GUIDELINES

For

GENERAL PRACTITIONERS

2024

Press record

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FOREWORD

It is a great honor for me to write a foreword to Guidelines for General Practitioners by General Practitioners' society, Myanmar Medical Association (Central).

General practitioners are the primary health providers in the community looking after the majority of the people of our country. They are being trusted and depend upon by every families in the surrounding area where they practice. The first and foremost care by the General Practitioners are the most important for all the people.

Guidelines based on a critical appraisal of scientific evidence (evidence-based guidelines) clarify which interventions are of proved benefit and document the quality of the supporting data. They alert clinicians to interventions unsupported by good science, reinforce the importance and methods of critical appraisal, and call attention to ineffective, dangerous, and wasteful practices.

Clinical guidelines can improve the quality of clinical decisions. They offer explicit recommendations for clinicians who are uncertain about how to proceed, overturn the beliefs of doctors accustomed to outdated practices, improve the consistency of care, and provide authoritative recommendations that reassure practitioners about the appropriateness of their treatment policies.

The Myanmar Medical Association together with the GP society has been helping out with the CME and CPD program for the Member doctors both inhouse sessions and online courses. This guideline is one of the essential parts of this CPD for the GPs.

I would like to congratulate the GP society for their effort for producing this guideline and also, I would like to encourage them to review and updated regularly.

Professor Aye Aung
President
Myanmar Medical Association

April, 2024

PREFACE

We are writing this letter to express our sincerest gratitude and appreciation for the successful completion of the **second edition** of the **General Practitioners' Guidelines**. This accomplishment is the result of an exceptional collaborative effort, and we would like to extend our thanks to all those involved.

The General Practitioners' Guidelines has been an invaluable resource since its inception with the launch of the first edition in November 2017. As per the initial plan, the guidelines were intended to be updated every three years to ensure the most up-to-date information reaches Myanmar General Practitioners, enhancing their knowledge in primary healthcare and family health.

However, the unforeseen outbreak of the Covid-19 pandemic disrupted our plans and posed numerous challenges for the team. In-person meetings became impossible due to safety concerns, making it necessary for us to find alternative means of communication and collaboration. Despite the adversity faced, the team members demonstrated remarkable resilience and adaptability by utilizing online platforms and technology to continue the update process.

We would like to extend our deepest gratitude to the dedicated team members who persevered and worked tirelessly during these trying times. Their commitment, professionalism, and unwavering dedication to the project enabled us to overcome the obstacles posed by the pandemic and successfully complete the second edition of the guideline.

Furthermore, we would like to express our sincere appreciation to the specialist societies that actively contributed to the development of the guidelines. Their expertise and invaluable insights have ensured that the content remains current, accurate, and relevant, enabling our General Practitioners to provide the highest quality of care to their patients.

We would also like to extend our heartfelt thanks to the esteemed President of the Myanmar Medical Association, for their continuous support and guidance throughout this endeavor. Their leadership and unwavering commitment to advancing medical knowledge in Myanmar have been instrumental in the success of this Guidelines.

Moreover, the decision to distribute the guideline as electronic copies reflects our commitment to ensuring easy access for all Myanmar General Practitioners. By making it available in this format, we aim to facilitate the dissemination of updated knowledge, thus empowering our healthcare professionals to deliver the best possible care to the community.

In conclusion, we would like to express our deepest gratitude to all those who contributed to the development and distribution of the General Practitioners' Guidelines Second Edition. The unwavering supports and collective efforts have made a significant impact on enhancing primary healthcare and family health care in Myanmar.

Once again, thank you for your outstanding dedication, resilience, and invaluable contributions. We look forward to our continued collaboration in advancing medical knowledge and improving healthcare outcomes for all.

Dr Khine Soe Win and Dr Win Zaw April, 2024
General Practitioners' Society (Central)
Myanmar Medical Association

EDITORIAL

It is my privilege to inform you that our updated and revised edition of "**Guidelines for General Practitioners**" will be published very soon and it is my great pleasure to be the editor-in-chief of this guideline book. There are various reasons for revising and updating the previous edition.

This is the fact that some important topics, for example, malaria and family violence are missing in the first edition and some clinical practice guidelines like Diabetes Management have been changed during the interim period. Of course, this opportunity arises due to the emergence of COVID-19 in the world. As all you know, Medicine is an ever-changing science; we need to consider updating our guidelines at least five- yearly. Hence the time is up now!

Education is achieved by assimilating information from many resources and readers of this book can enhance their learning experience in terms of reflecting in their daily Family/General Practice. We all take immerse pride in contributing good educational resource dedicated to Myanmar General Practitioners. The editors and authors anticipate that the readers will both enjoy and profit from their work in preparing this volume.

Happy studying and learning,

Dr Win Lwin Thein
Editor-in chief
Vice President (GP Society)
April, 2024

ACKNOWLEDGEMENT

We would like to thank all our talented and hard-working colleagues who have contributed to the ongoing development of the **Guidelines for General Practitioners**.

Especially, we would like to highlight the significance of the second edition which appears when the family medicine development process in Myanmar is being idle. Many factors are impeding the developing process lately, which has been accelerated previously by the commitment of the MOHS, the medical universities, and the General Practitioners' Society before the COVID-19 pandemic started.

No one can deny that the Myanmar health care system is lacking a strong and effective primary care task force. The best solution to mend this defect is retraining the thousands of general practitioners who are working individually across the country. Here comes the role of family medicine to train these GPs and primary care doctors to be able to use its principles effectively and, in turn, strengthen primary care.

Many GPs are using some family medicine principles consciously or unconsciously in varying degree of competency. Person-centered care, continuity of care, and family-oriented care became the culture of most practices for a long time. But only a few GPs can enjoy the most effective coordinated care and seamless continuity of care with secondary and tertiary care providers. The reasons behind this would be the absence of standardization in general practitioners' service quality and unawareness of the value of family medicine practitioners by other specialties and the public.

To resolve this ambiguity, primary care doctors should be involved in the retraining programs and thereafter CME/CPD and other life-long-learning programs which prescribe family medicine curricula.

We also acknowledge the effort of the contributors to make this new edition more family medicine-oriented, in addition to the Family Medicine chapter at the beginning of the book. We genuinely believe that the new edition will be a better reference for the GP/FP who wants to practice quality primary care and for future family medicine programs in Myanmar.

Finally, we would like to thank all academic writers who contributed to the General Practice Guidelines-first edition. Without their kind support, this second edition could never have happened.

Regards,

Dr. Tin Aye and Dr. Kyaw Thu

General Practitioners' Society (Central), MMA **April, 2024**

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SYMBOLS AND ABBREVIATIONS

AAA abdominal aortic aneurysm
ABC airway, breathing, circulation
ABCD airway, breathing, circulation, dextrose
ABO A, B and O blood groups
ACE angiotensin-converting enzyme
ACEI angiotensin-converting enzyme inhibitor
ACTH adrenocorticotrophic hormone
ADHD attention deficit hyperactivity disorder
ADT adult diphtheria vaccine
AFP alpha-fetoprotein
AI aortic incompetence
AIDS acquired immunodeficiency syndrome
AIIRA angiotensin II (2) reuptake antagonist
AKF acute kidney failure
ALE average life expectancy
ALL acute lymphocytic leukaemia
ALP alkaline phosphatase
ALT alanine aminotransferase
AMI acute myocardial infarction
AML acute myeloid leukaemia
ANA antinuclear antibody
ANF antinuclear factor
AP anterior–posterior
APH ante-partum haemorrhage
ASD atrial septal defect
ASIS anterior superior iliac spine
ASOT antistreptolysin O titre
AST aspartate aminotransferase
AV atrioventricular
AZT azidothymidine
BCC basal cell carcinoma
BCG bacille Calmette-Guérin
BMD bone mass density
BMI body mass index
BP blood pressure
BPH benign prostatic hyperplasia
Ca carcinoma
CABG coronary artery bypass grafting
CAD coronary artery disease
CAP community acquired pneumonia
CBT cognitive behaviour therapy
CCF congestive cardiac failure
CCU coronary care unit
CD4 T helper cell
CD8 T suppressor cell
CDT combined diphtheria/tetanus vaccine
CEA carcinoembryonic antigen
CFS chronic fatigue syndrome
CHD coronary heart disease
CHF chronic heart failure
CIN cervical intraepithelial neoplasia
CK creatinine kinase
CKD chronic kidney disease
CKF chronic kidney failure
CML chronic myeloid leukaemia
CMV cytomegalovirus
CNS central nervous system
COAD chronic obstructive airways disease
COC combined oral contraceptive
COCP combined oral contraceptive pill
COPD chronic obstructive pulmonary disease
COX cyclooxygenase
CPA cardiopulmonary arrest
CPAP continuous positive airways pressure
CPK creatine phosphokinase
CPR cardiopulmonary resuscitation
CR controlled release
CREST calcinosis cutis; Raynaud's phenomenon; oesophageal involvement; sclerodactyly; telangiectasia
CRF chronic renal failure
CR(K)F chronic renal (kidney) failure
CRP C-reactive protein
CSF cerebrospinal fluid
CT computerised tomography
CTS carpal tunnel syndrome
CVA cerebrovascular accident
CVS cardiovascular system
CXR chest X-ray
DBP diastolic blood pressure
DC direct current
DHA docosahexaenoic acid
DI diabetes insipidus
DIC disseminated intravascular coagulation
dL decilitre
DMARDs disease modifying antirheumatic drugs
DNA deoxyribose-nucleic acid
DRABC defibrillation, resuscitation, airway, breathing, circulation
drug dosage bd—twice daily, tid/tds -three times daily, qid/qds -four times daily
ds double strand
DS double strength
DSM diagnostic and statistical manual (of mental disorders)
DU duodenal ulcer
DUB dysfunctional uterine bleeding
DVT deep venous thrombosis
EBM Epstein-Barr mononucleosis (glandular fever)
EBV Epstein-Barr virus
ECG electrocardiogram
ECT electroconvulsive therapy
EDD expected due date
EEG electroencephalogram
ELISA enzyme linked immunosorbent assay
ESRF end-stage renal failure
ESR(K)F end stage renal (kidney) failure
ERCP endoscopic retrograde cholangiopancreatography
esp. especially
ESR erythrocyte sedimentation rate
FB foreign body
FBE full blood count

FEV1 forced expiratory volume in 1 second
fL femtolitre = (1e–15) litre
FSH follicle stimulating hormone
FUO fever of undetermined origin
FVC forced vital capacity
g gram
GA general anaesthetic
GABHS group A beta-haemolytic streptococcus
GBS Guillain-Barré syndrome
GFR glomerular filtration rate
GI glycaemic index
GIT gastrointestinal tract
GLP glucagon-like peptide
GnRH gonadotrophin-releasing hormone
GO gastro-oesophageal
GORD gastro-oesophageal refl ux
GP general practitioner
G-6-PD glucose-6-phosphate
GU gastric ulcer
HAV hepatitis A virus
anti-HAV hepatitis A antibody
Hb haemoglobin
HbA haemoglobin A
anti-HBc hepatitis B core antibody
HBeAg hepatitis B e antigen
anti-HBs hepatitis B surface antibody
HBsAg hepatitis B surface antigen
HBV hepatitis B virus
HCG human chorionic gonadotropin
HCV hepatitis C virus
anti-HCV hepatitis C virus antibody
HDL high-density lipoprotein
HEV hepatitis E virus
HFM hand, foot and mouth
HFV hepatitis F virus
HGV hepatitis G virus
HIV human immunodeficiency virus
HNPCC hereditary nonpolyposis colorectal cancer
HPV human papilloma virus
HRT hormone replacement therapy
HSV herpes simplex viral infection
IBS irritable bowel syndrome
ICE ice, compression, elevation
ICS inhaled corticosteroid
ICS intercondylar separation
ICT immunochromatographic test
IDDM insulin dependent diabetes mellitus
IDU injecting drug user
IgE immunoglobulin E
IgG immunoglobulin G
IgM immunoglobulin M
IHD ischaemic heart disease
IM, IMI intramuscular injection
inc. including
IPPV intermittent positive pressure variation
IR internal rotation
ITP idiopathic (or immune) thrombocytopenia purpura
IUCD intrauterine contraceptive device
IUGR intrauterine growth retardation
IV intravenous
IVI intravenous injection
IVP intravenous pyelogram
IVU intravenous urogram
JCA juvenile chronic arthritis
JVP jugular venous pulse
KA keratoacanthoma
kg kilogram
KOH potassium hydroxide
LA local anaesthetic
LABA long acting beta agonist
LBBB left branch bundle block
LBO large bowel obstruction
LBP low back pain
LDH/LH lactic dehydrogenase
LDL low-density lipoprotein
LFTs liver function tests
LH luteinising hormone
LHRH luteinising hormone releasing hormone
LIF left iliac fossa
LMN lower motor neurone
LNG levonorgestrel
LRTI lower respiratory tract infection
LSD lysergic acid
LUQ left upper quadrant
LUTS lower urinary tract symptoms
LV left ventricular
LVH left ventricular hypertrophy
mane in morning
MAOI monoamine oxidase inhibitor
mcg microgram (also µg)
MCV mean corpuscular volume
MDI metered dose inhaler
MDR multi-drug resistant TB
MI myocardial infarction
MRCP magnetic resonance cholangiography
MRI magnetic resonance imaging
MS multiple sclerosis
MSM men who have sex with men
MSU midstream urine
N normal
NAD no abnormality detected
NGU non-gonococcal urethritis
NHL non-Hodgkin's lymphoma
NIDDM non-insulin dependent diabetes mellitus
nocte at night
NSAIDs non-steroidal anti-inflammatory drugs
NSU non-specific urethritis
(o) taken orally
OA osteoarthritis
OCP oral contraceptive pill
OGTT oral glucose tolerance test
OSA obstructive sleep apnoea
OTC over the counter
PA posterior–anterior
PAN polyarteritis nodosa
Pap Papanicolaou
pc after meals
PCA percutaneous continuous analgesia
PCB post coital bleeding

PCL posterior cruciate ligament
PCOS polycystic ovarian syndrome
PCP pneumocystis carinii pneumonia
PCR polymerase chain reaction
PCV packed cell volume
PDA patent ductus arteriosus
PEF peak expiratory flow
PEFR peak expiratory flow rate
PET pre-eclamptic toxaemia
PFT pulmonary function test
PH past history
PID pelvic inflammatory disease
PLISSIT permission: limited information: specific suggestion: intensive therapy
PMS premenstrual syndrome
PMT premenstrual tension
POP plaster of Paris
POP progestogen-only pill
PPI proton-pump inhibitor
PPROM preterm premature rupture of membranes
PR per rectum
prn as and when needed
PROM premature rupture of membranes
PSA prostate specific antigen
PSIS posterior superior iliac spine
PSVT paroxysmal supraventricular tachycardia
PT prothrombin time
PTC percutaneous transhepatic cholangiography
PU peptic ulcer
PUO pyrexia of undetermined origin
pv per vagina
qds, qid four times daily
RA rheumatoid arthritis
RBBB right branch bundle block
RBC red blood cell
RCT randomised controlled trial
RF rheumatic fever
Rh rhesus
RIB rest in bed
RICE rest, ice, compression, elevation
RIF right iliac fossa
RPR rapid plasma reagin
RR relative risk
RSV respiratory syncytial virus
RT reverse transcriptase
rtPA recombinant tissue plasminogen activator
SAH subarachnoid haemorrhage
SARS severe acute respiratory distress syndrome
SBE subacute bacterial endocarditis
SBO small bowel obstruction
SBP systolic blood pressure
SC/SCI subcutaneous/subcutaneous injection
SCC squamous cell carcinoma
SCG sodium cromoglycate
SIADH syndrome of secretion of inappropriate antidiuretic hormone
SIDS sudden infant death syndrome
SIJ sacroiliac joint
SL sublingual
SLE systemic lupus erythematosus
SLR straight leg raising
SND sensorineural deafness
SNHL sensorineural hearing loss
SNRI serotonin noradrenaline reuptake inhibitor
SOB shortness of breath
sp species
SR sustained release
SSRI selective serotonin reuptake inhibitor
SSS sick sinus syndrome
stat at once
STI sexually transmitted infection
SVC superior vena cava
SVT supraventricular tachycardia
T3 tri-iodothyronine
T4 thyroxine
TB tuberculosis
tds, tid three times daily
TENS transcutaneous electrical nerve stimulation
TFTs thyroid function tests
TG triglyceride
TIA transient ischaemic attack
TIBC total iron binding capacity
TM tympanic membrane
TMJ temporomandibular joint
TNF tissue necrosis factor
TOF tracheo-oesophageal fistula
TORCH toxoplasmosis, rubella, cytomegalovirus, herpes virus
TPHA Treponema pallidum haemoglutination test
TSE testicular self-examination
TSH thyroid-stimulating hormone
TT thrombin time
TV tidal volume
U units
UC ulcerative colitis
U & E urea and electrolytes
µg microgram
UMN upper motor neurone
URTI upper respiratory tract infection
US ultrasound
UTI urinary tract infection
U ultraviolet
VC vital capacity
VDRL Venereal Disease Reference Laboratory
VF ventricular fibrillation
VMA vanillyl mandelic acid
VSD ventricular septal defect
VT ventricular tachycardia
VUR vesico-ureteric reflux
VWD von Willebrand's disease
WBC white blood cells
WCC white cell count
WHO World Health Organization
WPW Wolff-Parkinson-White
XL sex linked

EMERGENCY MEDICINE

- Shock
- Anaphylaxis
- Adult Basic Life Support
- Acute Chest Pain
- Pulmonary Embolism
- Pneumothorax
- Status Asthmaticus in Adult
- Thyroid Crisis
- Snake Bite
- Insect Bite and Sting
- Acute Poisoning and Overdose
- Surgical Emergencies – Refer to Surgical Section Chapter
- Obstetrics Emergencies
- Acute Asthma in Children
- Convulsion / Febrile convulsion
- Management of Child with Shock
- Fractures
- Essential Trauma Care
- Head Injury
- Chest Trauma
- Abdominal and pelvic Trauma
- Limb Trauma
- Drowning
- Electrical Injuries
- Chocking

SHOCK

Definition

- Shock is a state of inadequate perfusion to vital organs, resulting in hypotension (systolic BP <80-90 mmHg) and reduced urine output.

Causes

- Anaphylactic shock
- Hypovolaemic (bleeding, fluid loss, heat exhaustion)
- Cardiogenic shock (pump failure, dysarrhythmia, AMI)
- Septic shock
- Obstructive cause (cardiac tamponade, pulmonary embolism)
- Adrenal failure

How to get diagnosis

- While conducting history taking and examination (rapid assessment), initial resuscitation should be done at the same time.
- Putting large bore cannula/cannulae & set up IV line (Normal Saline or Colloid). Give 100% 0_2 If available.

ANAPHYLACTIC SHOCK

- Rapid onset of shock with preceding history of i.v/oral drugs (or) food and food additives (or) insect bites (IM Diclofenac injection often causes hypotension in febrile patients)
- Difficult breathing, wheeze, feeling that throat is closing, tachypnoea, cyanosis (late)
- Pallor, clammy, tachycardia, agitation, confusion, urticaria, flushing, angioedema
- Abdominal pain, vomiting or incontinence

CARDIOGENIC SHOCK

- History of chest pain, dyspnoea, palpitation, past history of IHD, valvular heart, cardiovascular risk factors, alcohol history
- Dyspnoea ± Cyanosis, cold &clammy extremities, tachycardia (or) bradycardia (or) irregular heartbeats, displaced apex beat (If structural heart disease) present
- Raised JVP and basal crepitation may or may not be present.

SEPTIC SHOCK

- Ill toxic, T >38 °C or <36 °C
- Widened pulse pressure, tachypnoea, mental obtundation or agitation
- ± Acidotic breathing
- [Source of sepsis: obvious infection source like may cellulitis gangrene or hidden infection, biliary sepsis, pyelonephritis and in the patients of reproductive age - don't forget septic abortion]
- The old (or) immunocompromised patient may not have fever.

HYPOVOLAEMIC SHOCK

- History of diarrhea, vomiting, dehydrated skin turgor, (or) obvious bleeding like GI bleeding

(or) menorrhagia

- Hidden bleeding like leaking abdominal aortic aneurysm, splenic rupture, haemorrhage from HCC, 3rd space loss (acute pancreatitis). Undue pallor and tachycardia lead to diagnosis of blood loss.

HYPOADRENALISM

- Lethargy, weight loss, skin crease/scar pigmentation, hypotension, hypoglycemia,
- Tuberculous adrenalitis is not uncommon.

DIAGNOSTIC WORK UP

- **Hypotension with**
- **Tachypnoea:**
  - cardiac failure, pneumothorax, pulmonary embolism, acidosis
- **Tachycardia:**
  - seen in most of the cause except heart block, overdose β-blockers
  - check If abnormal rhythm (Atrial fibrillation, flutter, multiple VPCs).
- **Unequal pulse:**
  - check BP on both arms (thoracic aortic dissection)
- **Cardiac murmur:**
  - →underlying valvular heart (or) acute valvular lesion.
- **Crepitation:**
  - localised +Bronchial breath sound →Pneumonia
- **Wide spread crepts**
  - +gallop rhythm, orthopnoea → failure
  - +proceeding fever (or) underlying COPD → severe pneumonia
- Pallor + cold extremities + cyanosis → Cardiogenic Shock
- + Warm and vasodilated (bounding pulse), toxic looking → Septic Shock
- Undue pallor + tachycardia + no orthopnoea + no basal crepts → Haemorrhagic Shock (do per-rectal examination to detect concealed loss)
- Urticaria + wheezing + soft tissue swelling eyelid/lip → Anaphylaxis

Management

General

- Rapid assessment of vital sign, airway, BP, PR/HR, 0_2 saturation (If pulse oximeter is in hand).
- IV Access.
- Fluid challenge 200ml N/S over 5-10 mins.
- High flow 0_2 (If available)
- If pulmonary oedema present, inotrope support is indicated as fluid replacement can precipitate pulmonary oedema. (Dobutamine 5-20 µg/kg/min If cardiogenic shock, dopamine 2.5-20 µg/kg/min If septicemia but be aware uncontrolled rate on the way to hospital which may precipitate arrhythmia)
- Hypovolaemic shock: appropriate fluid replacement (rapid and adequate replacement is important)

Specific

- Septic - Intravenous 3rd generation cephalosporin (ceftriaxone, cefotaxime) after test dose can be given. (Blood culture should be taken prior to antibiotic If feasible.) Hypoadrenalism - IV hydrocortisone 100 mg stat.
- SVT (narrow complex tachycardia) - carotid sinus massage can be tried (gentle
- massage on carotid artery at level of thyroid cartilage on either side for 8 secs, be careful in elderly, risk of embolisation).

Anaphylaxis

- Lie flat, secure the airway, give0 2
- Give IM adrenaline 0.5mg - 1 mg (0.5ml - 1 ml of 1:1000) repeat every 10 minutes according to BP and pulse and respiration even before searching for IV access. Secure IV access
- IV Chlorpheniramine 10 mg and IV hydrocortisone 4 mg 6 hrly for at least 24 - 48 hrs. Add IV ranitidine 50 mg tds.
- If bronchospasm does not subside, nebulized salbutamol (or) aminophylline infusion can be given.

Transfer and referral

- After initial resuscitation, transfer the patients to nearest hospital. If patient has AMI, transfer to the hospital with facility to thrombolysis.
- Referral letter should include vital sign records and initial treatment that is helpful to the doctors from hospital.

ANAPHYLAXIS

Definition

- Severe systemic allergic reaction that is life-threatening.

Common causes

- Foods: Nuts, milk, fruit, fish and shellfish, eggs, pulses (beans, peas)
- Drugs: Antibiotics, aspirin and other NSAIDs, opioids
- Insect stings Wasp or bee
- Latex
- Idiopathic

Clinical features

- Often history of anaphylaxis/severe allergic reaction. Anaphylaxis is likely when *all* of the following are met:
    - Sudden onset/rapid progression of symptoms over minutes
    - Life-threatening:
- Airwayproblems: difficulty breathing/swallowing; feeling that throat is closing; hoarseness; stridor, *and/or*
- Breathing problems: increased respiratory rate; wheeze; shortness of breath; oxygen saturation <92%; cyanosis (late sign); confusion due to anoxia; respiratory arrest, *and/or* Circulation problems: shock (pallor, clammy, tachycardia; bradycardia is a late feature); decreased BP; faintness/dizziness; collapse; agitation/confusion; loss of consciousness.
- May cause myocardial ischaemia and ECG changes even If normal coronary arteries
- Skin and/or mucosal changes -Flushing, erythema, urticaria, and/ or angioedema, rhinitis and/or conjunctivitis. Skin or mucosal changes alone are *not* a sign of an anaphylactic reaction, although they may develop into one.

Other symptoms

- Abdominal symptoms, e.g., abdominal pam, vomiting or incontinence; anxiety with/without sense of impending doom.

Differential diagnosis

- Life-threatening- Severe asthma; septic shock
- Non-life-threatening- Simple faint; hyperventilation/panic attack; breath-holding attacks in small children; lone urticaria /angio-oedema

Management urgent action

- If suspected when the initial call comes in, request an emergency ambulance immediately.
- Ask If the patient has had a similar event before.
- If so, does he/she have an adrenaline auto-injector device? If yes, advise immediate use.
- Then visit-on attendance, follow the algorithm in Figure 1.
- Patients with airway/breathing problems may prefer to sit up; If low blood pressure, lie flat (on left side If pregnant) with legs elevated; If unconscious and breathing, place in the recovery position.

First-line treatment (adults)

- Oxygen 8 L/min (by face mask)

- Adrenaline 0.3-0.5 mg (1:1000) IM best given in mid antero-lateral thigh (mg= mL of 1:1000 adrenaline)
- Remove cause (e.g., bee sting) If possible.
- Set up IV access.
- If no rapid improvement:
    - repeat IM adrenaline every 3-5 minutes
    - set up adrenaline infusion: 1 mg adrenaline to 1000 mL N saline (i.e. 1 mL = 1 µg adrenaline) bolus of 50 µg (= 50 mL) can be given as required (best with ECG monitor)
    - Set up additional IV line (preferably two 'wide bore' lines) and infuse crystalloid solution (e.g., Normal saline 1-2 L) with bolus (20 mL/kg) over 1-2 min
    - Salbutamol aerosol inhalation (or nebulisation If severe), especially If wheeze/stridor
- Patients who have refractory or very severe anaphylaxis should be referredto hospital.
- If very severe add glucagon 1 mg IM or IV (If available)

Note

- Proper documentation is obligatory.
- Record resuscitations and medications (Name, dose and given time)
- Proper explanations and counsellings
- Show of care and concern
- Admission of the patient accompanied with family doctor/general practitioner 1s advised.

Anaphylactic reaction

↓

Check (A, B, C, D, E)

A=**A**irway, **B**=**B**reathing, **C**=**C**irculation, **D**=**D**isability (e.g., confusion, coma),
E=**E**xposure (e.g., Skin changes, facial or lip swelling, wheezing/stridor)

↓

Diagnosis: Look for

- Acute onset of illness, and
- Life threatening airway changes: swelling, hoarseness, stridor and/or
- Life threatening breathing changes: rapid breathing, wheeze, fatigue, cyanosis, oxygen saturation <92%, confusion, and/or
- Life threatening circulation problems: pale, clammy, low BP, drowsy/coma and usually
- Skin changes

↓

Call for help / Lie the patient flat / Raise the patient's legs

↓

Give adrenaline (epinephrine) 1:1000 solution

- >12 years → 0.5 ml (500 µg) i.m
- 6-12 years → 0.3 ml (300 µg) i.m
- <6 years → 0.15 ml (150 µg) i.m

If skills and equipment are available

Establish an airway

Monitor

- Pulse Oximetry
- ECG
- BP

Give after initial resuscitation
Antihistamine (Chlorphenamine)
i.m or slow iv
>12 years →10 mg;
6-12 years → 5 mg;
6 month-6 years → 2.5 µg/kg;
<6 month → 250 µg
Hydrocortisone
Im or slow iv
>12 years → 200 mg
6-12 yrears → 100 mg
6 months – 6 years → 50 mg
<6 months → 25 mg

Give as soon as possible:
High flow oxygen (>10 L/min)
IV fluid challenges:
Adult → 500 ml – 1 L
Child → crystalloid 20 ml/kg
Repeated as needed
Stop i.v colloid if this might be the cause of

Follow-up

- Warn patients or parents of the possibility of recurrence.
- Advise sufferers to wear a device (e.g., Medic-Alert bracelet) that will inform bystanders or medical staff should a future attack occur.
- *Consider supplying sufferers (or parents) with an adrenaline auto-injector device (e.g., EpiPen®) which can be used to administer IM adrenaline (epinephrine) immediately should symptoms recur. *If you supply an auto-injector device, teach anyone likely to need to use it how to operate the device. IM adrenaline is very safe.
  *(*Currently in Myanmar it is not available to use Medic Alert bracelet and EpiPen)*

- In case of anaphylactic shock, General Practitioners should note the following medications as the ABCD mnemonics.
  A. Adrenaline (IM)
  B. Burmeton (Chlorpheniramine)
  C. Corticosteroid (Hydrocortisone/ Solumedrol)
  D. Drip(N/S)

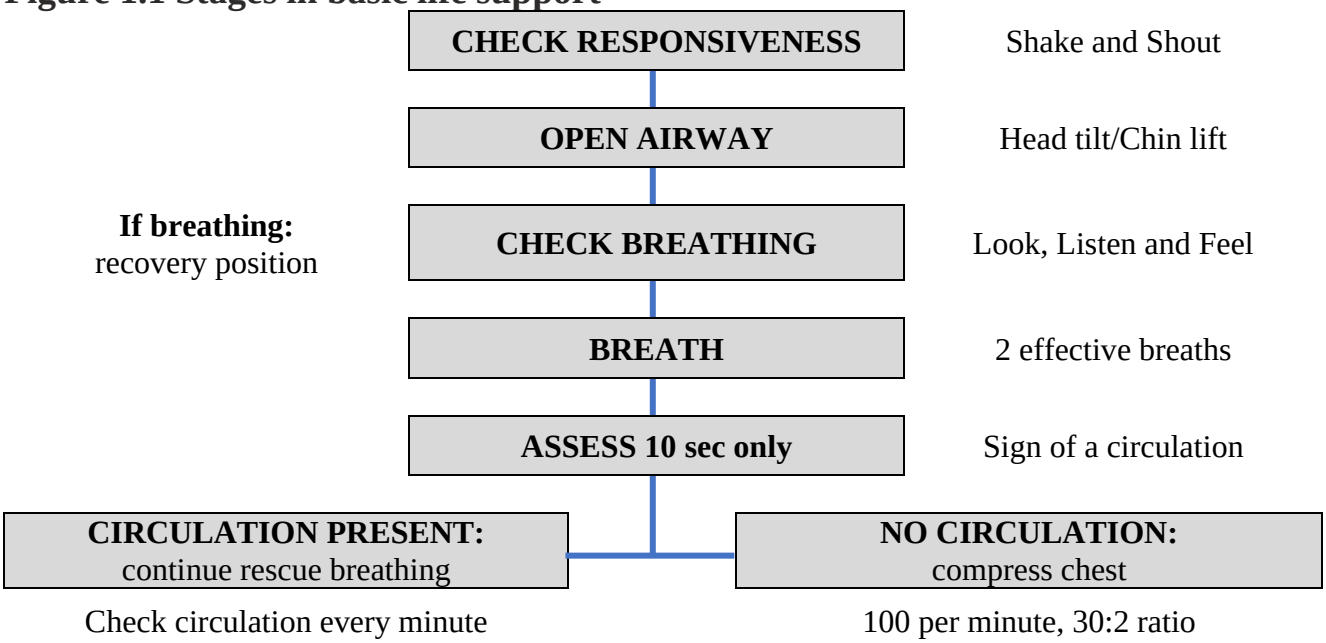
Reference:

1. *Oxford handbook of General Practice 4th Edition*
2. *John Murtagh General Practice 6th Edition*

ADULT BASIC LIFE SUPPORT

- Basic life support (BLS) is the backbone of effective resuscitation following a cardiorespiratory arrest. The aim is to maintain adequate ventilation and circulation until the underlying cause for the arrest can be reversed. A period of 3-4 minutes without adequate perfusion (less If the patient is hypoxic) will lead to irreversible cerebral damage.
- Occasionally you will be the first to discover the unresponsive patient, and it is important to rapidly assess the patient and begin cardiopulmonary resuscitation (CPR). The various stages in BLS are described here and summarized in Figure 1.1.

Figure 1.1 Stages in basic life support



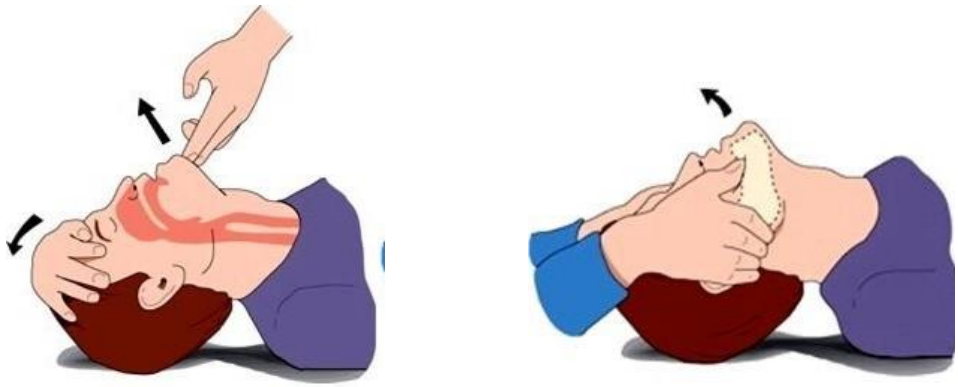
Assessment of the patient

Ensure safety of rescuer and victim.

- Check whether the patient is responsive. Gently shake the victim and ask loudly, "Are you all right?"
  - If the victim responds, place them in recovery position and get help.
  - If the victim is unresponsive, shout for help and move on to assess airway (see below).

Airway assessment

- Open the airway. With two fingertips under the point of the chin, tilt the head up. If this fails, place your fingers behind the angles of the lower jaw and apply steady pressure upward and forward. Remove ill-fitting dentures and any obvious obstruction. If the patient starts breathing, roll patient over into the recovery position and try to keep the airway open until an orophyrangeal airway can be inserted. Use jaw thrust without head extension, If trauma is suspected (see Fig. 1.2).



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- Keep the airway open; look, listen, and feel for breathing. Look for chest movements, listen at the victim 's mouth for breathing sounds, and feel for air on your cheek (for no more than 10 seconds).
- If the patient is breathing, tum patient into the recovery position, check for continued breathing, and get help.
- If the patient is not breathing or is making occasional gasps or weak attempts at breathing, send someone (or go for help If alone). (On return) Start rescue breaths by giving two slow effective breaths, each resulting in a visible rise and fall in the chest wall; a mouth-to- barrier device may be used.

Assessment of circulation

- Assess signs of circulation by feeling the carotid pulse for no more than 10 seconds.
- If there are signs of circulation but no breathing, continue rescue breaths and check for signs of breathing every 10 breaths.
- If there are no signs of circulation, start chest compression. Combine rescue breaths and compression at the rate of 30 compressions to two effective breaths, repeating this cycle 5 times in approximately 2 minutes.
- The ratio of compressions to lung inflation remains the same for resuscitation with two persons.
- Kneel by the side of the victim and place the heel of one hand in the centre of the victim's chest. Place the heel of your other hand on top of the first hand. Interlock the fingers of your hands and ensure that pressure is not applied the victim's ribs. Don't apply any pressure over the upper abdomen or the bottom end of the bony sternum.
- Position yourself vertically above the victim's chest and with arms straight.
- Press down on the sternum 5-6 cm.
- After each compression, release all the pressure on the chest without losing contact between your hands and the sternum. Compression and release should take an equal amount of time.
- Repeat at the rate of 100-120 times/minute.

ACUTE CHEST PAIN

Definition

- Pain over precordium developed within minutes to hours.

Life threatening causes

- Acute Myocardial Infarct
- Massive Pulmonary Embolism
- Acute Aortic dissection
- Tension Pneumothorax
- Oesophageal rupture

Other causes

- Acute Pericarditis
- Pleurisy
- Musculoskeletal pain

Immediate questions

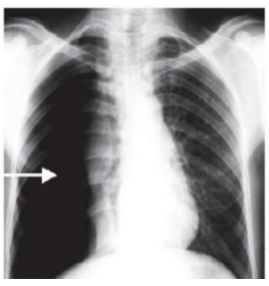
- location of Chest pain
- Radiation
- Character
- Precipitating Factors
  - associated symptoms (palpitation, sweating, syncope, haemoptysis, shortness of breath, vomiting)
  - Previous history of Cardiovascular risk factors
  - Prolong immobilization, recent major surgery

Rapid assessment

- fever
- pallor/cyanosis
- sweating
- anxious/restlessness
- unequal pulse
- raised JVP
- Tracheal shift, equality of breath sound
- Blood pressure & heart rate
- Respiratory Rate
- DVT
- Tenderness on Chest wall

Check

- pulse oximetry
- RBS with glucometer
- ECG -7 arrhythmia, ST elevation (always compare with previous ECG If available)
- Urgent portable Chest X-



ray → Tension Pneumothorax

Pointers for AMI

- Prolong cardiac pain >30 mins
- Central compressing pain
- Radiation to neck, jaw, arm, epigastrium or back
- Anxiety and fear of impending death
- Marked nausea, vomiting & sweating
- Shortness of breath, syncope,
- Precipitated by cold wind, stress

Pointers of pulmonary embolism

- Cyanosis
- Tachycardia
- Raised JVP
- Hypotension
- Predisposing factors such as DVT

Pointers of acute aortic dissection

- sudden tearing chest pain radiate to back
- sweating, pallor
- unequal radial pulse & BP

Pointers of tension pneumothorax

- Very Sudden onset
- Unilateral sharp chest pain
- Tracheal shift
- Hypotension
- unilateral reduced breath sound

Pointers for oesophageal rupture

- burning central chest pain
- sweating
- preceded by excessive vomiting

Pointers for pericarditis

- Central
- worsen on inspiration or lying flat
- relieved by sitting forward

Emergency management

A. Symptomatic management
    a. Oxygen inhalation (4L to 6L)
    b. Sublingual GTN
    c. IV antiemetic
    d. NSAID for musculoskeletal pain
B. Disease management
    a. P.O Aspirin 300mg and P.O Clopidogrel 300 mg (unless contraindicated) for AMI
C. Immediate Referral Criteria *(referral detail with given Tx and vital signs)*
    a. Ongoing Chest Pain

b. Pallor / Cyanosis / Sweating
c. Restless
d. Hypotension
e. Arrhythmia
f. ↓Sp02
g. Unequal radial pulse
h. Unequal breath sound

Further Reading

1. *Davidson's Principle and Practice of Medicine, 21' [1] Edition, 20I 0*
2. *Oxford Handbook of General Practice, 3rd Edition, 2010*
3. *Current Medical Diagnosis & Treatment, 48[1] Edition, 2009*

PULMONARY EMBOLISM

Definition

- Venous thrombi, usually from a deep vein thrombosis in the leg pass into the pulmonary circulation and block blood flow to the lungs. Without treatment, 20% with proximal deep vein thrombosis develop pulmonary embolus (PE).

Symptoms

- Acute dyspnoea,
- Pleuritic chest pain
- Haemoptysis
- Syncope
- Large clots can be rapidly fatal

Signs

- Hypotension
- Tachycardia
- Cyanosis
- Increased JVP
- Tachypnoea
- Pleural rub

Differential diagnosis

- Pneumonia and pleurisy
- Acute coronary syndrome
- Other causes of acute breathlessness: acute LVF, asthma, exacerbation of COPD, pneumothorax, shock (e.g., due to anaphylaxis), arrhythmia, hyperventilation
- Other causes of acute chest pain: aortic dissection, rib fracture, musculoskeletal chest pain, pericarditis, oesophageal spasm, shingles

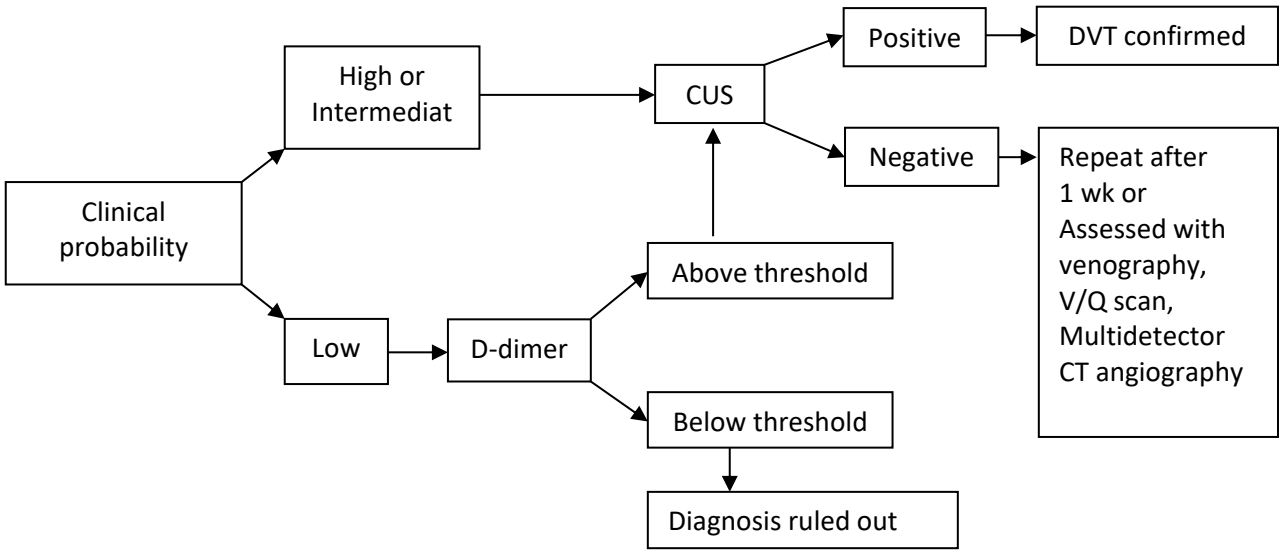
Investigation

- Chest X-ray and ECG
- Wells score for DVT

Cancer	+l
Paralysis or recent plaster cast	+l
Bed rest >3 days or surgery <4 wks	+l
Pain on palpation of deep veins	+l
Swelling of entire leg	+l
Diameter difference on affected calf >3cm	+l
Pitting oedema (affected side only)	+l
Dilated superficial vein (affected side)	+l
Alternative diagnosis at least as probable as DVT	-2

(0) Low risk, (1-2) Intermediate risk, (3) High risk

Diagnostic algorithm for clinically suspected DVT/PE



CUS = compression ultrasonography

Management

Immediate action

- Most of the pulmonary embolism deaths occur within 1 hour.
- It is an acute medical emergency.
- Give i.v access for haemodynamic instability patient before refer to hospital.
- If suspected, give oxygen as soon as possible (aim to keep Sp02 at 94-98%).
- Needs supportive medical care and anti-coagulation
- Initial anticoagulation with LMWH and warfarin, then followed by oral anticoagulant
- LMWH should be continued for at least 4 day and anti INR is in therapeutic range for
- 2:2 day. Target INR 2.5 (Range 2-3)
- Oral anticoagulants reduce risk of further thromboembolism and should be continued for 3-6 months after a single DVT
- If a patient has a DVT and there is no obvious cause
- If <45 yr, consider thrombophilia
- If>45 yr, consider undiagnosed cancer

Further management

- In all cases of proven PE, anticoagulation is started in hospital before discharge to general practice.
- Warfarin should be continued for 2:3 months. Aim to keep the INR 2.5 (range 2-3)
- Malignancy: continue treatment with LMWH for 6 months or until cure of cancer
- Pregnancy: LMWH is continued until delivery or end of pregnancy

Refer

- All suspected DVT/PE cases must be referred to hospital (urgently).

Reference:

1. *Oxford Handbook of General Practice, 4th Edition*
2. *John MURTAGH's Handbook of General Practice, 5th Edition*

PNEUMOTHORAX

Definition

- Pneumothorax is the present of air in the pleural space which can occur spontaneously or result from iatrogenic injury or trauma to the lung or chest wall.
- Primary spontaneous pneumothorax occurs in patients with no history of lung disease in whom smoking, tall stature and the present of apical subpleural blebs are additional risk factors.

Classification of pneumothorax

- Spontaneous
    - Primary
        - No evidence of overt lung disease. Air escape from the lung into the pleural space through rupture of a small subpleural emphysematous bullae or pleural bleb, or the pulmonary end of a pleural adhesion.
    - Secondary
        - Underlying lung disease, most commonly COPD and TB; also seen in asthma, lung abscess, pulmonary infarcts, bronchogenic carcinoma, all forms of fibrotic and cystic lung disease.
- Traumatic
    - Iatrogenic (e.g., following thoracic surgery or biopsy) or chest wall injury.

Types of spontaneous pneumothorax

- Closed type
- Open type
- Tension (valvular) type

Clinical feature

- sudden onset unilateral pleuritic chest pain
- breathlessness
- pallor ± or tachycardia

Physical examination

- normal in small pneumothorax,
- tracheal shift to opposite side
- hyper-resonance on percussion and obliteration of cardiac dullness
- decreased or absent breath sound in large pneumothorax

Investigation

- Chest X-ray

Management

- Primary pneumothorax in which lung edge is less than 2 cm from the chest wall and the patient is not breathless normally resolves without intervention. 50% collapse takes 40 days to be resolved.
- In young patients presenting with a moderate or large spontaneous pneumothorax, acute respiratory distress, chest pain, percutaneous (16-l 8G cannula through the 2nd intercostal space just above the 3rd rib at mid clavicular line) aspiration of air is a simple and well-tolerated alternative to intercostal tube drainage, with a 60-80% chance of avoiding the needle for a chest

drain.

- When needed, intercostal drains are inserted in the 4th, 5th or 6th intercostal space in the *mid-axillary line connected to an underwater seal or one-way Heimlich valve and secured firmly to the chest wall or refer depending upon clinical judgement.*
- Smoking cessation reduces risk of recurrence.

Refer

- Tension pneumothorax is the medical emergency. It was indicated/categoraized as urgent referral.

Reference

1. *Davison's Principles and Practice of Medicine, 22nd Edition*

STATUS ASTHMATICUS IN ADULTS

Symptoms/signs of a severe asthma attack

- PEFR 30-50% predicted or best
- 0_2 saturation 2:92%
- unable to talk in sentences
- intercostal recession
- tachypnoea, respiratory rate 2:25 breaths/min
- tachycardia, heart rate 2:110 bpm

Life-threatening signs

- PEFR <33% predicted or best
- 0_2 saturation <92%
- Arrhythmia
- Hypotension
- Cyanosis
- Exhaustion
- Poor respiratory effort
- Silent chest (inaudible wheeze)
- Altered consciousness

Differential diagnosis

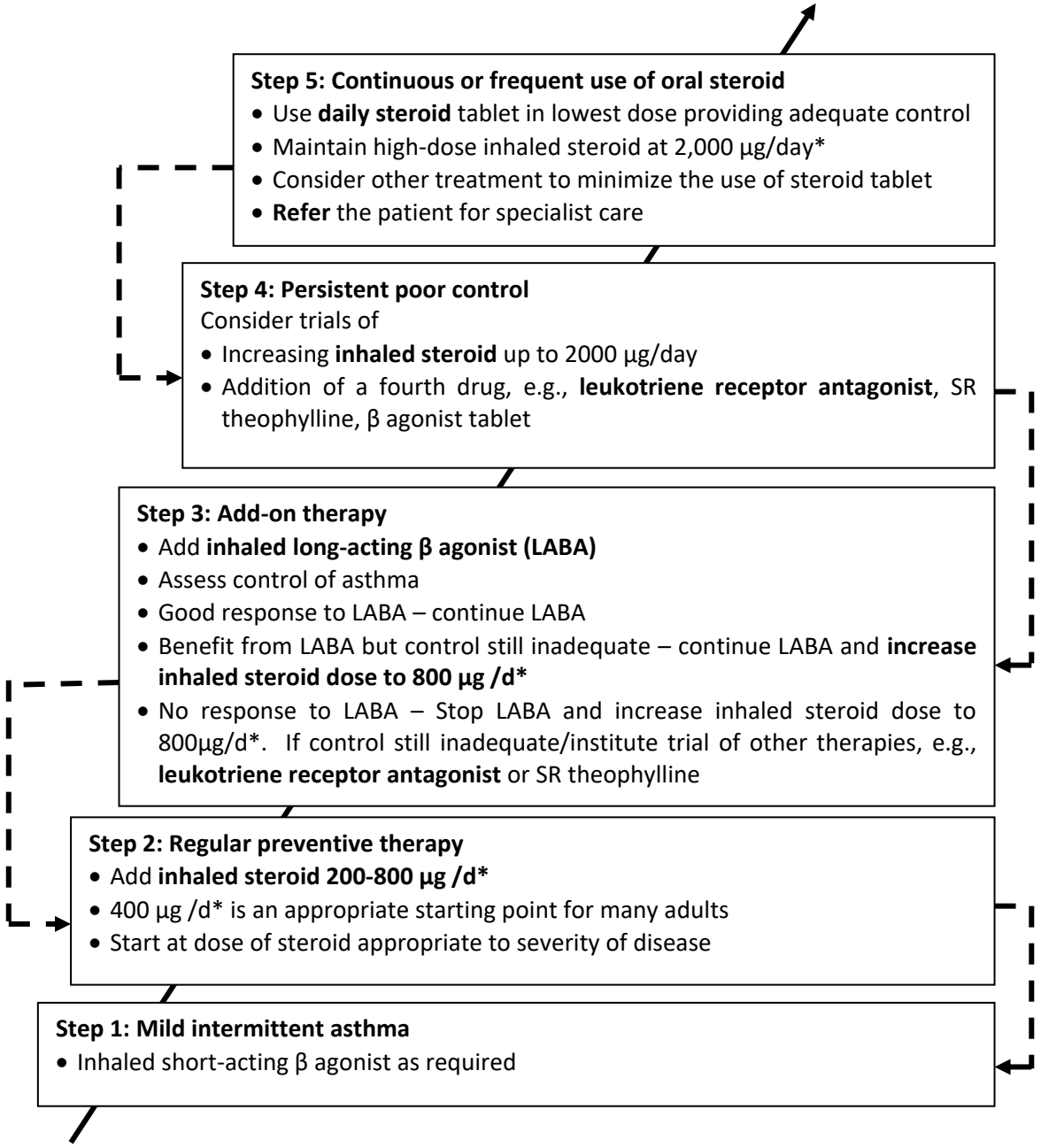
Airflow obstruction= FEV1/FVC <0.7

- AIRFLOW OBSTRUCTION
  - COPD
  - Bronchiectasis
  - Inhaled foreign body
  - Obliterative bronchiolitis
  - Large airway stenosis
  - Lung cancer
  - Sarcoidosis
- NO AIRFLOW OBSTRUCTION
  - Chronic cough syndrome
  - Hyperventilation syndrome
  - Vocal cord dysfunction
  - Rhinitis
  - Gastro-oesophageal reflux
  - Heart failure
  - Pulmonary fibrosis

Management of acute asthma

Drug treatment of asthma

- Use a stepwise approach
  - Start at the step most appropriate to the initial severity of symptoms. The aim is to achieve early control of the condition and then to decrease treatment by stepping down.



**All doses given refer to hydrofluoroalkane - beclometasone dipropionate (BDP-HFA) equivalent inhalers. For other drugs/ formulations adjust dose accordingly*

Fig 1: Summary of Stepwise management of asthma in adult

- Exacerbations
    - Treat early. In adult patients on 200 µg doses of inhaled steroids, a 5 times increase in dose reduces severity of exacerbations.
    - Alternatively, and in all other cases, use prednisolone 30-40 mg od for 1-2wk.
- *Selection of inhaler device*
    - If possible, use an MDI. Inadequate technique may result in drug failure. Patients must inhale slowly and hold their breath for 10s after inhalation.
    - Demonstrate inhaler technique before prescribing and check at follow-ups.
    - Spacers/breath-activated devices are useful If patients find activation difficult. Dry powder inhalers are an alternative.
- *Short-acting β2-agonists (e.g., salbutamol)*
    - Work more quickly and with fewer side effects than alternatives. Use pm unless shown

to benefit from regular dosing. Using 2:2 canisters/month or >10-12 puffs/d is a marker of poorly controlled asthma.
    - A budesonide /formoterol combination inhaler is an alternative rescue medication.
- *Inhaled corticosteroids*
    - Effective preventer. May be beneficial even for patients with mild asthma.
    - Consider if:
        - exacerbation of asthma in the last 2 year requiring steroids;
        - using inhaled 2 agonists 2:3 times/wk;
        - symptomatic 2:3 times/wk or
        - symptomatic 2:1 night/wk.
- *Oral steroids*
    - Prescribe as a single dose in the morning. Often started at high dose (e.g., 40-50mg od) to suppress disease process and then stopped after improvement.
    - If used as maintenance therapy, use the minimum dose that controls disease. Supply with a 'steroid card'
- *Add-on therapy*
    - Aims to improve lung function/symptoms. Before initiating a new drug, check compliance, inhaler technique, and eliminate trigger factors. Only continue If of demonstrable benefit.
        - Inhaled long-acting β2 agonists (LABA) (e.g., salmeterol)
        - Do not use without inhaled steroids. Combination inhalers (steroid + LABA) improve compliance
        - Leukotriene receptor agonists (e.g., montelukast) decrease exacerbations
        - Theophylline Side effects are common
- *Omalizumab*
    - Monoclonal antibody that binds to circulating IgE. Useful for adults and children >6 yr If allergy is a factor in asthma, on high-dose inhaled steroid + LABA, and frequent exacerbations. Given subcutaneously every 2-4wk. Always specialist-initiated.

DIFFICULT ASTHMA

- Persistent symptoms and/or frequent exacerbations despite treatment at step 4/5.
- Check diagnosis and exacerbating factors.
- Assess adherence to medication. Find out about family, psychological, or social problems that may be interfering with effective management.

THYROID CRISIS (THYROID STORM)

- Clinical features are marked anxiety, weight loss, weakness, proximal muscle weakness, hyperpyrexia, tachycardia (>150/ minute), heart failure and arrhythmias.
- It is usually precipitated by surgery or an infection in an undiagnosed patient.
- Referral is required for urgent intensive hospital management with antithyroid drugs; IV saline infusion, IV corticosteroids, anti-heart failure and antiarrhythmia therapy.

ADDISONIAN CRISIS

- An addisonian crisis develops because of an inability to increase cortisol in response to stress, which may include intercurrent infection, surgery or trauma.

Clinical features

- Nausea and vomiting
- Acute abdominal pain
- Severe hypotension progressing to shock
- Weakness, drowsiness progressing to coma

Urgent management

- Establish IV line with IV fluids
- Hydrocortisone sodium succinate 200 mg IV and 100-200 mg 4-6 hourly
- Arrange urgent hospital admission

EMERGENCY PSYCHIATRIC MANAGEMENT

SUICIDE ATTEMPTS AND SUICIDAL THOUGHTS

- suicidal attempt is considered to be one of the commonest psychiatric emergencies.
- Suicide is a type of deliberate self-harm and is defined as an intentional human act of killing oneself.

Aetiology

- Psychiatric Disorders:
  - Major depression
  - Schizophrenia
  - Drug or alcohol abuse
  - Dementia
  - Delirium
- Personality disorder Physical Disorders:
  - Patients with incurable or painful physical disorders like, cancer and AIDS.
- Psychosocial Factors:
  - Failure in examination
  - Dowry harassment
  - Marital problems
  - Loss of loved object
  - Isolation and alienation from social groups
  - Financial and occupational difficulties

Risk factors for suicide

- Age:
  - Males above 40 years of age
  - Females above 55 years of age
- Sex:
  - Men have greater risk of completed suicide
  - Suicide is three times more common in men than in women.
  - Women have higher rate of attempted suicide.
- Being unmarried, divorced widowed, or separated
- Having a definite suicidal plan
- History of previous suicidal attempts
- Recent losses

Suicidal tendency in psychiatric disorder management

- Be aware of certain signs which may indicate that the individual may commit suicide;
  - Suicidal threat
  - Writing farewell letters
  - Giving away treasured articles
  - Making a will
  - Closing bank accounts
  - Appearing peaceful and happy after a period of depression
  - Refusing to eat or drink, maintain personal hygiene.
- Monitoring the patient's safety needs:

- Take all suicidal threats or attempts seriously and notify psychiatrist.
- Search for toxic agents such as drugs/alcohol.
- Do not leave the drug tray within reach of the patient, make sure that the daily medication is swallowed.
- Remove sharp instruments such as razor, blades, knives, glass bottles from his environment.
- Remove straps and clothing such as belts, neckties.
- Do not allow the patient to bolt his door on the inside, make sure that somebody accompanies him to the bathroom.
- Patient should be kept in constant observation and should never be left alone.
- Have good vigilance especially during morning hours.
- Spend time with him, talk to him, and allow him to ventilate his feelings.
- Encourage him to talk about his suicidal Plans/ methods.
- If suicidal tendencies are very severe, sedation should be given as prescribed.
- Encourage verbal communication of suicidal ideas as well as his/ her fear and depressive thoughts.
- Enhance self-esteem of the patient by focusing on his strengths rather than weaknesses. His positive qualities should be emphasized with realistic praise and appreciation. This fosters a sense of self-worth and enables him to take control of his life situation.

Management of attempted suicide

- Assess for vital signs, check airway, If necessary clear airway.
- If pulse is weak, start IV fluids.
- Tum patient's head and neck to one side to prevent regurgitation and swallowing of vomitus.
- Emergency measures to be instituted in case of self-inflicted injuries.

Management of shock

- Transfer the patient to medical centre immediately.
- If there is no evidence of life, leave the body in the same position/room in which it was found (move the patient in case suicide from a common living area for example, dining room or TV room)
- Inform authorities, record the incident accurately
- Once the patient is transferred to mortuary or police custody clean the place with disinfectant solution

SNAKE BITES

- Major poisonous snakes in Myanmar
    - Russel's viper (more than 90%), Cobra, Krait, Sea snake, Green snake, Green pit viper

Signs of local envenomation

- local pain and inflammation, local bleeding, bruising, lymphangitis and lymph node enlargement, blistering, skin necrosis.

Early clues of severe envenoming

- snake identified as a dangerous species, rapid extension of local swelling, early tender enlarged regional lymph nodes, early systemic features (nausea, vomiting, collapse, headache, heaviness of eyelids, ptosis, inappropriate drowsiness, spontaneous systemic bleeding).

Clinical syndromes of envenomation (As a clue for species diagnosis)

- Syndrome 1: Local envenomation with bleeding/ clotting disturbance (Viperidae,
- green snake)
- Syndrome 2: Local envenomation with bleeding/clotting disturbance, shock, acute kidney injury, proteinuria, conjunctival edema (Russell's viper)
- Syndrome 3: Local envenomation with paralysis (Cobra)
- Syndrome 4: Paralysis with minimal local envenomation sign (bitten on land while sleeping on ground- Krait) (bitten in the sea- sea snake)
- Syndrome 5: Paralysis with dark brown urine and acute kidney injury (sea snake)
- Note: There may be considerable overlap of clinical features caused by venom of different species.

Management

- First Aid
- Reassurance, immobilize whole body by laying in a comfortable and safe position, immobilize the bitten limb by splinting, pressure-immobilization or application of pressure pad, avoidance of incision, vigorous cleaning, massage and application of chemicals.

Rapid assessment and resuscitation

- Airway, Breathing, Circulation, Disability of nervous system (paralysis and impaired consciousness). Give intravenous fluid to combat the shock. Give oral analgesic (Paracetamol) for pain relief but NSAIDs should be avoided.

Transport to hospital

- quickly, safely and comfortably (in recovery position, if possible, with immobilization of bitten limb)

Anti-venom treatment

- Antivenom may be given before transfer to hospital If it is available and there is definite indication.

Indications

- If and when a patient with proven or suspected snake bite develops one or more of the features of local and/or systemic envenomation (See above). Should only be given when benefits are

considered likely to exceed the risks of anti-venom treatment.

Dose and route

- 40-80 ml of monovalent or 80-160 ml of polyvalent anti-venom by slow intravenous injection (not more than 2 ml/min) or intravenous infusion after dilution with 250- 500 ml isotonic saline (over one hour).
- Note: skin sensitivity test is not recommended.

Caution:

- Epinephrine should be drawn up in readiness in case of anaphylaxis.
- Never inject/infiltrate anti-venom locally
- Intramuscular route should not be used unless intravenous injection is not possible.
- Closely observe for at least one hour for possible reaction.
- In cobra envenomation, anti-venom treatment alone may not be solely reliable.
- Timely detection of respiratory muscle paralysis and artificial breathing/ventilation is important and life-saving.

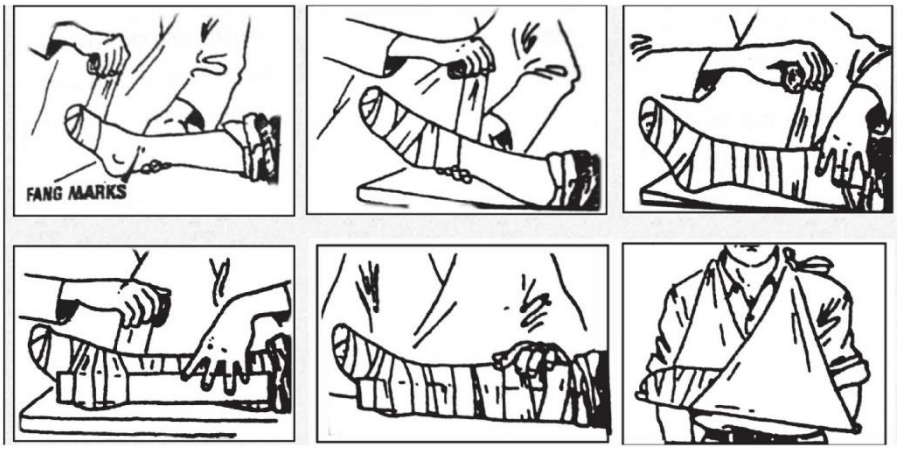


Fig: Pressure immobilization method

INSECT BITES AND STINGS

Mild reaction-

- itching or stinging sensation and mild swelling that disappear within a day or so. A delayed reaction may cause fever, urticaria, joint pain and lymph node enlargement.

Management of mild reaction

- **Move to a safe area** to avoid more stings.
- **Remove the stinger**, especially If it is stuck in the skin to prevent the release of more venom. Wash the area with soap and water.
- **Apply a cold** pack or cloth filled with ice to reduce pain and swelling.
- **Analgesics** such as ibuprofen or paracetamol, to ease pain from bites or stings.
- Apply a **topical cream** to ease pain and provide itch relief Creams containing ingredients such as hydrocortisone, lidocaine or may help control pain. Other creams, such as calamine lotion or lotion containing baking soda, can help soothe itchy skin.
- **Antihistamine** containing diphenhydramine or chlorpheniramine maleate orally.
- Severe reactions affect more than just the site of the insect bite and may progress rapidly.

Signs and symptoms are:

- Difficulty breathing, swelling of the lips or throat, lightheadedness and syncope, dizziness, confusion, tachycardia, urticaria, nausea, cramps and vomiting, hypotension and shock.

Management of severe reaction

- Epinephrine - 0.5 -1 mg intramuscularly to the lateral thigh.
- Antihistamine - Intravenous chlorpheniramine maleate.
- Corticosteroid- Intravenous hydrocortisone 100-200 mg.
- Loosen tight clothing and cover the person with a blanket. Don't give anything to drink.
- Turn the person on his or her side to prevent choking If there's vomiting or bleeding from the mouth.
- Start CPR If there are no signs of circulation or breathing.

ACUTE POISONING AND OVERDOSE

Diagnosis of acute poisoning

- Mainly from history given by the patient or witness or by circumstantial evidences such as empty bottle or package of drug, suicide note, trace of the poison on the mouth or body and peculiar smell.

NOTE:

- Acute poisoning should be considered as a differential diagnosis in a patient with unexplained coma.
- Presence of lateralizing signs (i.e. asymmetry of pupils, posture, movement, plantar response) virtually excludes the diagnosis of poisoning.
- There should be high index of suspicion of head injury.

TOXIDROMES

- A clinical syndrome caused by dangerous level of poison in the body. It may indicate a medical emergency requiring treatment at poison center. They are often variable and often obscured by co-ingestion of multiple agents.

SYMPTOMS	BP	HR	RR	Temp	Pupils	Bowel sound	Diaphoresis
Anticholenergic		Up		Up	Up	Down	Down
Cholenergic					Down	Up	Up
Hallocinogic	Up	Up	Up		Up		Up
Sympathomimetic	Up	Up	Up	Up	Up		Up
Sedative/ hypnotic	Down	Down	Down	Down		Down	Down
Opiate	Down	Down	Down	Down	Down	Down	

Toxidromes and possible causative agents

Anticholenergic: Atropine, benztropine, antihistamine, antispasmodics, anti-parkinsonism, antipsychotics.
Cholenergic: Organophosphates, carbamates, nerve gas, mushroom,
Hallucinogic: Amphetamine, cocaine, LSD
Sympathomimetics: Methamphetamine, phenylpropanolamine, ephendrine, pseudoephendrine, cocaine, salbutamol
Sedative/hypnotic: Benzodiazepines, anticonvulsants, barbiturates, methaqualone, ethanol
Opiates- Opioids

Indications for hospital referral

- All patients who show features of poisoning
- Patients who have taken poisons with delayed action (aspirin, iron, paracetamol, tricyclic antidepressants, modified-released preparations)

Prehospital management

- Remove from toxic atmosphere (inhalational poison) without rescuer themselves being put at risk.

- Maintain ABC (Airway, breathing and circulation)
- Remove contaminated clothing and wash the skin.
- Correct hypoglycemia If suspected or detected by finger prick test.
- Give thiamine in possible alcohol abuse.
- Treat the shock.
- Treat prolonged and recurrent major fit by rectal or IV diazepam.
- Keep in semi-prone position.
- May try gastric suction or induced vomiting IF:
- Patient has possibly taken dangerous amount of poison
- Patient is conscious and there is no or low risk of chocking/aspiration.
- There is possible delay in transfer to hospital.
- Patient has not taken - corrosives, hydrocarbons, paraquet (weed killer)
- Initiation of antidotes may be considered If poison can be identified and specific antidote is available.

Common poisoning: diagnostic features and readily available antidotes

Methanol/ethylene glycol

- Diagnosis: History, multiple victims from the same source (in methanol poisoning),
- acidosis, blurring of vision (methanol)
- Antidote- ethyl alcohol, IV $NAHC0_3$ for acidosis

Mushroom

- Diagnosis: History and features of cholinergic toxidrome.
- Antidote: IV Atropine

Opiates

- Diagnosis: circumstantial diagnosis, opiate toxidrome
- Antidote: Naloxone

Organophosphate/ carbamate insecticide

- Diagnosis: peculiar smell, features of cholinergic toxidrome.
- Antidote: IV Atropine 0.6- 1.2 mg (may repeat every 15-30 minutes If cholinergic features persist)

Paracetamol

- Diagnosis: History and circumstantial evidence only as there is no specific clinical feature in early phase.
- Antidote: N-acetyl-cystiene (a mucolytic agent Musol/Actein) 140mg/kg stat followed by 70mg/kg every 4 hours.

Stimulants (amphetamine, ephedrine)

- Diagnosis: sympathomimetic toxidrome, hyperthermia.
- Antidote: β-blockers, Diazepam

Tricyclic antidepressants

- Diagnosis: History, circumstantial evidence and features of anticholenergic toxidrome.
- Antidote: No specific antidote, correct acidosis by IV $NaHC0_3$ and monitor arrhythmias
- If in doubt: about the diagnosis and how to act-

- ***Contact Poison Treatment Centre, New Yangon General Hospital or National Poison Control Centre, DMR (Lower Myanmar)***
- ***NPCC (DMR) - 01379480, 01 379481***
- ***PTC (NYGH) - 01 384493***

Prevention

- Small amount only of drug should be bought
- Keep drugs in safe place
- Keep drugs and liquids in their original containers
- Child resistant drug containers should be used
- Prescription for any susceptible patient must be monitored carefully
- Household products should be labeled and kept safely, away from children.

SURGICAL EMERGENCIES

Refer Chapter 17 page
GI Bleeding
Acute Abdomen
Burns and Scold

OBSTETRIC EMERGENCIES

ECLAMPSIA

- Occurs when a pregnant woman has fit as a result of preclampsia. Usually, blood pressure is very high and if the baby is not yet born, it becomes distressed. There is a serious risk of stroke in the mother.
- Women with preeclampsia has a chance of eclamptic seizure. 44% occur after the baby is born usually less than 24hours after delivery.
- Give PR diazepam 10-20mg or intravenous If available. Urgent referral is required.

HELLP SYNDROME

- Occurs in pregnancy or 48 hours after delivery.
- Associated with severe eclampsia.
- Haemolysis
- Elevated liver enzymes
- Low platelets

Signs

- Hypertension (80%)
- Right upper quadrant pain (90%)
- Nausea
- Vomiting (50%)
- Oedema

Management

- Refer for obstetric assessment.

OBSTETRIC SHOCK

Causes

- Haemorrhage: APH (page - 885), placenta abruption (page - 887), PPH
- Ruptured uterus
- Inverted uterus
- Pulmonary embolus
- Anaphylaxis (usually drug)
- Amniotic fluid embolism
- Broad ligament haematoma
- Septicaemia

Management

- Give intravenous access and start intravenous fluids, give oxygen
- Treat the cause If apparent.
- Immediate refer to hospital.

FETAL DISTRESS

Signifies hypoxia Signs:

- Passage of meconium during labour
- Fetal tachycardia (>160 bpm at term)
- Fetal bradycardia

Management

- Give mother oxygen via a face mask and tum her onto her side.
- Refer to hospital for assessment+/- delivery.

ACUTE ABDOMINAL PAIN IN PREGNANCY

- Non- obstetric causes of abdominal pain may be forgotten or signs may be less well localized than in the non-pregnant patient (acute abdominal pain in surgery)

APPENDICITIS

- Mortality is higher in pregnancy and perforation more common (15-20%).
- Fetal mortality is 5-10% for simple appendicitis but rise to 30% when there is perforation.
- Due to the pregnancy, the appendix is displaced and pain is often felt in the paraumblical region or subcostally.
- Refer immediately If suspected.

CHOLECYSITITIS

- Pregnancy encourages gallstone formation. Symptoms include right upper quadrant pain, nausea and vomiting. Diagnosis can be confirmed on ultrasound.
- Treatment is the same as outside pregnancy aiming for interval cholecystectomy after birth.

TORSION OR RED DEGENERATION OF FIBROIDS

- Fibroid s increase in size in pregnancy. They may twist if pedunculated.
- Red degeneration occurs usually after 20 week and may occur until the puerperium.
- It presents as abdominal pain+/- localized tenderness+ /- vomiting and low-grade fever. Confirm diagnosis with USS. Treatment is with rest and analgesia. Pain resolves within one week.
- If not relieved, refer.

TORSION OR RUPTURE OF *OVARIAN CYSTS*

- Torsion or rupture of a cyst may both cause abdominal pain as may bleeding into a cyst. USS can confirm the presence of a cyst.

Management

- Depends on the nature of cyst and the severity of the pain.
- Refer for assessment and treatment.
- *If less than 20 weeks gestation,* also consider

ECTOPIC PREGNANCY

- *If more than 20 weeks gestation*, also consider

HAEMATOMA OF THE RECTUS ABDOMINIS

- Rarely bleeding into the rectus sheath and haematoma formation occurs spontaneously or after coughing in late pregnancy. May cause swelling and abdominal tenderness. USG can be helpful. If unsure of diagnosis, refer to hospital.

UTERINE RUPTURE

- Associated with maternal mortality of 5% and fetal mortality of 30%.70% are due to dehiscence of Caesarean section scars. Rupture occurs most commonly during labour but occasionally in the third trimester or after an otherwise normal delivery.

Presentation

- Pain is variable but usually severe, bursting, constant lower abdominal pain+/- heavy vaginal bleeding.
- Generally associated with profound shock in the mother and fetal distress. If in labour, the presenting part may disappear from the pelvis+/- contraction stop.

Management

- Refer as an emergency.

PLACENTAL ABRUPTION (ABRUPTION PLACENTA)

- Part of the placenta becomes detached from the uterus. Consequences depend on degree of separation and the amount of blood loss.

Presentation

- Typically, constant pain -may be felt in the back If posterior placenta
- Woody hard, tender uterus
- Shock+/-PV bleeding
- Fetal heart absent or signs of fetal distress (fetal tachycardia or bradycardia)

Management

- If suspected, refer as an acute emergency.

SHOULDER DYSTOCIA

- After less than 1% deliveries but is life-threatening emergency. Occurs when the anterior shoulder impacts upon the symphysis pubis after the head has delivered and prevents the rest of the body following. Most cases of shoulder dystocia are unanticipated.

Clues

- Prolonged first or second stage of labour
- Head bobbing: the head consistently descends then returns to its original position during a contraction or pushing in second stage

Management

- If no time to refer
    - Do episiotomy. Then try any of these procedure (no particular order)
    - Roll the mother onto hands and knees and try delivering POSTERIOR SHOULDER FIRST
    - FLEX AND ABDUCT THE MOTHER'S LEG UP TO HER ABDOMEN
    - (UPSIDE DOWN SQUATTING POSITION) → try deliver again
    - Deliver the POSERIOR ARM → put a hand in the vagina in front of the baby → ensure the posterior elbow is flexed in front of the body and pull to deliver the forearm. The anterior shoulder usually follows
    - EXTERNAL PRESSURE - ask an assistant to apply suprapubic pressure with the heel of hand
    - (A Rocking movement can help)
    - Adduction of the most accessible (preferably anterior) shoulder.
    - Simultaneously put pressure on the posterior clavicle to turn the baby
    - If unsuccessful continue rotation through 180 degrees and try again

CORD PROLAPSE

- The cord passes through the os in front of the presenting part of the baby. If the presenting part squashes the cord, umbilical blood flow is restricted causing fetal hypoxia and distress (fetal mortality 10%- 17%)

Risk factors

- Malpresentation --- breech / transverse /oblique
- Cephalo-pelvic disproportion
- Multiple pregnancy
- Preterm rupture of membranes
- Polyhydramnios
- Pelvic tumours

Management

- Minimize handling of the cord to prevent spasm.
- Try to keep the cord within VAGINA.
- Aim to prevent presenting part from occluding the cord. Try
    - Displacing to prevent presenting part upwards with the examining hand
    - Get patient into knee/elbow position-----head down
    - If possible, drop the head end of the bed
    - Fill the bladder with 500-750ml normal saline via a catheter and clamp the catheter
- REFER as an emergency for emergency Caesarean section (usually)

RETAINED PLACENTA

- The third stage of labour is complete in less than 97% of labours. If the placenta has not been delivered in 30 min (to allow for cervical spasm) it will probably not delivered spontaneously.

Management

- Avoid excessive cord traction.
- Check the placenta is not in the vagina- remove If it is
- Check the uterus

- If the uterus is well contracted
- Cervical spasm is probably trapping an otherwise separated placenta- wait for cervix to enable removal of the placenta.
- If the uterus is bulky,
- The placenta may have failed to separate. Try Rubbing up a contraction.
- Putting the baby to the breast (stimulated uterus contraction)
- Give a further dose of syntometrine
- If the placenta will still not deliver, refer as emergency for manual removal.

UTERINE INVERSION

Management

- Do not remove the placenta If attached until the uterus is replaced. If not early, try to replace the uterus. Otherwise refer as an emergency. The mother may become profoundly shocked so set up an intravenous infusion before transfer If possible, and give oxygen via face mask.

BROAD LIGAMENT HAEMATOMA

- Presents in a recently delivered women as obstetric shock without excessive bleeding per vagina Pain, tenderness on the affected side. The uterus is deviated from that side.

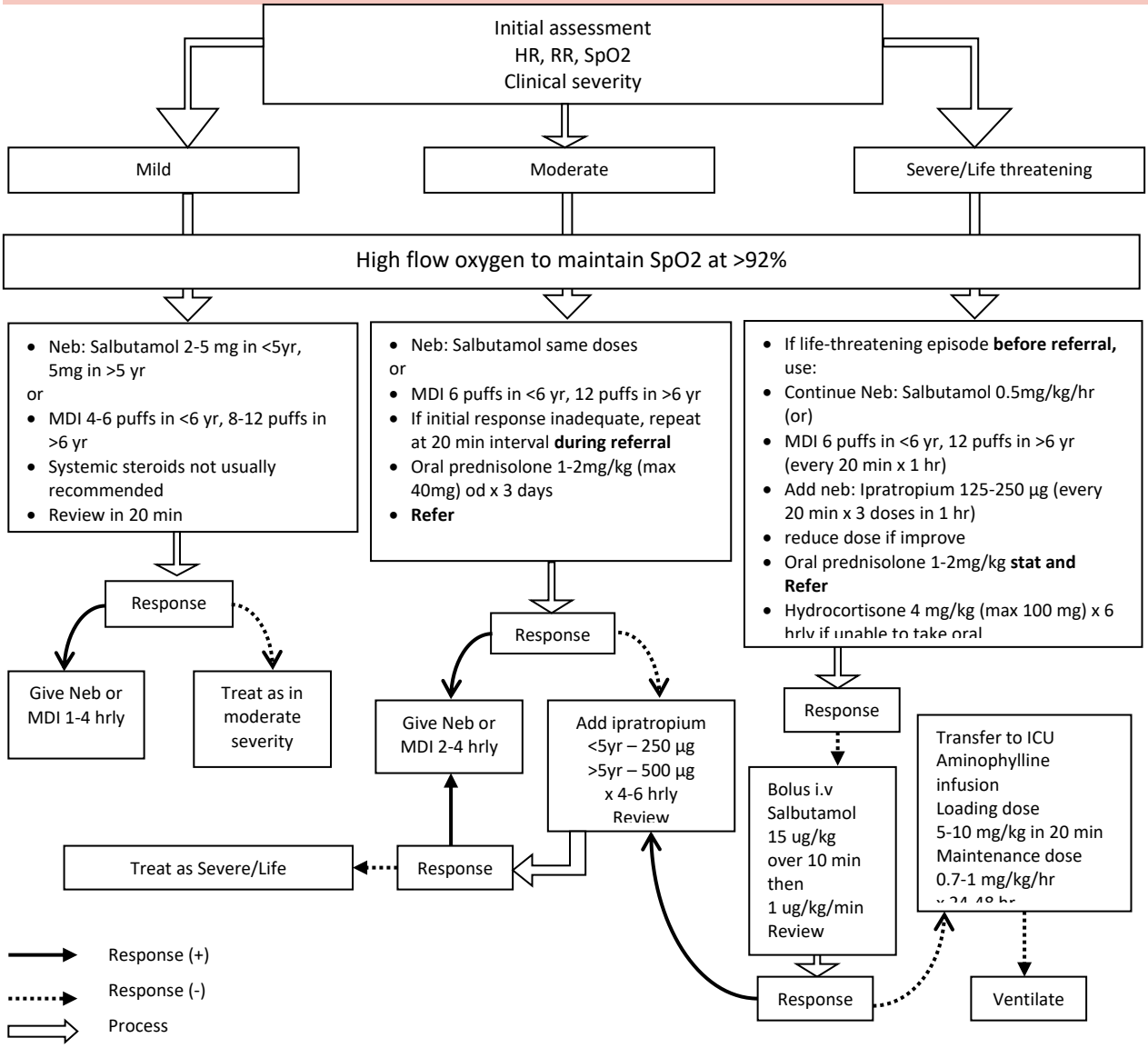
Management

- Refer as acute emergency to the nearest hospital.

AMNIOTIC FLUID EMBOLISM

- Presents with shock, cyanosis and dyspnea. May occur at the height of contraction
- If suspected
- Resuscitate -Airway, breathing, circulation and refer as an emergency to hospital.

ACUTE ASTHMA IN CHILDREN



CONVULSION

Common causes of convulsions with fever

- Febrile convulsion
- Pyogenic meningitis
- Cerebral malaria
- Encephalitis
- TB meningitis
- Brain abscess

Common causes of convulsions without fever

- Epilepsy
- Hypertensive encephalopathy
- Lead encephalopathy
- Sub-dural haematoma
- Brain tumour

FEBRILE CONVULSION

Definition

- Convulsions occurring in association with fever in children between 6 months and 6 years of age, in whom there is no evidence of intracranial pathology or metabolic derangement.

	Simple febrile convulsion	**Complex febrile convulsion**
Duration	<15 minutes	>15 minutes
Type	Generalized	Focal
Recurrence	Not recur during one febrile episode	>one seizure during one febrile episode

Investigations

- Most febrile convulsion follows acute viral infection and investigations are usually not necessary.
- Appropriate investigations should be done only when underlying infection is suspected.

Management

First aid measures for seizure

- Semi-prone position
- Check Airway, Breathing and Circulation.
- Adequate airway and suction, 02
- Clothing must be loosened. Excess clothing removed.
- Don't put anything into mouth
- To control fits If more than 4 minutes - PR Diazepam - 0.3 - 0.5 mg/kg

Control fever

- Take off clothing and give tepid sponging.

- Antipyretic e.g., oral or rectal Paracetamol 15 mg/kg 4-6 hourly.
- NOT ALL CHILDREN NEED TO BE ADMITTED.

The main reasons for admission are: -

- To exclude intracranial pathology especially infection
- Fear of recurrent fits
- To investigate and treat the cause of fever
- To allay parental anxiety, especially If they are staying far from the hospital.

Reassess the child

- Exclusion of other intracranial causes of fits
- Meningitis - signs of meningism, tense or bulging anterior fontanelle, prolonged or frequent fits (check Full blood count, Lumbar puncture)
- Encephalitis - change in sensorium, neurological signs may be present
- Cerebral malaria - came from or travelled to malaria endemic area, change m sensorium, (check Malaria parasites)
- Features of Complex febrile convulsion
- Persistent lethargy

Prevention of recurrence

- Generally, not recommended because
- The risks and potential side effects of antiepileptic medications outweigh the benefits.
- No medication has been shown to prevent the future onset of epilepsy.
- Long term prophylaxis with daily anticonvulsants is not routinely used even If episodes are frequent. However intermittent prophylaxis (like oral diazepam at the start of temperature and every 8 hours for 24 hours only) can be considered for such children with frequent episodes.

Risk factors for recurrent febrile convulsion

- Family history of febrile convulsion in 1st degree relative
- Early onset (<l year)
- Low grade fever during 1st febrile convulsion
- Brief duration (<1-2 hour) between onset of fever and seizure

Risk factors for epilepsy

- Family history of epilepsy in 1^{51}degree relative
- Underlying neurodevelopmental abnormality
- Complex febrile convulsion

MANAGEMENT OF THE CHILD WITH SHOCK

Definition

- State of circulatory dysfunction leading to inadequate cellular perfusion and tissue hypoxia
- Inadequate perfusion of the body's vital organs resulting in anaerobic metabolism and tissue acidosis.
- Multiple end- organ failure and death If insufficient compensation to reverse these changes

Compensated shock

- Prolong capillary refill and cold peripheries (reduce blood flow to non vital organs)
- Increase in heart rate (up to 200 beats per minute for a finite period of time)
- Increase in respiratory rate (to improve oxygen delivery)
- Reduce urine output (<0.5 ml/kg/hour)
- Agitation and confusion
- Blood pressure is maintained

Uncompensated shock

- Anuria
- (A further) reduction of conscious level: GCS <8, only response to pain (AVPU)
- Respiratory failure
- Hypotension (pre-terminal sign)
- In children, the two commonest forms of shock are;
- Hypovolaemic shock secondary to trauma or gastroenteritis
- Septic shock, i.e. distributive

Management chart for child with shock

Condition	**Immediate Management**
drowsy restless cold extremities reduced urine output rapid thready pulse low BP or narrow pulses pressure	Clear airway IV fluid (e.g., R/L or N/S or D/S 20ml/kg/hr)

In a child with shock, the following conditions should be considered

ASK	LOOK FOR	POSSIBLE DIAGNOSIS	INVESTI-GATION	MANAGEMNET
1. Diarrhoea, Vomiting	Two of the following signs: Lethargic/ unconscious Sunken eyes Not able to drink or drinks poorly Skin pinch goes back very slowly	Acute watery diarrhoea with severe dehydration	•Stool RE Serum U, C&E If available	Treat as diarrhea (See Plan C)

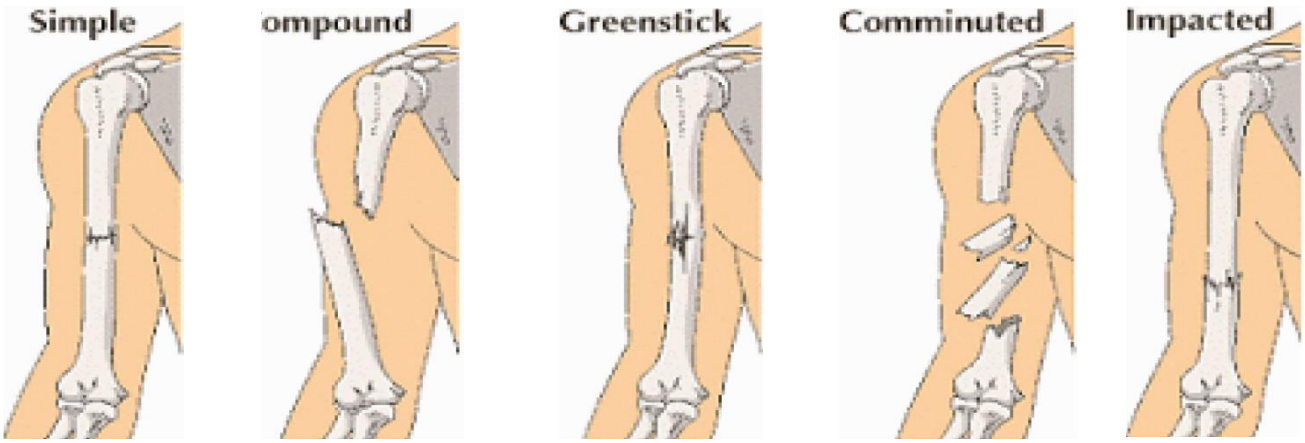
ASK	LOOK FOR	POSSIBLE DIAGNOSIS	INVESTI-GATION	MANAGEMNET
•Rapid Onset	Rice water stool, Fishy smell, •Washer woman's hands	•SUSPECTED CHOLERA	• Rectal swab	>8yrs Tetracycline 12.5mg/kg/dose 6H x 3 days Norfloxacin6mg/kg /dosel2H x 3 days
•Ingestion of mushroom or Tapioca	Constricted pupil in mushroom poisoning	•MUSHROOM OR TAPIOCA POISIONING		Inj. atropine sulphate 0.02mg/kg IM or SC for mushroom poisoning Refer to hospital
2. Fever with Diarrhoea	Febrile, Toxic Splenomegaly	•Acute Watery diarrhoea with septicaemic shock		Cefotaxime 50mg/kg IN or I/Mor Ceftriazone 50mg/kg Referred to hospital
Fever with septic foci	•Toxic •Febrile (or) hypothermia Bounding pulse Splenomegaly •Focus of infection± •Pallor±	Septicaemic shock		Cefotaxime 50mg/kg IN or I/Mor Ceftriazone 50mg/kg Referred to hospital
High continuous fever <7days with •vomiting •Bleeding manifesta- tions (coffee ground vomiting /Melaena)	Hypotension •Narrow pulse pressure 9<20 mmHg) Hepatomegaly	Dengue Shock Syndrome (DSS)		•Treated as DSS
Acute onset Fever with skin rash	Characteristic skin rash Purpuric rash with central necrosis Petechiae	Meningo-coccaemia		IV N/S 20ml/kg bolus If shock not revived give 2nd bolus ofN/S
H/O travel to malaria endemic area within last 6 month	Splenomegaly ± •Pallor±	• Algid malaria		Inj: Artesunate IN • N/S 20ml/kg bolus Refer to Hospital
3. History of taking Drugs (e.g., Penicillin/ Streptomycin)	Dyspnoea •Wheezing± •Vomiting, Diarrhoea If due to streptomycin	Anaphylactic shock		• N/S 20ml/kg bolus IM Adrenalin (1:1000 Solution) • >12 yrs7 0.5 ml • 6- 12yrs70.3ml • <6 yrs70.15ml Repeat after 5min if not better Injection-Hydrocortisone Injection-Chlorpheniramine
4. History suggestive of blood loss/any blunt injury	Evidence of external injuries •Pallor± • Abd: pain, rigidity	Shock due to blood loss		• N/S 20ml/kg Refer to hospital

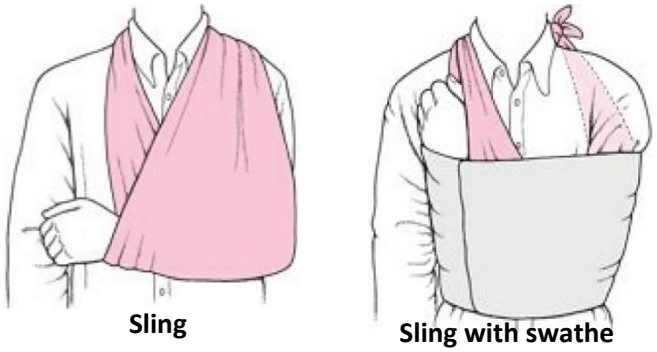
ANAPHYLAXIS

- Anaphylaxis is the most urgent of clinical immunologic events. It is defined as the clinical response to an immediate (type) immunologic reaction.
- Anaphylaxis is a severe allergic reaction, which may cause upper airway obstruction with stridor, lower airway obstruction with wheezing or shock or all three. Common causes include allergic reactions to antibiotics, to vaccines, to blood transfusion and to certain foods, especially nuts.
- Consider the diagnosis If any of the following symptoms is present and there is a history of previous severe reaction, rapid progression or a history of asthma, eczema or atopy.
- Severity of anaphylaxis

Severity	Symptoms	Signs	Treatment
Mild	Itching mouth •Nausea	•Urticaria Oedema of the face Conjunctivitis Throat congestion	Remove the allergen as appropriate Give oral anti histamine
Moderate	Cough or wheeze •Diarrhoea •Sweating	•Wheeze Tachycardia •Pallor	•Give adrenaline 0.15ml ofl:1000 IM into the thigh; the dose may be repeated every 5-15 mints
Severe	Difficulty in breathing •Collapse •Vomiting	Severe wheeze with poor air entry Oedema of the larynx •Shock Respiratory arrest Cardiac arrest	If the child is not breathing, start basic life support •Give adrenaline 0.15 ml ofl:1000 IM and repeat every 5-15 min. Give 100% oxygen. •Ensure stabilization of the airway, breathing, circulation and secure IV access Administer 20 ml/kg normal saline 0.9% or Ringer 's lactate solution IV as rapidly as possible. If IV access is not possible, insert an intraosseous line

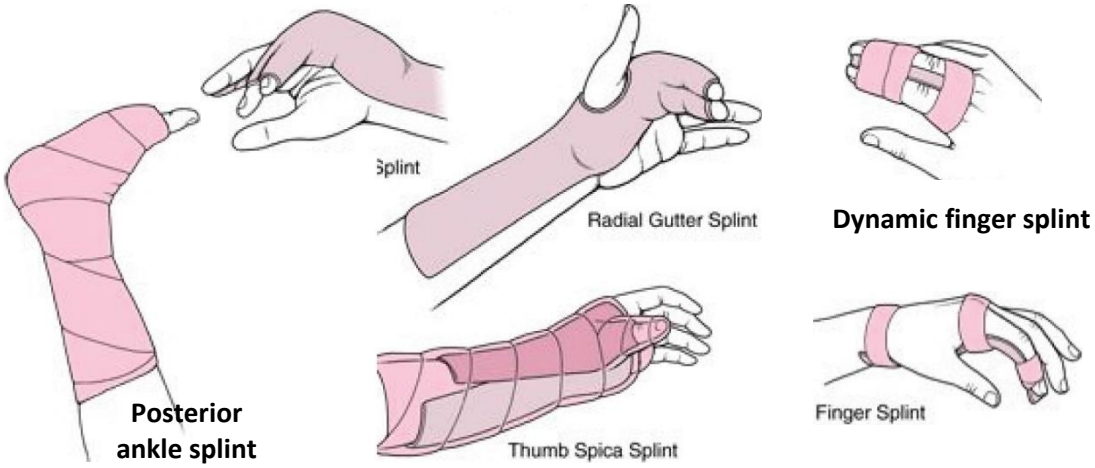
FRACTURE





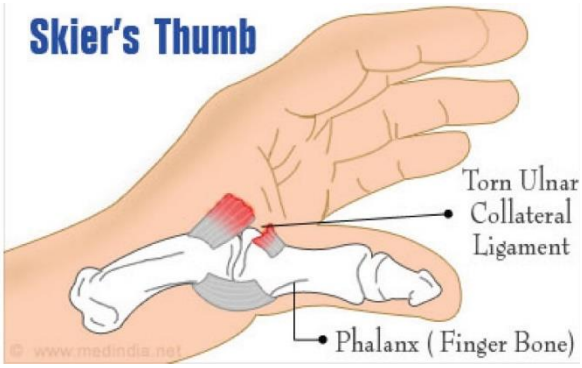
Sling

Sling with swathe



If you have enough facilities, you can do splintage.

GAMEKEEPER'S THUMB



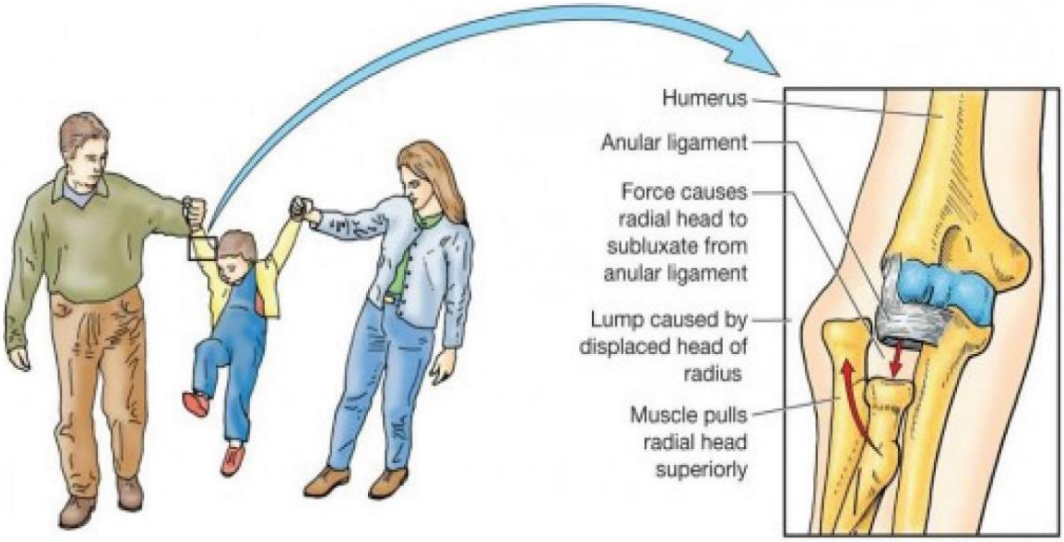
- Forced thumb abduction causes rupture of the ulnar collateral ligament.
- Can occur on wringing a pheasant's neck-hence the name, or, more commonly, by catching the thumb in the matting on a dry ski slope.
- The thumb is very painful and pincer grip weak.
- Refer-open surgical repair is the most effective treatment.

PULLED ELBOW

- Common in children <5 years.
- Traction injury to elbow causes subluxation of radial head. Often occurs when the child is pulled up suddenly by the hand. Child will not use the arm. No clinical signs.
- M >F, Left arm >Right arm, X-rays are unhelpful.

Management

- Apply anterior pressure with the thumb on the radial head whilst supinating and extending the forearm. Immediate recovery is seen after reduction.



Subluxation and dislocation
Anterior view

GUIDELINES FOR ESSENTIAL TRAUMA CARE

- Nobody is immune to trauma.
- Trauma may be life threatening or limb threatening.
- A basic general principle of management is the same in all kind of trauma cases such as primary survey assessment, secondary survey assessment, etc.

Primary survey

- **Airway management**
  - Its primary objective is to diagnose an obstructed or potentially obstructed airway, to clear the obstruction and keep the airway patent.
  - If any abnormalities are detected, measures to intervene are instituted immediately.
  - The skills to assess a patient for obstruction of the airway, to establish and maintain a patent airway, and to ensure adequate ventilation and oxygenation of the patient, are essential.
  - It is essential that healthcare personnel know the signs of airway obstruction and are skilled in manual maneuvers to keep an airway patent while maintaining cervical spine protection [Chin lift, Jaw thrust, recovery position]
  - Suction is very important step.
  - Correct Methods of insertion of oropharyngeal airway in children and adults.
  - Skill in using Bag-Mask-Valve is important.
  - Cricothyroidotomy is generally considered to be the surgical airway of choice in emergency situations and can be performed in several seconds.
- **Breathing: Management of respiratory distress**
  - The ability to assess a patient for respiratory distress and adequacy of ventilation is essential
  - To understand important of adequate oxygenation to all trauma patient.
  - The recognition of tension pneumothorax, its primary treatment by needle thoracostomy and definitive treatment by tube thoracostomy are essential.
  - Recognition of the presence of a sucking chest wound and the ability to apply a three-way dressing for immediate treatment is essential.
- **Circulation-Management of Shock**
  - The ability to assess a patient for the presence of shock is essential.
  - The ability to recognize signs and symptoms of shock depending on amount of blood loss.
  - Control of external haemorrhage through manual pressure and through the application of a pressure dressing is essential.
  - Ability to know indication and complication of arterial tourniquet.
  - splinting of fractured extremities and pelvic binding are effective way of controlling internal bleeding and to relieve pain.
  - Fluid replacement with crystalloid is essential in hypovolemic shock. Two Large bore needle intravenous line is recommended.
  - Intraosseous route is very effective and safe in children especially under five years.
- **Disability**
  - Assess the patient for neurological disability from brain or spine injury.
  - Examine the pupil size and reaction to light on both sides.
  - Is the patient **A**wake? Opening eyes to **V**oice? Opening eyes to **p**ain? **U**nresponsive? **U**
- **Exposure**
  - Undress the patient and look for hidden injury.
  - Cover the patient as soon as possible to keep the temperature stable.

HEAD INJURIES

Introduction and relevant to GP

- Head trauma is a major cause of death and disability in children and adults. Rapid and effective assessment and management save lives and reduces disability. Hypoxia and hypotension double the mortality of head-injured patients.

How to diagnose

- The assessment of neurological status including determination of level of consciousness usingthe Glasgow coma scale
- Recognition of lateralizing signs
- Determination of pupillary size and reflexes
- Skull X ray and CT scan

Points to diagnose

- *Extradural haematoma—*
    - commonly results after an impact to the head.
    - Features of acute extradural haematoma include:
        - An initial loss of consciousness after the impact
        - The patient may wake up (lucid interval)
        - Then rapid deterioration and unconsciousness
    - Arterial bleeding with rapid increase in intracranial pressure
    - Boggy scalp swelling over the site of the fracture
    - The development of paralysis on the opposite side with a fixed pupil on the same side as the impact to the head.
- *Acute subdural haematoma---*
    - commonly occurs in association with severe head injury. It results from bleeding from blood vessels around the brain and may be associated with significant primary brain injury.
    - Features of Acute subdural haematoma include:
        - Venous bleeding and clotted blood in the subdural space
        - Frequently severe bruising or damage to the underlying brain.
- *Base-of-skull fractures* -
    - bruising of the eyelids (Racoon eyes) or over the mastoid process (Battle's sign),
    - cerebrospinal fluid (CSF) leak from ears and/or nose

Management

- General principles of management
- The priority of management is stabilisation of the airway, breathing and circulation, with immobilisation of the cervical spine.
- Keeping the oxygen level as high as possible and the systolic blood pressure above 90mmHg is the most important aim in emergency treatment for patients with head injury.
- Monitoring of vital signs, pupils and regular neurological observations.
- Elevate the head of the bed, if possible, without bending the neck.
- Keep the temperature stable.
- Mannitol 20% infusion may reduce intracranial pressure.

Referral criteria

- Patients who need endotrachaeal intubation.

- Patients who need CT scan.
- Patients who need surgical interventions.
- Patients who need conservative treatment.

CHEST TRAUMA

Introduction and relevant to GP

- Approximately a quarter of the deaths due to trauma are attributed to chest injury.
- Immediate deaths can result from disruption to the airway, injury to the great vessels or from injury to the heart.

How to diagnose

- Clinical evaluation starts with obtaining a good history regarding the mechanism of injury followed by clinical examination and most often a radiological evaluation.

Point to diagnose and management

- Rib Fractures
- History of trauma, tenderness, crepitus and painful, particularly with movement, deep breaths or coughing on affected area.
- Signs and symptoms of lung, liver, and spleen injury may be present.
- CXR (PA and lateral) is useful (sensitivity is 50%). Sometime CT scan may need.
- Ribs fractures are managed analgesia alone as they tend to heal without complication.

PNEUMOTHORAX
TENSION PNEUMOTHORAX –

- It is a clinical diagnosis, not on X-ray.
- Signs and symptoms include:
    - Restless and short of breath.
    - Absent breath sounds.
    - Resonance to hyper resonance to percussion on the affected side with tracheal shift to the opposite side.

Immediate management

- It consists of insertion of large bore needle in second intercostal space in mid- clavicular line on affected site follow by proper intercostals drainage.

SIMPLE PNEUMOTHORAX

- does not have an increase in intrathoracic pressure on the affected side. Chest X-ray to confirm the diagnosis and size of the pneumothorax. Treatment is insertion of proper chest drain.

FLAIL CHEST

- Flail chest is a clinical anatomic diagnosis noted in blunt trauma patients with paradoxical or reverse motion of a chest wall segment while spontaneously breathing, two or more fractures per rib in at least two ribs.
- The flail segment moves independently of the rest of the thoracic cage. The degree of respiratory insufficiency is typically related to the underlying lung injury.
- Management includes good analgesia with ventilatory support.

HAEMOTHORAX

- Reduced chest wall movement, reduced air entry, dullness on percussion on affected side. Insertion of a chest tube to drain blood and re-expansion of lung is enough in most of the cases.
- The conditions need for refer are initial drainage more than 1.5 litres of blood, ongoing blood loss more than 250 ml per hour and failure of lung re-expansion after chest tube insertion.

PULMONARY CONTUSION

- A high degree of suspicion based on the mechanism of injury is necessary.
- Patient may be asymptomatic to severely distress.
- Signs and symptoms include chest pain, shortness of breath, reduced oxygen saturation. Ventilatory support may need in severe cases.

OPEN (SUCKING) CHEST WOUND

- Air is sucked into the chest cavity, and severe cases mediastinum may shift to opposite site.
- As a temporary measure a dressing may be applied on top of wound with three sides sealed to act as a 'valve' follow by proper intercostal drain.

MYOCARDIAL CONTUSION

- This can follow blunt trauma to sternum. An abnormal ECG, signs of heart failure, and low blood pressure indicate underlying cardiac contusion. Need to refer for higher level care.

PERICARDIAL TAMPONADE

- Usually, history of penetrating injury to heart and patient present with cardiogenic shock.
- Urgent refer is require.

RUPTURE OF THE AORTA

- Very high on-site mortality rate.

RUPTURE OF TRACHEA OR MAJOR BRONCHI

- Up to 50% mortality rate. Clinical signs include shortness of breath, haemoptysis, and collapsed lung on the affected side on X-ray.

INJURY TO THE OESOPHAGUS AND INJURY TO THE DIAPHRAGM

- Early surgeon involvement cans safe life.

ABDOMINAL AND PELVIC TRAUMA

Introduction and relevance to GP

- Patients involved in major trauma should be considered to have an abdominal injury until otherwise excluded. Blunt and penetrating trauma can present with significant abdominal injury.

Classification of the mechanism of injury:

- Penetrating trauma e.g., gunshot, knife wounds
- Blunt trauma e.g., compression, crush and deceleration injuries
- Explosions can cause both blunt and penetrating trauma as well as blast pressure injuries to the lungs and hollow viscera.
- Life threatening haemorrhage is a frequent complication of major pelvic fractures and causes 30% of polytrauma deaths.

Diagnosis and management

- The initial assessment of the abdominal and pelvic trauma patient is the Primary Survey: ABCDE.
- The assessment of the "Circulation" during the Primary Survey involves careful evaluation of the abdomen and pelvis for possible hidden haemorrhage, especially in hypotensive patients.
- Repeating the primary survey and serial physical examinations of the abdomen will identify clinical deterioration and assist in making the diagnosis.
- Physical examination includes inspection, palpation, percussion and auscultation of the abdomen as well as examination of:
    - Urethra, perineum, and gluteal region
    - Rectum (tone, blood, prostate position),
    - Vagina
    - Pelvis (fractures and stability)

Useful investigations (optional)

- Diagnostic peritoneal lavage (DPL)
- ultrasound (Focused Assessment Sonography in Trauma or FAST)
- abdominal computed tomography (CT)

The management of abdominal injury

- may include early surgical intervention and stabilization.

The management of pelvic fractures

- includes early identification and immobilisation to stop bleeding, using either simple stabilization with a sheet pulled tight and tied round the hips (femoral greater trochanters) or commercially available pelvic slings.

LIMB TRAUMA

Introduction and relevance to GP

- Injuries to the extremities are the primary cause of injury-related disability.
- These disabilities can be greatly reduced If promptly recognized and corrected.
- The diagnosis of major limb injuries and recognition of associated neurovascular compromise (including compartment syndrome) are essential at all health care levels. Peripheral haemorrhage is a preventable cause of early death with limb trauma.

Diagnosis and management

- Begins with Primary Survey ABCDE.
- *Examination* must include inspection and palpation:
- Skin colour and temperature
- Grazes and bleeding sites
- Limb alignment and deformities
- Active and passive movements
- Pulse assessment comparing proximal to distal to a fracture and with the other side
- Unusual movements and crepitation
- Level of pain.

General principles of management of limb injuries:

- Keep blood flowing to peripheral tissues
- Prevent skin necrosis and infection
- Prevent damage to peripheral nerves
- Provide pain relief

Special issues relating to limb trauma

- *Active bleeding:*
  - Stop the bleeding and replace the blood loss.
- *Open fractures and joint injuries:*
  - Any fracture or joint injury situated near a wound must be considered as "open".

Principles of the treatment of open fracture include:

- Stop external bleeding
- Immobilise
- Relieve pain
- Early surgical consultation.

Amputated parts of extremities

- Cover the wound with sterile gauze. Wrap the amputated part with moistened saline gauze and place into a sterile plastic bag.

COMPARTMENT SYNDROME

- Compromise perfusion to tissues within an anatomical compartment due to increased pressure within that compartment. Suspect it in patients that have pain out of proportion to the injury.
- The earliest and most important sign is increasing pain especially on passive stretching of the muscles. Loss of pulse or sensation are very late signs.

Management

- It is by early detection and referral to hospital.
- Consider fasciotomy If the condition is urgent and the doctor is competent.

CRUSH INJURY

- localised tissue injury that occurs when a compressive force is applied.

Crush syndrome

- Is a systemic condition that results from injuries sustained by compressive forces sufficient in duration and pressure to cause widespread ischaemia and necrosis of soft tissues.
- The limb may become tense, swollen and pulseless.
- Myoglobinuria and/or haemoglobinuria due to skeletal muscle destruction make the urine tea-coloured quite early on.
- Hypovolaemic shock and acidosis are present.

Management

- The main goal of treatment is to prevent crush injury syndrome developing.
- Start IV fluids (ideally before the limb is freed and decompressed) and insert a urinary catheter.
- Refer to appropriate center.

DROWNING

Definition

- Drowning is defined as death due to asphyxiation following immersion in a fluid, whilst near-drowning is defined as survival for longer than 24 hours after suffocation by immersion.
- Drowning remains a common cause of accidental death. In about 10% of cases no water enters the lungs and death following intense laryngospasm (dry drowning).
- Prolonged immersion in cold water, with or without water inhalation results in a rapid fall in core body temperature and hypothermia
- Following inhalation of water, there is a rapid onset of ventilation-perfusion imbalance with hypoxemia and development of diffuse pulmonary oedema.
- Fresh water is hypotonic and, although rapidly absorbed across alveolar membranes, impairs surfactant function which leads to alveolar collapse and right-to -left shunting of unoxygenated blood.
- Absorption of large amounts of hypotonic fluid can result in haemolysis. Salt water is hypertonic and inhalation provokes alveolar oedema, but the overall clinical effect is similar that of fresh water drowning.

Clinical features

- Those rescued alive (near-drowning) are often unconscious and not breathing. Hypoxaemia and metabolic acidosis are inevitable features. Acute lung injury usually resolves rapidly over 48-72 hours, unless infection occurs.

Complications

- include dehydration, hypotension, haemoptypsis, rhabdomyolysis, renal failure and cardiac dysarrhythmias. A small number of patients, mainly the more severely ill, progress to develop the acute respiratory distress syndrome.
- Survival is possible after immersion for periods of up to 30 minutes in very cold water. Long term outcome depends on the severity of the cerebral hypoxic injury and is predicted by the duration of immersion, delay in resuscitation, intensity of acidosis and the present of cardiac arrest.

Management

- Initial management requires cardiopulmonary resuscitation with administration of oxygen, and maintenance of the circulation. The victims can respond to resuscitation after considerable immersion time (up to 30 minutes) and that mouth-to-mouth resuscitation should always be attempted even If pulseless or with fixed dilated pupils.
- It is important to clear the air-way of foreign bodies and protect the cervical spine.
- Continuous positive airways pressure should be considered. Hypothermia should be attended to with warming, such as a hot-air blanket If available and warm fluid.
- Observation is required for a minimum of 24 hours. Prophylactic antibiotics are only required If exposure was to obviously contaminated water

Reference:

1. *Davidson's Principle and Practice of Medicine, 21st Edition*
2. *John Murtagh* 's *Handbook of General Practice, 6th Edition*

ELECTRICAL INJURIES

- Electrical injuries have 3 clinical presentations
    - Direct trauma from electrical current causing through the body
    - Trauma from conversion of electrical energy to thermal energy
    - Mechanical effects of electrical current including violent muscle contraction and falls.
- Emergent evaluation of electrical injuries should follow the traditional pathway of primary and secondary surveys, followed by a detailed and specific history and physical examination describing specific injuries by system.

Cutaneous injuries

- Bums are the most common injury associated with electrical accidents. Low -voltage injuries tend to create small, well-demarcated contact bums at the site of skin entry and exit. In high-voltage injuries, the bums are serious and appear as painless, depressed, yellow-gray, charred creaters with central necrosis.
- High-voltage injuries may largely spare the skin surface but cause massive damage to underlying soft tissue and bone, necessitating escharotomies, fasciotomies, or amputations.
- The 'kissing' bum is sometimes associated with electrical injury. This bum occurs at flexor creases such as antecubital fossa when a current arcs across both flexor surfaces. It is important to recognize this type of injury because it is often associated with extensive underlying tissue damage.

Cardiac

- The most serious presentation of electrical injury is cardiac arrest. Ventricular fibrillation is more common with low-voltage AC injuries, whereas asystole is seen more often with DC high-voltage injuries.
- Autonomic dysfunction following electrical injuries can cause serious cardiovascular complications related to the release of catecholamines.
- This may lead to cardiac arrest, transient hypertension, tachycardia, vasovagal syncope, thermo-dysregulation, and vasoconstriction.
- Electrical exposure may cause direct myocardial tissue damage ie caused by electric current flowing horizontally (head to foot).

Respiratory

- Respiratory arrest as a result of tetanic contraction of the thoracic musculature, injury to the respiratory control center of the central nervous system or
- Combined cardiopulmonary arrest secondary to asystole or ventricular fibrillation.
- Blunt chest trauma due to falls or being thrown from a high-voltage source may cause pulmonary contusion.

Vascular

- Greatest damage to the media layer of blood vessels and can lead to delayed aneurysm formation or rupture.
- Most severe in the small muscle branches lead to tissue necrosis.
- Any vascular injury can also lead to edema and compartment syndrome.

Neurologic

- CNS lesions are more common with lighting injury, while PNS lesions are seen more often with electrical injuries.
- Spinal cord damage is the most common delayed consequence of electrical injury.

- The high-voltage entry sites in the head and neck, an exit site in the lower extremities led to paraplegia, where as an exit site in the upper extremities led to quadriplegia

Musculoskeletal

- Direct electrothermal energy leading to coagulation necrosis, become edematous and necrotic, resulting in rhabdomyolysis or compartment syndrome.
- A bone has the highest degree of resistance, severe electrothermal bone damage such as periosteal bums and osteonecrosis is seen.
- Falls secondary to electrical injury and forceful tetanic muscle contractions create fractures and joint dislocations.

Renal

- Myoglobin release from muscle damage also cause renal tubular damage and subsequent renal failure.

Other

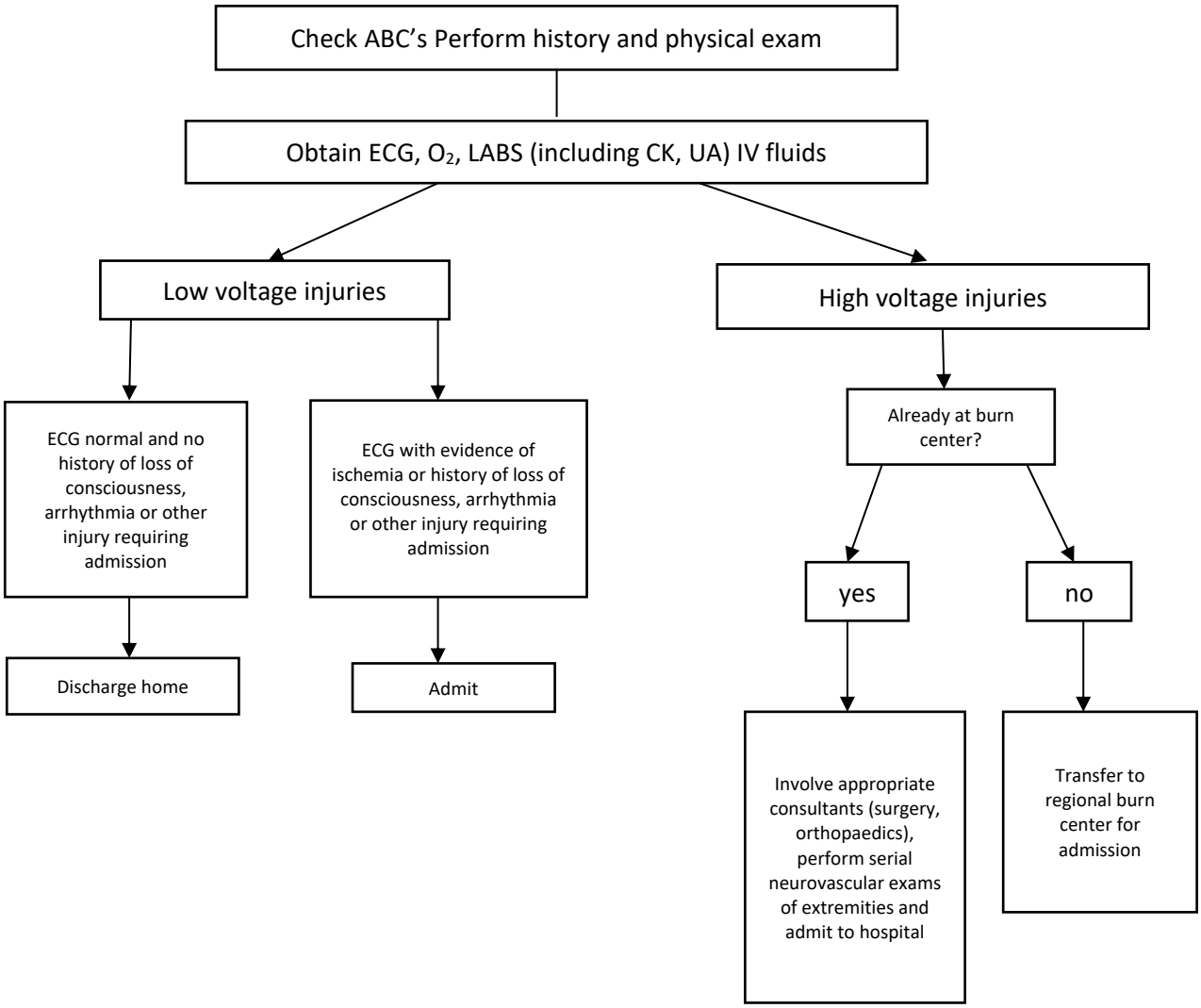
- Cataracts may occur immediately but more often develop months after the injury. Hearing loss is well-known sequela of lightning injury and may also occur after electrical injury.
- Injury to eighth cranial nerve may also suffer from chronic tinnitus and imbalance problems.

Summary of multi-system presentations of electrical injuries

System	Presentation
Skin	Cutaneous bum
Cardiac	Arrhythmias, cardiac arrest
Respiratory	Respiratory arrest due to muscle tetany or central nervous system causes
Vascular	Aneurysm formation, tissue ischaemia
Neurologic	Loss of consciousness,transient paralysis or parathesia, peripheral neuropathy, spinal cord injury
Musculoskeletal	Fractures or dislocations secondary to muscle spasm or falls, muscle necrosis, compartment syndrome
Renal	Myoglobinuria leading to renal failure.
Others	Cataracts, neuropsychological effects

Management

- History
- Physical examination
- Diagnostic studies
- Electrocardiogram
- laboratory tests
- Radiology
- Laboratory test recommended for patients with Electrical injuries
- CBC
- Electrolytes
- BUN and creatinine
- Urinalysis
- Serum myoglobin
- Liver function tests/amylase/lipase
- Coagulation profile
- Blood type and screen/cross match


Check ABC's Perform history and physical exam
Obtain ECG, O_2, LABS (including CK, UA) IV fluids
Low voltage injuries
High voltage injuries
ECG normal and no history of loss of consciousness, arrhythmia or other injury requiring admission
ECG with evidence of ischemia or history of loss of consciousness, arrhythmia or other injury requiring admission
Already at burn center?
Discharge home
Admit
yes
no
Involve appropriate consultants (surgery, orthopaedics), perform serial neurovascular exams of extremities and admit to hospital
Transfer to regional burn center for admission

CHOKING

- It is a blockage of the upper airway by food or other objects, which prevents a person from breathing effectively. Choking can cause a simple coughing fit, but complete blockage of the airway may lead to death.
- Choking is a true medical emergency that requires fast, appropriate action by anyone available. Emergency medical teams may not arrive in time to save a choking person's life.
- The brain is extremely sensitive to this lack of oxygen and begins to die within four to six minutes. It is during this time that first aid must take place. Irreversible brain death occurs in as little as 10 minutes.

Causes

- Choking is caused when a piece of food or other objects gets stuck in the upper airway.
- Any object that ends up in the airway will become stuck as the airway narrows.
- Normal swallowing mechanisms may be slowed If a person has been drinking alcohol or taking drugs, and if the person has certain illnesses such as Parkinson's disease.
- In older adults, risk factors for choking include advancing age, poor fitting dental work, and alcohol consumption.
- In children, choking is often caused by chewing food incompletely, attempting to eat large pieces of food or too much food at one time, or eating hard candy.
- Children also put small objects in their mouths, which may become lodged in their throat. Nuts, pins, marbles, or coins, for example, create a choking hazard.

Choking symptoms

- If an adult is choking, you may observe the following behaviors:
- Coughing or gagging
- Hand signals and panic (sometimes pointing to the throat)
- Sudden inability to talk
- Clutching the throat: The natural response to choking is to grab the throat with one or both hands. This is the universal choking sign and a way of telling people around you that you are choking.
- Wheezing
- Passing out
- Turning blue: Cyanosis, a blue coloring to the skin, can be seen earliest around the face, lips, and fingernail beds. You may see this, but other critical choking signs would appear first.
- If an infant is choking, more attention must be paid to an infant's behavior. They cannot be taught the universal choking sign.
- Difficulty breathing
- Weak cry, weak cough, or both

Management

Fig 1: Pictures of Abdominal Thrusts (Heimlich Maneuver)

- In adults and children older than one year of age, abdominal thrusts (formerly referred to as the "**Heimlich Maneuver**") should be attempted. This is a thrust that creates an artificial cough. It may be forceful enough to clear the airway.
- *The quick, upward abdominal thrusts force the diaphragm upward very suddenly, making the chest cavity smaller. This has the effect of rapidly compressing the lungs and forcing air out. The rush of air out will force out whatever is causing the person to choke. (see Fig 1)*
- This maneuver should be repeated until the person is able to breathe or loses consciousness.
- If the person loses consciousness gently lay him or her flat on their back on the floor. To clear the airway, kneel next to the person and put the heel of your hand against the middle of the abdomen, just below the ribs. Place your other hand on top and press inward and upward five times with both hands. If the airway clears and the person is still unresponsive, begin CPR.
- For babies (younger than one year of age), the child will be too small for abdominal thrusts to be successful. Instead, the infant should be picked up and five back blows should be

administered, followed by five chest thrusts. Be careful to hold the infant with the head angled down to let gravity assist with clearing the airway. Also be careful to support the infant's head. *If the infant turns blue or becomes unresponsive, CPR should be administered.*

Variations of abdominal thrusts for special circumstances:

- **The victim is seated**:
    - The maneuver may be performed with the victim seated. In this instance, the back of the chair acts as a support for the victim. The rescuer still wraps his or her arms around the victim and proceeds as described above. The rescuer will often have to kneel down. In the event that the back of the chair the victim is sitting in is too high, either stand the victim up or rotate the victim 90 degrees, so that the back of the chair is now to one side of the victim.
- **For small rescuers and large victims,** particularly children rescuing an adult:
    - Instead of standing behind the victim, have the victim lie down on his or her back. Straddle the victim's waist. Place one hand on the belly, halfway between the belly button and the edge of the breastbone. Thrust inward and upward. This is the same technique used in unconscious people.
- **Pregnant/obese people**:
    - Abdominal thrusts may not be effective in people who are in the later stages of pregnancy or who are obese. In these instances, chest thrusts can be administered.
- For the **conscious person sitting or standing**, take the following steps:
    - Place your hands under the victim's armpits.
    - Wrap your arms around the victim's chest.
    - Place the thumb side of your fist on the middle of the breastbone.
    - Grab your fist with your other hand and thrust backward. Continue this until the object is expelled or until the person becomes unconscious.
- For the **unconscious pregnant or obese person**:
    - The sequence of events is the same as those for an unconscious adult. Chest thrusts, rather than abdominal thrusts, are delivered.
- To position yourself for chest thrusts, take the following steps:
    - Kneel on one side of the victim.
    - Slide two fingers up the bottom edge of the rib cage until you reach the bottom edge of the breastbone called the xiphoid process.
    - With your two fingers on the xiphoid, place your other hand on the breastbone, just above your fingers. The thrusts should be quick and forceful to remove the object.
    - Care should be taken because complications such as rib fractures and heart muscle damage have been known to occur with chest thrusts.
- If at all possible, **subdiaphragmatic (below the ribcage) abdominal thrusts** should be used in the pregnant woman, especially If there is still room between the enlarging uterus and baby, and the rib cage to perform the maneuver.
- If facilities available:
    - Intubation:
        - a breathing tube is passed into a person's windpipe (trachea). This may push the object that is obstructing the airway out of the way enough to provide air to the lungs.
        - To perform intubation, a metal scope is inserted into the back of the throat to aid in seeing the vocal cords, which mark the opening of the trachea.
        - If, while using this scope, the object causing the obstruction can be seen, it may then be removed with a long instrument called a Magill forceps.
- If unsuccessful, perform a surgical procedure called a cricothyrotomy.

Prevention tips for children

- Don't give young children hard foods or small objects that are likely to become lodged in their airways.
- Cut foods such as hot dogs, sausages, and grapes into small pieces before serving them to young children.
- Look over toys to find small pieces
- Choking on a rubber balloon including dangerous objects.
- Store small objects, such as buttons and batteries, out of a child's reach.
- Do not allow children to play sports with food or gum in their mouths.
- Tell babysitters and older brothers and sisters, what foods and objects should not be given to young children.
- Instruct children to chew their food thoroughly before swallowing.

Prevention tips for adults

- Avoid placing objects such as nails or pins in your mouth for quick access.
- Take small bites and chew food thoroughly.
- Be aware that alcohol may impair your ability to chew and swallow, and increase your risk of choking.

Choking Prognosis

- The lack of oxygen caused by choking can result in brain damage or death in four to six minutes. Unless immediate action is taken to open a completely obstructed airway, the chances for survival and complete recovery decrease rapidly. If the object can be removed quickly and breathing returns to normal, recovery should be complete.

Reference

1. *https://www.emedicinehealth.com/choking/ topic-guide.htm*