebulising solution	A	N
Salmeterol	25 micrograms/ dose	Inhaler	B	E
Theophylline anhydrous	200 mg	Tablet	A	E
Mucolytics				
Carbocisteine	250 mg/5 mL	Syrup	A	N
N-acetylcysteine	200 mg/mL	Injection	A	N
Systemic antihistamines				
Cetirizine	10 mg	Tablet	B	E
Cetirizine	1 mg/1 mL	Syrup	B	E
Chlorpheniramine	2 mg/5 mL	Syrup	A	E
Chlorpheniramine	4 mg	Tablet	A	E
Promethazine	25 mg/mL	Injection (2 mL)	A	V
Promethazine	10 mg	Tablet	A	E
Promethazine	5 mg/5 mL	Syrup	A	E
SENSORY ORGANS – OPTHALMOLOGICALS				
Anti-infectives				
Chloramphenicol	1%	Eye drops	A	E
Chloramphenicol	1%	Eye ointment	A	V
Gentamicin	0.30%	Eye drops	B	E

Swaziland_FINAL press.indb 281 5/19/12 2:51 PM

Medicine	Strength	Dosage Form	Level	VEN
Sulphacetamide	1%	Eye drops	B	E
Tetracycline	1%	Eye ointment	A	E
Antifungal				
Natamycin	5%	Eye drops	B	E
Natamycin	5%	Eye ointment	B	E
Corticosteroids				
Betamethasone	0.10%	Eye drops	B	E
Dexamethasone	0.10%	Eye drops	B	E
Fluorometholone	0.10%	Eye drops	B	N
Hydrocortisone	0.10%	Eye drops	B	E
Prednisolone	10%	Eye drops	B	E
Corticosteroids and anti-infectives in combination				
Betamethasone + neomycin	0.1% + 0.35%	Eye drops	B	N
Chloramphenicol + neomycin		Eye drops	B	N
Dexamethasone + chloramphenicol	0.1% + 0.5%	Eye drops	B	N
Dexamethasone + chloramphenicol + neomycin	0.1% + 0.5% + 0.35%	Eye drops	B	N
Antiglaucoma preparations and miotics				
Acetazolamide	250 mg	Tablet	B	E
Dorzolamide	10 mg/mL	Eye drops	B	E
Latanoprost	0.005%	Eye drops	B	E
Pilocarpine	2%	Eye drops	B	E
Pilocarpine	10 mg/0.5 mL	Injection	B	E
Timolol	0.25%	Eye drops	B	E
Timolol	0.50%	Eye drops	B	E
Mydiatrics and cycloplegics				
Atropine	10 mg/mL	Eye drops	B	E
Homatropine	20 mg/mL	Eye drops	B	E
Decongestants and anti-allergics				
Antazoline + tetryzoline	(0.5 mg + 0.4 mg)/mL	Eye drops	A	E
Oxymetazoline	0.05%	Eye drops	B	N
Sodium cromoglycate	2%	Eye drops	A	N

Swaziland_FINAL press.indb 282 5/19/12 2:51 PM

Medicine	Strength	Dosage Form	Level	VEN
Anaesthetics				
Oxybuprocaine	0.40%	Eye drops	B	E
Diagnostic agents				
Fluorescein	1%	Eye drops	S	E
Fluorescein sodium	1 mg	Paper strips	S	E
Tear replacements				
Hydroxypropyl methylcellulose	2%	Eye drops	B	N
Polyacrylic acid	2 mg/g	Liquid gel	B	N
Tears Naturelle®	—	Eye drops	B	N
SENSORY ORGANS–OTOLOGICALS				
Anti-infectives				
Chloramphenicol	1%	Ear drops	B	E
Ear wax removal				
Dichlorobenzene	2%	Ear drops	B	N
Diagnostic materials				
Impression material	—	—	B	N
Investment gel	—	—	B	N
Wax	—	—	B	N
SENSORY ORGANS–VARIOUS				
Antipoisoning agents				
Charcoal, activated	—	Powder	A	E
Dantrolene	20 mg/70 mL	—	B	E
Desferrioxamine	500 mg	Powder for injection	A	E
Flumazenil	0.1 mg	Injection	B	E
Ipecacuanha	—	Syrup	A	E
Methionine	—	Injection	A	E
Methylene blue	1%	Injection	B	E
Naloxone	0.02 mg/mL	Injection	A	V
Naloxone	0.4 mg/mL	Injection	A	V
Obidoxime chloride	250 mg/mL	Injection	B	E
Pralidoxime mesylate	250 mg/5 mL	Injection	B	E
Medical gases				
Oxygen	—	Gas	B	V

Swaziland_FINAL press.indb 283 5/19/12 2:51 PM

Medicine	Strength	Dosage Form	Level	VEN
Diagnostic agents				
Barium sulphate	—	Enema	B	E
Barium sulphate	—	Powder	B	E
Barium sulphate contrast meal	—	—	B	E
Blood glucose test strip (20–800 mg/dl)	—	Strips	A	E
Pregnancy diagnostic kit (HCG)	—	—	A	E
ULTRAVIST 300® iopromide	623 mg	—	B	E
ULTRAVIST 370® iopromide	769 mg	—	B	E
Urine test strip (glucose, protein, pH, ketamines, blood)	—	Strips	A	E
Urine test strip (glucose, protein, pH, ketamines, blood, nitrogen, bilirubin, urobilin)	—	Strips	B	E
Other nontherapeutic products				
Electrocardiogram gel	—	Gel	B	E
Formalin	40%	Liquid	B	N
Ultrasound gel	—	Gel	B	E

Swaziland_FINAL press.indb 284 5/19/12 2:51 PM

MEDICINES INDEX

Abacavir, 274
Abacavir + lamivudine, 274
Acetazolamide, 282
Acetylsalicylic acid (aspirin), 266, 276
Acyclovir, 268, 274
Adrenaline, 267
Adriamycin, 276
Agents acting on the renin-angiotensin system, 268
Albendazole, 280
Albumin, 265
Alcuronium chloride, 277
Alimentary tract and metabolism, 263
Allopurinol, 277
Amikacin, 273
Aminoglycosides, 272
Aminophylline, 281
Amiodarone, 267
Amitriptyline, 280
Amlodipine, 267
Amoxicillin, 271
Amoxicillin + clavulanic acid, 271
Amphenicols, 272
Amphotericin B, 273
Ampicillin, 271
Anaesthetics, general, 277
Anaesthetics, local, 277
Anaesthetics [ophthalmologicals], 283
Analgesics, local, 277
Anhydrous theophylline, 281
Antacids, antiflatulents, 269
Antazoline + tetryzoline, 282
Anti-acne preparations, 269
Anti-allergics and decongestants, 282
Anti-anaemics, 266
Antibiotics and chemotherapeutics for dermatological use, 268
Anticholinergics, antispasmodics and, 263
Anticoagulants, 266
Anti-D (RH) immunoglobulin, 275
Antidepressants, 280
Antidiarrhoeals, intestinal anti-inflammatory, and anti-infective agents, 264
Antiemetics and antinauseants, 263
Anti-epileptics, 278
Antifungals, 282
Antifungals for dermatological use, 268
Antiglaucoma preparations and miotics, 282
Anti-gout preparations, 277
Antihaemorrhagics, 266
Antihaemorrhoidals, 264
Antihelmintics, 280
Antihistamines, systemic, 281
Antihypertensives and antihypotensives, 267
Anti-infectives [ophthalmologicals], 281
Anti-infectives [otologicals], 283
Anti-infectives, corticosteroids in combination, 282
Anti-inflammatory and antirheumatic products (including paracetamol), 276
Antimalarials, 280
Anti-migraine preparations, 278
Antineoplastics and immunomodulating agents, 276
Antiparasitic products, insecticides, and repellants, 280
Antiparkinsons agents, 279
Antipeptic ulcerants, 263
Antipoisoning agents, 283
Antiprotozoals, 280
Antipruritics, 268
Antipsoriatics, 268
Anti-psychotic agents, 279
Antiretrovirals, 274
Antirheumatic products, anti-inflammatory and, 276
Antispasmodics and anticholinergics, 263
Antiseptics and disinfectants, 269
Antivenom polyvalent, 275
Antivirals for systemic use, 274

Swaziland_FINAL press.indb 285 5/19/12 2:51 PM

Anugesic, 264
Anxiolytics, 279
Aqueous cream, 268
Artemether + lumefantrine, 280
Aspirin (acetylsalicylic acid), 266, 276
Atenolol, 267
Atorvastatin, 268
Atovaquone, 280
Atropine, 267, 282
Azathioprine, 276
Azithromycin, 272

Barium sulphate, 284
Barium sulphate contrast meal, 284
BCG [bacillus Calmette-Guérin—tuberculosis vaccine], 275
Beclomethasone, 269, 281
Beclomethasone diproprionate, 281
Benzathine benzylpenicillin, 271
Benzexhol (trihexyphenidyl), 279
Benzoic acid, 268
Benzoyl peroxide, 269
Benzyl benzoate, 280
Benzylpenicillin, 271
Beta-blocking agents, 267
Betamethasone, 282
Betamethasone + neomycin, 282
Bicarbonate, sodium, 265
Biperiden, 279
Bisacodyl, 264
Bismuth subgallate compound, 264
Bleomycin, 276
Blood and blood-forming organs [medicines for], 265
Blood glucose test strip, 284
Blood substitutes, 265
Bromocriptine, 279
Bupivacaine hydrochloride, 277

Calamine, 268
Calcium channel blockers, 267
Calcium gluconate, 265
Capreomycin, 273
Captopril, 268
Carbamazepine, 278
Carbidopa + levodopa, 279
Carbimazole, 270
Carbocisteine, 281
Cardiac therapy, 267
Cardiovascular system, 267
Carvedidol, 267
Cefaclor, 271
Cefazoline, 271
Cefixime, 271
Ceftriaxone, 271
Cefuroxime, 271
Cephalosporins, 271
Cetirizine, 281
Cetrimide + chlorhexidine (Savlon®), 269
Charcoal, activated, 283
Chloramphenicol, 272, 281, 283
Chloramphenicol and neomycin, 282
Chloramphenicol, dexamethasone, 282
Chlorhexidine, cetrimide +, 269
Chlorhexidine gluconate, 263, 269
Chloroquine, 280
Chloroxylenol (Dettol®), 269
Chlorpheniramine, 281
Chlorpromazine, 279
Cidex® (glutaraldehyde), 269
Ciprofloxacin, 272
Clarithromycin, 272
Clindamycin, 272
Clofazimine, 273, 274
Clomiphene, 270
Clonazepam, 278
Clotrimazole, 268, 269
Cloxacillin, 271
Cod liver oil (vitamin A + vitamin D), 265
Codeine phosphate, 277
Colchicine, 277
Condoms (latex, female), 270
Condoms (latex, male), 270
Conjugated estrogen, 270
Corticosteroids, 282
Corticosteroids and anti-infectives in combination, 282
Corticosteroids for dermatological use, 268

Swaziland_FINAL press.indb 286 5/19/12 2:51 PM

Co-trimazole (trimethoprim + sulfamethoxazole), 272
Co-trimazole DS, 272
Cromoglycate, sodium, 282
Cyclizine, 263
Cyclophosphamide, 276
Cycloplegics and mydiatrics, 282
Cycloserine, 273
Cyclosporine, 276
Cystostatic agents, 276

Dacarbazine, 276
Dantrolene, 283
Dapsone, 274
Darrows [solution], 266
Decongestants and anti-allergics, 282
Decongestants for topical use, nasal decongestants, 281
Dermatologicals, 268
Desferrioxamine, 283
Dettol® (chloroxylenol), 269
Dexamethasone, 270, 282
Dexamethasone + chloramphenicol, 282
Dexamethasone + chloramphenical + neomycin, 282
Dextran, 265
Dextrose, 266
Dextrose + sodium chloride, 266
Diagnostic agents [ophthalmologicals], 283
Diagnostic agents [sensory organs–various], 284
Diagnostic materials [otologicals], 283
Diazepam, 279
Dichlorobenzene, 283
Diclofenac, 276
Didanosine, 274
Digoxin, 267
Dihydralazine, 267
Diltiazem, 267
Dinoprostone, 270
Diphtheria + pertussis + tetanus, 275
Diphtheria + tetanus, 275
Diuretics, 267
Dorzolamide, 282
Doxycycline, 272

Ear wax removal, 283
Ectoparasiticides, including scabicides, 280
Efavirenz, 274
Efavirenz, tenofovir + lamivudine, 275
Efavirenz, zidovudine + lamivudine, 275
Electrocardiogram gel, 284
Emollients and protectives, 268
Emulsifying ointment (emulsifying wax + white soft paraffin + liquid paraffin), 268
Enalapril, 268
Endocrine therapy, 276
Enflurane, 277
Enoxoparin sodium SC, 266
Ephedrine, 277
Ergometrine, 269
Ergometrine + oxytocin, 270
Ergotamine + caffeine, 278
Erythromycin, 272
Erythropoietin, 266
Estrogens, 270
Ethambutol, 273
Ethanol, 269
Ethinylestradiol, levonorgestrel +, 270
Ethinylestradiol, norgestrel +, 270
Ethionamide, 273
Ethosuximide, 278
Ethyl chloride, 277
Etomidate, 277

Fentanyl, 277
Ferric hydroxide sucrose complex, 266
Ferrous fumarate + folic acid, 266
Ferrous sulphate, 266
Flucloxacillin, 271
Fluconazole, 273
Flumazenil, 283
Fluorescein, 283
Fluorescein sodium, 283
Fluorometholone, 282
Fluorouracil, 276

Swaziland_FINAL press.indb 287 5/19/12 2:51 PM

Fluoxetine, 280
Flupenthixol, 279
Fluphenazine decanoate, 279
Fluticasone, 281
Folic acid, 266
Formalin, 284
Furosemide, 267

G-Cide®, 269
Gabapentin, 280
Gamma benzene hydrochloride, 281
Ganciclovir, 274
General anaesthetics, 277
General anti-infectives, systemic, 271
Genitourinary systems and sex hormones, 269
Gentamicin, 272, 281
Gentian violet, 263
Glibencalmide, 264
Gliclazide, 264
Glutaraldehyde (Cidex® and G-Cide®), 269
Glycerine BP, 264, 269
Glycerine thymol, 263
Glycerine, adult, 264
Glycerine, paediatric, 264
Glyceryl trinitrate, 267
Griseofulvin, 273
Gynaegological anti-infectives and antiseptics, 269

Haloperidol, 279
Halothane, 277
Heparin, 266
Hepatitis B, 275
Homatropine, 282
Hormonal contraceptives, systemic, 270
Hydrochlorothiazide, 267
Hydrocortisone, 269, 270, 282
Hydrogen peroxide, 269
Hydroxypropyl methylcellulose, 283
Hyoscine butylbromide, 263

Ibuprofen, 277
Imipramine, 280
Immune sera and immunoglobins, 275
Immunomodulating agents and antineoplastics, 276
Immunosuppresants, 276
Impression material, 283
Indinavir, 274
Indomethacin, 277
Insulin, isophane, 264
Insulin, soluble, 264
Insulin, zinc, 264
Insulin + isophane (30/70), 264
Intrauterine [contraceptive] device (IUD), 270
Investment gel, 283
Iopromide (ULTRAVIST 300® and 370®), 284
Ipecacuanha, 283
Ipratropium bromide + salbutamol, 281
Irbesartan, 268
Isoflurane, 277
Isoniazid, 273
Isoniazid, rifampicin +, 273
Isoniazid, rifampicin + pyrazinamide, 273
Isoniazid, rifampicin + pyrazinamide + ethambutol, 273
Isosorbide dinitrate, 267
IUD (intrauterine device), 270
IV solutions, 266
Ivermectin, 280

Kanamycin, 273
Ketamine, 277
Ketoconazole, 268

Lamivudine, 274
Lamivudine, stavudine +, 275
Lamivudine, stavudine + nevirapine, 275
Lamivudine, tenofovir +, 275
Lamivudine, tenofovir + efavirenz, 275
Lamivudine, zidovudine +, 275
Lamivudine, zidovudine + efavirenz, 275
Lamivudine, zidovudine + nevirapine, 275
Latanoprost, 282
Laxatives, 264
Leprostatics, 274

Swaziland_FINAL press.indb 288 5/19/12 2:51 PM

Levodopa, carbidopa +, 279, 282
Levofloxacin, 273
Levonorgestrel + ethinylestradiol, 270
Levothyroxine sodium, 270
Lidocaine, 263, 267
Lignocaine, 277
Lignocaine-epinephrine, 277
Lincosamides, macrolides, and streptogramins, 272
Lipid modifying agents, 268
Liquid paraffin BP, 264
Lithium carbonate, 279
Local anaesthetics, 277
Loperamide, 264
Lopinavir + ritonavir, 274
Lorazepam, 280
Lubricating jelly, 269
Lumefantrine, artemether +, 280

Macrolides, lincosamides, and streptogramins, 272
Magnesium hydroxide, 263
Magnesium sulphate, 265
Magnesium trisilicate, 263
Maintenance solution + 10% glucose (Maintelyte®), 266
Mannitol, 266
Mantoux test, tuberculin, 276
Measles [vaccine], 275
Mebendazole, 280
Medical gases, 283
Medicated dressings, 269
Medroxyprogesterone acetate, 270
Mefenamic acid, 277
Mefloquine, 280
Metformin, 264
Methadone, 278
Methionine, 283
Methotrexate, 276
Methyl salicylate, 269
Methylated spirits, 269
Methyldopa, 267
Methylene blue, 283
Methylphenidate, 280
Metoclopramide, 263
Metronidazole, 280
Miconazole, 263, 269
Mineral supplements, 265
Miotics and antiglaucoma preparations, 282
Misoprostol, 270
Modulators of the genital system, 270
Morphine, 278
Moxifloxcin, 273
Mucolytics, 281
Multivitamin, 265
Muscle relaxants, 277
Musculoskeletal system, 276
Mydiatrics and cycloplegics, 282

N-acetylcysteine, 281
Naloxone, 283
Nasal decongestants and other decongestants for topical use, 281
Natamycin, 281
Nelfinavir, 274
Neolyte, 266
Neomycin + betamethasone, 282
Neomycin + chloramphenicol, 282
Neomycin, dexamethasone + chloramphenicol +, 282
Neostigmine, 280
Nervous system, 277
Nevirapine, 275
Niclosamide, 280
Nicotinamide, 265
Nifedipine, 268
Nitrofurantoin, 273
Nitrous oxide, 277
Nontherapeutic products, 284
Norethindrone, 270
Norethisterone, 270
Norethisterone enanthate, 270
Norgestrel + ethinylestradiol, 270
Nystatin, 263, 269

Obidoxine chloride, 283
Ofloxacin, 273
Olanzapine, 279
Omeprazole, 263

Swaziland_FINAL press.indb 289 5/19/12 2:51 PM

Ondansetron, 263
Opiod analgesics, 277
Ophthalmologicals, sensory organs,
Oral and mouth preparations, stomatological medicines, 263
Oral antidiabetics, 264
Oral rehydration salts, 264
Orphenadrine, 279
Other dermatological preparations, 269
Other nervous system agents, 280
Oxybuprocaine, 283
Oxygen, 283
Oxymetazoline, 281, 282
Oxytocics, 269
Oxytocin, 270

p-amino salicylic acid, 273
Pancuronium bromide, 277
Paracetamol, 277
Paracetamol + codeine phosphate, 278
Paraffin BP, liquid, 264
Paraffin, soft, 269
Parenteral nutrition bag with electrolytes, prefilled 3-chamber bag, 265
Penicillins, 271
Pentastarch, 266
Pentavalent combination vaccine (DPTw-HB/Hib), 275
Pertussis, diphtheria, tetanus, 275
Pethidine, 278
Phenobarbitone, 278
Phenoxymethylpenicillin, 272
Phenytoin, 278
Phytomenadione, 266
Pilocarpine, 282
Pituary and hypothalamic hormones, 270
Plasmalyte B, 266
Podophyllin, 268
Poliomyelitis vaccine, 275
Polyacrylic acid, 283
Polygeline (Haemaccel®), 266
Potassium chloride, 265
Potassium citrate, 269
Povidine iodine, 269
Pralidoxime mesylate, 283
Praziquantel, 280
Prednisolone, 270, 282
Pregnancy diagnostic kit (HCG), 284
Primaquine, 280
Procaine penicillin, 272
Prochlorperazine, 263
Progestegen, 270
Proguanil, 280
Promethazine, 263, 264, 281
Propofol, 277
Propranolol, 267
Prostaglandins, 270
Psychostimulants, 280
Pyrazinamide, 273

Quinine, 267, 280
Quinine sulphate, 280
Quinolone antibacterials, 272

Rabies (purified Vero rabies vaccine), 276
Rabies immunoglobulin (human), 275
Ranitidine, 263
Respiratory system, 281
Rifampicin, 273
Riampicin + isoniazid, 273
Riampicin + isoniazid + pyrazinamide, 273
Riampicin + isoniazid + pyrazinamide + ethambutol, 273
Ringer's lactate, 267
Risperidone, 279
Ritonavir, 274
Ritonavir, lopinavir +, 274

Salbutamol, 281
Salbutamol + ipratropium bromide, 281
Salicyclic acid, 268, 269
Salmeterol, 281
Saquinavir, 274
Savlon® (cetrimide and chlorhexidine), 269
Scabicides, ectoparasiticides, 280
Selenium sulphide, 268
Sennosides A + B, 264
Sensory organs–opthalmologicals, 280
Sensory organs–otologicals, 283

Swaziland_FINAL press.indb 290 5/19/12 2:51 PM

Sensory organs–various, 283
Setraline, 280
Sex hormones and genitourinary system, 269
Silver nitrate (caustic pencil), 268
Silver sulphadiazine, 268
Simvastatin, 268
Sodium bicarbonate, 265
Sodium chloride, 265, 267
Sodium cromoglycate, 282
Sodium hypochlorite (sterilising fluid), 269
Sodium valprorate, 279
Soft paraffin, 269
Spectinomycin, 272
Spironolactone, 267
Stavudine, 275
Stavudine + lamivudine, 275
Stavudine + lamivudine + nevirapine, 275
Sterilising fluid (sodium hypochlorite), 269
Streptogramins, macrolides, and lincosamides, 272
Streptomycin, 272
Sulphacetamide, 282
Sulphasalazine, 264
Sulphonamides with anti-infectives in combination, 272
Sulphur, 268
Sulpiride, 279
Sumatriptan, 278
Suxamethonium, 277
Systemic antihistamines, 281
Systemic antimycotics, 273
Systemic corticosteroids, 270
Systemic hormones, excluding sex hormones, 270

Tamoxifen, 276
Tear replacements, 283
Tears Naturelle®, 283
Tenofovir, 275
Tenofovir + lamivudine, 275
Tenofovir + lamivudine + efavirenz, 275
Terizidone, 273
Tetanus + diphtheria, 275
Tetanus + diphtheria + pertussis, 275
Tetanus immunoglobulin, 276
Tetanus toxoid, 276
Tetracycline, 272, 282
Tetryzoline, antazoline +, 282
Theophylline anhydrous, 281
Thiopental sodium, 277
Thyroid preparations, 270
Timolol, 282
TINE test, tuberculin, 276
Tinidazole, 280
Topical contraceptives, barrier methods, 270
Total parenteral nutrition, 265
Tramadol hydrochloride, 278
Tranexamic acid, 268
Trichloroacetic acid, 268
Trifluoperazine, 279
Trihexyphenidyl (benzexhol), 279
Trimethoprim + sulfamethoxazole (co-trimoxazole), 272
Tuberculin, Mantoux test (diagnostic), 276
Tuberculin, TINE test (screening), 276
Tuberculostatics, excluding streptomycin, 273
Typhoid, 276

Ultrasound gel, 284
ULTRAVIST 300® and 370® (iopromide), 284
Urine test strip (glucose, protein, pH, ketamines, blood), 284
Urine test strip (glucose, protein, pH, ketamines, blood, nitrogen, bilirubin, urobilin), 284

Vaccines and tests, 275
Vancomycin, 272
Vinblastine, 276
Vincristine, 276
Vitamin A (retinal), 265
Vitamin B1 (thiamine), 265
Vitamin B12 (cyancobalamin), 265

Swaziland_FINAL press.indb 291 5/19/12 2:51 PM

Vitamin B6 (pyridoxine hydrochloride), 265
Vitamin B complex, 265
Vitamin C (ascorbic acid), 265

Warfarin, 266
Water for injection, 267
Wax, 283

Yellow fever vaccine, 276

Zidovudine, 275
Zidovudine + lamivudine, 275
Zidovudine + lamivudine + efavirenz, 275
Zidovudine + lamivudine + nevirapine, 275
Zinc (as sulphate), 265
Zinc oxide, 268
Zuclopenthixol decanoate, 276

Swaziland_FINAL press.indb 292 5/19/12 2:51 PM

Annex 1. Adverse Drug Reaction Form

This form can be obtained from Central Medical Stores. Please use the telephone or fax numbers given below in the form for a copy.*

MINISTRY OF HEALTH
Adverse Drug Reactions (ADR) Report Form

*Report can be returned to Central Medical Stores by fax 25186279 or 25186642, by e-mail swazilandpharmacovigilance@gmail.com or cms@realnet.co.sz, or by post to: Adverse Drug Reaction, Central Medical Stores, P. O. Box 72, Kwaluseni.

For further inquiries, please contact the Pharmacist (Pharmacovigilance) at Central Medical Stores at 25184111 or 25187255.

Section (A): Patient Information

Patient initials or ref. no.:	Sex: ☐ Male ☐ Female	Pregnant? ☐ No ☐ Yes ☐ Unknown
Weight (if known): kg	Date of birth: (dd/mm/yyyy): ____/____/____ or age (at last birthday):	

Section (B): Medication History

All Drug Therapies/Vaccines Prior to ADR (Please use trade names and circle the suspected drug.)	**Batch number**	**Daily Dosage**	**Route**	**Date Begun**	**Date Stopped**	**Indication for Use**

Allergies or other relevant history (including medical history, liver/kidney problems, smoking, alcohol use, etc.)

Section (C): About the Adverse Drug Reaction

Date of onset of ADR: (dd/mm/yyyy): ____/____/____

Description of event:

Category of ADR (please tick):w
☐ Suspect minor/major reaction from a drug (e.g., allergic reaction)
☐ Adverse Event (e.g., congenital defects)
☐ Product Use Error (e.g., use of antibiotic instead of NSAID)

Severity (can tick more than one if appropriate):
☐ Life threatening
☐ Hospitalized (dd/mm/yyyy) ____/____/____
☐ Hospitalization NOT required

Swaziland_FINAL press.indb 293 5/19/12 2:51 PM

Annex 1. Adverse Drug Reaction Form (continued)

Relevant Laboratory result:

Section (D): Treatment & Outcome
Treatment of ADR: ☐ No ☐ Yes Details (including dosage, frequency, route, duration)
Outcome: ☐ Recovered on: (dd/mm/yyyy) ___/___/___ ☐ Not yet recovered ☐ Unknown ☐ Died on: (dd/mm/yyyy) ___/___/___ ☐ Persistent disability ☐ Birth defect ☐ Medically significant events Details:

Section (E): Reporter Details		
Name:		
Sector of service: ☐ Private ☐ Public	Occupation: ☐ Doctor ☐ Dentist ☐ Pharmacist ☐ Nurse ☐ Others	
Correspondence Address:		
Tel. no.:	Fax. no.:	E-mail:
FOR OFFICIAL USE ONLY Also report to: ☐ Manufacturer ☐ Distributor/Importer ☐ Other Date of this report: (dd/mm/yyyy) ___/___/___		

Instructions/Notes

1. ADR can be briefly described as a noxious and unintended response to a drug or vaccine when the normal dose is used.
2. This report form is used for voluntary reporting of all suspected ADR.
3. There is no need to put down the full name of the patient.
4. Please provide information to every section. Information of individual reporter will be treated with strict confidence.
5. Please use another page for additional information if necessary.
6. Where date is required write in this format DD/MM/YYYY

"Completion of this form is not an admission of guilt or negligence"

Swaziland_FINAL press.indb 294 5/19/12 2:51 PM

Annex 2. Motion to Amend the STG/EML

Return to: Ministry of Health
Department: Pharmaceutical Services, PO Box 5, Mbabane

Motion To Amend The STG/EML

SECTION 1: TO BE COMPLETED BY APPLICANT (The applicant can be prescriber, dispenser, Pharmacy Therapeutic Committee, secretariat)	
Name:	Designation:
Name of facility:	Region:
Date of submission:	Signature:
Request for changes to (tick appropriate) ☐ Standard Treatment Guideline ☐ Essential Medicines List	
Has the motion been presented, reviewed, and approved by one of the following (kindly attach minutes of meeting)? ☐ Hospital/Institution Pharmacy Therapeutic Committee ☐ Regional Pharmacy Therapeutic Committee	

PART A: AMENDMENTS TO THE STG Note: If the proposed change involves medicines used for the management of the condition, please also complete PART B
Indicate the condition to be changed Condition:
Request for the following changes to be made on the STG:
Reasons for the request:
Evidence:

Swaziland_FINAL press.indb 295 5/19/12 2:51 PM

Annex 2. Motion to Amend the STG/EML (continued)

PART B: AMENDMENTS TO THE EML
Type of Request (tick appropriate): ☐ Deletion of listed medicine ☐ Addition of a new medicine ☐ Replacement of a listed medicine ☐ Reclassification of a listed medicine
For replacements, please complete below: Replacement of *(generic name, strength, and dosage form)*: Replacement with *(generic name, strength, and dosage form):*
For reclassifications, please complete below: Reclassification of *(generic name, strength, and dosage form)*: From this class: To this class:
For additions please complete below: Addition of *(generic name, strength, and dosage form)*:
For deletions please complete below: Deletion of *(generic name, strength, and dosage form)*:
Reasons for request:
Evidence:

Swaziland_FINAL press.indb 296 5/19/12 2:51 PM

Annex 2. Motion to Amend the STG/EML (continued)

SECTION 2: TO BE COMPLETED BY CMS
Estimated cost of proposed medicine: E _____ per _____ Current cost of similar acting medicine(s) on the EML 1. Name, strength, dosage form: E _____ per _____

SECTION 3: TO BE COMPLETED BY STANDARD TREATMENT GUIDELINES & ESSENTIAL MEDICINES LIST COMMITTEE	
For requested changes to STGs ☐ Accept proposed changes to the STG ☐ Deny/Reject proposed changes to the STG Reasons for decision:	
For requested changes to EML ☐ Accept proposed changes to the EML ☐ Deny/Reject proposed changes to the EML Reasons for decision:	
Signature of STG/EML Secretariat:	Date:
Signature of STG/EML Chairperson:	Date:

Swaziland_FINAL press.indb 297 5/19/12 2:51 PM

Annex 3. Immunisation Schedules

Table 3.1 Immunisation Schedule

Age of Child	Vaccines Needed/Storage Temperatures	How and Where Given
At birth	**BCG**—bacillus Calmette-Guérin/ 0 to 8°C	Intradermal Left forearm
	OPV (0)—oral polio vaccine/ –15 to –25°C	Drops by mouth
6 weeks	**OPV (1)**—oral polio vaccine/ –15 to –25°C	Drops by mouth
	DPT/Hib (1)—diphtheria, tetanus, acellular pertussis, and haemophilus influenzae type b combined/ 0 to 8°C	Intramuscular
	Hep B (1)—hepatitis B vaccine/ 2 to 8°C	Intramuscular Outer upper aspect of the thigh
10 weeks	**OPV (2)**—oral polio vaccine/ –15 to –25°C	Drops by mouth
	DPT/Hib (2)—diphtheria, tetanus, acellular pertussis, and haemophilus influenzae type b combined/ 0 to 8°C	Intramuscular Outer upper aspect of the thigh
	Hep B (2)—hepatitis B vaccine/ 2 to 8°C	Intramuscular Outer upper aspect of the thigh
14 weeks	**OPV (3)**—oral polio vaccine/ –15 to –25°C	Drops by mouth
	DPT/Hib (3)—diphtheria, tetanus, acellular pertussis, and haemophilus influenzae type b combined/ 0 to 8°C	Intramuscular Outer upper aspect of the thigh
	Hep B (3)—hepatitis B vaccine/ 2 to 8°C	Intramuscular Outer upper aspect of the thigh
9 months	**Measles vaccine (1)**/ –15 to –25°C	Subcutaneous Upper left arm

Swaziland_FINAL press.indb 298 5/19/12 2:51 PM

Annex 3. Immunisation Schedules (continued)

Age of Child	Vaccines Needed/Storage Temperatures	How and Where Given
18 months	**OPV (4)** Oral polio vaccine	Drops by mouth
	Measles vaccine (2)/ –15 to –25°C	Subcutaneous Upper left arm
5 years	**DT vaccine**—tetanus and reduced strength of diphtheria vaccine/ 0 to 8°C	Intramuscular Upper aspect of buttock
	OPV (5)—oral polio vaccine/ –15 to –25°C	Drops by mouth

Notes:

- Strategy to control measles in hospitals and health centres, and clinics during an outbreak:
  - All hospitalised children (ages 6 to 8 months) should be given measles vaccine before discharge. These children should then be revaccinated at 9 months.
  - If a measles case is diagnosed in a clinic or outpatient department, all other contacts in that unit (ages 6 months to 15 years) should be revaccinated after excluding measles.
- If the first dose of measles vaccine is given after 15 months, then there is no need for a booster dose.
- For missed opportunities:
  - Pentavalent (DPT/Hib/HepB) can be given up to the age of 23 months four weeks apart.
  - BCG can be given at first contact up to the age of 15 years.
- DPT and DT considerations:
  - For children who have not received their primary doses of DPT and who are older than 23 months on first contact, use DT vaccine as shown in the schedule
  - School children between 11 and 14 years who never received DPT or DT vaccine should be given TT vaccine using the five-dose schedule (see table D2).
- Vitamin A supplementation and de-worming tablets should be given at 6-month intervals. Vitamin A should be given from 6 months and de-worming tablets from 12 months. Refer to 13.2.2 for dosages. Store vitamin A at room temperature.
- Refer to the Comprehensive Immunisation Schedule from the Swaziland Expanded Program on Immunisation poster for information about side effects.

Table 3.2 Tetanus Immunisation Schedule

Dose	Schedule	How and Where Given
TT1	At first contact	Subcutaneous or intramuscular upper left arm
TT2	At least 28 days after TT1	
TT3	At least 6 months after TT2	
TT4	At least 1 year after TT3	
TT5	At least 1 year after TT4	

Note: Store TT at +2–8°C. ***Caution:*** Do *not* freeze TT.

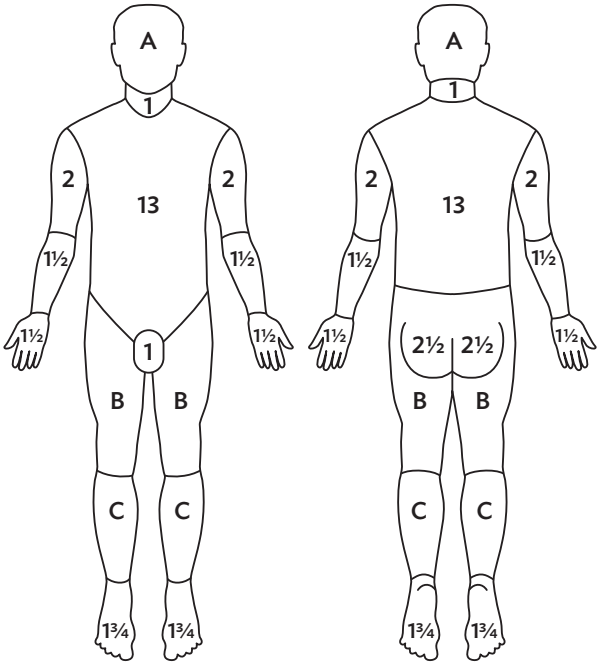
Swaziland_FINAL press.indb 299 5/19/12 2:51 PM

Annex 4. Chart for Estimating Percentage of Total Body Surface Area (TBSA) Affected By Burns

Name:		
Sex:	I.P. No.:	Date:

Lund and Browder Charts

Ignore simple erythema



Superficial

Deep

Region	%
Head	
Neck	
Ant. Trunk	
Post. Trunk	
Right Arm	
Left Arm	
Buttocks	
Genitalia	
Right Leg	
Left Leg	
Total Burn	

Relative percentage of body surface area affected by growth						
Area	**Age 0**	**1**	**5**	**10**	**15**	**Adult**
A = ½ of head	9½	8½	6½	5½	4½	3½
B = ½ of one thigh	2¾	3¼	4	4½	4½	4¾
C = ½ of one lower leg	2½	2½	2¾	3	3¼	3½

Swaziland_FINAL press.indb 300 5/19/12 2:51 PM