



सत्यमेव जयते

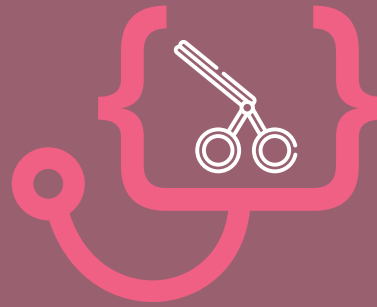
Department of Health Research

Ministry of Health and Family Welfare, Government of India



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2019 Edition, Vol. I

STANDARD TREATMENT WORKFLOWS *of India*

PARTNERS

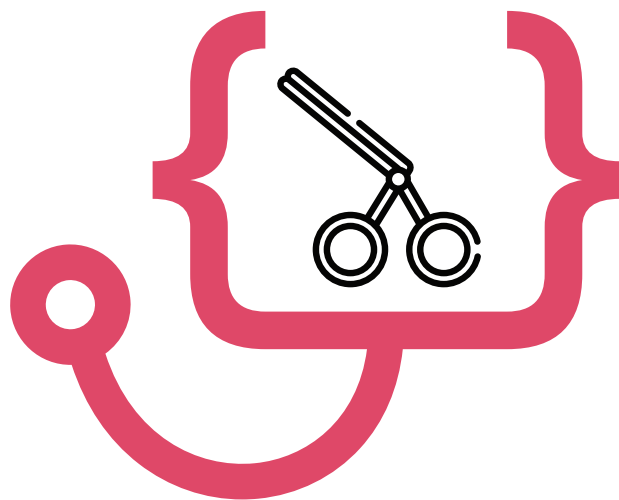


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Printed in India



STANDARD
TREATMENT
WORKFLOWS
of India



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Department of Health Research
Ministry of Health and Family Welfare, Government of India



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These STWs have been prepared by national experts of India with feasibility considerations for various levels of healthcare system in the country. These broad guidelines are advisory, and are based on expert opinions and available scientific evidence. There may be variations in the management of an individual patient based on his/her specific condition, as decided by the treating physician. There will be no indemnity for direct or indirect consequences. Kindly visit our web portal (stw.icmr.org.in) for more information. © Indian Council of Medical Research and Department of Health Research, Ministry of Health & Family Welfare, Government of India.



डॉ हर्ष वर्धन Dr Harsh Vardhan

स्वास्थ्य एवं परिवार कल्याण, विज्ञान और प्रौद्योगिकी
व पृथ्वी विज्ञान मंत्री, भारत सरकार

Union Minister for Health & Family Welfare,
Science & Technology and Earth Sciences
Government of India

सबका साथ, सबका विकास, सबका विश्वास
Sabka Saath, Sabka Vikas, Sabka Vishwas



FOREWORD

As per National Health Policy 2017, Health for all which is equitable, accessible and affordable is a priority for Government of India. The health sector in the country is working hard towards achieving Universal Health Coverage and Sustainable Development Goals. As the transition to value-based care moves forward, the focus in patient care is shifting to both quality and quantity.

2. Providing quality healthcare is a key focus area. I congratulate Department of Health Research and Indian Council of Medical Research for addressing this issue through the development of Standard Treatment Workflow that are evidence based as well as locally contextual with the aim of guiding decisions and criteria regarding diagnosis, management, and treatment of common diseases. These workflows will play a pivotal role in realizing the dream of Universal Health Coverage with equitable health systems.

3. I am happy to state that within a year of initiating this ambitious activity, the first volume is ready to be released. I am confident that all stakeholders contributing towards healthcare in the Country will benefit from these workflows.

Congratulations to the Team!

(Dr. Harsh Vardhan)

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स्वास्थ्य अनुसंधान विभाग

स्वास्थ्य एवं परिवार कल्याण मंत्रालय एवं

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Preface

To revive clinical medicine and encourage rational use of drugs , diagnostics and other healthcare services, we embarked upon this ambitious initiative of developing standard treatment workflows for common and serious diseases encountered by the treating doctors at all levels of health system.

In addition, we also wanted to create a robust pre-defined referral mechanism to decongest the tertiary centres and revitalize the primary and secondary health facilities.

I hope these resource stratified treatment workflows would be useful to doctors working at primary, secondary as well as tertiary levels and help in optimal utilization of resources not only in our country but also other countries like ours where the resources are limited and demands on the health system are high.

Balram Bhargava

(Balram Bhargava)

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HEART FAILURE
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STEMI
UNSTABLE ANGINA/ NSTEMI

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- **CONTRIBUTORS**

INTRODUCTION

GOAL

To empower the primary, secondary and tertiary care physicians/surgeons towards achieving the overall goal of Universal Health Coverage with disease management protocols and pre-defined referral mechanisms by decoding complex guidelines

OBJECTIVES

Primary Objective:

To formulate clinical decision making protocols for common and serious medical/surgical conditions for both OPD and IPD management at primary, secondary and tertiary levels of healthcare system for equitable access and delivery of health services which are locally contextual

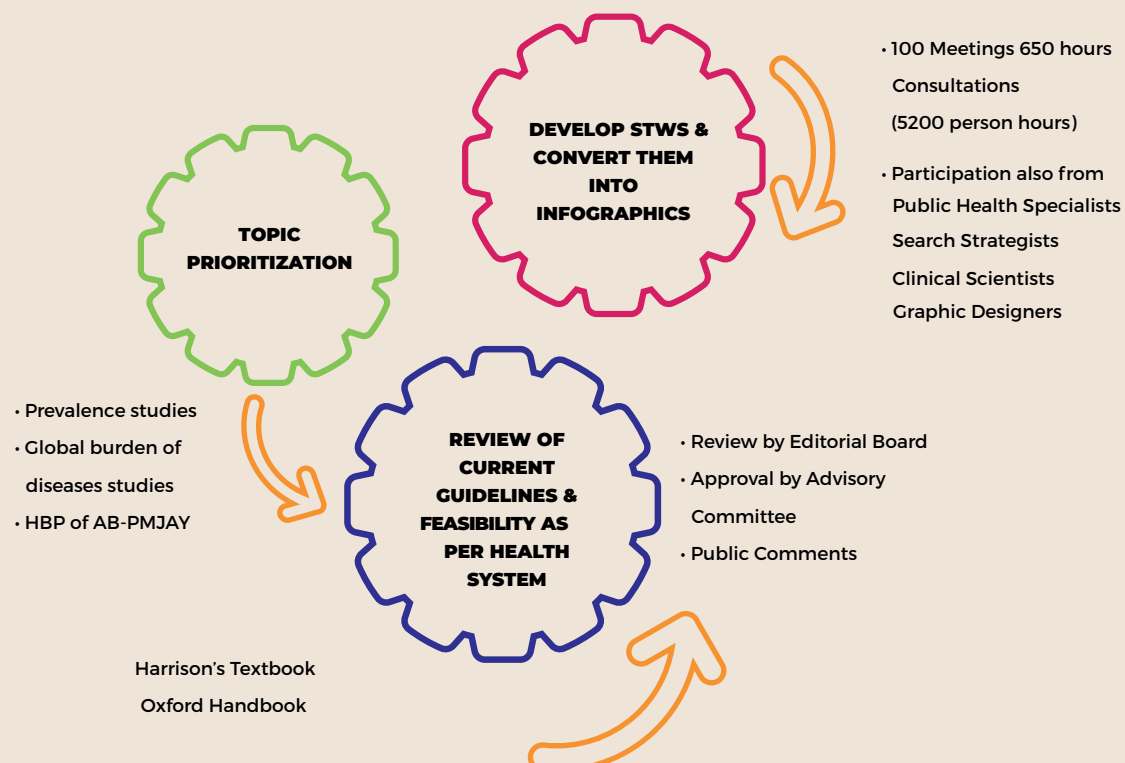
Secondary Objective:

To facilitate PMJAY arm of Ayushman Bharat with secondary and tertiary level management of all surgical and medical conditions covered under the scheme.

METHODOLOGY



PROCESS OVERVIEW





CARDIOLOGY

Standard Treatment Workflow (STW) for the Management of **ATRIAL FIBRILLATION** ICD-10-I48.91

WHEN TO SUSPECT ?

SYMPTOMS

- Rapid rate palpitations with or without
 - General fatigue or weakness or exhaustion
 - Dizziness, near syncope or syncope
 - Shortness of breath
 - Chest pain
- More marked on exertion

SIGNS

- Irregularly irregular pulse
- Variable heart sound

LOOK FOR RISK FACTORS

- Prior valvular heart disease or CHF or MI
- Prior TIA or stroke or embolic episode
- Hypertension, DM, COPD,CKD, Obesity

LOOK FOR PRECIPITATING FACTORS:

- Post (cardiac) surgery
- Alcoholism or binge drinking
- Myo-pericarditis or ACS
- Pneumonitis or pulmonary embolism
- Sepsis, hyperthyroidism

MANAGEMENT PRINCIPLES:

- Categorize AF
- Look for immediate intervention indicators
- Assess stroke risk & need for anti-coagulation
- Assess bleeding risk
- Need for rate control
- Consideration for rhythm control

CATEGORIZE AF

- Paroxysmal AF: Episodes of AF for less than 7 days
- Persistent AF: AF lasting from 7 days to 1 year
- Long standing persistent AF: AF lasting for > 1 year
- Permanent AF: AF with heart rate control as only option

LOOK FOR IMMEDIATE INTERVENTION INDICATORS:

- Systolic BP 90 mmHg, HR > 150 or <50/min
- Ongoing Angina
- CHF or TIA or stroke
- Major bleed on Oral Anti-coagulants

STROKE RISK SCORE		BLEEDING RISK SCORE	
CHA ₂ DS ₂ -VAS _c	SCORE	HAS-BLED	SCORE
- Congestive heart failure/LV dysfunction	1	- Hypertension i.e. uncontrolled BP	1
- Hypertension	1	- Abnormal renal/ liver function	1 or 2
- Aged ≥ 75 years	2	- Stroke	1
- Diabetes mellitus	1	- Bleeding tendency or predisposition	1
- Stroke/ TIA/ TE	2	- Labile INR	1
- Vascular disease [prior MI, PAD or aortic plaque]	1	- Age (e.g. >65)	1
- Aged 65-74 years	1	- Drugs (e.g. concomitant aspirin or NSAIDs or alcohol)	1
- Sex category [i.e. female gender]	1		
Maximum Score	9		9

OAC if score >1 in men and >2 in women Bleeding Risk High in score >3

CHOICE OF ANTI-COAGULATION:

- Vitamin K antagonist
 - Aim for INR 2-3
 - Assess risk of bleeding
 - Take measures to reduce/ modify risk of bleeding
 - Dietary modification & regular monitoring

MEASURES TO REDUCE HIGH BLEEDING RISK:

- Control SBP to less than 140 mmHg
- Avoid dietary indiscretions
- Avoid concomitant aspirin, anti platelets, NSAIDs
- Avoid alcohol
- Correct anemia

HEART RATE CONTROL

In all patients except hemodynamic instability	Beta blocker or calcium blocker or combination	BB ± digoxin in HF	Rate aim to be less than 110/ min
------------------------------------------------	------------------------------------------------	--------------------	-----------------------------------

CONVERSION TO NSR

Hemodynamic instability	Uncontrolled symptoms despite HR control	Unacceptable rate control drug side effects	Patients' preference
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MANAGEMENT

AT PHC/ CHC:

- Detailed clinical evaluation
- Basic investigations
- Careful ECG evaluation
- Start OAC if indicated (based on Stroke risk)
- Start Metoprolol if HR >110/ min & no evidence of CHF
- Refer if indicators for early intervention

AT DISTRICT HOSPITAL:

- Admit if indicators of early interventions
- Immediate cardioversion after heparinization, if hemodynamic instability
- Manage precipitating factors if any
- Assess stroke, bleeding risk & coagulation parameters
- Detailed echocardiogram
- Start OAC, maintain INR around 2-3
- Control HR by single drug or combination of BB & Ca Blocker

Refer HR uncontrolled or CHF or angina

AT TERTIARY CENTRE:

- Re-assess clinical status, adequacy of AC
- Consider need of NOAC
- Optimise management of underlying cardiac disease
- Stress life style and AF risk factor modification
- Assess need for rhythm control and discuss pros & cons
- Consider RFA in select patient

INVESTIGATIONS

BASIC INVESTIGATIONS:

- Hemograms
- Blood sugar, Creatinine
- Electrolytes
- 12 lead ECG

DESIRABLE INVESTIGATIONS:

- Plain X-ray chest
- Thyroid evaluation
- Liver function test
- Troponins
- Prothrombin time, INR (Coagulation profile)
- Echocardiography

OPTIONAL INVESTIGATIONS:

- Prolonged ECG monitoring
- Trans-esophageal echocardiography
- Exercise Stress Test
- CT scan
- MRI
- EP study
- Coronary angiography

WHAT TO LOOK FOR IN ECG ?

- Ventricular rate
- Chamber enlargement
- Pre-excitation
- Prior MI
- Bundle branch block
- QT interval

RHYTHM CONTROL

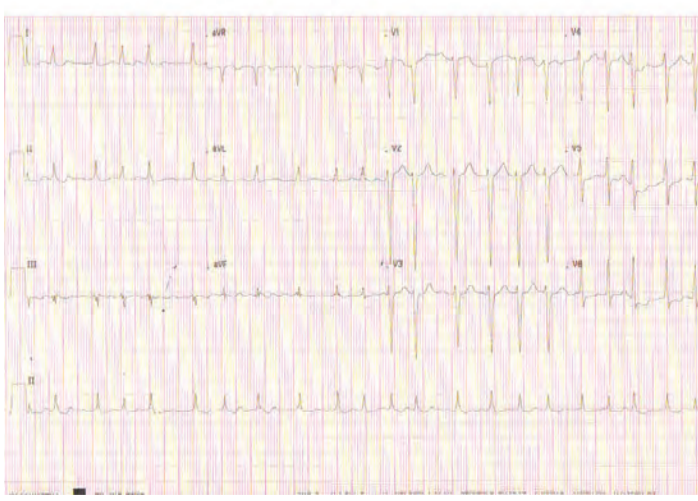
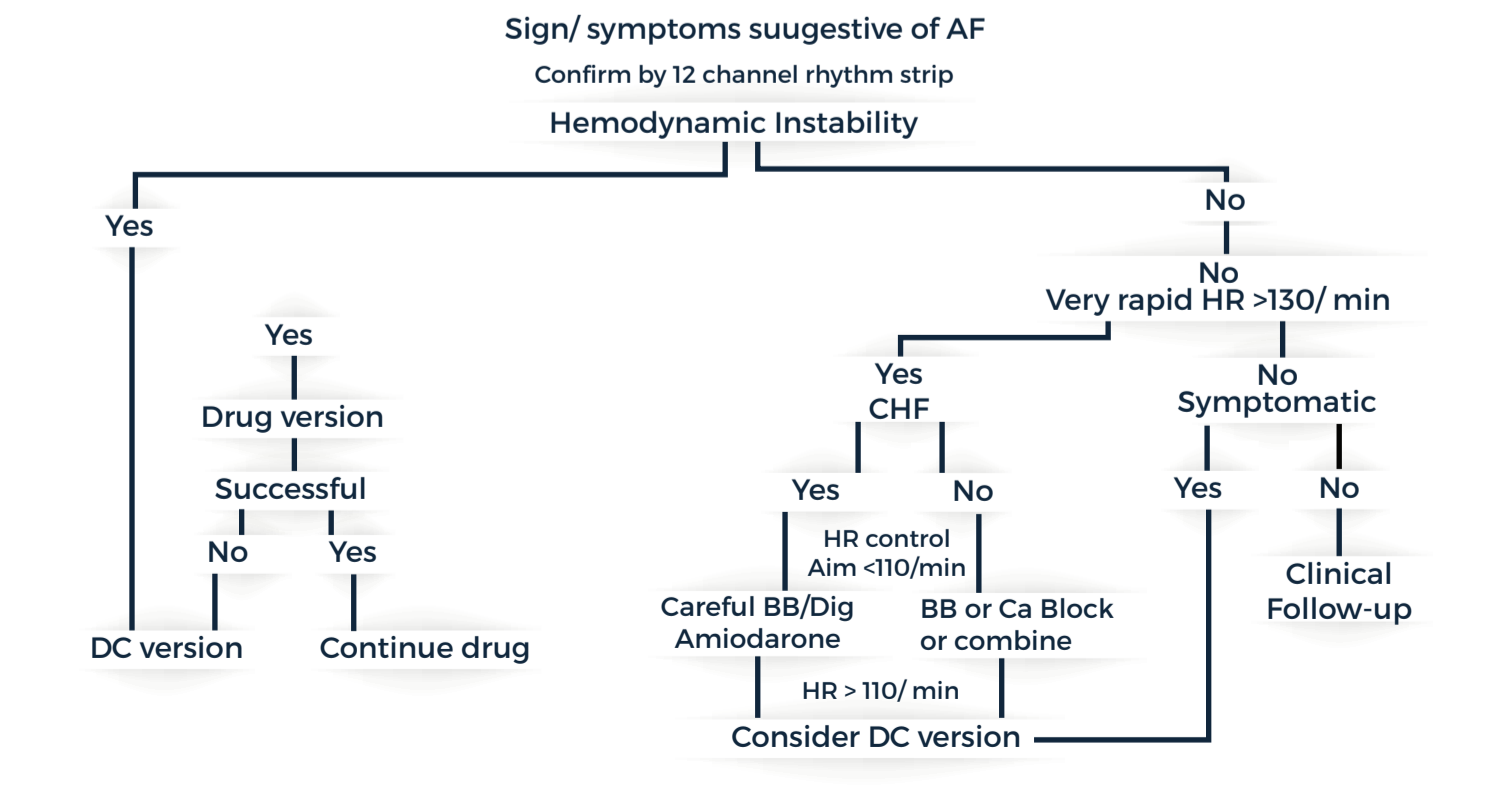
Pharmacological Cardioversion

CHF CAD Abnormal LVH	Normal Heart
Amiodarone	Flecainide Ibutilide Propafenone
	Pill in pocket (Flecainide OR Propafenone)

Long Term Rhythm Control

CHF	Normal Heart	CAD, LVH
Amiodarone	Flecainide Propafenone Sotalol	Amiodarone Sotalol

MANAGEMENT ALGORITHM



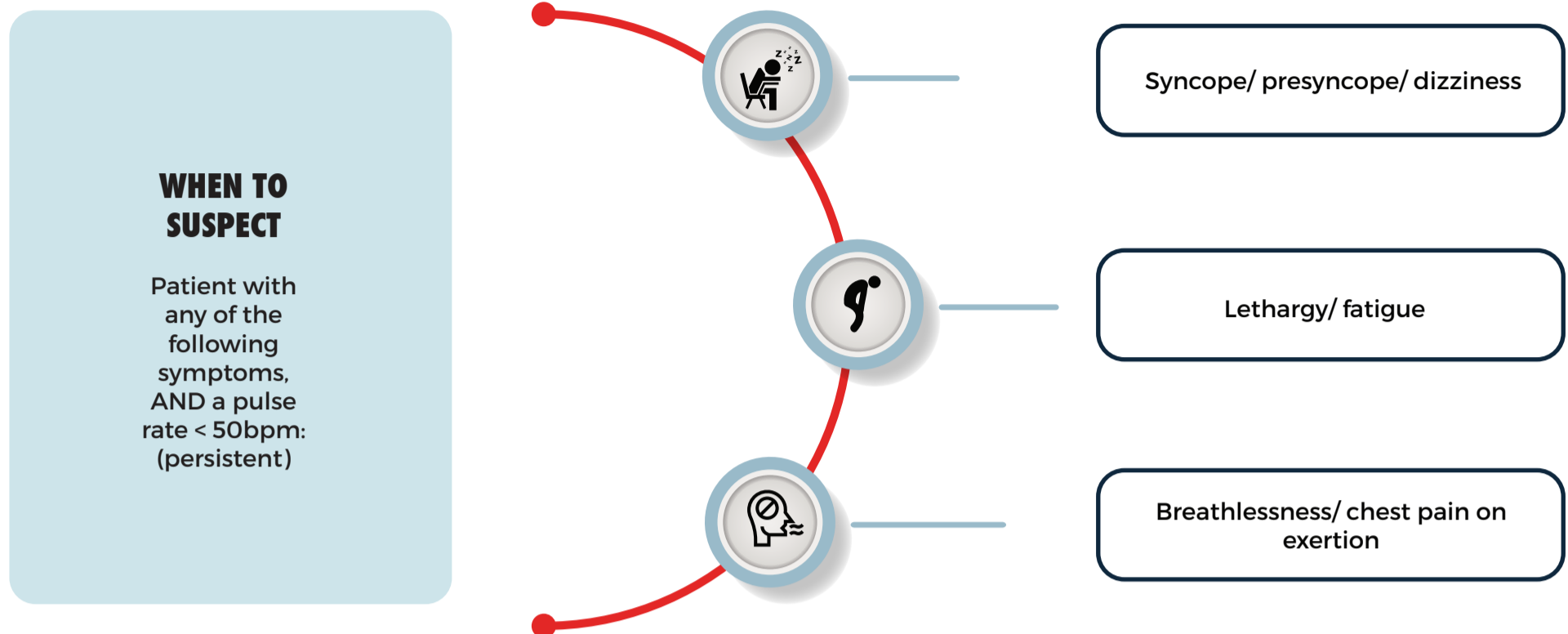
Anti-coagulants in all Except

- Reversible
- Score <1 (men) ; <2 (women)

KEEP A HIGH THRESHOLD FOR INVASIVE PROCEDURES



Standard Treatment Workflow (STW) for the Management of **BRADYARRHYMIAS IN SYMPTOMATIC PATIENTS** ICD-10-R00.1



BASIC EVALUATION

HISTORY

- Syncope/ presyncope: frequency, associated fall/ injury/ incontinence
- Exertional angina or known coronary artery disease
- Known hypothyroidism or kidney disease
- On beta-blockers, Calcium Channel Blockers or digoxin
- Patient with an implanted pacemaker or other device
- Yellow oleander poisoning

EXAMINATION

- Drowsiness/ impaired consciousness
- BP, heart rate

TESTS TO BE DONE

- Patient presenting to PHC/CHC:**
- 12-lead ECG
 - Blood urea, serum creatinine
 - Electrolytes
 - Blood sugar

EVALUATION AND TREATMENT OF UNSTABLE PATIENTS

1. TREATMENT OF ASSOCIATED CONDITIONS

- Hyperkalemia

- Suspected drug (BB or CCB) overdose:

- Withhold the drug
- iv insulin (1 U/kg bolus followed by 0.5 U/kg/h) with glucose monitoring(or) iv glucagon if available

2. TEMPORARY PACEMAKER INSERTION

(iv dopamine or adrenaline may be given till the time TPI can be placed)

EVALUATION AND MANAGEMENT OF STABLE PATIENTS

Findings on 12-lead ECG

- Atrioventricular block
- Sinus node dysfunction
- Other conduction disorders with 1:1 AV conduction
- Non-diagnostic ECG

INDICATIONS FOR URGENT TREATMENT/REFERRAL

- Hypotension (SBP <90 mmHg), impaired consciousness or ongoing chest pain
- Recurrent or ongoing syncope/presyncope
- Associated headache with or without neurologic deficit (suspect intracranial event)
- Patient with a pre-existing device
- If ECG available, evidence of any of the following
 - Complete heart block
 - Sinus node disease with pauses >3 s long
 - Bradycardia (HR < 50 bpm)
 (with or without hyperkalemia, serum K > 5 mEq/L)

GENERAL APPROACH TO PATIENTS WITH SYMPTOMATIC BRADYCARDIA

1. Rule out associated conditions

- Renal dysfunction, hyperkalemia
- Drug toxicity (BB, CCB, clonidine, Lithium)
- Sleep apnea (clinical scoring systems such as Epworth Sleepiness Scale may be used for initial assessment)

2. Transthoracic echocardiography

INDICATIONS FOR PERMANENT PACING

AV NODAL DISEASE

- Complete heart block, advanced AV block, or Mobitz Type II block
- Symptomatic patients with AV block other than above
- Associated neuromuscular disease

SINUS NODE DYSFUNCTION

- Symptomatic patients with sinus pauses > 3 s long with symptom correlation
- Asymptomatic patients with sinus pauses > 6 s long

OTHER CONDUCTION DISORDERS WITH 1:1 AV CONDUCTION

- Symptomatic patients with HV ≥100 ms on EPS
- Others (alternating BBB, infiltrative/ neuromuscular disease)

RECOMMENDED PACING MODES

1. SND with intact AV conduction

- Atrial-based single or dual chamber pacing
- VVI pacing is reasonable if symptoms are infrequent

2. AV node disease

- VVI/Dual chamber pacing in patients with LVEF >50%
- CRT (or HBP) in patients with LVEF 36-50% and requiring ventricular pacing >40% of the time
- CRT (or HBP) if LVD <35%

ADDITIONAL TESTING

- Advanced imaging (cMRI)** may be needed if infiltrative disease is suspected
- Ambulatory ECG** may be needed
 - In patients with first or second degree AV block for symptom correlation
 - In patients with suspected sinus node disease for detection of pauses and symptom correlation
 - In symptomatic patients with LBBB or bifascicular block
- Implantable Loop Recorder and EPS** (consult published society guidelines)

ECG: SINUS BRADYCARDIA



ECG: THIRD DEGREE HEART BLOCK





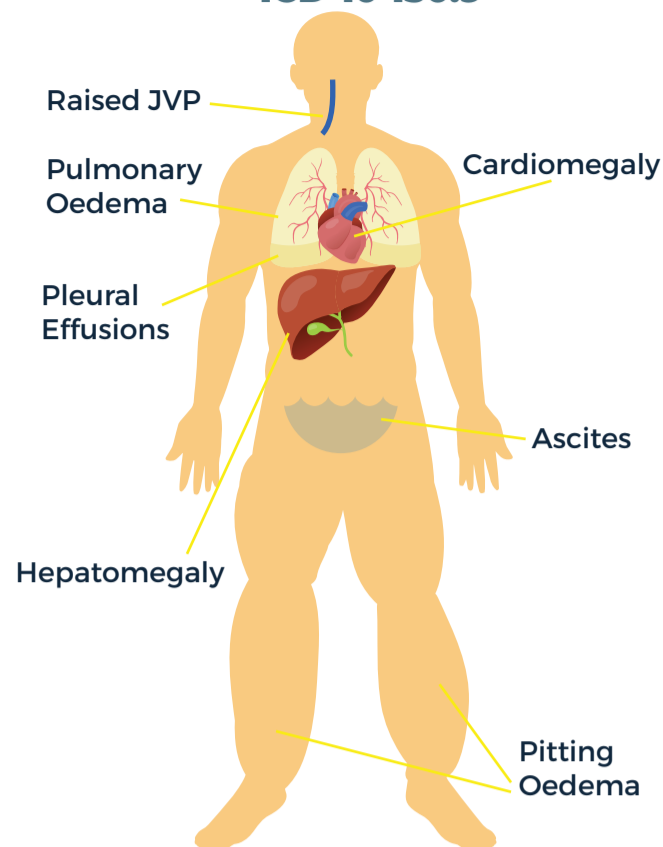
Standard Treatment Workflow (STW) for the Management of HEART FAILURE: A BREATHLESS PATIENT

ICD-10-I50.9
SYMPTOMS

1. Dyspnea/orthopnea/PND
2. Pink frothy sputum
3. Dependent pedal edema
4. Recent weight gain
5. Easy fatigability
6. H/o CHF/MI

SIGNS

1. Tachypnoea
2. Tachycardia or irregular pulse
3. Basal crepitations
4. Cardiomegaly
5. Presence of murmurs
6. Systemic desaturation


ADDITIONAL INFORMATION

- Prior history of respiratory illness like asthma or COPD
- Known patient of CHF/ similar illness in past with response to therapy
- Prior history of RHD, CAD, pregnancy, cancer chemotherapy
- Risk factors: HT, DM, smoking, hyperlipidemia or premature CAD in first degree relatives

COMMON ETIOLOGY AND INDICATORS

1. Ischemic cardiomyopathy: past MI
2. Diabetic cardiomyopathy
3. RHD: existing valvular disease
4. Post-viral: acute onset breathlessness within last 3 months
5. Peri-partum cardiomyopathy-onset in last trimester or after delivery
6. Idiopathic cardiomyopathy
7. Post-cancer chemotherapy

MANAGEMENT AT PHC

- Rule out respiratory cause: Breathlessness with fever, cough and expectoration or known patient of asthma or COPD
- Likely CHF: Decongest with furosemide

REFER IF FOLLOWING:

- BP < 90 mmHg or > 200 mmHg
- Heart rate < 50/min or > 120/min
- Respiratory rate > 30/min or cyanosis
- Oliguria
- Altered sensorium

**REFER TO
COMMUNITY
HEALTH CENTRE**
MANAGEMENT AT CHC

- Admit and stabilize
- Send for routine investigations
- ECG: Rule out acute ST-Elevation MI
- X-ray chest: Rule out respiratory etiology
- Decongest with intravenous furosemide
- O₂ therapy if systemic saturation < 90%
- Start enalapril and spironolactone orally
- Consider carvedilol after decongestion

KEEP WATCHING

1. Respiratory distress and oxygen saturation
2. BP and heart rate
3. Electrolytes and renal parameters

**REFER TO A
DISTRICT
HOSPITAL**
MANAGEMENT AT DISTRICT HOSPITAL

- Admit and re-assess
- Optimise therapy with furosemide/ enalapril/ spironolactone/ O₂ and stabilize
- Consider non-invasive ventilation if marked respiratory distress and O₂ saturation < 90%
- Echocardiography: confirm diagnosis of HFrEF: LV ejection fraction < 35%
- Search for etiological diagnosis
- Consider carvedilol after decongestion
- Refer back to CHC/ PHC after stabilization

REFER TO TERTIARY CARE IF

- CHF uncontrolled,
- Unstable hemodynamics
- Suspected ongoing ischemia
- Abnormal electrolytes
- Abnormal renal functions
- Structural heart disease
- Unclear etiology

MANAGEMENT AT TERTIARY HOSPITAL

1. Re-assess and confirm diagnosis of HF
2. Categorize acute (< 3 months) vs chronic (> 3 months) and HFrEF (EF < 35%) vs HFpEF (EF 35-50%)
3. Optimize therapy with furosemide, enalapril, carvedilol, spironolactone and O₂
4. Consider ARNI and ivabradine
5. Pneumococcal and influenza vaccines
6. Investigate for etiology and manage
7. Consider non-pharmacological invasive therapy
 - a. ICD: In selected patients (Ref Arrhythmia STW)
 - b. BiV: Consider in NYHA class II/ III Symptomatic patient, EF < 35%, QRS > 150msec in sinus rhythm with LBBB morphology and optimal medical therapy of > 3 months
8. Etiology based Interventions
 - a. PCI
 - b. Valve replacement
 - c. CABG

CONSIDER AT ALL LEVELS

Smoking Cessation

Salt restriction

Physical activity

Weight Reduction

Moderation of alcohol

Control of DM/ HTN/ Lipids

Secondary CVD prevention with aspirin and statins

INVESTIGATIONS:
BASIC INVESTIGATIONS

- Hemogram, ESR
- Blood sugar
- Urine examination
- Urea/ Creatinine
- Sodium/ Potassium
- ECG
- Chest X-ray PA view

WHAT TO LOOK FOR IN X RAY

- Cardiomegaly
- Pulmonary venous congestion
- Pneumonia or other lung pathology

WHAT TO LOOK FOR IN AN ECG?

- Pathological Q wave
 - Conduction abnormalities, especially LBBB
 - Chamber enlargement
 - Atrial fibrillation
- Note: If ST elevation present, manage as STEMI

DESIRABLE INVESTIGATIONS

- 2D Echocardiography
- BNP/NT pro-BNP
- Troponin
- Lipid profile
- Thyroid function test
- Iron profile

OPTIONAL INVESTIGATION

- Prolonged ECG monitoring
- Coronary angiography
- Radionuclide imaging
- CT scan
- MRI
- PET
- Myocardial biopsy
- Electrophysiological study

COMMON DRUGS AND DOSAGE FOR CHF
FUROSEMIDE

- Dose 20-80 mg daily PO
- Intravenous 10-40 mg SOS in acute stage
- Change to oral when symptoms subside
- Monitor serum electrolytes, creatinine and uric acid on therapy

SPIRONOLACTONE

- Dose 25-50 mg once daily PO
- Keep watch on serum potassium and creatinine every 2-4 weekly

CARVEDILOL

- Dose 3.125 to 25 mg twice daily PO
- Start after decongestion with low dose with BP > 100 mmHg and HR > 60/ min
- Uptitrate dose 1-2 weekly till maximum tolerable dose
- Keep watch on BP, heart rate and recipitation of CHF symptoms
- Increase diuretics and reduce carvedilol to manage reappearance of CHF

ENALAPRIL

- Dose 2.5 to 10 mg twice daily PO
- Start with low dose with BP > 100 mmHg, normal electrolyte and creatinine less than 2.5 mg/dl
- Uptitrate dose 1-2 weekly till maximum tolerable dose
- Keep watch on BP and electrolytes before every increment and on follow-up

KEEP A HIGH THRESHOLD FOR INVASIVE PROCEDURES
ABBREVIATIONS

ICD: Implantable Cardioverter defibrillator
BiV: Bi-Ventricular Pacing
PND: Paroxysmal Nocturnal Dyspnea

PCI: Percutaneous Coronary Intervention
CABG: Coronary Artery Bypass Graft
CVD: Cardiovascular Diseases
RHD: Rheumatic Heart Disease
CAD: Coronary Artery Disease

HFrEF: Heart Failure with reduced Ejection Fraction
HFpEF: Heart Failure with preserved Ejection Fraction
STEMI: ST elevation Myocardial Infarction
LV: Left Ventricle
COPD: Chronic Obstructive Pulmonary Disease

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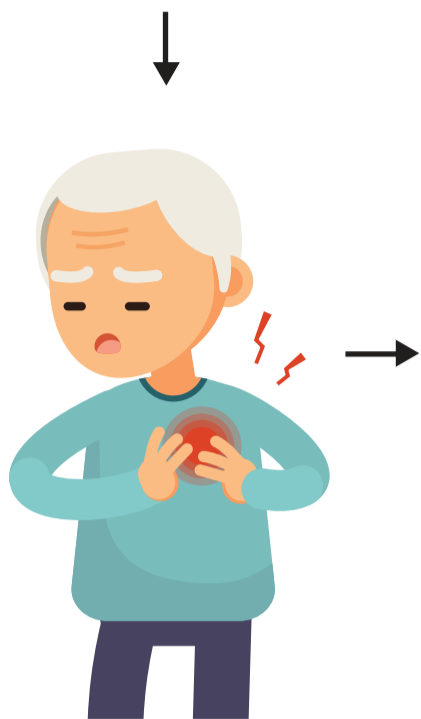
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Standard Treatment Workflow (STW) for the Management of STABLE ANGINA

ICD-10-I20.9

PATIENT PRESENTING WITH CHEST PAIN



CONSIDER ANGINA IF

- Diffuse retrosternal pain, heaviness or constriction, radiating to arms or neck or back
- Associated with sweating
- Easily reproduced with post-meal exertion
- Consider atypical presentation: Exertional fatigue or breathlessness or profuse sweating or epigastric discomfort

Likelihood more if known patient of CAD

ANGINA UNLIKELY IF

- Variable location or characteristic
- Long lasting (hours to days) or short lasting (less than a minute)
- Restricted to areas above jaw or below epigastrum
- Localized to a point
- Pricking or piercing or stabbing type of pain
- Precipitated by movement of neck or arms or respiration

CATEGORIZE ANGINA

ACUTE CORONARY SYNDROME

- Angina at rest or lasting more than 20 minutes
- Recent worsening of stable angina (crescendo) to CCS class III
- New onset effort angina of less than 1 month in CCS class II/ III
- Post infarction angina

For management: refer to STEMI/ NSTEMI STW

STABLE ANGINA

Any effort related pain fitting in previous category, relieved by rest or NTG in 1-2 min

STABLE ANGINA: GENERAL MANAGEMENT

1. Manage factors potentating angina
 - Anemia, Thyrotoxicosis, Pregnancy, febrile illness
 - Hypertension, Ventricular hypertrophy, CHF
 - Tachy or brady-arrhythmia
 - Drugs : bronchodilators, steroids
2. Risk factor control
3. Other atherosclerotic CV disease : PVD, stroke
4. Secondary prevention : Statins, BB, ACE-I

INVESTIGATIONS

ESSENTIAL INVESTIGATIONS

1. Hemogram
2. Urea, Creatinine, Electrolytes
3. Sugar, HbA1C
4. Lipids
5. Liver function test
6. ECG
7. Plain X-ray chest

DESIRABLE INVESTIGATIONS

1. Echocardiography
2. Exercise Treadmill Test
3. Thyroid Function Test
4. Iron profile
5. Uric acid

OPTIONAL INVESTIGATIONS

1. Stress radionuclide/ echocardiographic imaging
2. CT scan including multi-slice coronary angiography
3. Coronary Angiography
4. Coronary Fractional Flow Reserve
5. Intra-vascular Ultrasound/ OCT

MANAGEMENT

MANAGEMENT AT PHC/ CHC LEVEL

1. Control angina :
Metoprolol
Add nitrates if symptoms not controlled
2. ECG for Q waves, ST - T changes, BBB or chamber enlargement
3. Aspirin & high intensity statins
4. Refer to higher centre electively

MANAGEMENT AT DISTRICT HOSPITAL LEVEL

1. Optimise anti-anginal treatment
2. Echocardiography for LV function or structural heart disease
3. Risk stratify by exercise treadmill test in low, intermediate or high risk (DUKE risk score) for cardio-vascular events , if patient is ambulatory and ECG is interpretable
4. Refer to tertiary centres if:
 - Angina uncontrolled on optimal medical therapy
 - Echo reveals abnormality
 - Non-ambulatory patient or un-interpretable ECG
 - High risk on exercise stress test for possible re-vascularization

MANAGEMENT AT TERTIARY LEVEL

1. Reassess and optimise drug therapy: If uncontrolled choose from trimetazidine, nicorandil ranolazine and ivabid
2. Risk stratify with exercise treadmill test if not already done
3. Stress imaging if following:
 - Non ambulatory patient
 - Abnormal or uninterpretable baseline ECG
 - Exercise treadmill test result is equivocal
 - Compromised LV function

RISK CATEGORIZATION

Based on clinical features, GRACE score & TIMI score

A. Very high:

- Acute LVF
- Hypotension
- Uncontrolled Ventricular arrhythmia
- Severe MR

B. High Risk:

-GRACE score > 140 or TIMI score >4

C. Intermediate Risk:

-GRACE score 109-140 or TIMI score 2-3

D. Low Risk:

-Grace score <108 or TIMI score 0-1

RISK CATEGORY MANAGEMENT

Low/ Intermediate Risk Group

1. Optimal anti-anginal therapy
2. Follow up 3-6 monthly at primary/ secondary care centre
3. Refer to tertiary centre when change in symptomatic status

High Risk Group

1. Discuss pros and cons of possible revascularization and dual anti-platelet therapy
2. Angiography, if any of following
 - Angina not controlled on optimal medical therapy
 - High risk on non-invasive testing
 - Cardiac arrest survivor or documented VT

REVASCULARIZATION

1. Revascularize if anatomy is suitable
2. Prefer CABG over PCI in DM with multivessel disease or left main disease
3. Complete re-vascularization is preferable
4. Use invasive functional and imaging modalities (FFR, IVUS, OCT) when indicated
5. Stress on continuing dual anti-platelets (aspirin and clopidogrel) after PCI

DRUGS & DOSAGE

Anti-platelets

1. Aspirin 75 mg OD
2. Clopidogrel 75 mg OD (if intolerant to aspirin)

Statins:

Atorvastatin: 40-80 mg OD
Rosuvastatin: 20-40 mg OD

Ace-inhibitor

Ramipril: 2.5-10 mg OD
Enalapril: 2.5-10 mg BD

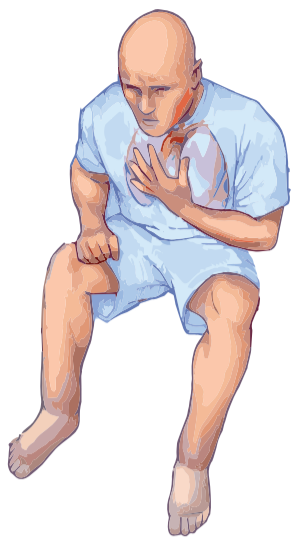
Anti-ischemic:

1. Metoprolol:
Short acting: 25-100 mg BD
Long acting: 25 -100 mg OD
2. Nitrates:
Isosorbide mono-nitrate: 20 to 60 mg in 2 divided dose
Nitroglycerine sustained release: 2.6 to 6.5 mg BD
3. Calcium channel blockers:
Verapamil 40-80 mg TDS
Diltiazem 30 to 90 mg TDS
4. Nicorandil: 5-10 mg BD
5. Ranolazine: 500 -1000 mg BD
6. Trimetazidine: 20 mg mg TDS

KEEP A HIGH THRESHOLD FOR INVASIVE PROCEDURES : STRENGTHEN SECONDARY PREVENTION WITH STATINS, BB & ACE-I

Standard Treatment Workflow (STW) for the Management of ST ELEVATION MYOCARDIAL INFARCTION (STEMI)

ICD-10-I21.3



CONSIDER ANGINA IF

- Diffuse retrosternal pain, heaviness or constriction
- Radiation to arms or neck or back
- Associated with sweating
- Easily reproduced with post-meal exertion
- Consider atypical presentation: Exertional fatigue or breathlessness or profuse sweating or epigastric discomfort/ syncope

More likelihood if known patient of CAD/ multiple risk factors

ACUTE CORONARY SYNDROME:

- Angina at rest or lasting more than 20 minutes
- Recent worsening of stable angina (crescendo) to CCS class III
- New onset effort angina of less than 1 month in CCS class II/III
- Post infarction angina

ECC: If ST Elevation: Follow ST Elevation MI (STEMI) protocol
If no ST Elavation: UA/NSTEMI

ANGINA UNLIKELY IF:

Variable location or characteristic	Long lasting (hours to days) or short lasting (less than a minute)	Restricted to areas above jaw or below epigatrium	Localized to a point	Pricking or piercing or stabbing type of pain	Precipitated by movement of neck or arms or respiration
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PATIENT WITH STEMI WITHIN 12 HOURS

ECG REVEALS ST ELEVATION MI*

Refer to primary angioplasty/ thrombolysis capable hospital

*Includes new onset LBBB

GENERAL MEASURES

- Admit in ICU equipped with continuous ECG monitoring & defibrillation
- Routine bio-chemistry and serial cardiac enzymes (troponin)
- Pain relief by opioid
- O2 if saturation less than 90%
- Aspirin 325 mg, Clopidogrel 300 mg and Atorvastatin 80 mg
- Echocardiography, particularly for mechanical complication

PCI CAPABLE HOSPITAL

- Proceed for PCI
- Radial route preferred
- Preferably within 90 minutes

DURING PROCEDURE

- Use unfractionated heparin
- No routine thrombosuction
- Tackle culprit artery only unless shock
- DES to be preferred

POST PROCEDURE

- Continue dual antiplatelets for at least 1 year

PCI INCAPABLE CENTRE

A. Transfer to PCI capable hospital if PCI can be performed within 120 min

B. If Transfer to PCI capable hospital not feasible

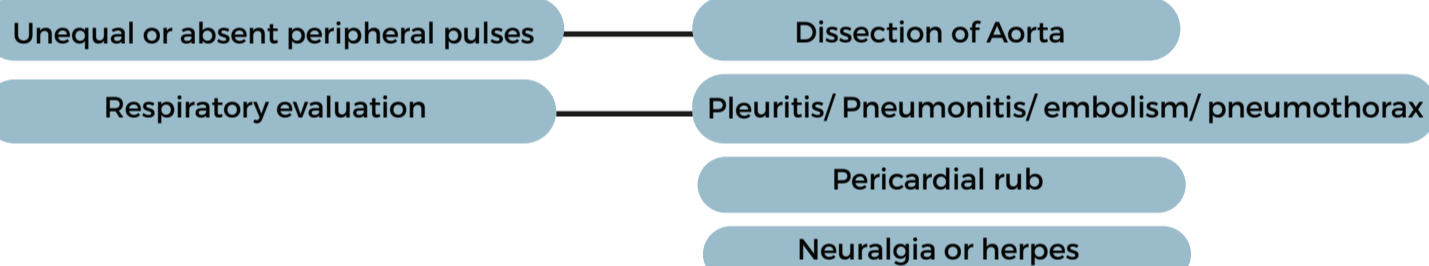
THROMBOLYSE

- Within 12 hours of symptom onset, if no contra-indication
- Preferably with fibrin specific agent Tenecteplase/ TPA/ Reteplase or Streptokinase, if fibrin-specific are unavailable
- Therapy to be started within 10 min preferably

POST THROMBOLYSIS

- ECG to be done at 60-90 min after starting thrombolysis to assess whether thrombolysis is successful (>50% ST settlement with pain relief) or not
- If successful, transfer patient for PCI within 3-24 hours
- If thrombolysis failed, transfer patient immediately for PCI capable hospital
- Enoxaparin (preferred over unfractionated heparin) to be continued till PCI OR discharge

LOOK FOR OTHER CAUSES OF CHEST PAIN (ONGOING OR WITHIN 12 HRS)



PATIENT WITH STEMI IN 12-24 HOURS

Transfer to PCI capable hospital immediately

If ongoing pain, thrombolysis and transfer immediately

PATIENT WITH STEMI AFTER 24 HOURS

Angiography with a view to PCI only if any of following/ Contra indications of angiography:

Recurrent anginal pain not controlled by medical therapy

Cardiogenic shock

Acute LVF

Mecahnical complication

Dynamic ST-T changes

Life threatening ventricular arrhythmias

ABSOLUTE CONTRA-INDICATIONS TO THROMBOLYTIC THERAPY:

Previous intra-cerebral hemorrhage or stroke of unknown etiology

Ischemic stroke in last 6 months

CNS neoplasm or AV malformation

Recent (within 1 month) major trauma/surgery/ head injury

Recent (within 1 month) major GI bleed

Known bleeding tendency (except menstrual bleed)

Aortic dissection

Severe uncontrolled hypertension

DRUGS & DOSAGE

Anti-platelets

- Aspirin: Loading dose 325 mg followed by 75 mg OD
- Clopidogrel: Loading dose 300 mg followed 75 mg OD
- Prasugrel: Loading dose 60 mg followed by 10 mg OD
- Ticagralor: Loading dose 180 mg followed by 90 mg BD

Anti-ischemic:

- Metoprolol:**
Short acting: 25-100 mg BD
Long acting: 25-100 mg OD
- Nitrates:**
Isosorbide mono-nitare 20 to 60 mg in 2 divided dose
Nitroglycerine sustained release 2.6 to 6.5 mg BD
Nitroglycerine IV 5-25 mcg/ min infusion

Statins:

High dose Atorvastatin 80 mg OD

Ace-inhibitor

Ramipril 2.5-10 mg OD
Enalapril 2.5-10mg BD

Oxygen:

If oxygen saturation below 90%

Morphine:

Titrated in a dose of 2-4 mg IV every 15 minutes

Beta-blocker:

Oral beta-blocker if LVEF is less than 40%

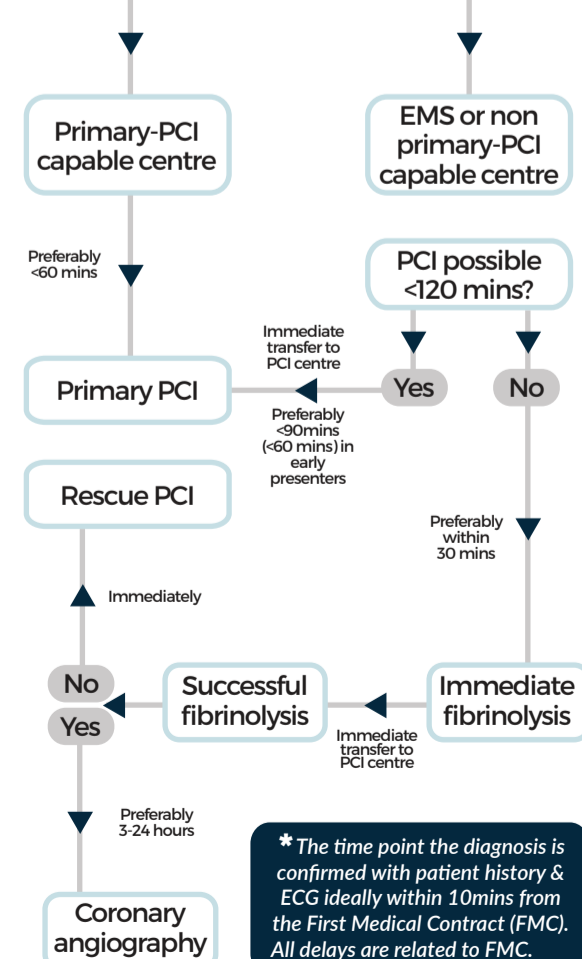
Anti thrombotics:

- Unfractionated heparin: Bolus of 60 U/Kg (maximum 5000 U) followed by 12 U/Kg hourly infusion to maintain APTT at 50-70 sec
- Enoxaparin: 1 mg/Kg SC 12 hrly

Thrombolytic Therapy:

- Tenecteplase**
35 mg IV bolus if 60-70 Kg
40 mg IV bolus if 70-80 Kg
45 mg IV bolus if more than 80 Kg
- Reteplase**
10 mg IV bolus, repeat after 30 min
- Alteplase**
15 mg IV bolus followed by 0.75 mg/Kg over 30 min upto 50 Kg weight, then 0.5 mg/Kg over 60 min up to 35 mg
- Streptokinase**
1.5 million units IV over 60 min

STEMI DIAGNOSIS*

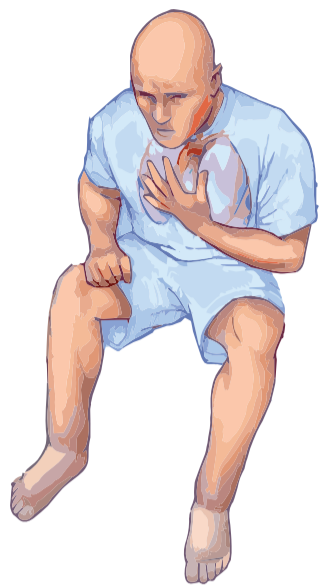


KEEP A HIGH THRESHOLD FOR INVASIVE PROCEDURES



Standard Treatment Workflow (STW) for the Management of UNSTABLE ANGINA/ NSTEMI

ICD-10-I20.0



CONSIDER ANGINA IF

- Diffuse retrosternal pain, heaviness or constriction. Radiation to arms or neck or back
- Associated with sweating
- Easily reproduced with post-meal exertion
- Consider atypical presentation: Exertional fatigue or breathlessness or profuse sweating or epigastric discomfort

More likelihood if known patient of CAD/ multiple risk factors

ACUTE CORONARY SYNDROME:

- Angina at rest or lasting more than 20 minutes
- Recent worsening of stable angina (crescendo) to CCS class III
- New onset effort angina of less than 1 month in CCS class II/III
- Post infarction angina

ECC:
 - If ST Elevation: Follow ST Elevation MI (STEMI) STW
 - If no ST Elavation: UA/NSTEMI

RED FLAG SIGNS

- Pain lasting for more than 20 minutes
- Recurrent or ongoing pain or rest pain
- Associated breathlessness, profuse sweating or syncope
- Hemodynamic instability

Refer as emergency to nearest Primary PCI/Thrombolysis capable centre

Rest pain beyond 24hrs or without above features may be referred early for further evaluation

LOOK FOR OTHER CAUSES OF PROLONGED CHEST PAIN

Dissection of aorta (unequal/ absent peripheral pulses)

Respiratory Evaluation: Pleuritis/ pneumonitis/ embolism/ pneumothorax

Pericardial rub

Neuralgia or herpes

ANGINA UNLIKELY IF:

Variable location or characteristic

Long lasting (hours to days) or short lasting (less than a minute)

Restricted to areas above jaw or below epigastrium

Localized to a point

Pricking or piercing or stabbing type of pain

Precipitated by movement of neck or arms or respiration

MANAGEMENT

PHC/ CHC LEVEL

- ECG, Troponin.
- Start
 - Aspirin, Clopidogrel
 - Heparin/ LMWH
 - High dose atorvastatin
 - Metoprolol
- Risk stratify GRACE score or TIMI score
 - Refer High/ Intermediate risk to PCI capable centre
 - Refer Low risk for further evaluation to DH
- Refer to PCI capable centre if:
 - Acute LVF
 - Hypotension
 - Systolic murmur
 - Arrythmia

DISTRICT HOSPITAL

- Admit in ICU equipped with ECG monitoring and defibrillator
- Troponin & bio-chemistry if not done
- Serial ECG & echocardiography
- Continue Aspirin, Clopidogrel, Heparin & Metoprolol
- Add nitrates if needed
- Management for different risk categories:
 - Very high, High or Intermediate risk or LVEF <40%: Refer for revascularization
 - Low risk patients: Conservative management
 - Life style modification
 - Risk factor control
 - Secondary prevention

TERTIARY CENTRE

- Admit, reassess clinically and monitor in ICCU
 - Continue aspirin and heparin
 - Load with clopidogrel or prasugrel or ticagralor if not already done
 - Optimal medical therapy to continue (BB, high dose atorvastatin, ACE-inhibitors, intra-venous nitrates if ongoing pain, severe MR or LVF)
 - Detailed echocardiography
 - Low risk patients may undergo non-invasive risk stratification with exercise stress test, CT coronary angiography or stress imaging
 - Very high risk, high risk and intermediate risk patients may be subjected to coronary revascularization
- Revascularization:
- Discuss pros & cons of re-vascularization and prolonged dual anti-platelet therapy
 - Revascularize if anatomy is suitable
 - Prefer CABG over PCI in DM with multivessel disease or left main disease
- Revascularization strategy:
- Very High risk: Urgent re-vascularization (within few hours) after loading preferably with Ticagrelor or prasugrel if PCI is planned
 - High risk patients: Early revascularization (within 24 hours)
 - Intermediate risk patients: Revascularization (within 72 hours)
 - Continue Dual anti-platelets in patients undergoing PCI for atleast 12 months in DES and for 3 months in BMS

1. GRACE SCORE:

Killip Class	Points	SBPI mm Hg	Points	Heart rate Beats/ min	Points	Age. y	Points	Creatinine Level, mg/ dL	Points
I	0	<80	58	≤50	0	≤30	0	0-0.39	1
II	20	80-99	53	50-69	3	30-39	8	0.40-0.79	4
III	39	100-119	43	70-89	9	40-49	25	0.80-1.19	7
IV	59	120-139	34	90-109	15	50-59	41	1.20-1.59	10
		140-159	24	110-149	24	60-69	58	1.60-1.99	13
		160-199	10	150-199	38	70-79	75	2.00-3.99	21
		≥200	0	≥200	46	80-89	91	>4.0	28
						≥90	100		

2. TIMI SCORE:

- One point for each of following
- Age >65 yrs
 - More than 3 risk factors
 - Known CAD (>50% lesion)
 - Recurrence of angina in 24 hrs
 - Aspirin use within 7 days
 - ST deviation >0.5 mV
 - Raised cardiac markers

Sum total = TIMI score of patient

Other risk factors	Points
Cardiac arrest at admission	39
ST-Segment Deviation	28
Elevated Cardiac Enzyme Levels	14

Sum Total= GRACE score of patient

UNSTABLE ANGINA OR NSTEMI DIAGNOSIS



If at non-PCI-capable hospital
 Very high risk: Immediate transfer to PCI-capable hospital
 High risk: same-day transfer
 Intermediate risk: transfer for PCI within 72 h
 Low risk: transfer if pursuing invasive treatment

UA/NSTEMI: RISK CATEGORIZATION:

Based on clinical features, GRACE score & TIMI score

- Very high risk:
 - Acute LVF
 - Hypotension
 - Uncontrolled Ventricular arrhythmia
 - Severe MR
- High Risk:
 - GRACE score > 140 or TIMI score ≥4
- Intermediate Risk:
 - GRACE score 109-140 or TIMI score 2-3
- Low Risk:
 - GRACE score <108 or TIMI score 0-1

UA/NSTEMI: RISK CATEGORY MANAGEMENT:

- Low risk:
 - Conservative management: Aspirin, clopidogrel, BB and statin
 - TMT if ambulatory patient within a week to risk stratify
 - Refer low risk for re-vascularization if
 - Recurrent pain
 - Hemodynamic deterioration
 - New ECG change
- Intermediate/ Very High/ High risk: Re-vascularization

DRUGS & DOSAGE

Anti-platelets

- Aspirin: Loading dose 325 mg followed by 75 mg OD
- Clopidogrel: Loading dose 300 mg followed 75 mg OD
- Prasugrel: Loading dose 60 mg followed by 10 mg OD
- Ticagralor: Loading dose 180 mg followed by 90 mg BD

Anti thrombotics:

- Enoxaparin: 1 mg/Kg SC 12 hrly
- Unfractionated heparin: Bolus of 60 U/Kg (maximum 5000 U) followed by 12 U/Kg hourly infusion to maintain APTT at 50-70 sec

Anti-ischemic:

- Metoprolol:
 - Short acting 25-100 mg BD
 - Long acting 25 -100 mg OD
- Nitrates:
 - Isosorbide mono-nitrate 20 to 60 mg in 2 divided dose
 - Nitroglycerine sustained release 2.6 to 6.5 mg BD
 - Nitroglycerine IV 5-25 mcg/ min infusion

Statins:

High dose Atorvastatin 80 mg OD

Ace-inhibitor

Ramipril 2.5 -10 mg OD
 Enalapril 2.5-10 mg BD

KEEP A HIGH THRESHOLD FOR INVASIVE PROCEDURE

This STW has been prepared by national experts of India with feasibility considerations for various levels of healthcare system in the country. These broad guidelines are advisory, and are based on expert opinions and available scientific evidence. There may be variations in the management of an individual patient based on his/her specific condition, as decided by the treating physician. There will be no indemnity for direct or indirect consequences. Kindly visit our web portal (stw.icmr.org.in) for more information.



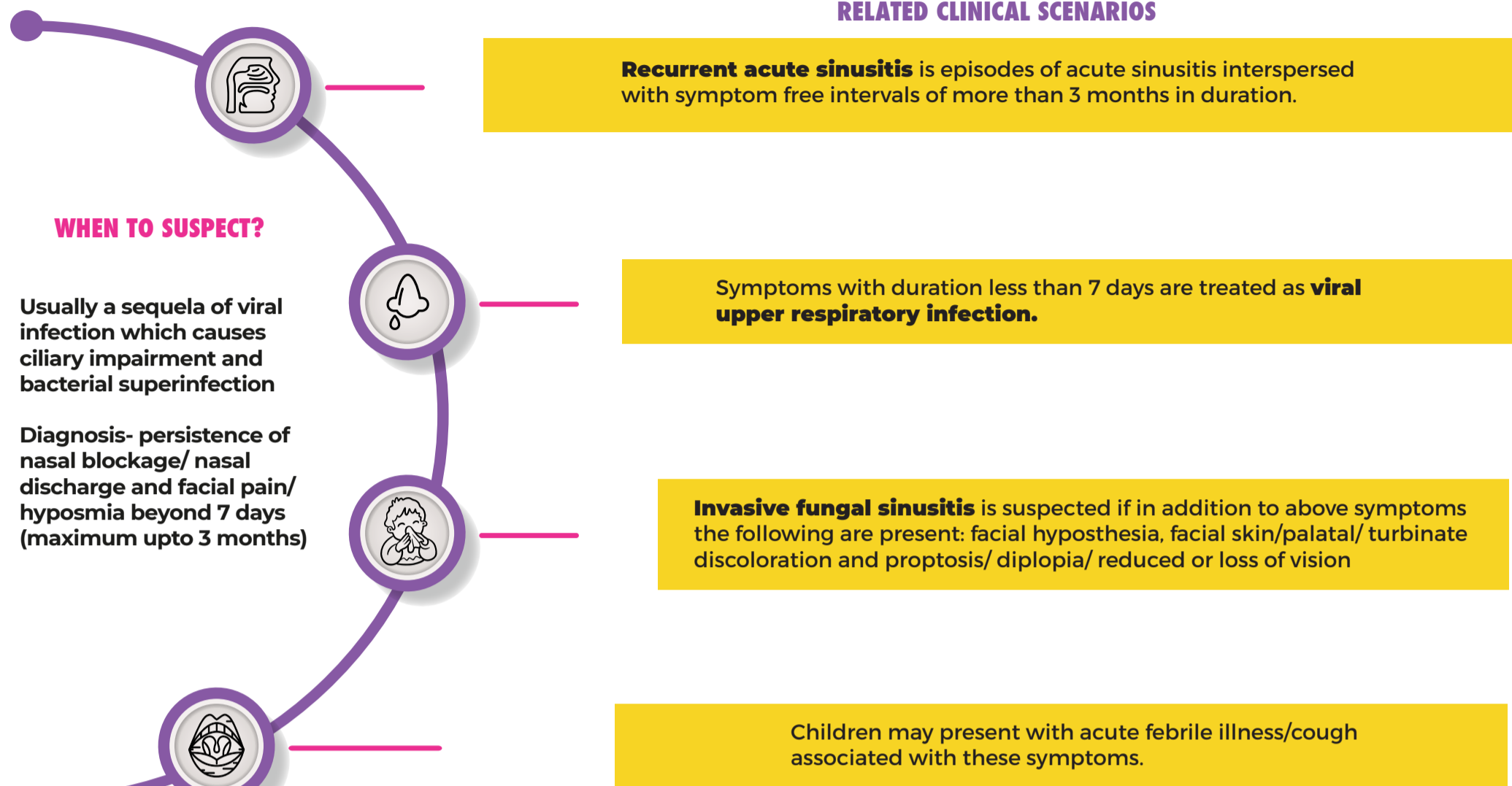
ENT



Standard Treatment Workflow (STW) for the Management of ACUTE RHINOSINUSITIS

ICD 10 J01.90

RELATED CLINICAL SCENARIOS



ALTERNATIVE CLINICAL SCENARIOS

- Consider alternate diagnosis if: Unilateral symptoms/ Bleeding/ Crusting/ Cacosmia (foul smell)
- Rule out other contributory factors: Allergy/ upper alveolar dental caries/ DNS/ LPR/ smoking.
- Rhinorrhoea and nasal congestion in second trimester of pregnancy is considered hormonal in etiology and is to be managed with saline irrigation/ drops

RED FLAGS FOR REFERRAL TO DISTRICT HOSPITAL

- Known diabetic/ immunocompromised
- Suspicion of complications viz. (A) Orbital involvement (Periorbital edema/ erythema, displaced globe, ophthalmoplegia, visual disturbance); (B) Meningitis/ altered sensorium; (C) Frontal fullness.
- Non-resolution with oral antibiotics for ten days
- Pointers of invasive fungal sinusitis (Facial hypoesthesia, facial skin/palatal/turbinate discoloration)

CLINICAL EXAMINATION

PRELIMINARY

- Anterior rhinoscopy: Discharge, bleeding, crusting, polyposis
- Oral examination: Dental caries, post nasal drip, palatal discoloration
- Assess for contributory factors listed above

DESIRABLE

- Nasal endoscopy

LABORATORY INVESTIGATIONS

Desirable in non-resolving/worsening cases despite antibiotic therapy

- Endoscopy- for guided nasal swabs/ KOH smear
- CT PNS (for suspected complications / non-resolving cases on antibiotics for 14 days)
- Screen for Diabetes / Immunodeficiency

MANAGEMENT

PHC / PRIMARY LEVEL

Duration of treatment 7-14 days

- Oral antibiotics- Amoxicillin/ Co-amoxyclov for 7-10 days. Levofloxacin and Azithromycin can be opted for patients intolerant/ sensitive to penicillins.
- Topical budesonide/ mometasone nasal spray once/twice a day for 2 weeks provides earlier symptomatic relief.
- Normal saline nasal washes help in clearing secretions and improved effect of topical medications
- Topical/ oral decongestant (Oxymetazline/ pseudoephedrine) for 3-5 days relieves symptoms.
- Adequate hydration and steam inhalation.
- Antihistaminics (patients with co-existing allergy).

INDICATIONS OF PARENTERAL ANTIBIOTIC THERAPY

- Orbital/ intracranial complications
- Non-resolution of symptoms with at least 7 days of oral antibiotics
- Worsening of symptoms while on oral antibiotics

DISTRICT HOSPITAL

- Surgical interventions to manage: Underlying anatomical conditions causing recurrent acute sinusitis like- DNS/ adenoid hypertrophy/ anatomical variations seen on CT
- Ophthalmology referral for suspected intraorbital complications
- Dental deferral for suspected dental origin infection.
- Invasive fungal sinusitis- start antifungal medications, control underlying immunocompromising co-morbidity and consider debridement.

TERTIARY LEVEL

Cases of acute invasive fungal sinusitis/ complicated acute bacterial sinusitis and patients with immunocompromised status may be referred for management.

KEEP A HIGH THRESHOLD FOR INVASIVE PROCEDURES

ABBREVIATIONS

CT: Computerized Tomogram
PHC: Primary Health Center

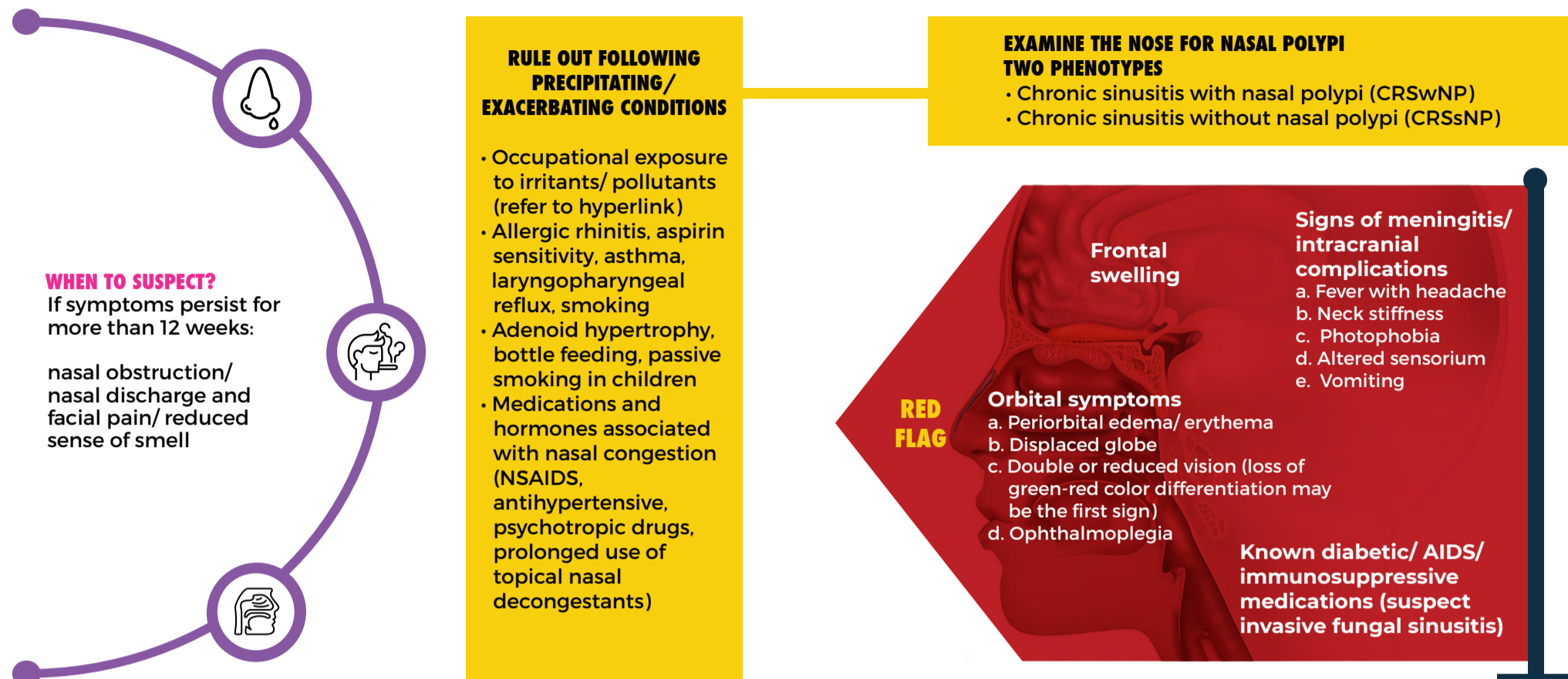
DNS: Deviated Nasal Septum
LPR: Laryngo Pharyngeal Reflux

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Standard Treatment Workflow (STW) for the Management of CHRONIC RHINOSINUSITIS ICD 10 - J32.9



TREATMENT OF CRS

- Mild/ moderate symptoms (no significant congestion/ discharge/ polypi/ complications)
 - Address etiology and exacerbating factors.
 - For allergic rhinitis, antihistamines and nasal steroid spray to be given.
 - Saline nasal wash
 - Steam inhalation
 - Stretching exercises and yoga are very effective for nasal congestion
 - Topical (oxymetazoline/ xylometazoline) and oral decongestants are associated with cardiovascular risks and rebound phenomenon. Hence, careful patient selection and short course treatment to be followed.
 - Intra nasal steroid sprays for 6-8 weeks (Fluticasone propionate/ Fluticasone furoate/ Mometasone) after discussing risk - benefit - cost issues with patient regarding steroid sprays
If no symptomatic relief to above treatment, perform nasal endoscopy and consider NCCT of paranasal sinuses

IN ALL PATIENTS, ESPECIALLY IN THE PRESENCE OF NASAL POLYPI, RULE OUT ALLERGY/ ALLERGIC RHINITIS

- Consider allergen avoidance
- Skin prick test
- Co-existing bronchial asthma needs to be treated
- Consider AIT if indicated.

In presence of nasal purulent discharge

- Culture directed antibiotics to be considered
- If culture is negative, empirical antibiotics (Amoxycillin/ Co-amoxyclov/ Fluoroquinolone/ Roxithromycin) to be given for at least 2 weeks.
- Upper dental (particularly 1st molar) infection may cause maxillary sinusitis which is to be treated with metronidazole.

HYPERLINK

(<https://www.dovemed.com/diseases-conditions/airborne-irritant-induced-sinusitis/>)

- In the presence of nasal polypi, initial nasal steroid spray and subsequent endoscopic surgery is to be planned.

- Short course of oral steroid (Prednisolone 0.5 mg/kg for 5 - 10 days) provides temporary relief in nasal obstruction in extensive polypi.
- Steroid therapy is not a replacement for surgery.

1

Identification of precipitating or exacerbating factors is the key to successful treatment outcome.

2

Always rule out DNS/ nasal polypi in CRS, as surgical treatment may be necessary for complete resolution of symptoms.

3

Ensure adherence to nasal saline washes / regular physical activity / medications.

4

Educate patients on correct technique of using steroid nasal sprays and nasal irrigation.

5

Prolonged use of topical nasal decongestant beyond 5-7 days may cause rebound congestion and rhinitis medicamentosa and to be strongly discouraged.

ABBREVIATIONS

CT: Computerized Tomogram

AIT: Allergen Immuno Therapy

DNS: Deviated Nasal Septum

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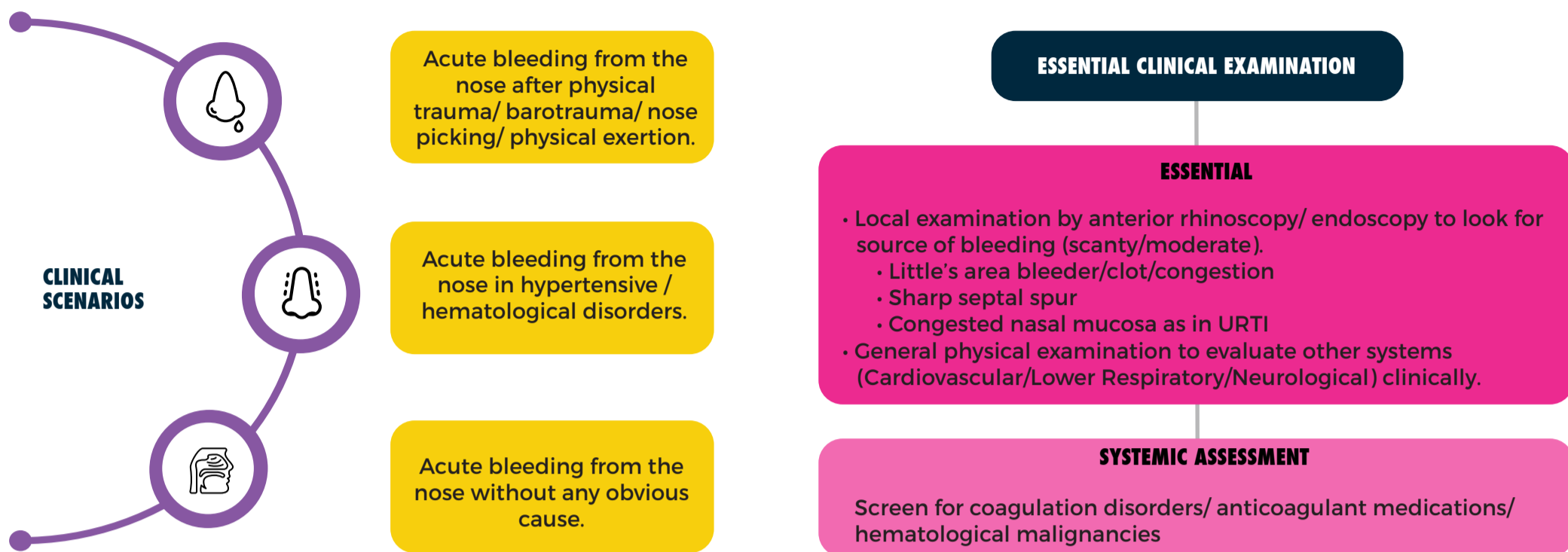


Department of Health Research
Ministry of Health and Family Welfare, Government of India



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Standard Treatment Workflow (STW) for the Management of EPISTAXIS ICD-10-R04.0



MANAGEMENT

STEP-WISE MANAGEMENT PRINCIPLE

1. Ensure patent airway/ avoid aspiration by head down/lateral positioning
2. Restore hemodynamic stability by intravenous fluid replacement/ transfusion
3. Control bleeding/bleeder by
 - Bidigital compression of nose for 10 minutes in Trotter's position (cotton pledgets soaked in 4% xylocaine with adrenaline may be used)
 - Short term tab labetalol will take care of uncontrolled hypertension
 - Chemical/electrocauterization of bleeder in Little's area
4. Tamponade of bleeders by anterior nasal packing/ epistaxis balloon
5. Posterior nasal packing if bleeding is not controlled with above measures
6. Antibiotic prophylaxis and hospitalization is recommended after nasal packing
7. H2blockers/ PPI to be given in case of blood aspiration to avoid gastritis
8. Persisting bleeding despite nasal packing > consider arterial ligation (sphenopalatine / anterior ethmoidal artery).
9. Selective embolization is an alternative to surgery
10. Address identified etiology, if any



INVESTIGATIONS

ESSENTIAL

1. Hemoglobin level
2. Coagulation profile
3. Complete blood count

DESIRABLE

CT scan with contrast in cases with no obvious cause// suspected benign or malignant lesion

Features suggestive of neoplasia

- Unilateral bleeding
- Nasal obstruction
- Visual/orbital symptoms
- Obvious mass lesion

Persistent bleeding despite nasal packing

Altered blood counts/ coagulation profile

Recurrent profuse bleeding

- Consider JNA in teenage boys
- Aneurysmal bleeding (specially following trauma) to be ruled out by DSA
- To be managed by appropriate treatment at tertiary level

RED FLAG SIGNS

FOLLOW UP SERVICES

1. Continued nasal lubrication for 2 weeks with liquid paraffin
2. Repeat anterior rhinoscopy/ endoscopy to know/confirm the cause of bleeding
3. Oral hematinics to be considered if needed

QUALITY ASSESSMENT PARAMETERS

1. Recurrence of episodes
2. Improvement in hemoglobin level over a period of time.

POINTS TO PONDER WHILE MANAGING EPISTAXIS

1. Epistaxis in children is almost always anterior and from Little's area, consequent to mucosal drying by dry air.
2. Epistaxis in adults is often related to hypertension and arises posteriorly from the posterior end of inferior turbinate
3. Initial non-invasive methods may suffice in a large majority of patients.

ABBREVIATIONS

JNA: Juvenile Nasopharyngeal Angiofibroma
DSA: Digital Subtraction Angiography

CT: Computerized Tomograms
URTI: Upper Respiratory Tract Infection

KEEP A HIGH THRESHOLD FOR INVASIVE PROCEDURES



Standard Treatment Workflow (STW) for the Management of HEARING IMPAIRMENT IN PEDIATRIC AGE GROUP (0 - 12 YEARS) ICD 10 H90.5

Disabling hearing impairment (31 or more dB HL in better ear) may affect language development and learning outcomes and hence needs urgent intervention

WHEN TO SUSPECT IN CHILDREN

1. Parental concern about delayed speech, language, and developmental delay (refer to red flags)
2. Family history of Hearing Loss (HL).
3. Exposure to ototoxic drugs/ hyperbilirubinemia requiring exchange transfusion/ Neonatal ICU stay for > 3days.
4. In-utero infections (CMV/ rubella/ syphilis/ herpes/ toxoplasmosis)
5. Syndromes (NF) Or neurodegenerative disorders (Hunter syndrome, FA) associated with HL.
6. Post-natal infection known to cause HL (Meningitis)
7. Head Trauma
8. Recurrent/ persistent (>=3 months) middle ear disease
9. Chemo/ Radiotherapy to head and neck



UNIVERSAL HEARING SCREENING FOR CONGENITAL DEAFNESS

- Community based hearing screening:
 - i. May be co-ordinated with immunization schedule
 - ii. By primary health care workers.
 - iii. Using calibrated noisemakers/ toys
- All children who fail preliminary screen to undergo detailed evaluation at health care facility.

EVALUATION

ESSENTIAL

1. Clinical examination to look for ear canal deformities, tympanic membrane and middle ear status by otoscopy/ otoendoscopy.
2. Age appropriate audiological/ behavioral observation tests in a soundproof room by audiologist/ ENT specialist.
3. Tympanic membrane mobility test/ tympanometry.

COMMON CAUSES OF HL

1. Impacted wax
2. Middle ear fluid associated with adenoid hypertrophy/ cold climate
3. Tympanic membrane perforation
4. Sensorineural Hearing loss (SNHL) due to various causes as indicated earlier

RED FLAGS POINTING FOR URGENT HEARING EVALUATION

- 6months- no head turning to the side of calling
- 1yr- no babbling/ speech like sound production
- 1.5yrs- not saying mama/papa/dada or other names
- 2yrs-not pointing to pictures/ body parts when named or speaking less than 10 words
- 3 yrs- does not understand action words or not asking for things by names or not speaking small sentences.
- At any age- has regressed or lost previously acquired speech/ language milestones

MANAGEMENT

GUIDING PRINCIPLES

CONDUCTIVE HL

Wax removal under direct vision by ENT specialist relieves hearing impairment

Appropriate surgery is to be planned for tympanic membrane perforation

Middle ear fluid (OME) may be associated with adenotonsillar disease which needs to be treated. Initially medical treatment and surgery to be considered for OME persisting for more than 3months/ earlier in the presence of speech and language delay

For non-surgical candidates/ delayed surgical management, amplification by hearing aid to be reinforced in bilateral CHL.

SNHL

Appropriate amplification, preferential seating in classroom

Periodic evaluation for hearing aid users for mould fitting and amplification settings

Screening for developmental delay by pediatrician/ psychologist

DIVISION OF RESPONSIBILITIES

PHC LEVEL

- Suspect HL
- Initial evaluation
- Referral if initial evaluation is suggestive of HL
- Follow up of rehabilitated/ treated patients with HL
- Prevention of HL

DH LEVEL

1. Audiometric evaluation by Audiologist/ Otolaryngologist
2. Hearing aid dispensing (mould fitting and HA programming)
3. Rehabilitation by speech therapist
4. Appropriate surgery for CHL
5. Training programme for parents of hearing impaired children to enhance pre-school language development

TERTIARY LEVEL

- Surgical intervention options : Cochlear implant / BAHA (as per ADIP guidelines)
- Interdisciplinary team based interventions in children with multiple disabilities.

QUALITY ASSESSMENT PARAMETERS

- Short term: Quality of amplification using electroacoustic objective measures and culturally appropriate subjective questionnaire tools
- Long term (Desirable) : Use CBR matrix based measurement for ensuring holistic rehabilitation

FOLLOW UP SERVICES

1. Home visits by Health Worker/ASHA to ensure utilization of assistive devices and support parents to enhance language development.
2. School visits to educate teachers and normally hearing children to include their peers with hearing disability in the school environment
3. Home/ school visit by social worker for evaluation of social/ educational/ livelihood/ justice and empowerment domains of the child

KEEP A HIGH THRESHOLD FOR INVASIVE PROCEDURES

ABBREVIATIONS

ADIP : Assistance to disabled persons for purchase/ fitting of aids and appliances

BAHA : Bone Anchored Hearing Aid
CBR : Community Based Rehabilitation
CMV : Cyto Megalo Virus

FA : Friedreich Ataxia
NF : NeuroFibromatosis
OME : Otitis Media with Effusion

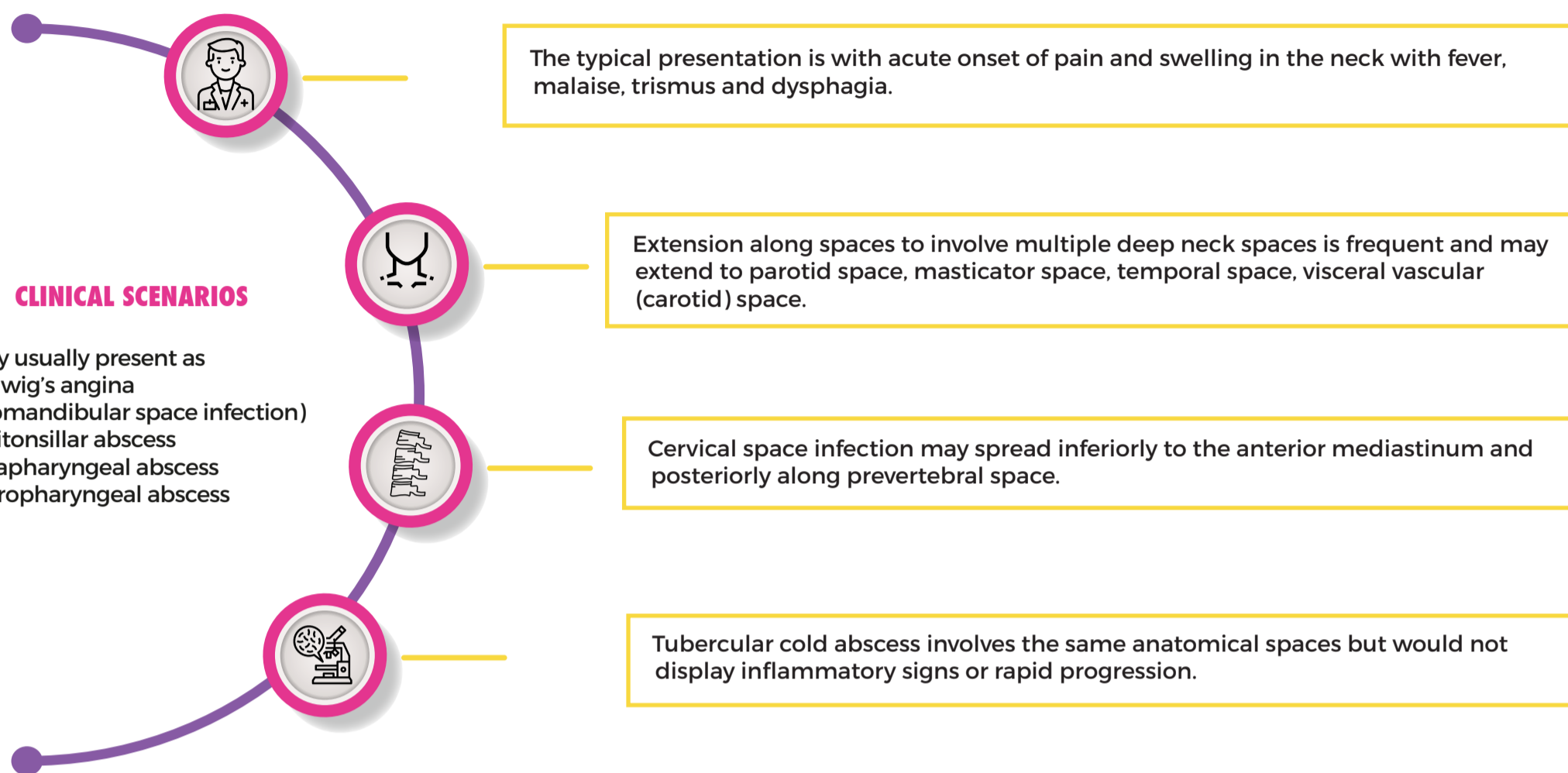
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Standard Treatment Workflow (STW) for the Management of **NECK SPACE INFECTION** ICD-10-J36, J39.0, K 12.2, J39.1

Rapidly progressive bacterial infections which spread along facial planes and spaces of head and neck region. They may be fatal unless emergently treated. Most of these infections are secondary to dental infection.



SYSTEMIC ASSESSMENT

Screen for diabetes mellitus, HIV infection, agranulocytosis and immunosuppressive therapy or chemotherapy. Signs of inflammation may be less marked and disease course may be more rapidly progressive in immunocompromised patients.

CLINICAL EXAMINATION

- Airway assessment to rule out stridor or respiratory compromise
- Look for signs of dehydration
- Monitor temperature, heart rate, respiratory rate, BP, and signs of sepsis/ septic shock.
- Oral cavity examination to check jaw opening, condition of teeth and floor of mouth
- Oropharyngeal examination to check for inflamed medially displaced tonsil & uvula and bulge in lateral pharyngeal wall
- Palpation of neck for lymph nodes, cellulitis, abscess or subcutaneous crepitus
- Cranial nerve examination to rule out lower cranial nerve palsies

RED FLAGS FOR REFERRAL TO DISTRICT HOSPITAL

- Breathing difficulty
- Trismus
- Torticollis/ neck stiffness
- Subcutaneous crepitus and skin discoloration or blisters suggest necrotizing fibrofascitis.
- Toxaemia
- Lower cranial nerve palsy
- Facial puffiness suggestive of venous thrombosis
- Mediastinal extension

INVESTIGATIONS

ESSENTIAL INVESTIGATIONS

1. **Contrast enhanced CT scan** of head and neck is the standard in evaluation of neck space infections. If CT Scan facility is not available, following should be done:-
 - a. **Lateral x-ray neck:** Prevertebral soft tissue thickening >7 mm at the level of C2 or > 2/3rd of the width of the vertebral body at C6 is highly suggestive of retropharyngeal abscess. It may also demonstrate foreign bodies, subcutaneous air, air fluid levels and erosion of vertebrae.
 - b. **Ultrasound neck** can suggest abscess and guide aspiration attempts.
2. **Blood:** Total and differential leukocyte count, blood sugar, urea
3. **Abscess Cultures with Gram stain** to direct antimicrobial therapy. Anaerobic culture, when available.

MANAGEMENT

PHC/PRIMARY LEVEL

1. Cautiously assess the airway. If found compromised, do endotracheal intubation/ consider tracheotomy
2. Immediately gain an IV access for hydration, broad spectrum antibiotics and pain killers.
3. Transfer the patient to hospital with facility for surgical drainage

DISTRICT HOSPITAL

1. **Hospitalization:** As an emergency for close watch and intensive management.
2. **Airway management:** In progressive disease, in view of impending airway compromise, consider securing the airway early. During acute respiratory difficulty, tracheostomy should be done if intubation is difficult
3. **Correction of fluid and electrolyte imbalance**
4. **Antibiotics:** Early and aggressive IV antibiotic therapy with a combination of Crystalline Penicillin, Aminoglycoside and Metronidazole or Clindamycin is preferred.
5. **Incision and drainage:** Peritonsillar abscess is drained intraorally. All other abscesses are drained via an external approach

INDICATIONS FOR I&D

- Necrotizing fibrofascitis
- Abscess formation
- No response to antibiotics over 48-72 hours
- Deterioration despite antibiotics over 24 hours
- Airway compromise or impending airway compromise
- Mediastinal spread
- Vascular complication like venous thrombosis

QUALITY ASSESSMENT PARAMETERS

Complete resolution of infection and follow up to ensure no recurrence; treatment of initial cause of infection in tooth or tonsil.

FOLLOW UP SERVICES

Consider cold tonsillectomy for patients with history of multiple episodes of tonsillar abscess

ABBREVIATIONS

CT - Computerized Tomography

MRI - Magnetic Resonance Imaging

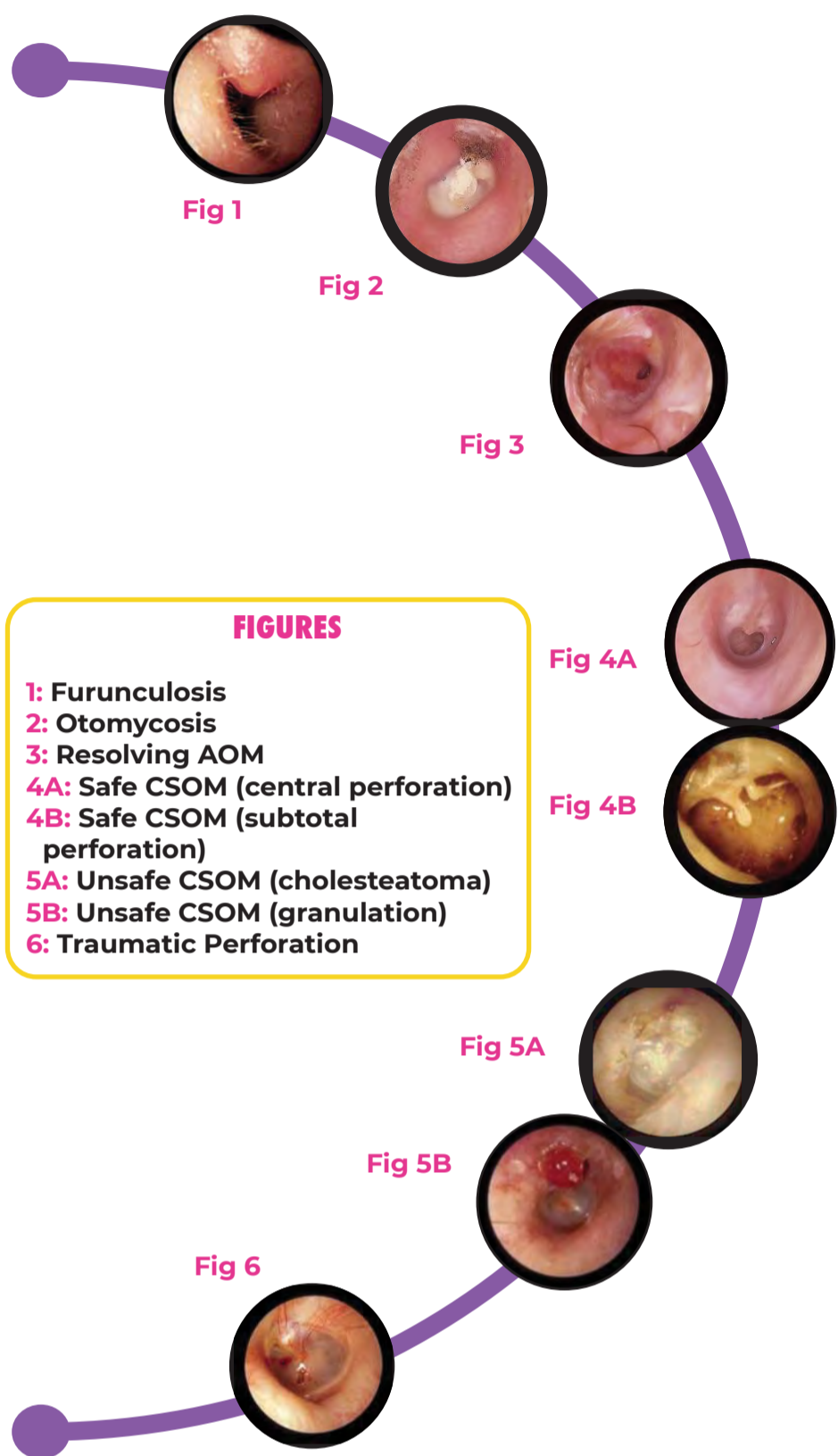
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Standard Treatment Workflow (STW) for the Management of **OTORRHOEA** ICD-10-H92.10

CLINICAL SCENARIOS



FIGURES

- 1:** Furunculosis
- 2:** Otomycosis
- 3:** Resolving AOM
- 4A:** Safe CSOM (central perforation)
- 4B:** Safe CSOM (subtotal perforation)
- 5A:** Unsafe CSOM (cholesteatoma)
- 5B:** Unsafe CSOM (granulation)
- 6:** Traumatic Perforation

DISEASES OF EXTERNAL EAR

- Serous/purulent discharge with significant tenderness of external ear amidst edema (localized-pus: furunculosis or generalized: **Acute otitis externa** denoting Staph/ Pseudomonas infection)
- Thick discharge with itching usually in hot/ humid climate: **Otomycosis** (Candida- white spores; Aspergillus- black spores) [Fig 2]
- Scanty serous discharge & itching with desquamated debris in ear canal **Eczematous otitis externa** (EAC)

DISEASES OF MIDDLE EAR

- URI with severe ear pain (manifested in children as inconsolable crying and ear tugging), relieved with episode of mucopurulent blood stained otorrhoea: **Resolving AOM** [Fig 3]
- Mucopurulent discharge > 12 weeks : CSOM
 - Active : otorrhoea in last 12 weeks
 - Inactive : no otorrhoea in last 12 weeks
 - Safe type : central perforation [Fig 4A] and total perforation [Fig 4B]
 - Unsafe type : cholesteatoma [Fig 5A] and granulation [Fig 5B]
- Recurrent painless profuse mucopurulent discharge with pale granulations/ multiple perforations unresponsive to antibiotics: **Tubercular otitis media** should be suspected and needs biopsy confirmation
- Bloody otorrhoea following Trauma: **Traumatic perforation**
- Acute onset bloody discharge with neural deficits/ neck nodes: **Neoplasia**
- Watery otorrhoea (may be associated with trauma) : **CSF Otorrhoea**

CLINICAL EXAMINATIONS

- Otoscopy as a part of Complete ENT examination by primary physician (Tele-otoscopy interpreted by physician)
- Hearing evaluation by conversation/ whisper/ Tuning forks tests
- General and systemic clinical examination

INVESTIGATIONS

- Pure tone audiometry
- Routine hemogram including blood sugar (fasting and postprandial)
- CT/ MRI in suspected complications (refer to red flags)
- Soft tissue x ray nasopharynx (To examine adenoid enlargement in children)
- Culture & sensitivity of aural secretions.

RED FLAGS FOR REFERRAL TO DISTRICT LEVEL

- Periaural abscess or cellulitis
- High grade fever, dizziness and toxic appearance
- Severe headache with neck stiffness/ vomiting / altered sensorium.
- Facial palsy/ Neurological deficits
- Diabetic with severe deep seated ear pain / neural deficits (Skull base osteomyelitis)
- Physical trauma with bloody/ watery discharge (suspected CSF leak)
- Suspected tuberculosis/ neoplasm

MANAGEMENT

PHC / PRIMARY LEVEL

- Acute otitis externa: Oral Ciprofloxacin/ Amoxicillin clavulanic acid combination for 7-10 days (2 weeks maximum) and analgesics. Ichthammol glycerine (1:9) packing of EAC in moderate to severe edema. Refer pus pointing furuncle to DH
- Otomycosis: Cleaning and Clotrimazole ear drops
- Eczematous otitis externa: Ciprofloxacin ear drops with steroid combination.
- AOM / Resolving AOM: Oral amoxicillin / Erythromycin / Clarithromycin for 10 days. With no response in 3 days start Amoxicillin clavulanic acid combination for 10 days. Refer to DH if no resolution
- Inactive CSOM: Referral to DH for surgery.
- Active CSOM: Ciprofloxacin ear drops with dry mopping & referral to DH for surgery. A course of oral antibiotics maybe prescribed in case of persistent otorrhoea after topical antibiotics
- Traumatic perforation: Topical antibiotics for otorrhoea if any and maintain ear dry till healing complete
- In case of suspicion of complications start intravenous Amoxicillin clavulanic acid combination and refer to DH

DISTRICT HOSPITAL

- Surgical interventions except neurosurgical interventions (eg I&D, tympanoplasty, mastoidectomy)
- Biopsy in suspected neoplasm
- Medical management of medical co-morbidities such as diabetes, tuberculosis, meningism/ meningitis

TERTIARY LEVEL

- Surgical management particularly of intracranial complications including neurosurgical interventions

- Patient to be educated for proper technique of ear mopping, contralateral lie (10 min) following instillation of drops & avoiding water entry e.g ear-plugs during bathing
- To ensure adequate immunization (measles/ H.Influenza/ Pneumococcus) in recurrent AOM and to adopt correct posture during breastfeeding while avoiding bottle feeding
- Pus culture sensitivity to guide antibiotic regime in recurrent/ complicated cases
- **Patient education to refrain from indigenous (oil/ hot water/ acid etc) ear treatments**

KEEP A HIGH THRESHOLD FOR INVASIVE PROCEDURES

ABBREVIATIONS

CT: Computerized Tomogram
MRI: Magnetic Resonance Imaging

AOM: Acute Otitis Media
CSOM: Chronic Suppurative Otitis Media

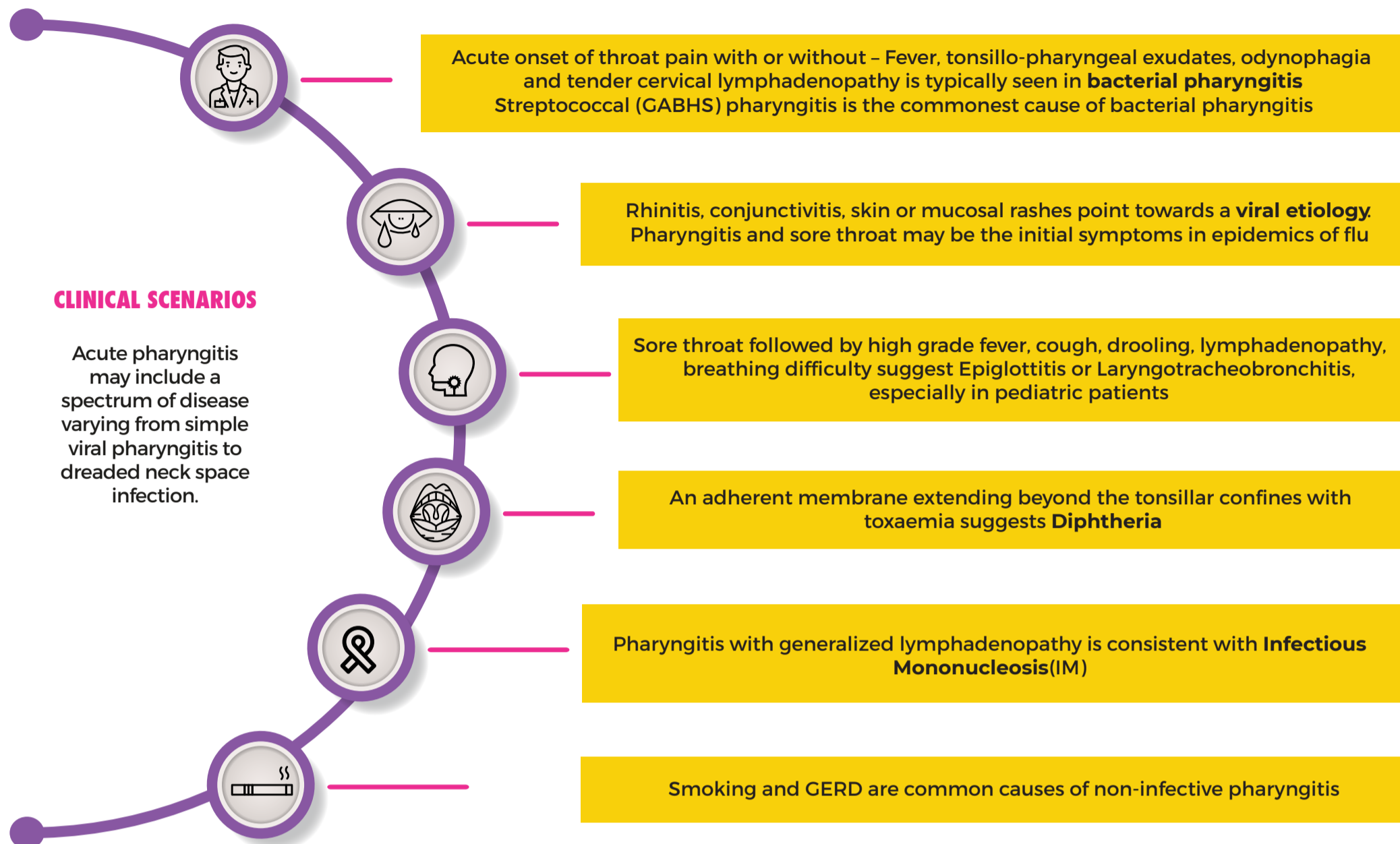
EAC: External Auditory Canal
URI: Upper Respiratory Infection

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Standard Treatment Workflow (STW) for the Management of PHARYNGITIS AND SORE THROAT ICD-10-J02



CLINICAL EXAMINATION

PRELIMINARY

- Temperature chart: fever is usually absent or low-grade in viral pharyngitis
- Check for vitals/ signs of dehydration due to compromised oral intake due to odynophagia
- Complete oral and oropharyngeal examination with tongue depressor
- Palpate for cervical and generalized lymphadenopathy
- Rheumatic fever and acute glomerulonephritis are potential systemic complications of streptococcal pharyngitis
- Hepatosplenomegaly can be found in IM
- A sandpapery scarlatiniform rash may be seen in GABHS infection whereas maculopapular rashes are seen with various viral infections and with IM empirically treated with penicillin

DESIRABLE

Assess Centor criteria and ascertain its score

RED FLAGS

- Generalized lymphadenopathy
- Cardiac murmurs
- Purulent productive cough with tachypnea suggestive of LRTI
- Hot potato voice
- Unilateral tonsillar enlargement
- Tonsillar membrane going beyond its confines
- Agranulocytosis
- Epidemic of flu

CLINICAL FEATURES	CENTOR SCORE	UNLIKELY TO HAVE GABHS	LIKELY TO HAVE GABHS	REQUIRE LAB TESTS TO CONFIRM GABHS INFECTION
Fever	1	Score = 0-1	Score = 4	Score = 2-3
Anterior cervical lymphadenopathy	1			
Tonsillar exudate	1			
Absence of cough	1			

INVESTIGATIONS

ESSENTIAL

Throat swab for culture, routine hemogram including total and differential leukocyte counts and peripheral smear to look for atypical lymphocytes (seen in IM).

OPTIONAL

GABHS rapid antigen detection test (RADT)

DESIRABLE

Lab tests to rule out EB Virus, Coxsackie virus, Herpes virus, fungal or Gonococcal pharyngitis

MANAGEMENT

PHC / PRIMARY LEVEL

DISTRICT HOSPITAL

1. Assess the patient for signs of toxicity, epiglottitis or oropharyngeal abscess
2. Ensure vitals/ hydration of the patient
3. Saltwater gargle, warm liquids, and rest may be helpful in relieving symptoms
4. Ibuprofen or Paracetamol is recommended for analgesia
5. Antibiotic therapy:
 - a. Patients positive for all 4 Centor criteria to be treated with antibiotics without waiting for antigen testing or cultures
 - b. Patients with Centor score of 2&3 to be treated with antibiotics only if antigen testing or throat swab culture is positive
 - c. Patients with Centor score of only 1 not to be treated with antibiotics
 - d. Amoxicillin (50 mg/kg/d in 2-3 doses orally) for 10 days is the first choice for GABHS infection. For patients who are sensitive for penicillin group, Erythromycin or Azithromycin is the antibiotic of choice
6. Parenteral antibiotics (Ceftriaxone/cefotaxime) and steroids are to be started when the airway is compromised due to suspected epiglottitis/Croup.

Management of complication e.g.

- Deep neck space infection
- Diphtheria
- Epiglottitis
- Croup

FOLLOW UP SERVICES

Recurrent (more than 7 episodes in previous year or 5/year in last two years or 3/year in last 3 years) tonsillitis episodes need to be evaluated for tonsillectomy.

KEEP A HIGH THRESHOLD FOR INVASIVE PROCEDURES

ABBREVIATIONS

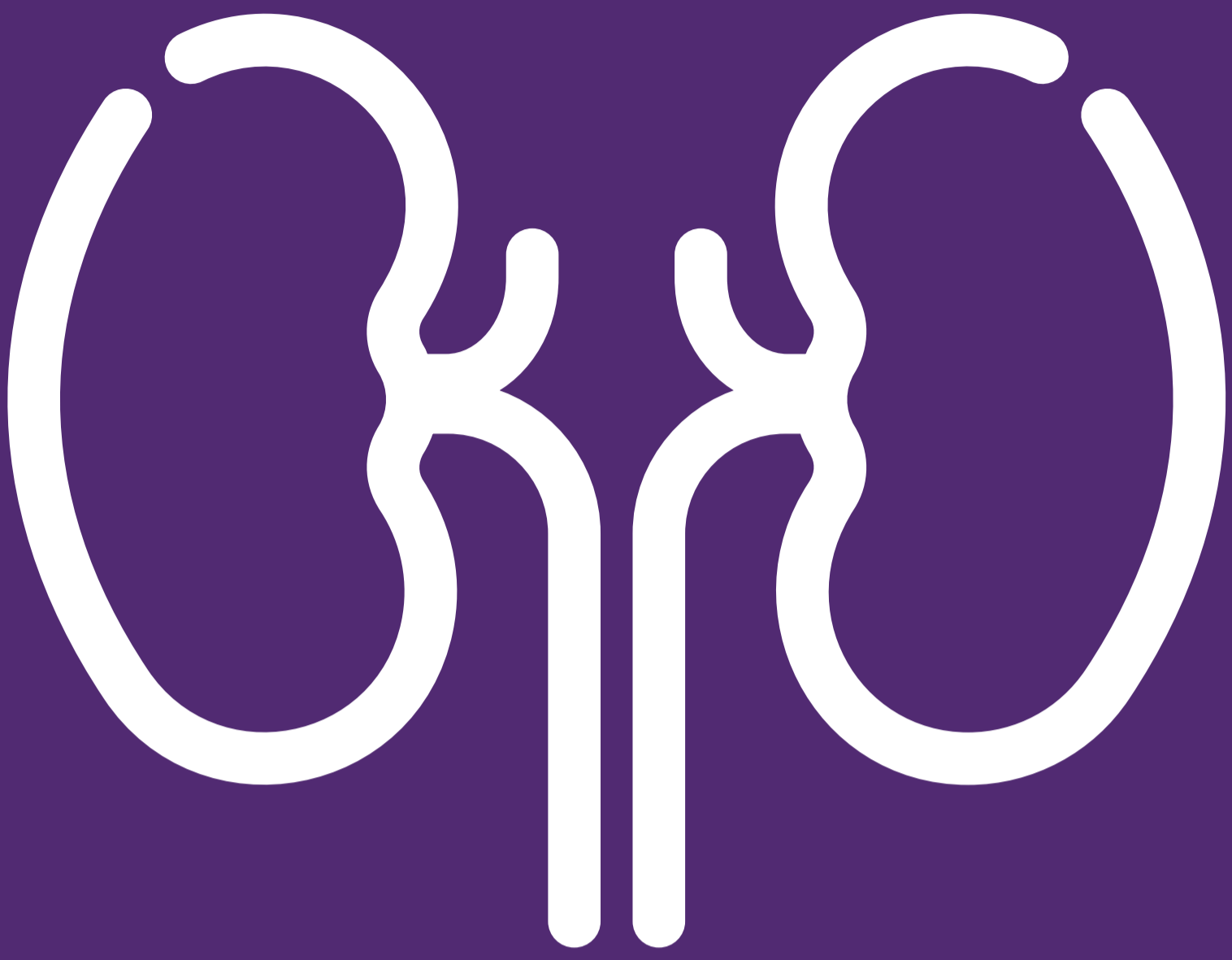
GABHS: Group A Beta Hemolyticus Streptococcus
GERD: Gastro Esophageal Reflux Disease
LRTI: Lower Respiratory Tract Infection

EB: Epstein Barr
RADT: Rapid Antigen Detection Test

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NEPHROLOGY

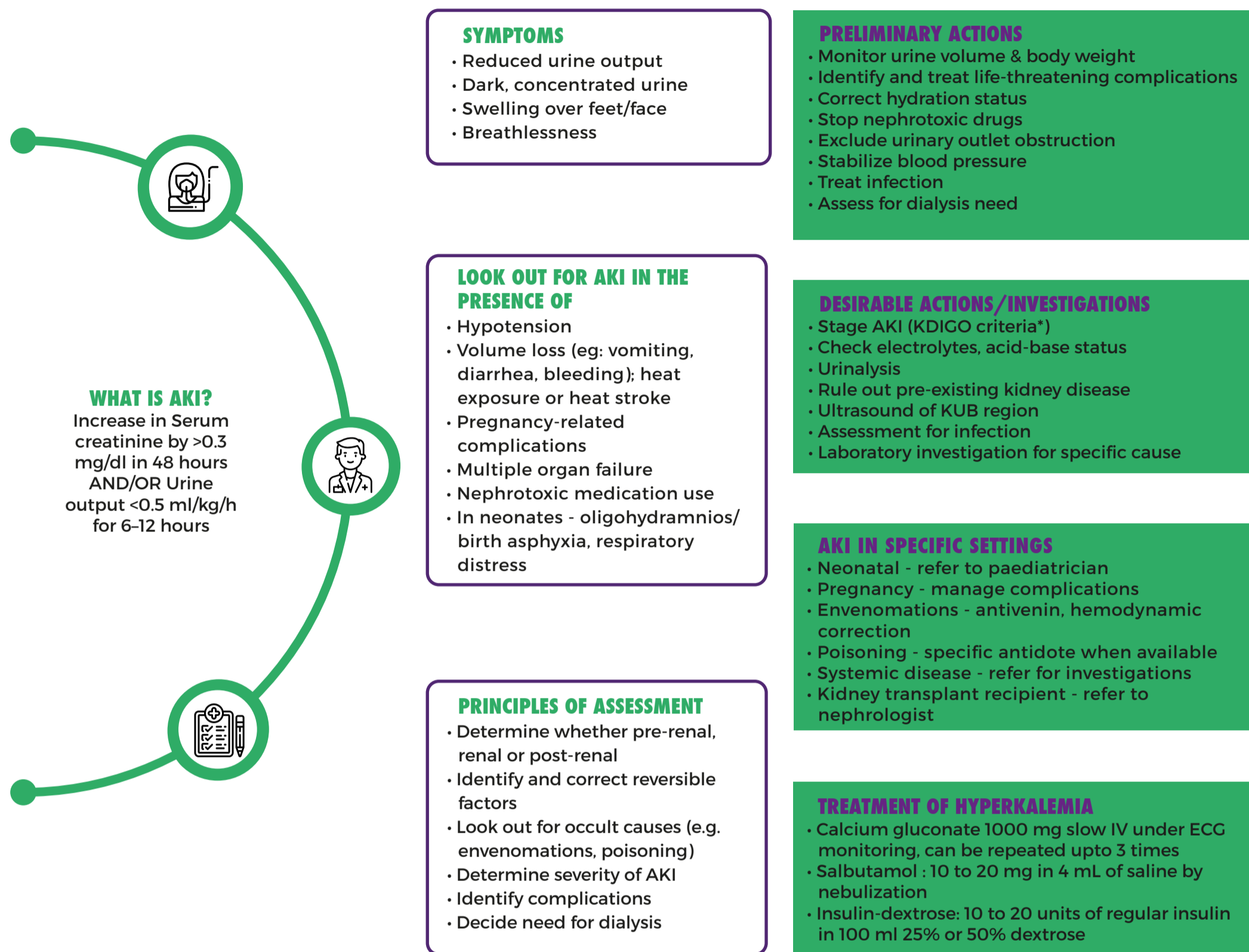


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Standard Treatment Workflow (STW) for the Management of **ACUTE KIDNEY INJURY** ICD-10-N17.9



MANAGEMENT

PRIMARY CARE

- Detailed history and physical examination
- Identify and correct volume deficit
- Stop nephrotoxic agents
- Identify and correct bladder outlet obstruction
- Give anti-snake venom if indicated
- Identify hyperkalemia and start treatment
- Identify pulmonary edema- start intravenous furosemide and oxygen
- PD if indicated
- Timely referral after stabilisation

SECONDARY CARE

- Detailed history and physical examination
- Identify and correct volume deficit
- Stop nephrotoxic agents
- Identify and treat hyperkalemia, metabolic acidosis and pulmonary edema
- Identify and correct urinary tract obstruction (USG, CT)
- Detailed investigation for infections
- Manage pregnancy complications - deliver if indicated
- Look for underlying CKD
- Dialysis (PD or HD)

TERTIARY CARE

- Detailed history and physical examination
- Identify and correct volume deficit
- Stop nephrotoxic agents
- Identify and correct urinary tract obstruction (USG, CT scan)
- Identify and treat hyperkalemia, metabolic acidosis and pulmonary oedema
- Detailed investigation for infections
- Manage pregnancy complications- deliver if indicated
- Look for underlying CKD
- Investigations for specific cause (including imaging, genetic tests)
- Kidney biopsy
- Dialysis (PD or HD)

RED FLAGS FOR URGENT REFERRAL

- Indications for dialysis
- Unexplained AKI
- Involvement of other organs
- Sepsis
- Systemic disease
- Complicated pregnancy

INDICATIONS FOR DIALYSIS

- Fluid overload
- Pericarditis
- Hyperkalemia
- Severe metabolic acidosis
- Encephalopathy
- Severe uraemia
- To create space for fluids or blood products

FOLLOW-UP OF AKI

- UO > 1L, stable or falling creatinine, no symptoms: stop dialysis
- Not resolving for >2 weeks: CECT to exclude cortical necrosis; kidney biopsy as indicated
- Look for systemic diseases (e.g. vasculitis, myeloma, TMA)
- Serum creatinine and urine protein q 6-12 months for life

ABBREVIATIONS

AKI: Acute Kidney Injury
CECT: Contrast-enhanced CT scan

PD: Peritoneal dialysis
TMA: Thrombotic microangiopathy

CKD: Chronic Kidney Disease
HD: Hemodialysis

UO: Urine output
USG: Ultrasonography

REFERENCE

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KEEP A HIGH THRESHOLD FOR INVASIVE PROCEDURES

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Standard Treatment Workflow (STW) for the Management of CHRONIC KIDNEY DISEASE (CKD) ICD-10-N18.3

WHAT IS CKD?

Abnormalities of kidney structure or function, present for >3 months, with implications for health



WHEN TO LOOK FOR CKD

- History of long-standing nocturia, or constitutional symptoms
- Edema, hematuria, proteinuria or renal stones
- Long-term intake of painkillers or herbal medicines
- Family history of kidney disease
- Growth retardation, rickets, or proximal myopathy
- Unexplained hypertension or anemia
- Longstanding diabetes, hypertension, CVD, stroke, PVD
- Systemic diseases (e.g. connective tissue disease)



EVALUATION OF NEWLY DIAGNOSED PATIENT WITH CKD

- Serum creatinine, electrolytes, bicarbonate
- Estimate glomerular filtration rate using CKD-EPI equation
- Urinalysis (examine sediment, proteinuria quantitation)
- Ultrasound of kidneys and urinary tract
- Calcium, phosphate, alkaline phosphatase, albumin
- CBC including peripheral blood film
- Iron profile - Serum iron, TIBC, TSAT
- HBsAg, anti-HCV



INITIAL ASSESSMENT FOR

- Confirmation of CKD diagnosis (repeat tests after 3 months)
- Staging and progression rate
- Establishing cause of kidney disease
- Identify and treat reversible factors (hypertension, volume loss, obstruction, infection)
- Look for complications (anemia, bone disease, dyselectrolytemias, CVD)



LIFESTYLE MEASURES FOR ALL CKD PATIENTS:

- Weight control/ weight gain monitoring in children
- Regular physical activity
- Reduce dietary salt intake to < 5 g/day
- Stop tobacco use in all forms
- Stop/moderate alcohol use
- Stop using unproven health supplements
- Do not use NSAIDS
- Avoid untested indigenous medicines

BP CONTROL (TARGET <130/80, 120/80 IF PROTEINURIA)

- Restrict dietary salt to < 5 g/day
- Use any anti-HT available in local pharmacy
- Diuretics - eGFR > 45 : thiazide, <45 ml/min: furosemide; <30 ml/min: do not use potassium sparing agents
- ACEI/ARB preferred* for proteinuric patients (> 1 g/d)

*caution/do not use if eGFR <30 ml/min, or Potassium >5.5 mEq/L

VACCINATION SCHEDULE FOR NEWLY DIAGNOSED CKD PATIENT

- If HBV -ve: 20 µg IM in each deltoid at 0,1,2 and 6 months
- In children - complete primary vaccination schedule

ANEMIA MANAGEMENT

- Establish iron replete state
- If not iron replete, give oral iron
- Consider IV iron for dialysis patients and those not tolerating orally
- If Hb still <8 g/dl - start erythropoietin, titrate to Hb 10-11 g/dl

MANAGEMENT OF HYPERPHOSPHATEMIA (PO₄>5.5)

- Start with Ca-containing binders
- Non Ca-binders can be used if serum Ca >9 mg/dl, vascular calcification or low iPTH

DIABETES CONTROL (TARGET HBA1C <7%)

- Do not use metformin if eGFR <30

NUTRITION

- Salt restriction < 5g/d. Protein 0.6-0.8 g/kg/day.
- DO NOT restrict proteins unless documented high protein user (dairy, white meat are good protein sources, mix different types of dal).
- Restrict green leafy vegetables if eGFR <30 ml/min
- Avoid fruit juices, coconut water and carbonated beverages
- For children: ensure adequate protein intake appropriate for age.

LOW POTASSIUM FRUITS/VEGETABLES:

Apple, pineapple, papaya, pear, tangerine, watermelon, grape, plum, cabbage, carrot, cauliflower, onion, radish, peppers, chillies, brinjal, cucumber, green beans, peas, rice, bread

VITAMIN D THERAPY

- Supplement 60,000 units cholecalciferol q2W
- Correction of acidosis with oral sodium bicarbonate
- Activated vitamin D if hyperparathyroidism

MANAGEMENT

PRIMARY CARE

- Detailed history and physical examination
- Identify and correct reversible factors
- Stop nephrotoxic agents
- Referral after stabilization

ADMISSION CRITERIA

- Initial evaluation or when patient presents with specific problems - like acute worsening, development of a new complication
- For creation of vascular access
- For PD catheter placement or initiation
- Initiation on HD and for kidney transplant

TERTIARY CARE

- Detailed history and physical examination
- Investigate to ascertain cause of CKD (imaging/biopsy/genetic studies)
- Tailor treatment to cause
- Identify and manage complications
- Vaccination
- Counseling: nutrition, lifestyle, pregnancy in women of child-bearing age
- Discussion regarding RRT
- Vascular access creation/PD catheter insertion
- Work-up for transplantation
- Send patient back to community with treatment plan

INDICATIONS FOR REFERRAL

- Initial evaluation of all newly diagnosed cases
- Rapid disease progression
- New complication
- Discussion for Renal Replacement Therapy (RRT)

DISTRICT HOSPITAL

- Detailed history and physical examination
- Investigate to ascertain cause of CKD
- Tailor treatment to cause
- Identify and manage complications
- Vaccination
- Identify and correct acute factors
- Counseling: nutrition, lifestyle, pregnancy in women of child-bearing age
- Discussion regarding RRT
- Vascular access creation or PD Catheter insertion
- Send patient back to community with treatment plan

PREPARATION FOR RENAL REPLACEMENT THERAPY

- eGFR < 30 : Preserve veins in the non-dominant arm for AV Fistula
- eGFR < 30 : discuss RRT options.
- eGFR < 15 : May need dialysis soon, counsel for AV fistula, list for transplant
- Dialysis start : depends on symptoms or eGFR <5 ml/min
- Look for contraindications to HD or PD : discuss choice in those suitable for either

CONSERVATIVE CARE

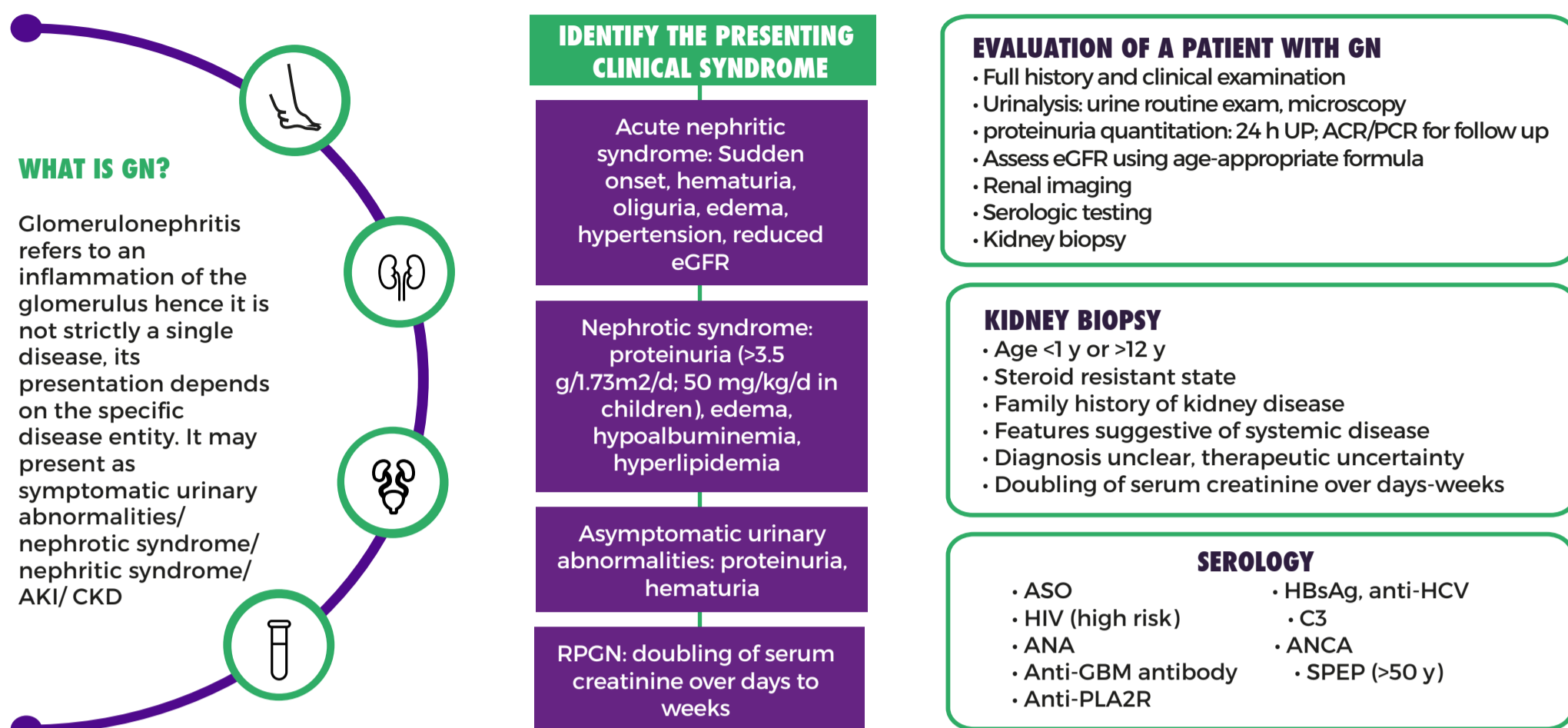
- If life expectancy limited, multiple comorbidities/personal preference
- Decision-making should be shared with patient/family

KEEP A HIGH THRESHOLD FOR INVASIVE PROCEDURES



Standard Treatment Workflow (STW) for the Management of GLOMERULONEPHRITIS

ICD-10-N05.9



IN CHILDREN <12 Y WITH NEPHROTIC SYNDROME DO NOT

- Give any vaccine while on steroids or within 3 months of stopping
- Prescribe bed rest unless indicated
- Restrict salt in children with nephrotic syndrome
- Restrict fluids
- Use ACE inhibition in children with renal dysfunction, or in steroid sensitive nephrotic syndrome

BEFORE STARTING STEROIDS IN CHILDREN, REMEMBER TO

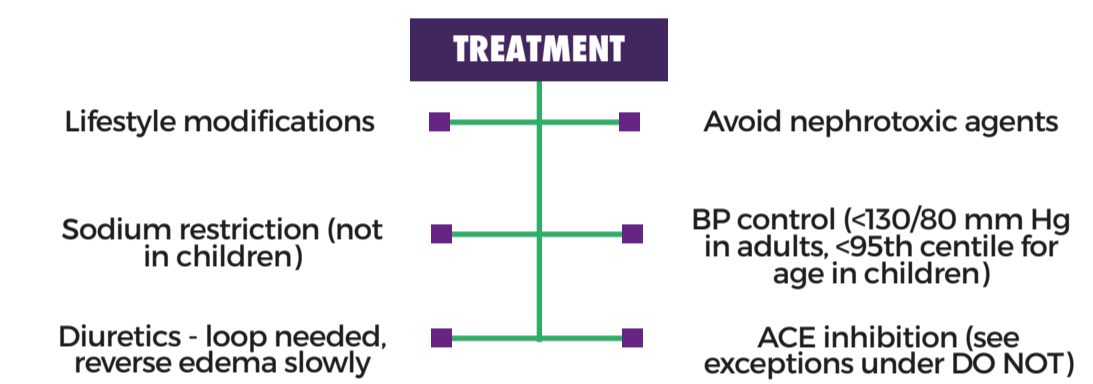
- Look for latent TB (Mantoux test, Chest X-ray)
- Start 6 months INH therapy (5mg/kg day) if asymptomatic Mantoux +ve
- Be on the lookout for common infections (e.g. peritonitis, pneumonia and skin infections)

CAUTION

- Non-nephrotic proteinuria: rule out orthostatic cases
- Isolated hematuria: rule out urological causes

LOOK FOR COMPLICATIONS

- Malnutrition
- Hypovolemia
- AKI
- Thromboembolism
- Infections



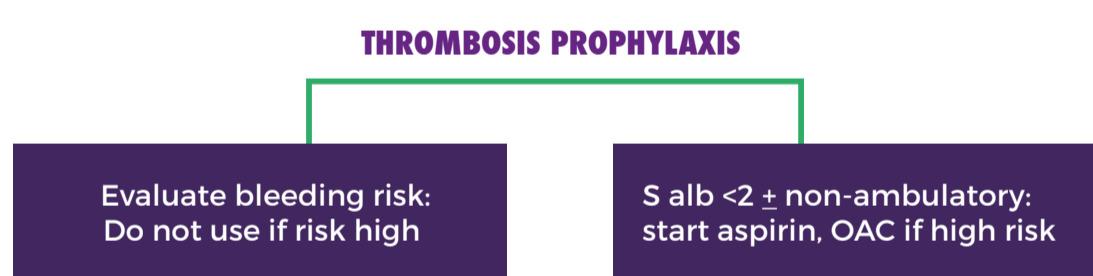
RECOMMENDED PHARMACOLOGICAL TREATMENT

CHILDREN

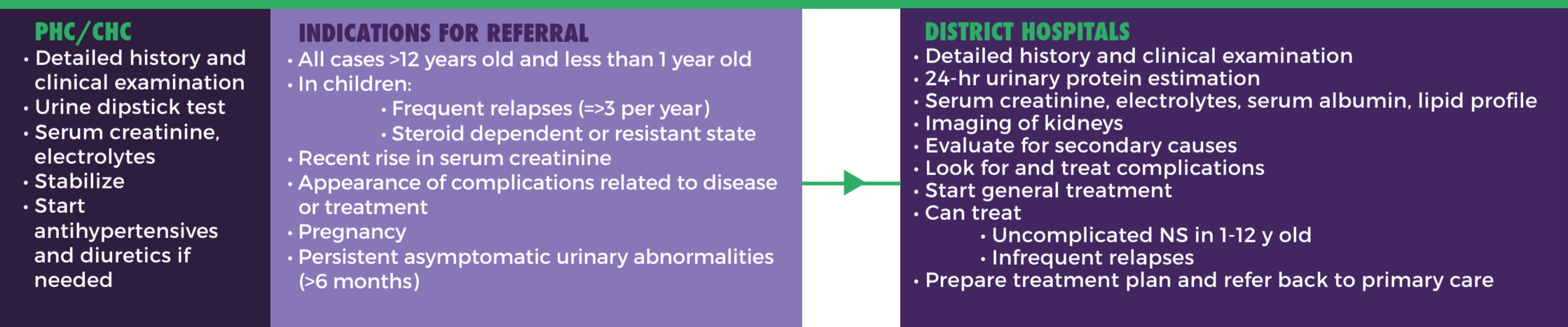
- Prednisolone 2 mg/kg x 6 w followed by 1.5 mg/kg A/D x 6w
- In case of relapse- Prednisolone 2 mg/kg x 2w followed by 1.5 mg/kg A/D x 4w

ADULTS

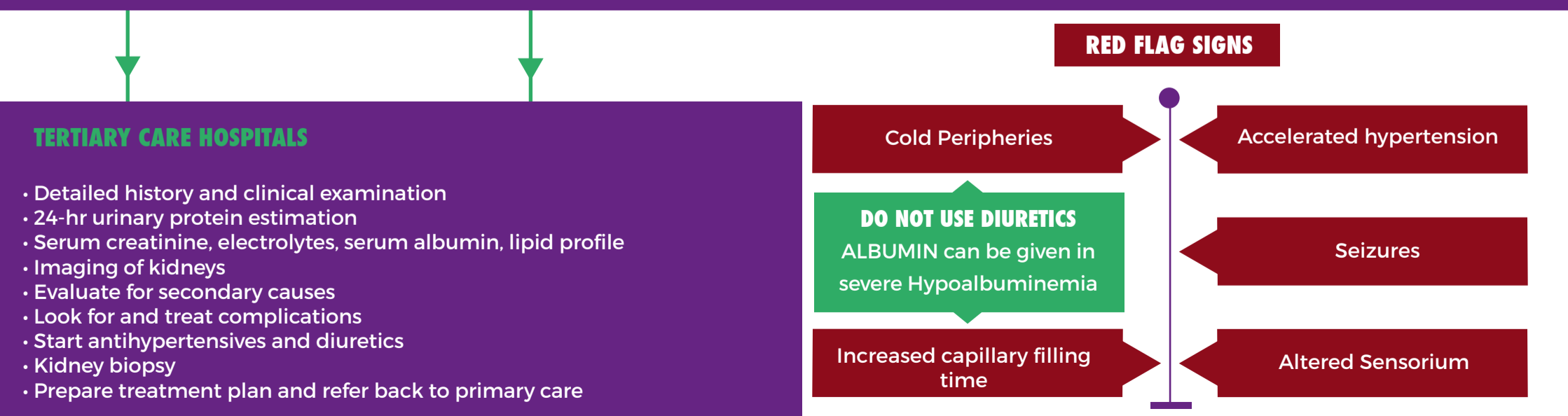
- Treatment Depends on diagnosis (biopsy, serology)
- Therapeutic choices include
 - Corticosteroid (Prednisolone, IV methylprednisolone)
 - CNIs (cyclosporine/tacrolimus)
 - Cyclophosphamide
 - Azathioprine
 - Mycophenolate mofetil
 - Levamisole
 - Rituximab



MANAGEMENT



ADMISSION CRITERIA: Initial evaluation, kidney biopsy, or management of complications



KEEP A HIGH THRESHOLD FOR INVASIVE PROCEDURES



Standard Treatment Workflow (STW) for the Management of URINARY TRACT INFECTIONS

ICD-10-N39.0



WHAT IS UTI?

At least 3 Symptoms (dysuria, frequency, urgency, suprapubic pain)

OR

Dipstick +ve for leucocyte esterase and nitrite if <3 symptoms

OR

- CUE >10 WBC/HPF in uncentrifuged urine +
- Urine culture >10⁵ CFU of single species/ml in Mid stream urine (multiple species indicate contamination)



DETERMINE UTI TYPE

SIMPLE CYSTITIS/ LOWER UTI

- Dysuria, urgency, frequency

PYELONEPHRITIS/ UPPER UTI

- Fever
- Chills and rigors
- Loin pain, pelvic pain
- Renal angle tenderness
- Toxic and sick appearance

COMPLICATED UTI

- History of stones, congenital anomalies, obstruction
- Diabetes
- Immunosuppression

WHEN TO DO URINE CULTURE?

- Complicated UTI
- Pyelonephritis
- Special situations
 - All males (except simple cystitis)
 - Children
 - Pregnancy
 - Recurrent UTI (> 2 episodes/ 6 months)
 - Catheter associated UTI

MANAGEMENT

PRIMARY CARE

- History and Examination
- Look for red flag signs and refer
- Refer special groups
- Treatment in primary care
 - Acute cystitis females
 - Acute cystitis males
- Treatment
 - Nitrofurantoin
 - Trimethoprim sulphamethoxazole
- Symptomatic relief

MALE UTI

- Acute cystitis/ simple UTI
- Rx Men for 7 days
 - Nitrofurantoin* 100 mg PO BD x 7d
 - TMP/SMX 1 DS tab PO BD x 7d
 - Ciprofloxacin 500 mg BD x 7 days
 - Levofloxacin 750 mg OD x 5 day
 - Acute cystitis is not to be referred
- ALL OTHER UTI IN MALES-REFER
- Pyelonephritis or complicated UTI
- Pelvic/perineal pain (prostatitis)

PRIMARY/ SECONDARY LEVEL

INITIAL ASSESSMENT

- History
 - Symptoms
 - Recurrent UTI
 - Diabetes
 - Congenital malformations
 - Stones
 - Immunosuppression
- Examination
 - Temperature, renal angle tenderness, genital exam

CYSTITIS/UTI IN FEMALES

- Empirical RX (only symptoms no tests needed)
- Nitrofurantoin* 100 mg PO BD x 5d
- TMP/SMX 1 DS tab PO BD x 3d
- If no response refer to higher centre

*Avoid if GFR <45,caution in elderly

SYMPTOMATIC TREATMENT

Plenty of water	Urine alkalinizer recommended eg citrate - Avoid if patient on nitrofurantoin	Phenazopyridine 200mg tid for 2 days	Local Estrogen creams for recurrent UTI in post menopausal women	Paracetamol for pain	Cranberry can be used
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RED FLAG SIGNS - REFER

- Pyelonephritis
- Complicated UTI

- Special situations (Children, pregnancy, males except simple cystitis, catheter UTI)

- Non response within 3 days of AB
- Recurrent UTI

TERTIARY LEVEL

• Send for culture	Rx Pyelonephritis/ complicated UTI	Rx pregnancy UTI	Rx all male UTI including prostatitis	Rx recurrent UTI	Rx non-resolving UTI
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PYELONEPHRITIS

- Empiric Outpatient:
- Urine c/s
 - Consider initial dose of a parenteral agent
 - Ceftriaxone 1-2 g IV/IM x 1
 - Gentamicin 5 mg/kg IV/IM x 1
 - Followed by
 - Ciprofloxacin 500 mg PO BD x 7d
 - Levofloxacin 750 mg PO OD x 5 d
 - Cefuroxime 500 mg PO BD x10-14d
 - Amoxy clav x10-14 days
 - TMP-SMX 1 DS BD x 7-10 days
- Empiric Inpatient :
- Ceftriaxone 1-2 g IV once daily+ /-AMP
 - Gentamicin +/-AMP
 - Others as per c/s- Carbapenem, Piperacillin Tazo
- IV therapy required until afebrile x 48 hrs, then switch to PO If no response in 3 days imaging

PREGNANCY UTI

- Urine culture at 1st antenatal visit
- For asymptomatic bacteriuria/acute cystitis:
 - Nitrofurantoin 100 mg PO BD x 5-7 d (avoid near-term)
 - Cephalexin 500 mg PO QID x 5-7 d
 - TMP/SMX 1 DS tab PO BD x 5-7 d (avoid in 1st trimester & near term; supplement with multivitamin containing folic acid)
- Check repeat urine c/s 7days after Rx to confirm clearing
- Repeat urine culture in each antenatal visit
- If recurrent- Antibiotic prophylaxis till term

CATHETER UTI

- Rx of asymptomatic CAUTI NOT recommended
- Urinary catheters should be removed as soon as not required
- If indwelling catheter for >2 weeks and is still indicated, replacing the catheter is recommended
- Symptomatic CAUTI
 - (Fever, back pain, new onset delirium, rigors)
 - Send culture
 - Rx as complicated UTI
- No role of routine antibiotic prophylaxis for prevention

MALES WITH PROSTATITIS

- UTI symptoms+ pelvic pain/ fever
- Refer
- Urine culture & MSU
- Digital rectal exam-tender prostate
- Older >35 yrs-
 - Septran DS BD
 - Levofloxacin 500mg OD, ciproflox 500 mg BD
 - Avoid nitrofurantoin
- Young males-
 - Doxy 100mg bd /azithro 1 gm / oflox 300mg BD for chlamydia + Single dose of Ceftriaxone 250mg IM for gonorrhoea
- Rx- 6 weeks
- Imaging to rule out abscess

RECURRENT UTI

- Uncomplicated RUTI
 - post coital voiding and post coital antibiotic
 - Low dose nitrofurantoin 50 mgX 6 months
 - Single strength septran x 6 months
 - Or norflox 200mg, ciproflox200mg , cephalexin 250mg
- Complicated RUTI
 - Urology referral
 - Cystoscopy, urodynamics (post menopausal)

ASYMPTOMATIC BACTERIURIA

- No symptoms
- Bacteria in urine culture >10⁵CFU/ml
- No treatment required

- Exceptions when you should treat
 - Pregnancy
 - Before any urological intervention

* Pregnancy UTI, Catheter UTI may also be managed at secondary level.

LONG TERM CONSEQUENCES

- Renal scars
- Hypertension
- CKD
- Poor quality of life

CHILDREN

SYMPTOMS

- Neonates and Infants <1yr
 - Fever,vomiting, diarrhoea, jaundice, Poor stream
- Older children same as adults

TREATMENT

- Infants <3months as upper UTI (PN) with IV antibiotics
 - Urinary bladder catheterisation for infants with upper tract UTI
- Older children
 - Upper UTI- IV antibiotics gentamicin, amikacin, ceftriaxone
 - Lower UTI- oral cefixime, oflox, ciproflox, amoxyclav
- Duration of Rx
 - Upper UTI- 10-14 days
 - Lower UTI 7-10 days
 - Adolescents 3-5 days

REFER

Upper UTI(PN), infants UTI, recurrent UTI

PREVENTION

Avoid constipation, clean washrooms

FIRST URINARY TRACT INFECTION*

Age <1 yr

- Ultrasound
- MCU
- DMSA renal scan

Age >5 yr

- Ultrasound
- If ultrasound abnormal: MCU and DMSA scan

Age 1-5 yr

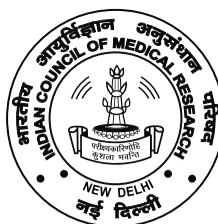
- Ultrasound
- DMSA scan
- MCU if ultrasound or DMSA scan is abnormal

All patients with recurrent UTI need detailed evaluation with ultrasonography DMSA scan and MCU

KEEP A HIGH THRESHOLD FOR INVASIVE PROCEDURES



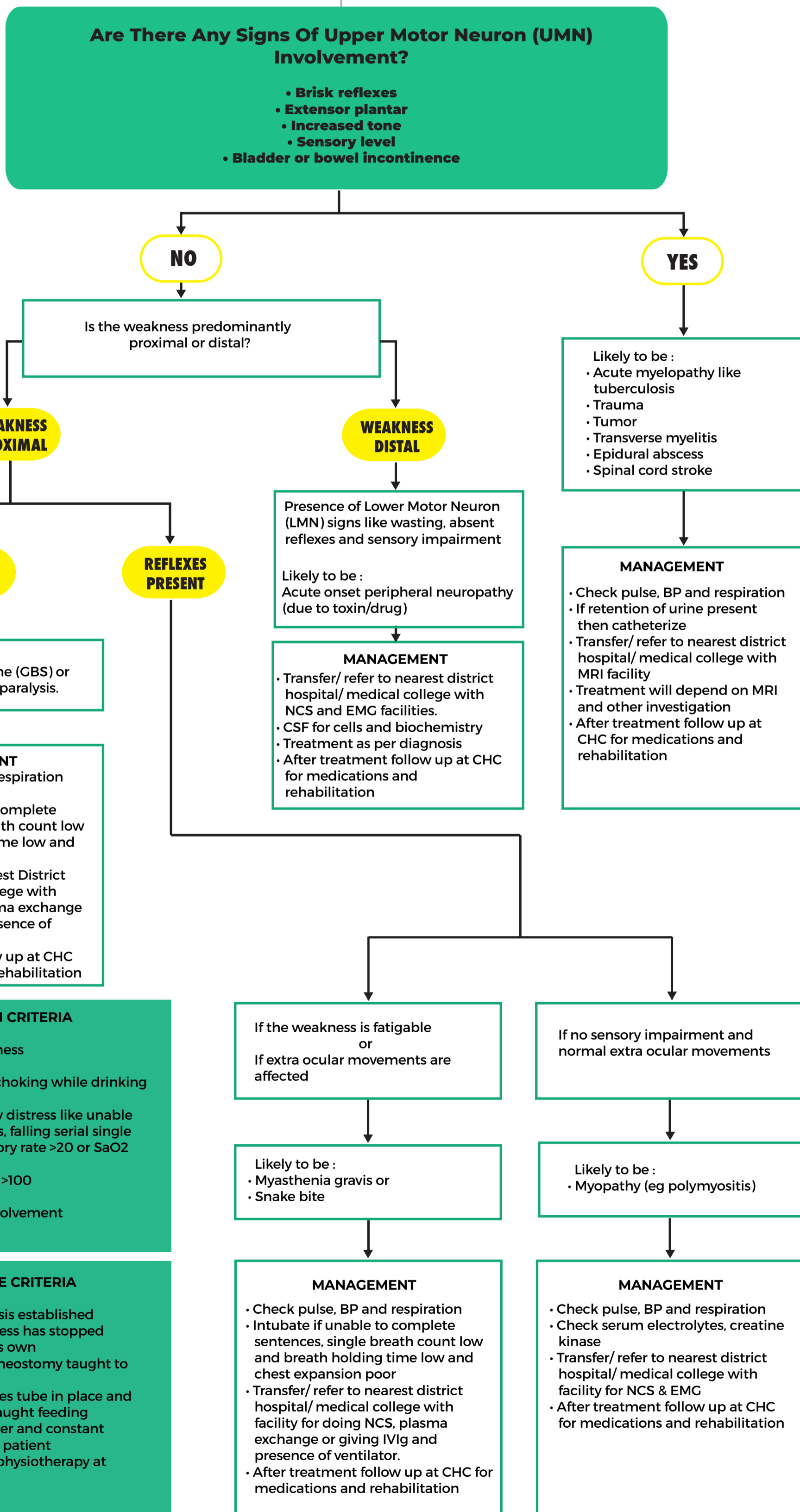
NEUROLOGY



Standard Treatment Workflow (STW) for the APPROACH TO ACUTE PARALYSIS

ICD 10 G82, G83

PRESENTATION WITH ACUTE ONSET (WITHIN HOURS TO DAYS) PARAPLEGIA OR QUADRIPLEGIA



👉 **KEEP A HIGH THRESHOLD FOR INVASIVE PROCEDURES**

Standard Treatment Workflow (STW) for the Management of DEMENTIA

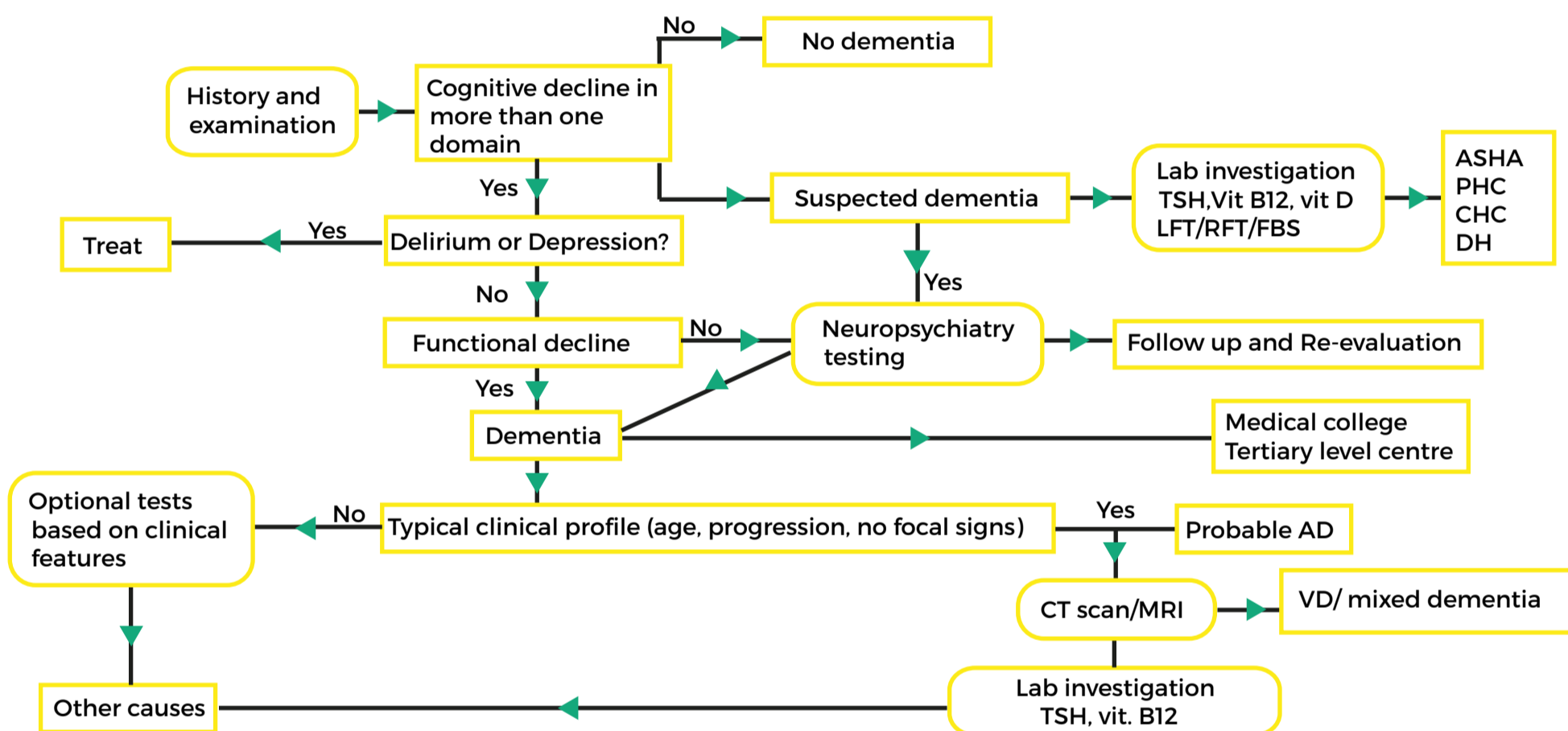
ICD 10 - F02,F03,G30



IMPORTANT POINTS TO CONSIDER

- Dementia is a complex and variable condition
- No single test will definitively diagnose dementia
- The clinical features if present, should be a change from baseline normal functioning in a middle aged to old person
- Assessment should aim at gathering information about changed behaviours, functional capacity, psychosocial support and medical comorbidities
- History should be taken from a close caregiver, staying with the patient for a longer duration than the appearance of symptoms

EVALUATION OF DEMENTIA



FOLLOW UP OF DIAGNOSED & TREATED PATIENTS INTERVENTION MATRIX FOR DEMENTIA ACROSS PLATFORMS OF CARE

PRIMARY HEALTH CENTRE (MEDICAL OFFICER)

- Diagnose dementia after detailed history
- Screening for:
 - Treatable causes of dementia - thyroid disorders, B-12 deficiency, subdural hemorrhage.
 - Depression.
 - Vascular risk factors
- Lab investigations- CBC, biochemistry, liver function tests, hemogram, lipid profile, TFT, VDRL, vit B12 level, vit D level
- Referrals for MRI/CT
- Initiation of treatment/drugs; treatment for co-morbid conditions (including depression, vision, hearing deficits and gait problems), thyroid, arthritis.
- Initiate therapy for vascular risk factors
- Encourage healthy lifestyle
- Assess for palliative care
- Learn and share facts about dementia to provide immediate need to the person with severe dementia
- Follow up and monitor for side effects of drugs/ red flags in patient/ signs of danger
- Follow-up of difficult patients under the guidance of higher centre.

DISTRICT HOSPITAL (SPECIALIST- PHYSICIAN/ GERIATRIC SPECIALIST/ NEUROLOGIST/ PSYCHIATRIST)

- Careful evaluation of all the referral patients of dementia
- Screening for treatable causes for dementia including normal pressure hydrocephalus, B12 deficiency, hypothyroidism, chronic meningitis
- Neuroimaging CT/MRI- to rule out subdural hematoma/ tumors/ NPH(surgically remediable causes of rapid cognitive decline)
- Lab investigations- CBC, liver function tests, biochemistry, hemogram, lipid profile, vit D levels, TFT, VDRL, retrovirus after counselling (whenever feasible and high index of suspicion)
- All the points mentioned in PHC to be followed if patient presents to a DH
- Upward referral linkages with tertiary care and downward referral with PHC.
- Encouraging patient and caregiver participation in an ongoing support program for them.
- Avoid antipsychotics until necessary
- Interaction with, training of MOs at PHC/UPHC and ongoing clinical support and supervision

REASONS FOR REFERRAL

- Not responding to adequate dose and duration of prescribed medications
- Presence of red flags

RED FLAGS

- Fever
- Rapid progression
- Seizures
- Recent head injury
- Alcoholism and falls

MEDICATIONS RECOMMENDED FOR USE FOR ALZHEIMERS DEMENTIA

FOR COGNITION

- **Donepezil:** 5 mg once after breakfast x 1 month, then 10 mg after breakfast to continue
If any side effect/ not tolerating: **Rivastigmine** to be used start dose 1.5 mg BD / 1 month then 3 mg BD x 1 month, then 4.5 mg BD x 1 month, then 6 mg twice after meals only x 1 month.
- **Memantine:** in moderate to severe dementia 5 mg BD x 1 month, then 10 mg BD to continue.
- **Galantamine:** 8 mg BD if not tolerating 1

FOR DEPRESSION

- Escitalopram 10 mg

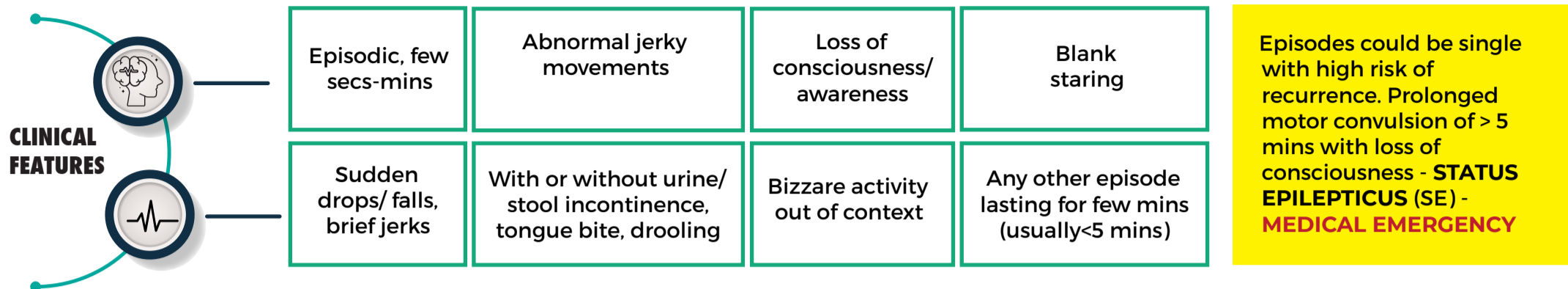
FOR AGITATION

- Identification of triggers
- Non pharmacological interventions

KEEP A HIGH THRESHOLD FOR INVASIVE PROCEDURES



Standard Treatment Workflow (STW) for the Management of **EPILEPSY** ICD 10 - G40



PRIMARY HEALTH CENTRE (MEDICAL OFFICER)

- Clinical diagnosis of epilepsy: detailed history from an eyewitness
- Differentiate between provoked seizures and epilepsy (provoked due to fever, acute CNS insult, antibiotics, and metabolic causes)
- Laboratory investigations:** CBC, liver function tests, routine biochemistry, hemogram, lipid profile, vit D levels, TFT (whichever feasible)
- Initiation of treatment:**
 - Treat the patient if patient has epilepsy (2 or more episodes of unprovoked seizures)
 - Treat a single seizure if risk of recurrence is high as in patients with focal seizures, mentally retarded, neurological deficits having family history of seizures abnormal EEG, neuroimaging
 - Anti Epileptic Drug (AED broad spectrum, low dose, start low go slow, except status epilepticus)
 - Emergency medical care of status epilepticus
- Treatment counselling:** side effects/toxicities of drugs, red flags, importance of adherence, maintaining treatment diary
- Advice on prevention of seizures:** regular medication, sleep 7-8 hrs, avoid excess TV/mobile/ photic stimulation, regular diet, lifestyle choices (avoid alcohol)
- Evaluate any possibility of superimposed non-epileptic seizure
- Training of MLP/ANM/ASHA on epilepsy
- For excessive alcohol use, refer to ANM/MLP where psychosocial interventions are carried out for substance use disorders
- Follow up visits for treatment monitoring & difficult patients under neurologist at STC centre
- Basic management of co-morbidities (behaviour, cognition, reproductive health, bone health)
- Alert to signs of abuse and neglect
- Maintain upward referrals with paediatrician/physician at DH

REASONS FOR REFERRAL

(centres with specialists like paediatrician, neurologist)

- Redflag Signs
- Progressive problems, rapid appearance of new symptoms
- Recent injury
- Symptoms appearing after alcohol binge
- Status epilepticus after stabilization
- Non response to adequate dose and duration of medication
- Serious side effects
- Neuroimaging

RED FLAG SIGNS

- Fever
- Headache
- Vomiting
- Altered Sensorium
- Severe Giddiness
- Loss of function of body

DISTRICT HOSPITALS

- Careful evaluation of all referral patients, provide specialized management for patients and refer back to PHC for follow up of management
- Maintain communication, ongoing clinical support and supervision of MOs at PHC
- Laboratory investigation**
 - CBC, liver function tests, antiepileptic drug levels, routine biochemistry, hemogram, lipid profile, vit D levels, TFT, CT brain (when necessary)
- Monitor side effects of AED
- Clinical Psychologist: counselling health services for persons with epilepsy or upon referral from PHC/UPHC

AED- BROAD SPECTRUM (GENERALIZED SEIZURES)

Sodium Valproate (avoid in women of child bearing age unless non responsive to other drugs)

DOSE (MAINTENANCE: MG/D)

Starting dose :200mg TDS
Maintenance Dose: 600-2400

ADVERSE EFFECTS

Anorexia, wt gain, nausea, vomiting, tremors, hair loss, PCOS, thrombocytopenia

Lamotrigine

Starting dose: 25mg HS (Lower dose with VPA)
Maintenance Dose: 100-300

Sedation, ataxia, dizziness, skin rash, SJS (lower risk with slow titration)

Levetiracetam

Starting dose: 250mg BD
Maintenance Dose: 1000-3000

Somnolence, dizziness, cognitive slowing, psychosis

Topiramate

Starting dose: 25mg OD
Maintenance Dose: 100-400

Sedation, somnolence, cognitive problems, weight loss, word finding difficulty, renal stones, seizure worsening

AED (focal seizures)

Carbamazepine

Starting dose: 100mg BD
Maintenance dose: 400-1200

Sedation, dizziness, ataxia, skin rash, SJS, hyponatremia, seizure worsening in some situations

Oxcarbazepine

Starting dose: 150mg BD
Maintenance dose: 600 to 1800

Sedation, dizziness, ataxia, headache, hyponatremia, skin rash

Phenobarbitone

Can be used for generalized also

Starting dose: 30mg HS
Maintenance dose: 60-180

Sedation, ataxia, depression, memory problems, hyperactivity in children, skin rash

Phenytoin

Starting dose: 200mg HS
Maintenance dose: 200-400

Ataxia, sedation, gum hyperplasia, coarsening of facial features, hirsutism, memory problems, osteomalacia & bone loss, skin rash

Folic Acid 5 mg/day to be added along with AEDs in all women of child bearing age. Polytherapy and valproate to be avoided in women with epilepsy

IMPENDING SE

5 MIN

ESTABLISHED SE

30 MIN

REFRACTORY SE

60 MIN 2 IV drugs fail (Benzo + IV AED)

FIRST ABCS TO BE DONE FROM WHEN YOU SEE PATIENT SIMULTANEOUSLY WITH MEDICATION

Out of Hospital/home : **Buccal/Intranasal IMDZ** with acute repetitive seizures/status (0.3-0.5 mg/kg)

ICU

EMERGENCY ROOM

IV Midazolam loading 0.2 mg/kg

OR CIV 0.05-0.5 mg/kg/hr

(can go up to 2 mg/kg/hr)

Taper gradually after seizure stops

(preferably as evidenced by EEG)

Thiopental 5-7 mg/kg IV bolus

further 50 mg until seizures controlled

3-5 mg/kg/hr for only 48 hours

OR Propofol IV loading 2-5 mg/kg

CIV 1-15 MG/KG/HR

OR Pentobarbital IV upto 10 mg/kg

@ <0.2-0.4 mg/kg/min CIV 0.5-2 mg/kg/h

OR Ketamine bolus 1.5 mg/kg

CIV 0.01-0.05 mg/kg/h max 10mg/kg/hr * to be

EEG Monitoring

- Phenytoin @50 mg/min 20 mg/kg repeat plus 10 mg/kg if seizures do not stop in 15-20 min
- If seizures not controlled or contra indication (CI) to PHT
- Intravenous Valproate 25-40 mg/kg @3-6 mg/kg/min
- If CI to above two; Phenobarbitone 20 mg/kg IV @ less than 5-60 mg/min but be prepared to Intubate and ventilate

Levetiracetam 20-30 mg/kg IV at 5 mg/kg/min (max 3g) or
Levetiracetam 1500-3000 mg via NGT or
Lacosamide 200-400 mg IV at 40-80 mg/min
Topiramate 150-800 mg bid via NGT

**Super refractory
> 24hr no control**

Airway, blood pressure, temperature, intravenous access, electrocardiography, CBC, glucose, electrolytes, AED levels, ABG, oximetry, tox screen, central line
If alcoholic- thiamine & glucose, if diabetic GLUCOTEST/blood sugar & glucose IV. MUST INFORM CONSULTANT ON CALL

KEEP A HIGH THRESHOLD FOR INVASIVE PROCEDURES

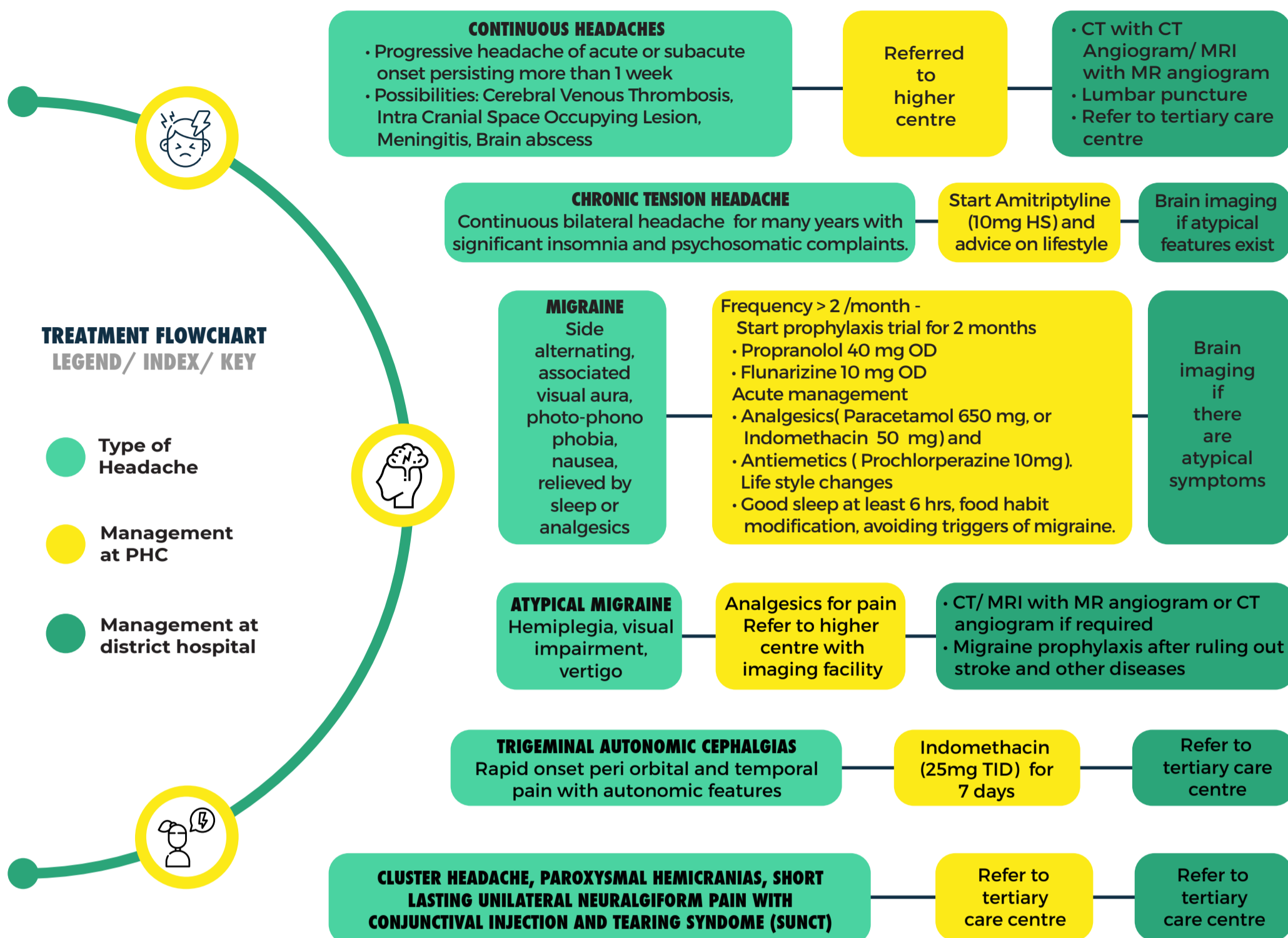
This STW has been prepared by national experts of India with feasibility considerations for various levels of healthcare system in the country. These broad guidelines are advisory, and are based on expert opinions and available scientific evidence. There may be variations in the management of an individual patient based on his/her specific condition, as decided by the treating physician. There will be no indemnity for direct or indirect consequences. Kindly visit our web portal (stw.icmr.org.in) for more information.

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Standard Treatment Workflow (STW) for the Management of HEADACHE

ICD-10-G43-44



- RED FLAG SIGNS**
- First or worst headache of the patient's life
 - Focal neurologic signs (not typical aura)
 - Severe headache awakening from sleep

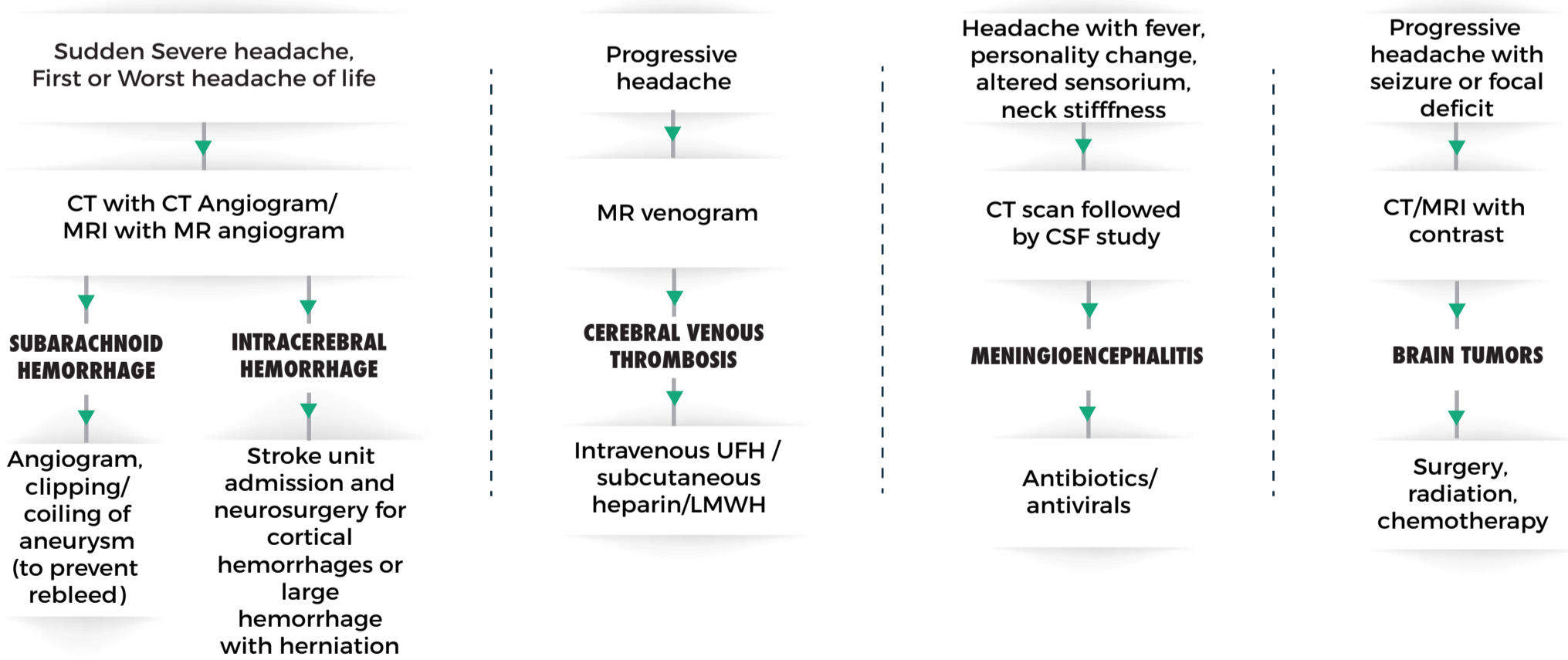
- Headache with fever, change in personality, mental status, level of consciousness
- Fever, neck stiffness or meningism
- New onset of severe headache in pregnancy or postpartum or while on hormone treatment

- Rapid onset with strenuous exercise
- Sudden onset (maximal intensity occurs within seconds to minutes, thunderclap headache)
- New headache type in a patient with malignancy or immunosuppression

REASONS FOR REFERRAL

- Non responding headaches
- Headaches with danger signs should be immediately referred and investigated for potentially dangerous conditions

TREATMENT OF MAJOR CATASTROPHIC HEADACHES AT TERTIARY CENTRE



INDICATIONS FOR ADMISSION

- Patient with unrelenting headache
- Immunosuppressed patients with continuous headache,
- First ever headache with worsening intensity,
- Progressive headache with other systemic disease
- Severe symptomatic primary headache disorders

CRITERIA FOR DISCHARGE

- Primary headache disorders- symptomatically improved severe episode of headache due to primary headache disorder can be discharged
- Secondary headache disorders- secondary headache disorders with essential work up, diagnosis and treatment as per individual case can be discharged

FOLLOW UP OF HEADACHE PATIENTS

CAUSES OF HEADACHE	TREATMENT OF HEADACHE
Intra cerebral hemorrhage	Good control of blood pressure
Seizures	Antiepileptic medications
Cerebral venous sinus thrombosis	Follow up of anticoagulation
Migraine	Give prophylaxis for adequate duration of time and taper after remission

KEEP A HIGH THRESHOLD FOR INVASIVE PROCEDURES

REFERENCES

- Hainer BL, Matheson EM. Approach to acute headache in adults. American family physician. 2013 May 15;87(10).
- <https://www.uptodate.com/contents/evaluation-of-headache-in-adults>

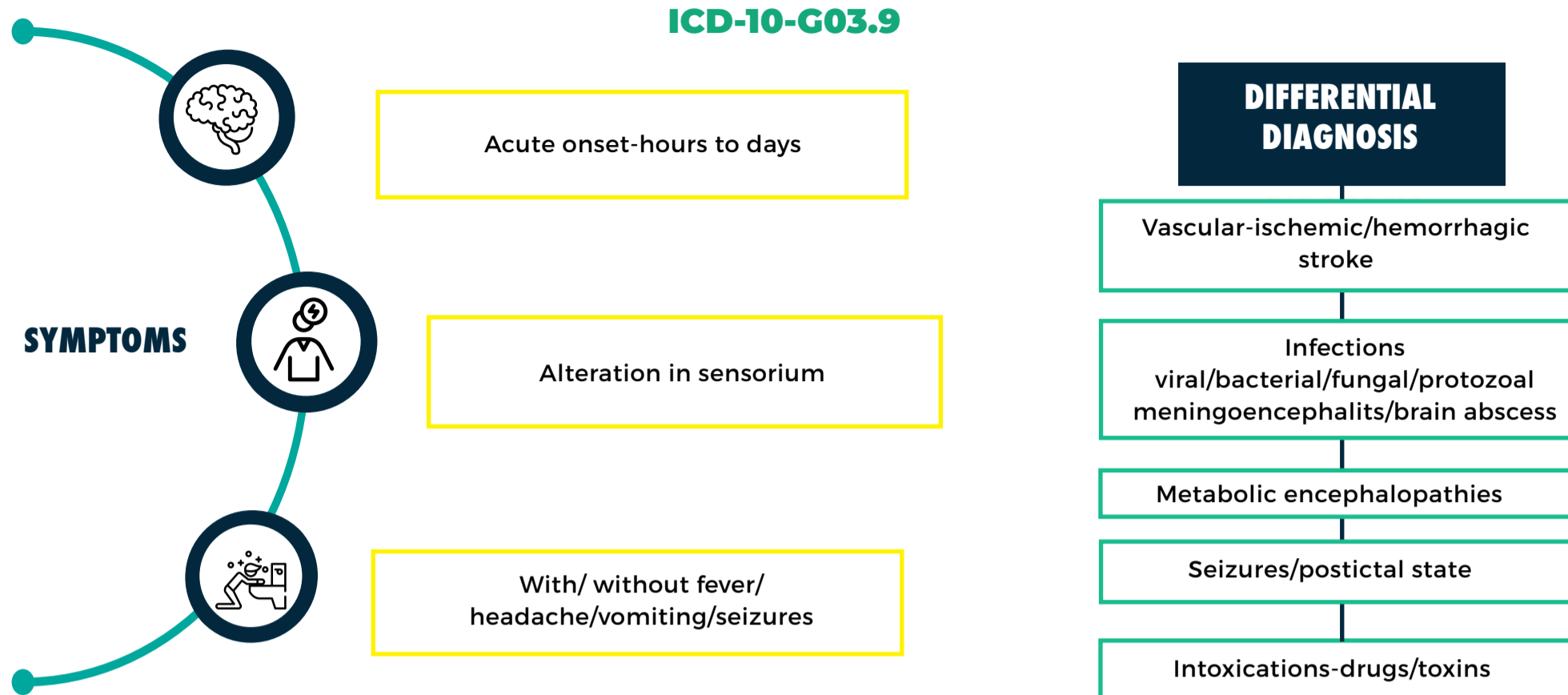
ABBREVIATIONS

CSF: Cerebrospinal Fluid, UFH: Unfractionated Heparin, LMWH: Low Molecular Weight Heparin



Standard Treatment Workflow (STW) for the Management of NEUROINFECTIONS

ICD-10-G03.9



AT PRIMARY CARE LEVEL

ESSENTIAL

Check Airway/Breathing/Circulation

Rule out circulatory shock, ongoing convulsions and hyperthermia/hyperpyrexia(core temperature > 40.5°C or hypothermia(< 36.5°C)

Establish IV access-urgent blood for hemogram/sugar/electrolytes/malaria testing-peripheral smear/rapid antigen detection

Correct hypoglycemia (blood sugar 50 mg/dl) with IV 100ml of 25% dextrose solution

If seizing- IV/IM Lorazepam 0.1 mg/kg followed by loading with Phenytoin 20 mg/kg weight at a rate of 50 mg/minute

When IV access not available-intra nasal or buccal Midazolam 0.2 mg/kg /intra rectal Diazepam 0.3-0.4 mg/kg

Urgent referral to higher centres with intensive care facilities

NOT RECOMMENDED

- Stomach wash
- Inj Mannitol
- Inj Steroids

CRITERIA FOR REFERRAL

Altered sensorium/seizures/focal deficits/hemodynamic instability -where imaging and ICU management are required.

AT SECONDARY CARE LEVEL(TALUK, DISTRICT) HEADQUARTERS HOSPITAL

ESSENTIAL

In addition to all the steps given above :

Establish and maintain airway: Intubate if GCS<8, impaired airway reflexes, abnormal respiratory pattern, signs of raised ICP, oxygen saturation <92% despite high flow oxygen, and fluid refractory shock

Inj Thiamine 100 mg IV

Stomach wash/activated charcoal administration-if history or suspicion of drug overdose/non corrosive poison intake

Start treatment for cerebral malaria-first dose of IV Artesunate 2.4 mg/kg OR Quinine 20 mg/kg bolus

Emergency CT/referral to centre with 24 hour CT facilities

DESIRABLE

- Neuroimaging-CT with contrast -to rule out hemorrhage/infarcts/focal edema or lesions
- Blood cultures aerobic/anaerobic
- First dose of empirical treatment of pyogenic meningitis-Inj Ceftriaxone 2 g + Inj Vancomycin 500 mg.
- Add Inj Ampicillin 2 g if older than 50 years / immunocompromised along with Inj Dexamethasone 8 mg
- Fundus examination,CSF study to rule out meningoencephalitis-if imaging rules out any mass lesions/herniations.
- Urgent referral to higher centres with Intensive care facilities

CRITERIA FOR REFERRAL

- Altered sensorium/seizures/focal deficits/hemodynamic instability -where imaging and ICU management are required.
- If no definite diagnosis achieved after preliminary investigations

AT TERTIARY CARE HOSPITALS-SELECTED DISTRICT HOSPITALS/MEDICAL COLLEGES

- Neuroimaging-MRI/CT with contrast to rule out abscess/herniations.
- If abscess-emergency neurosurgical consultation for favour of aspiration -open/stereotactic
- Blood cultures-aerobic/anaerobic
- CSF analysis-biochemistry/cytology/gram staining/culture-bacterial , AFB and fungal/viral PCR/TB-PCR/fungal antigen

Empirical antibiotic (within 30 minutes of arrival)

- If suspecting pyogenic meningitis-Inj Ceftriaxone 2 g+ Inj Vancomycin 500 mg+ Inj Ampicillin 2 g if older than 50 years or immunocompromised+ Inj Dexamethasone 8 mg IV
- Continue empirical treatment till culture yields causative organism,then tailor treatment as per sensitivity reports for 10-14 days.
- Steroids to be stopped after 48 hours,unless any other compelling indications-adrenal insufficiency/TBM

Viral-Herpes simplex/Zoster

- Inj Acyclovir 500 mg IV 8 hourly for 10 days

Cerebral malaria

Inj Artesunate 2.4 mg/kg IM or IV 3 doses 12 hours apart and then OD / Inj Quinine 20 mg/kg IV stat followed by 10mg/kg TDS till patient can take orally,then oral Artesunate+Pyrimethamine /Sulphadoxine for 3 days OR oral Quinine 10 mg/kg TDS for total 7 days + Doxycycline 3 mg/kg OD for 7 days.

COMPLICATIONS

Raised ICP

SIADH

Vasculitis

Hydrocephalus

*If uncomplicated-back referral to Secondary care centre for completing treatment regimen/monitoring.

CRITERIA FOR DISCHARGE

Afebrile,hemodynamically stable,seizure free >48 hrs

Diagnosis and treatment plan made and initiated.

Continuation of treatment with monitoring can be ensured for the prescribed duration.

KEEP A HIGH THRESHOLD FOR INVASIVE PROCEDURES

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Standard Treatment Workflow (STW) for the Management of STROKE

ICD-10-I63, I64

WHAT IS STROKE?

An episode of neurological dysfunction caused by focal cerebral, spinal, or retinal infarction or haemorrhage



SYMPTOMS

- Numbness or weakness, especially on one side of the body
- Loss of consciousness or altered consciousness
- Decreased vision in one or both eyes
- Language difficulties, either in speaking or understanding
- Difficulty walking; loss of balance or coordination
- Confusion or loss of memory
- Swallowing difficulties
- Paralysis of any part of the body, including face
- Sudden, severe headache with no known cause
- Neck pain
- Nausea and vomiting

WARNING SIGNS (BEFAST)

- **BALANCE** : Loss of balance or coordination
- **EYES** : Sudden blurred or double vision/ sudden, persistent vision trouble
- **FACE** : Deviation at the angle of the mouth
- **ARM** : Arm Drift
- **SPEECH** : Slurred speech or the inability to speak or understand
- **TIME** : Act fast
- Sudden new onset of headache or loss of consciousness
- Sudden giddiness, vomiting and imbalance

TYPES OF STROKE

Ischemic stroke Focal cerebral, spinal, or retinal infarction	Intracerebral haemorrhage Focal collection of blood within the brain parenchyma or ventricular system that is not caused by trauma	Subarachnoid haemorrhage Bleeding into the subarachnoid space	Cerebral venous thrombosis Thrombosis of a cerebral venous structure	Transient Ischemic Attack (TIA) Transient episode of neurologic dysfunction caused by focal cerebral, spinal cord, or retinal ischemia, without acute infarction
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PRELIMINARY MANAGEMENT

- Assess and manage ABCs
- Initiate cardiac monitoring
- Maintain O₂ saturation >94%
- Establish IV access
- Determine blood glucose and treat accordingly
- Determine time of symptom onset or last known normal, and obtain family contact information, preferably a cell phone
- Triage and RAPID TRANSFER of patient to nearest district hospital with CT Scan facility or Stroke center with facility for thrombolysis
- Referral hospital to be notified to handle the referred patient with stroke

INVESTIGATIONS

ESSENTIAL

- CT Scan head
- ECG
- Blood Sugar
- Lipids
- Renal parameter

DESIRABLE

- CTA
- Echocardiogram

OPTIONAL

- MRI/MRA
- Holter monitoring

MANAGEMENT

STROKE ONSET TIME: <4.5 HOURS

ISCHEMIC: *

IV tPA (0-4.5 hrs) or endovascular treatment according to eligibility and availability

HAEMORRHAGIC:

- Dysphagia assessment,
- Blood pressure/blood sugar monitoring and IV fluids.
- Prevention of Pneumonia
- Prophylaxis for deep venous thrombosis etc, monitor and record ECG

* RECOMMENDED DIAGNOSTIC STUDIES

ALL PATIENTS

- Noncontrast brain CT or brain MRI
- Blood glucose
- Oxygen saturation
- Serum electrolytes/renal function tests
- Complete blood count, including platelet count
- Markers of cardiac ischemia
- BT, CT, Prothrombin time/INR
- Activated partial thromboplastin time
- ECG
- FLP and carotid doppler (ischemic stroke)

SELECTED PATIENTS

- TT and/or ECT if it is suspected the patient is taking direct thrombin inhibitors or direct factor Xa inhibitors
- Liver function tests
- Toxicology screen
- Blood alcohol level
- Pregnancy test
- Arterial blood gas test (if hypoxia is suspected)
- Chest radiography (if lung disease is suspected)
- Lumbar puncture (if subarachnoid hemorrhage is suspected and CT scan is negative for blood)
- Electroencephalogram (if seizures are suspected)

STROKE ONSET TIME: >4.5 HOURS

Rapid Assessment, CODE Stroke, Blood pressure and Blood Sugar monitoring, NIHSS, Intravenous lines Endovascular treatment with Mechanical thrombectomy using stent retriever (4.5 hrs to 24hrs) according to eligibility

SECONDARY PREVENTION

Aspirin (in ischemic stroke)
 Antihypertensives
 Antidiabetics
 Lipid lowering agents

REHABILITATION

Physiotherapy
 Speech Therapy
 Occupational Therapy
 Vocational training

DISCHARGE PLANNING

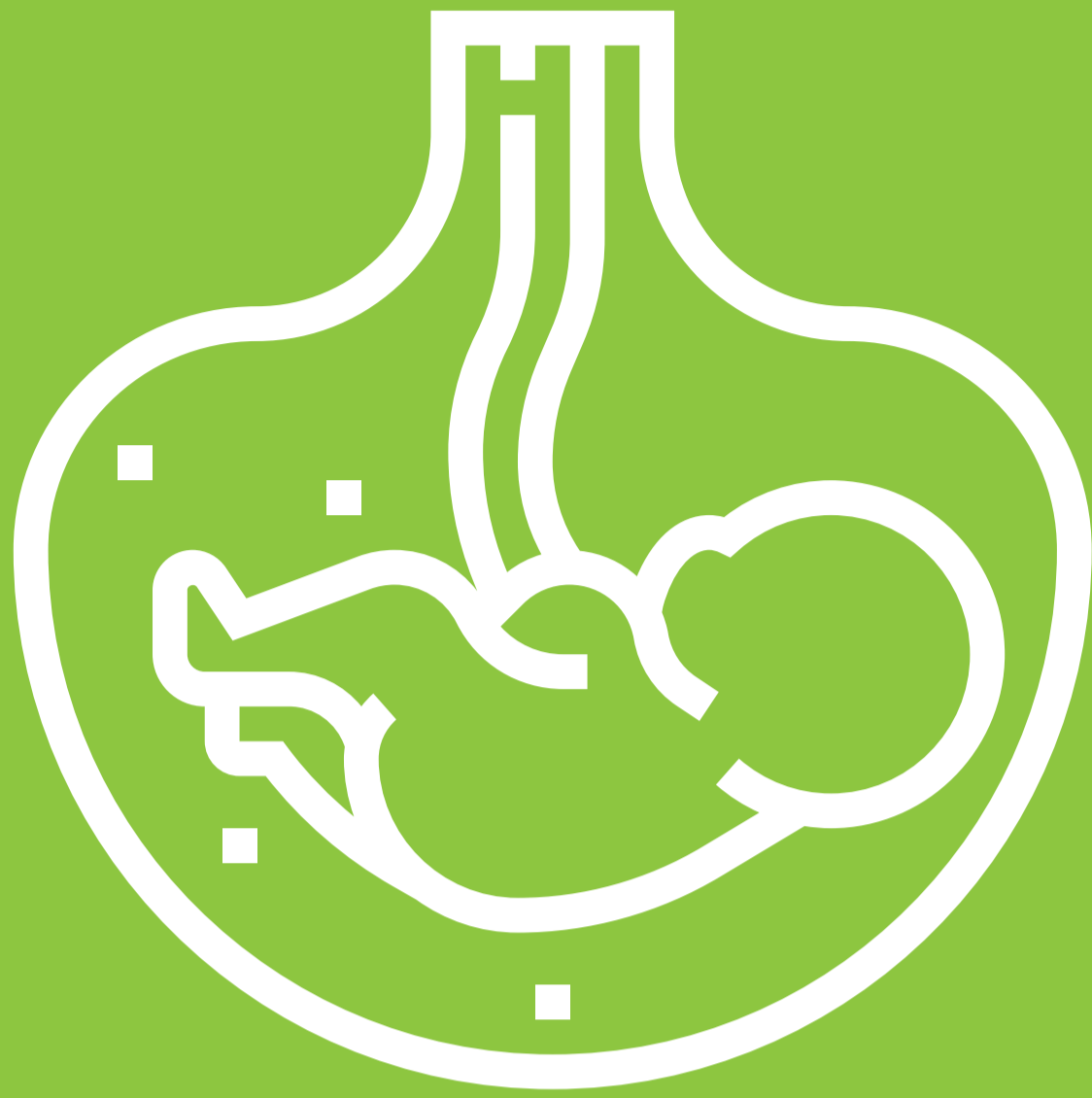
(checklist : drugs, diet, compliance, exercises, health education)

FOLLOW UP at 2nd week, 1st month, 3rd month and 6th month

STROKE UNIT MANAGEMENT

- Medical and Nursing staff : control of blood pressure; control of diabetes; swallow assessment; DVT prophylaxis; antiplatelet drugs
- Rehabilitation staff:
 - » Acute phase: basic bed mobility, transfer techniques, communication training, prevention of complications
 - » Subacute and chronic phase: mobility, gait and balance training, training of activities of daily living (grooming, eating, dressing etc), bowel/bladder training, perceptual and cognitive rehabilitation, provision of assistive devices.

KEEP A HIGH THRESHOLD FOR INVASIVE PROCEDURES



OBC



Standard Treatment Workflow (STW) for ANTE-NATAL MANAGEMENT OF NORMAL PREGNANCY

FIRST VISIT (PREFERABLY IN FIRST TRIMESTER)

ASK	EXAMINE	INVESTIGATIONS	DO
<ul style="list-style-type: none"> Age LMP Parity & obstetric history Any complaints especially excessive nausea & vomiting/ bleeding PV H/o medical illness : diabetes, hypertension, cardiac problem, epilepsy or any other chronic illness Consanguinity, multiple pregnancy H/o blood transfusion and H/o prior surgical intervention Personal history : tobacco/ alcohol intake Family history : diabetes, hypertension, genetic disorders/ congenital problems, multiple pregnancy, infections including tuberculosis 	<ul style="list-style-type: none"> Height, weight Calculate BMI Pallor, Jaundice, Pedal edema Pulse, BP, RR, temperature Thyroid Breast Respiratory and CVS examination P/A examination, P/S and P/V examination # If woman presents with bleeding per vaginum do P/A & P/S to confirm amount of bleeding & rule out local causes. All such cases to be referred to CHC or higher centre 	<p>ESSENTIAL TESTS</p> <ul style="list-style-type: none"> Hemoglobin Urine R & M ABO & Rh grouping <p>DESIRABLE TESTS</p> <ul style="list-style-type: none"> VDRL/ RPR HIV HBsAg WHO OGTT/ DIPSI test for diagnosis of GDM TSH in high risk cases (BOH, goiter, obesity or residing in iodine deficiency prone areas) <p>OPTIONAL TESTS*</p> <ul style="list-style-type: none"> Aneuploidy screen* by USG & double marker 	<ul style="list-style-type: none"> UPT if in doubt Fill up MCH protection card or ANC card, make entry on RCH portal & generate RCH number (in public sector) Give filled MCH protection card & safe motherhood booklet to woman Give Tab Folic Acid daily Give first dose of tetanus toxoid

SECOND VISIT (SECOND TRIMESTER)

ASK	EXAMINE	INVESTIGATIONS	DO
<ul style="list-style-type: none"> Any complaints since last visit Quickening and/ or fetal movements Adherence to medications 	<ul style="list-style-type: none"> Weight Pallor Pedal edema Pulse, BP in sitting position P/A examination for fundal height 	<p>ESSENTIAL TESTS</p> <ul style="list-style-type: none"> Hemoglobin Urine albumin <p>DESIRABLE TESTS</p> <ul style="list-style-type: none"> USG (Level II between 18-20 weeks for gross congenital malformations) WHO OGTT/ DIPSI test if >24weeks & at least 4 weeks have elapsed after 1st test <p>OPTIONAL TESTS*</p> <ul style="list-style-type: none"> Quadruple test as per availability <p>*Should be performed only if adequate counselling facilities are available</p>	<ul style="list-style-type: none"> IFA tablet one (if Hb >11g%) or twice (if Hb <11g%) daily with water or lemon juice Calcium carbonate 500 mg with vitamin D 250 mcg tablet twice daily with meals. Calcium Carbonate and IFA not to be given together Single dose of Albendazole 400mg Ensure compliance for investigations and treatment Discuss birth preparedness Give second dose Tetanus Toxoid at least four weeks after first dose

THIRD (28 – 34 WEEKS) AND FOURTH VISIT (36 - 40 WEEKS)

ASK	EXAMINE	INVESTIGATIONS	DO
<p>Same as above</p>	<ul style="list-style-type: none"> Same as above Auscultate FHS Measurement of abdominal girth and Symphysiofundal Height 	<ul style="list-style-type: none"> Hemoglobin Urine albumin Optional USG for fetal growth and liquor 	<ul style="list-style-type: none"> Continue IFA and calcium tablets and ensure compliance If non compliant or Hb < 9g% give parenteral iron sucrose therapy (not > 200mg at one time & not > 3 times a week) and refer patient with Hb < 7g% to higher centre Refer to higher centre if any discrepancy between fundal height and period of gestation

DANGER SIGNALS FOR PATIENT TO REPORT TO HEALTH FACILITY

- Fever
- Persistent vomiting
- Abnormal vaginal discharge
- Palpitations, easy fatigability and breathlessness at rest and/ or on mild exertion.
- Generalized swelling of the body/ puffiness of the face
- Vaginal bleeding
- Decreased or absent fetal movements at > 28 weeks gestation
- Leaking of watery fluid per vaginum (P/V)
- Severe headache/ blurring of vision/ convulsion
- Passing lesser amounts of urine and/ or burning sensation during micturition
- Itching all over the body

HIGH RISK PREGNANCY

- Any H/o medical illness, previous caesarean section, past obstetric mishap or congenital malformation
- Past H/o PPH
- Age > 35 years or < 19 years or parity > 4
- Malnourished (BMI < 18.5 kg/m² or > 30 kg/m²)
- Hemoglobin < 7g%
- BP > 140/90mm Hg on 2 occasions 6 hours apart
- APH
- Discrepancy between fundal height and period of gestation > 4 weeks
- GDM/ overt DM
- Multiple pregnancy
- Malpresentation at term
- Previous uterine surgery

* High risk pregnancy to be delivered at district hospital/medical college
* Preferably to have antenatal care also at these centres

COUNSELLING AT ALL LEVELS FOR :

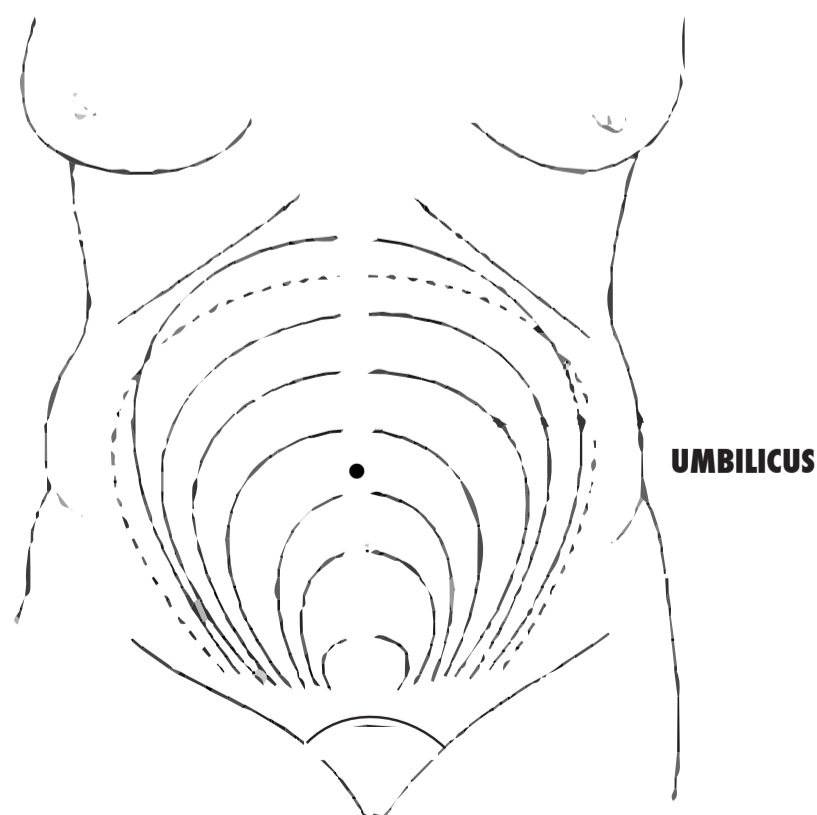
- Timing and place of next ANC visit based on presence or absence of risk factor
- Rest, nutrition, balanced diet and exercise
- Counselling for HIV testing
- Danger signs
- Institutional delivery
- Birth preparedness
- Early & exclusive breastfeeding for six months
- Post partum contraception

BIRTH PREPAREDNESS MUST INCLUDE IDENTIFICATION OF THE FOLLOWING :

- Facility for delivery
- Support persons
- Birth companion
- Means of transport in emergency
- Blood donors (if required in emergency)

ASSESSMENT OF FUNDAL HEIGHT & ITS CORRELATION WITH GESTATIONAL AGE

- At 12th week : Just palpable above the symphysis pubis
- At 16th week : At lower one-third of the distance between the symphysis pubis and umbilicus
- At 20th week : At two-thirds of the distance between symphysis pubis and umbilicus
- At 24th week : At the level of umbilicus
- At 28th week : At lower one-third of the distance between the umbilicus and xiphisternum
- At 32nd week : At two-thirds of the distance between the umbilicus and xiphisternum
- At 36th week : At the level of xiphisternum
- At 40th week : Sinks back to the level of the 32nd week, but the flanks are full, unlike that in the 32nd week



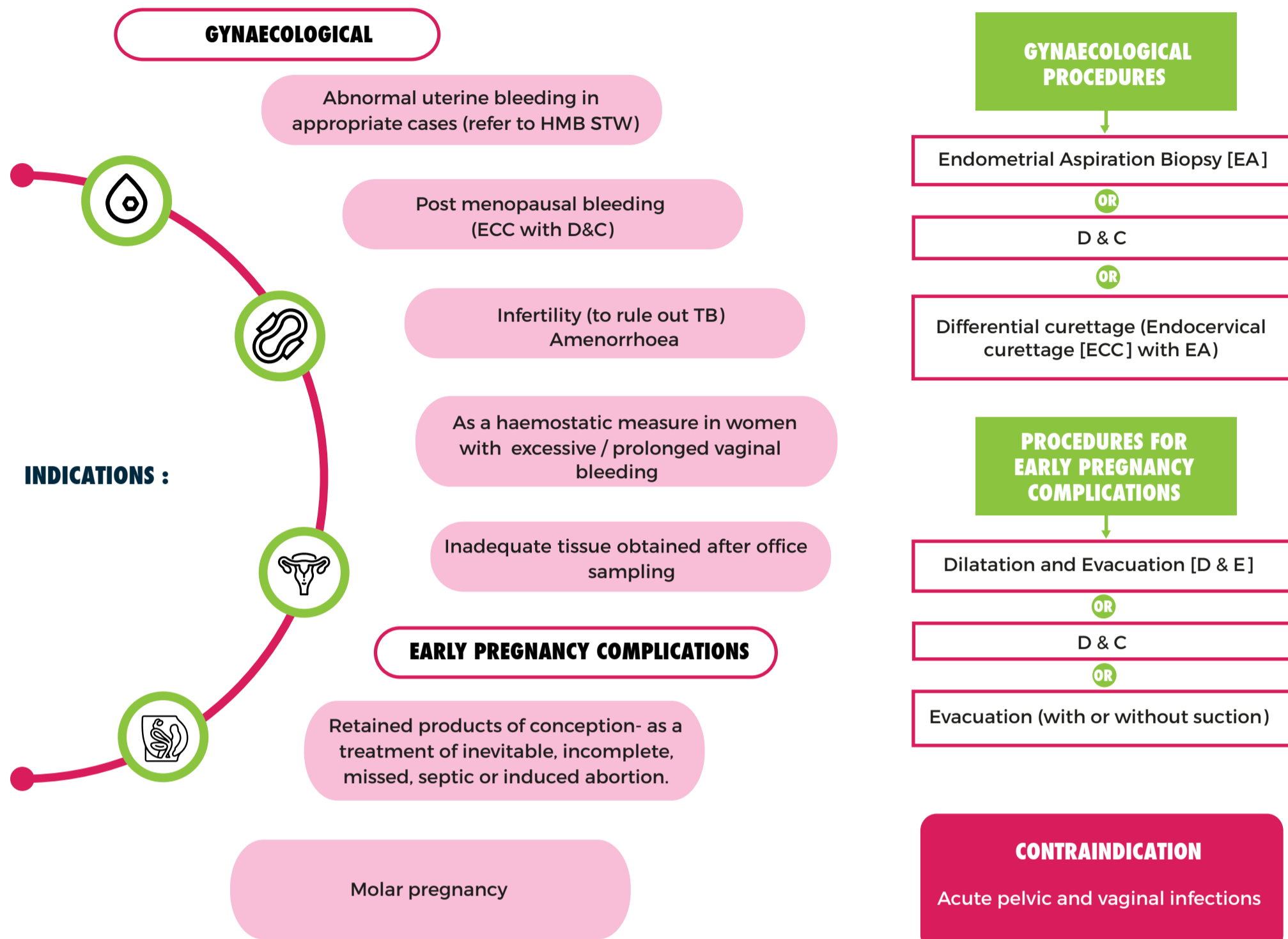
COUNSELLING IS AN IMPORTANT ADJUNCT TO MANAGEMENT

KEEP A HIGH THRESHOLD FOR INVASIVE PROCEDURES



Standard Treatment Workflow (STW) for DILATATION AND CURETTAGE (D&C)

- Mostly done for gynaecological indications, but may also be considered in early pregnancy complications
- Though office endometrial biopsy using either thin flexible or Karman cannula or office hysteroscopy has obviated the need for traditional D&C in gynaecological cases, it still has a place when other modalities are not available or do not yield adequate tissue



WHERE CAN IT BE PERFORMED?

- In secondary or tertiary healthcare centres preferably where facilities for anaesthesia and operation theatre are available to deal with procedure related complications, if any.
- Endometrial aspiration biopsy is usually done as an outpatient procedure in non pregnant cases.

ALL TISSUE REMOVED MUST BE SENT FOR HISTOPATHOLOGICAL EXAMINATION

PRE- OPERATIVE REQUISITES

Presence of a valid indication

General medical fitness & no contraindication

A written informed consent

ANESTHESIA (ANY OF THE FOLLOWING)

- General anesthesia
- Regional anesthesia
- Paracervical block with 1% xylocaine
- IV sedation
- IM/oral analgesia

Strict asepsis to be maintained. Antibiotics to be used judiciously and decided as per need of individual case.

POST PROCEDURE CARE & FOLLOW UP

- Observe the patient for minimum two hours after the procedure for haemorrhage or any other symptoms or signs of complications prior to discharge
- Patient can be discharged as soon as she is comfortable and alert.
- Most common side effect is abdominal cramps which can be managed by oral analgesics.
- **Warning signals to report back** are to be explained at the time of discharge - severe pain, bleeding, foul smelling discharge or fever.
- Follow up is done after a week with histopathology report for further advice.

COMPLICATIONS

- Excessive bleeding
- Cervical laceration
- Perforation of the uterus
- Injury to bowel and bladder
- Pelvic infection
- Post-operative intra uterine adhesions

DO'S

- Evacuation of urinary bladder before procedure.
- Safety checklist
- Dorsal/lithotomy position
- Bimanual pelvic examination prior to the procedure
- Sounding to measure uterocervical length ONLY in non pregnant women.
- Sample to be sent for histopathology and microbiology (where indicated)
- **REFER in case of a complication**

DONT'S

- Over abduction of legs
- No sounding in cases of pregnant uterus.
- No forceful insertion of any instrument
- Abandon the procedure in case of suspected perforation and refer to higher centre.
- Insertion of the dilator should be just beyond the internal os and NOT till the fundus

D&C is a blind procedure and may miss the pathology in some cases. In cases where focal pathology is suspected, tissue should be obtained under hysteroscopic visualization.

COUNSELLING IS AN IMPORTANT ADJUNCT TO MANAGEMENT

KEEP A HIGH THRESHOLD FOR INVASIVE PROCEDURES



Department of Health Research
Ministry of Health and Family Welfare, Government of India



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Standard Treatment Workflow (STW) for the Management of HEAVY MENSTRUAL BLEEDING (HMB)

ICD-10-H90.5

TO DO AT ALL LEVELS

HISTORY

- Age
- Parity
- Detailed menstrual history including irregularities
- Other medical illness: thyroid disorder, coagulopathy, jaundice etc
- IUCD use
- Lactation
- Drug intake

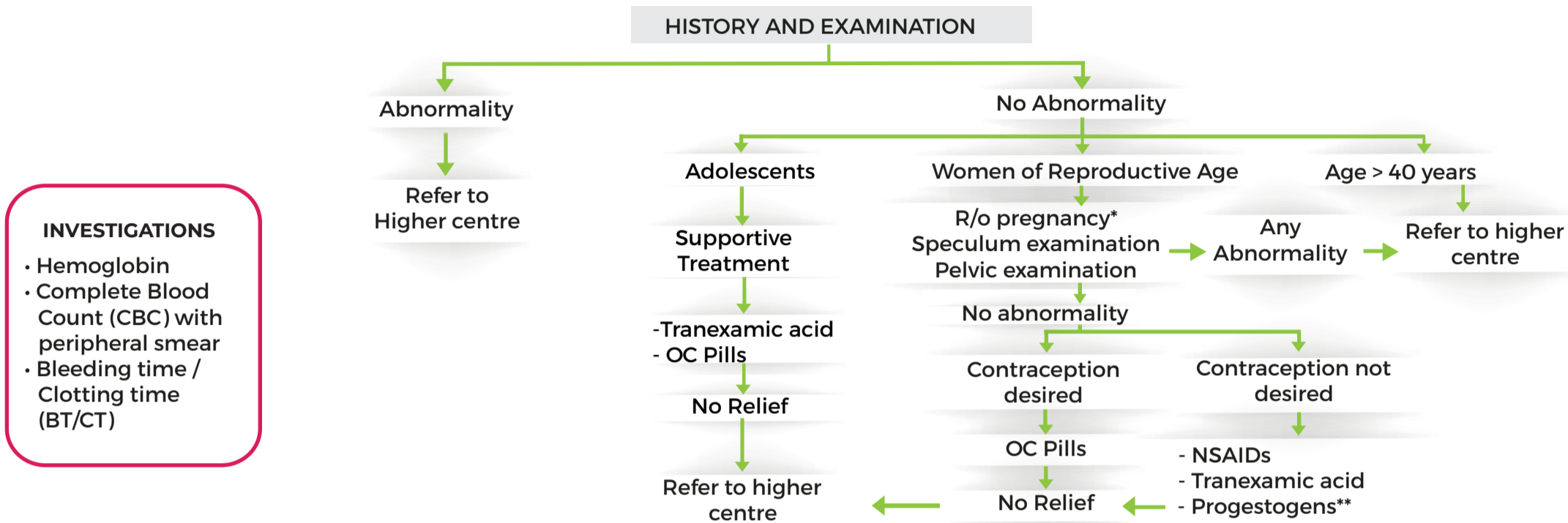
EXAMINATION

- **General**
Evaluate pallor
Calculate BMI
- **Systemic**
CVS, RS and hepatosplenomegaly
- **Local examination** (where indicated and feasible) P/S and P/V

SUPPORTIVE TREATMENT

- Reassurance
- Hematinics
- Tranexamic acid during episode of heavy bleeding

MANAGEMENT OF HMB AT PRIMARY LEVEL

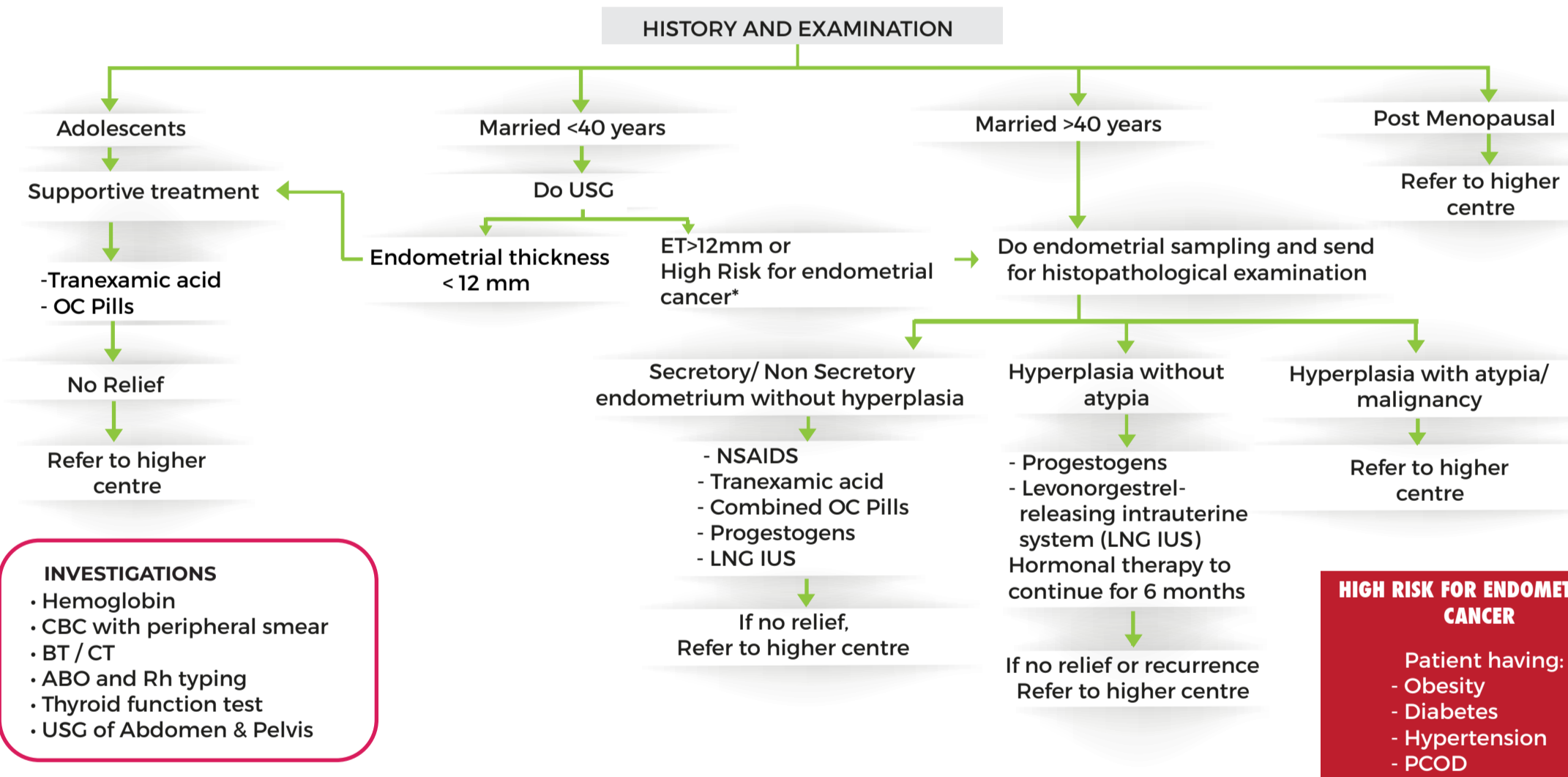


INVESTIGATIONS

- Hemoglobin
- Complete Blood Count (CBC) with peripheral smear
- Bleeding time / Clotting time (BT/CT)

* R/o Pregnancy in doubt especially in all women of reproductive age group after appropriate consent
** Amongst progestogens Norethisterone provides the best hemostasis

MANAGEMENT OF HMB AT SECONDARY LEVEL (CHC)



INVESTIGATIONS

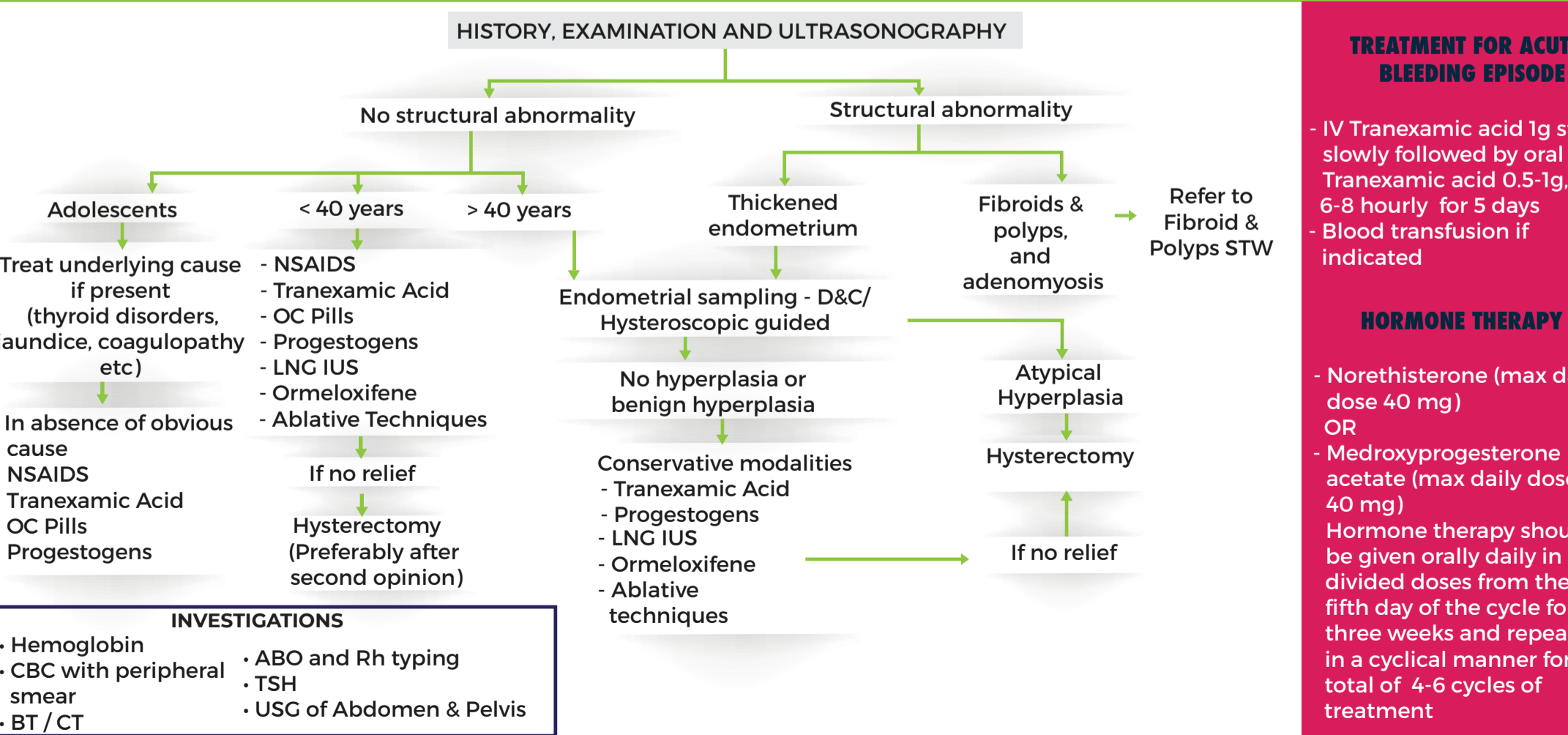
- Hemoglobin
- CBC with peripheral smear
- BT / CT
- ABO and Rh typing
- Thyroid function test
- USG of Abdomen & Pelvis

HIGH RISK FOR ENDOMETRIAL CANCER

Patient having:

- Obesity
- Diabetes
- Hypertension
- PCOD

MANAGEMENT OF HMB AT TERTIARY LEVEL



INVESTIGATIONS

- Hemoglobin
- CBC with peripheral smear
- BT / CT
- ABO and Rh typing
- TSH
- USG of Abdomen & Pelvis

TREATMENT FOR ACUTE BLEEDING EPISODE

- IV Tranexamic acid 1g stat slowly followed by oral Tranexamic acid 0.5-1g, 6-8 hourly for 5 days
- Blood transfusion if indicated

HORMONE THERAPY

- Norethisterone (max daily dose 40 mg)
- OR
- Medroxyprogesterone acetate (max daily dose 40 mg)

Hormone therapy should be given orally daily in divided doses from the fifth day of the cycle for three weeks and repeated in a cyclical manner for total of 4-6 cycles of treatment

COUNSELLING IS AN IMPORTANT ADJUNCT TO MANAGEMENT

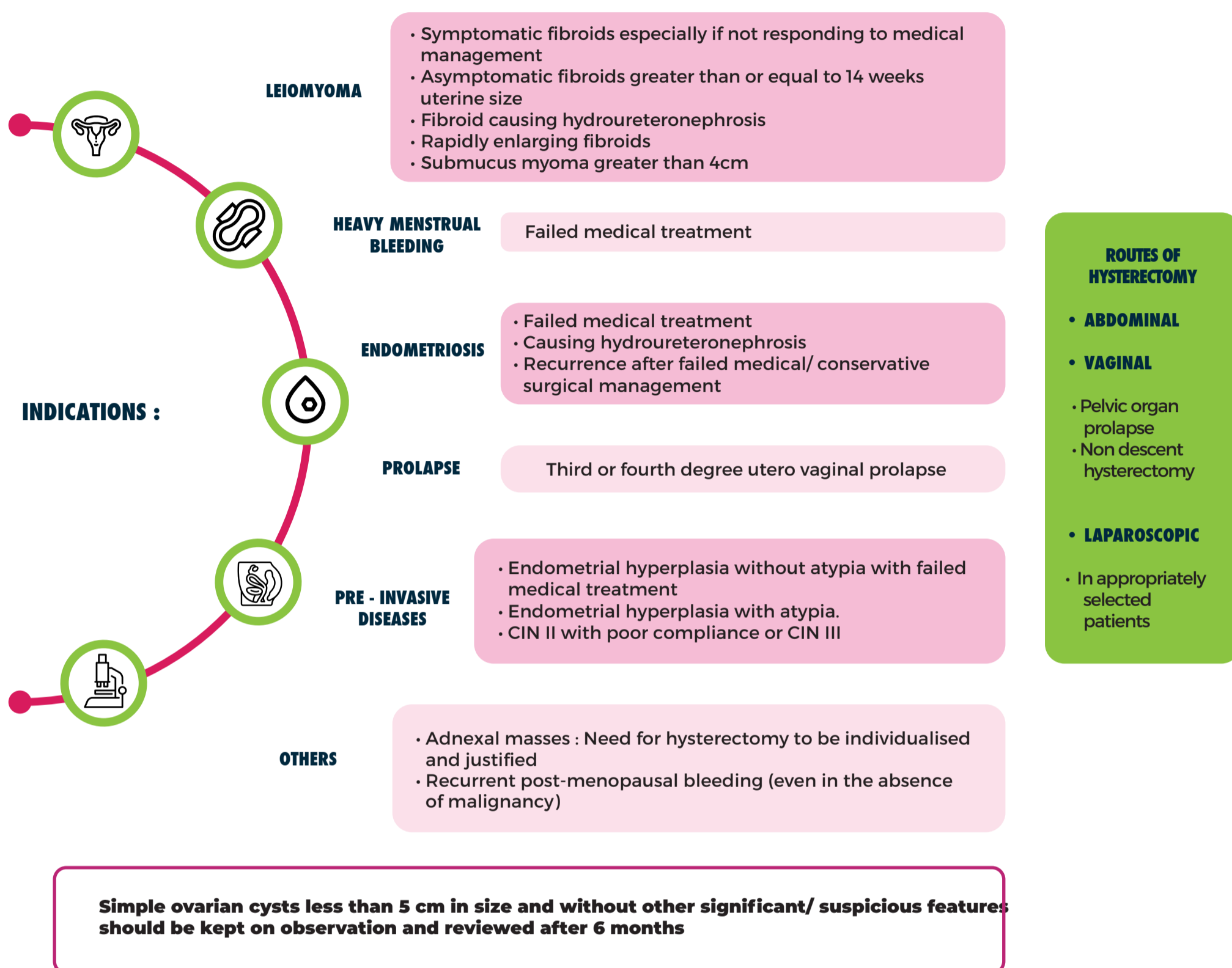
KEEP A HIGH THRESHOLD FOR INVASIVE PROCEDURES



Standard Treatment Workflow (STW) for HYSTERECTOMY FOR BENIGN GYNAECOLOGICAL CONDITIONS

IN WOMEN AGED LESS THAN 40 AND/OR LOW PARITY IT IS **MANDATORY** TO HAVE A SECOND OPINION FROM A QUALIFIED GYNAECOLOGIST

HYSTERECTOMY TO BE CONSIDERED ONLY WHEN CHILD BEARING IS COMPLETED & RARELY IN YOUNGER PATIENTS



HYSTERECTOMY SHOULD **NOT** BE DONE FOR

White discharge per vaginum

Cervicitis

Non specific abdominal or pelvic pain

Minor degree of utero vaginal prolapse

Fibroids which are small (less than 5 cm) or Asymptomatic (less than 12 weeks size uterus)

Simple ovarian cyst less than or equal to 5 cm

COMPONENTS OF PRE OPERATIVE COUNSELLING AND INFORMED CONSENT

- Need for hysterectomy
- Alternative treatment options
- Risks and benefits
- Potential complications of the procedure
- Removal/ conservation of ovaries & tubes
- Route of hysterectomy
- Possible need for post operative Hormone therapy in selected cases

INVESTIGATIONS

- Complete Blood Count
- Blood grouping & cross matching
- Fasting Blood Sugar & Post Prandial Blood Sugar
- Renal Function Test
- Liver Function Test
- Urine Routine & Microscopy
- Electrocardiogram
- X ray chest
- Others as indicated

COMPLICATIONS TO BE EXPLAINED

- Risk of Infection
- Bleeding (primary/ reactionary/ secondary)
- Injury to bladder/ bowel/ ureter
- Pain
- Fever
- Hernia (rare and late complication)

FOLLOW UP

- **Discharge summary with operative details**
- **Review for histopathology report**
- **Report if there is fever, bleeding or any other symptoms**
- Avoid lifting heavy weight for 8 weeks
- Abstinence for eight weeks
- Adequate iron and calcium & Vitamin D3 supplements
- Evaluate need for hormones in very selected patients

- **Ovaries should be preserved in most pre-menopausal women unless diseased or removal specifically indicated**
- While doing hysterectomy for benign gynaecological conditions in pre-menopausal women, it is recommended to combine it with bilateral salpingectomy with a view to minimise the risk of subsequent development of ovarian malignancy ^{1,2}

1. Pérez-López FR et al, Interventions to reduce the risk of ovarian and fallopian tube cancer: A European Menopause and Andropause Society Position Statement. Maturitas. 2017

2. Darelus A et al, Efficacy of salpingectomy at hysterectomy to reduce the risk of epithelial ovarian cancer: a systematic review. BJOG. 2017 .

👉 COUNSELLING IS AN IMPORTANT ADJUNCT TO MANAGEMENT

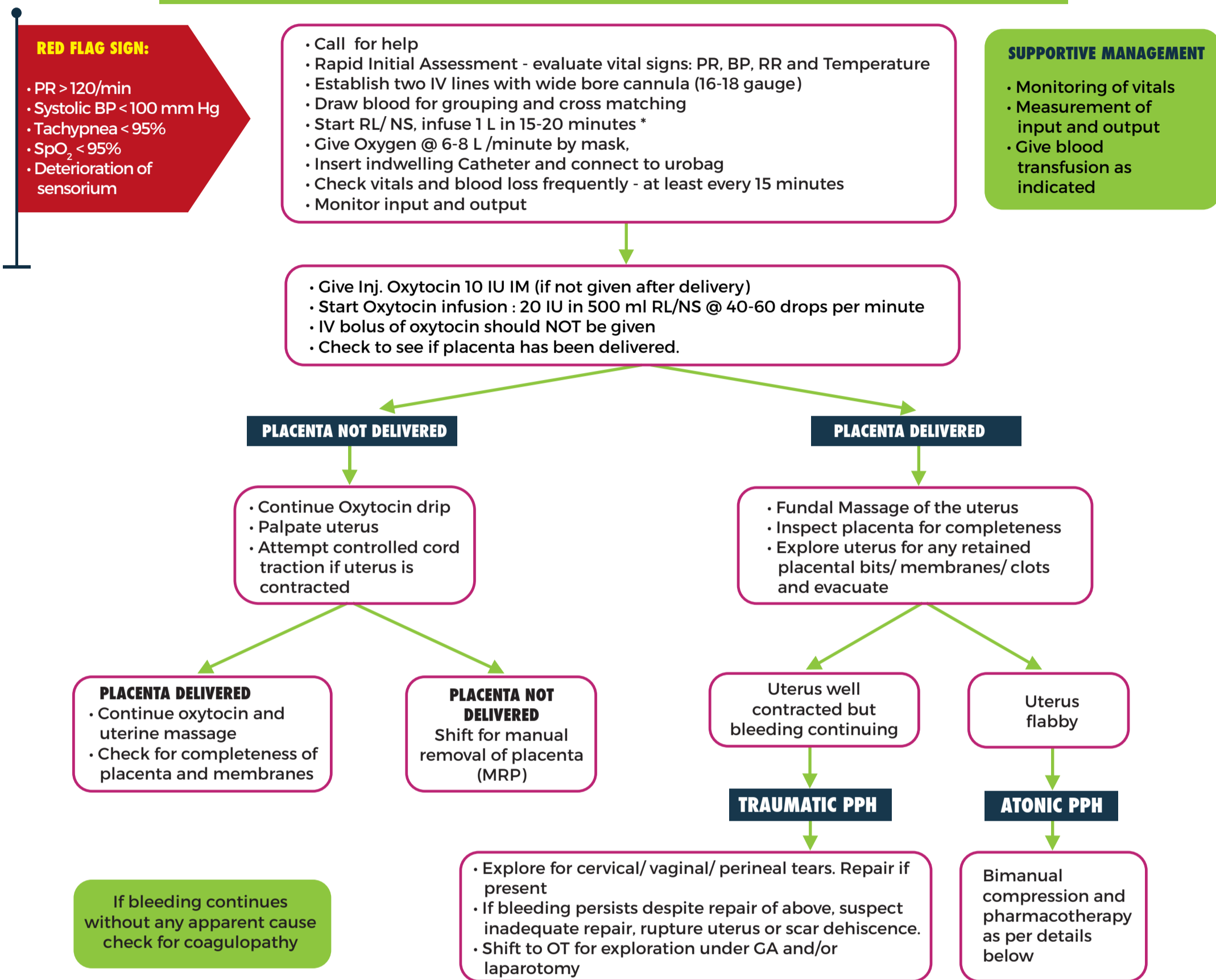
👉 KEEP A HIGH THRESHOLD FOR INVASIVE PROCEDURES



Standard Treatment Workflow (STW) for the Management of POSTPARTUM HAEMORRHAGE (PPH)

ICD O72

More than 500 ml of blood loss or any amount of bleeding which causes derangement of vital parameters is PPH



* Arrange for blood / blood product at the earliest

3 ml of crystalloid solution should be used to replace every ml of blood lost during the initial part of the acute bleeding phase

MANAGEMENT OF ATONIC PPH

PHARMACOTHERAPY

ANY OF THE FOLLOWING OPTIONS CAN BE USED EITHER ALONE OR COMBINATION AS PER AVAILABILITY

Inj Methyl Ergometrine 0.2 mg IM or IV slowly

- Contraindicated in hypertension, severe anemia, heart disease
- Can be repeated after 15 minutes to a maximum of 5 doses (1mg)

Or Tab Misoprostol (PGE1) 800 µg
Per rectal or sublingual

Inj Carboprost (PGF2 alpha) 250 µg IM

- Contraindicated in asthma
- Can be repeated every 20 minutes to a maximum of 8 doses (2 mg)

Bleeding not controlled

Explore uterus for retained bits

Continue bimanual compression & Oxytocin infusion @10-20 units /hr

Bleeding not controlled

- Check for coagulation defects
- If present give blood and blood components

Intra uterine balloon tamponade using condom catheter

Bleeding still not controlled

Surgical intervention

- Uterine compression sutures
- Systematic uterine devascularisation by doing Uterine → Ovarian → Internal Iliac artery ligation
- Hysterectomy

Bleeding controlled

- Repeat uterine massage every 15 minutes for first two hours
- Monitor vitals every 10 minutes for 30 minutes, every 15 minutes for next 30 minutes and every 30 minutes for next 3-6 hours or until stable
- Continue Oxytocin infusion @5-10 units /hr (total Oxytocin not to exceed 100 IU in 24 hours)

Tranexamic Acid (1g slow IV) has recently been recommended as an adjunctive treatment for PPH to be used as early as possible irrespective of cause but definitely within three hours of delivery. It can be repeated after 30 minutes if bleeding persists. Standard treatment for PPH must continue meanwhile^{1,2}

1 The WOMAN trial, The Lancet, 2017
2 WHO update on Tranexamic Acid, 2017

Timely Referral to a higher centre must be considered if facilities for blood transfusion or exploration and surgical intervention are not available. Patient must be transported with I/V fluids containing oxytocin on flow and preferably with uterine/vaginal tamponade in situ.

- Aortic compression may be used as a short time measure to reduce blood loss while awaiting definitive steps.
- Non-pneumatic anti-shock garment (NASG) should be used during transport if available
- Uterine artery embolization may be offered in selected patients if facilities are available

COUNSELLING IS AN IMPORTANT ADJUNCT TO MANAGEMENT

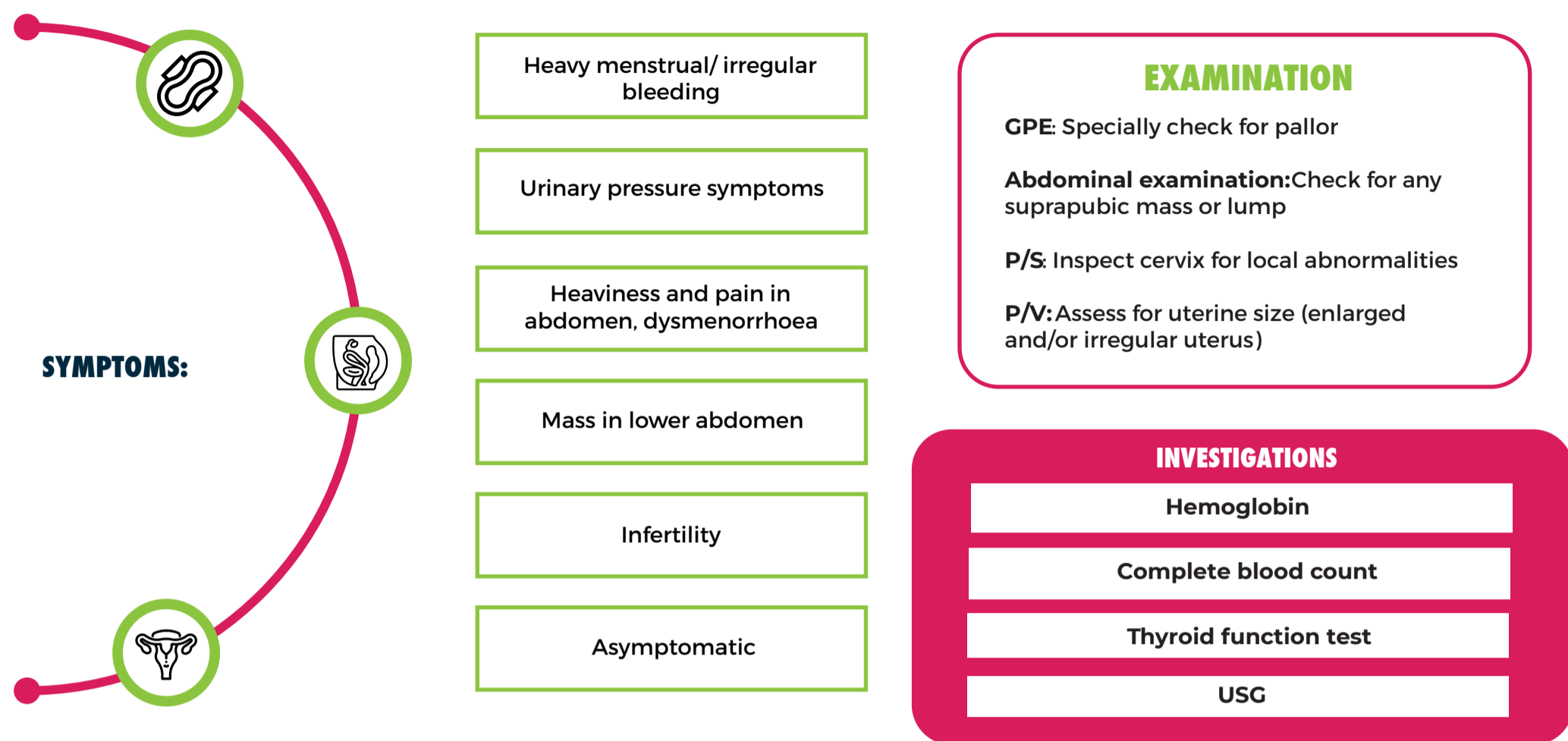
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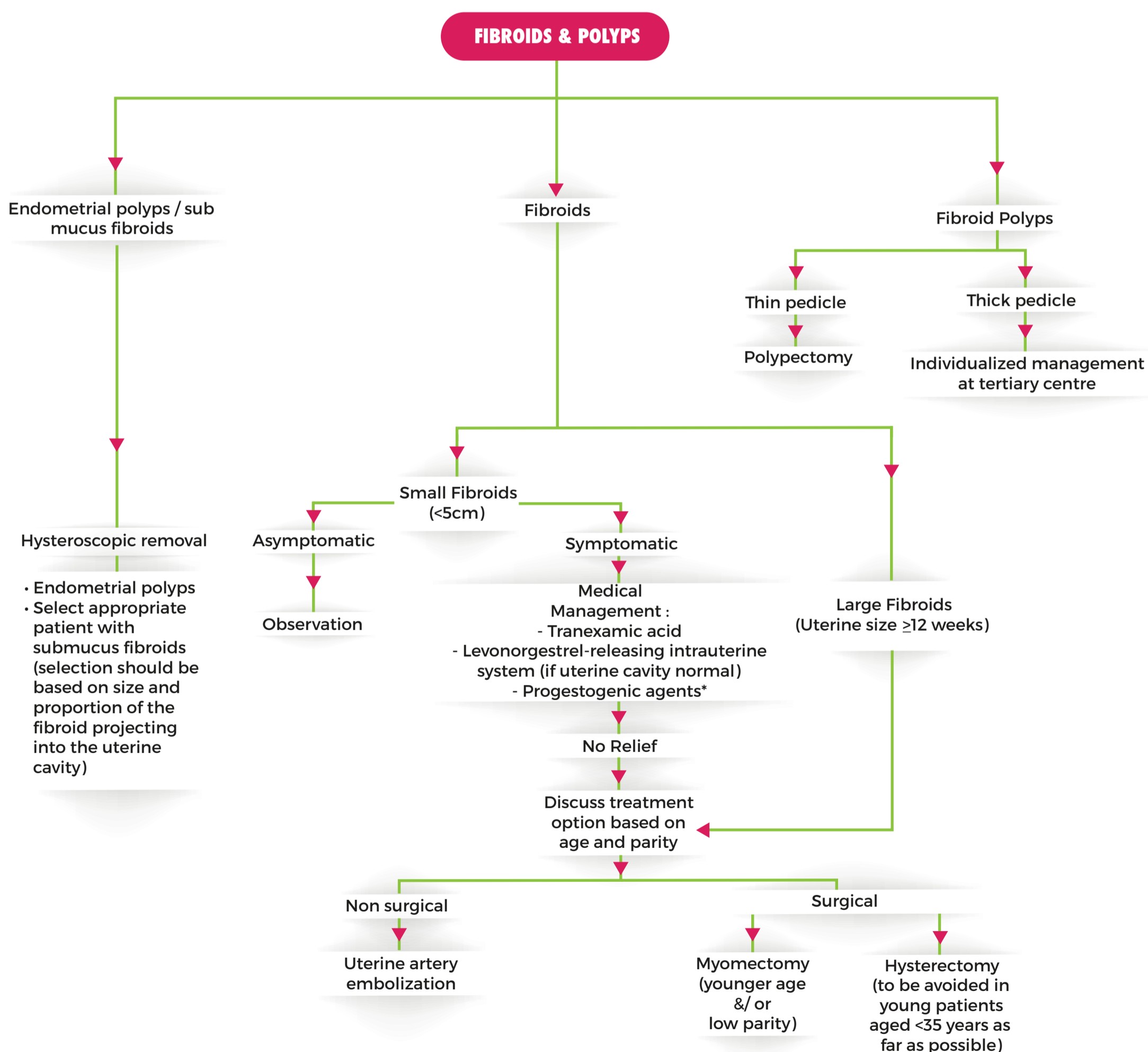
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Standard Treatment Workflow (STW) for the Management of **UTERINE FIBROIDS AND POLYPS** ICD-10-D25 & N84



ASYMPTOMATIC FIBROIDS <5CM DO NOT NEED TO BE TREATED



*Norethisterone (max daily dose 40 mg) OR Medroxyprogesterone acetate (max daily dose 40 mg). Any hormone should be given orally daily in divided doses for a duration of three weeks and repeated in a cyclical manner for total of 4-6 cycles of treatment

ALL THERAPUTIC OPTIONS NEED TO BE EXPLAINED TO THE PATIENT INCLUDING JUST KEEPING THE PATIENT ON OBSERVATION. ALL PATIENTS OF FIBROID UTERUS DO NOT NECESSARILY NEED HYSTERECTOMY.

COUNSELLING IS AN IMPORTANT ADJUNCT TO MANAGEMENT

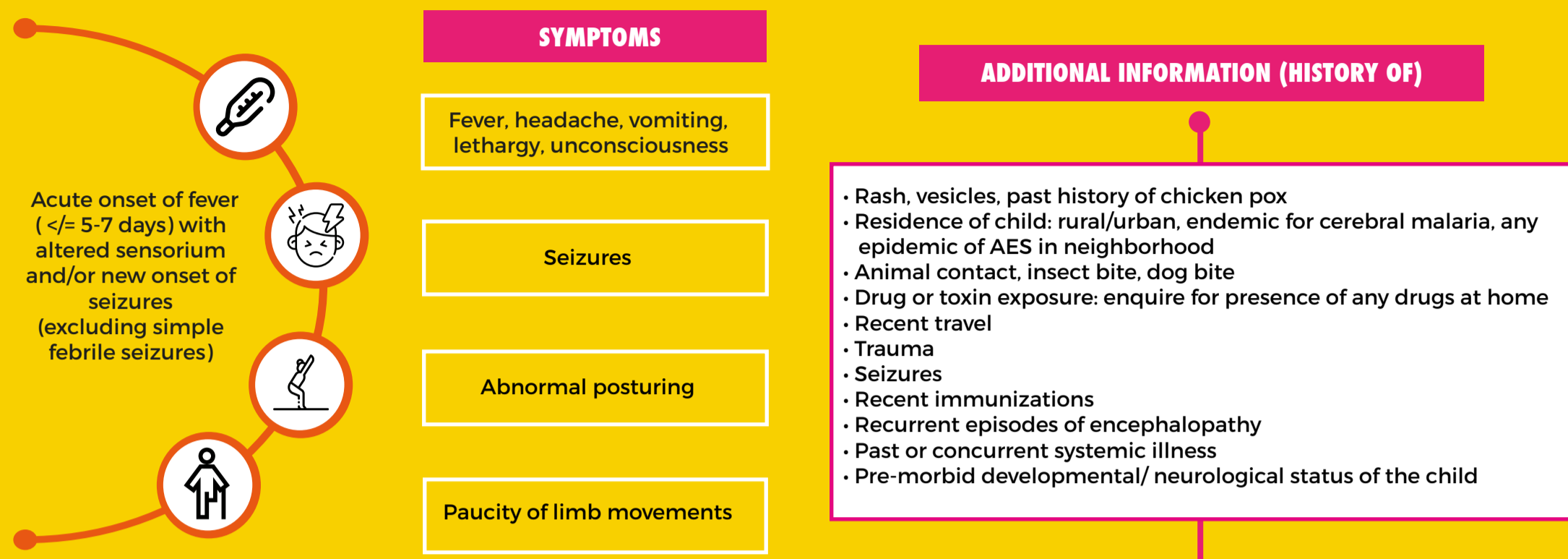
KEEP A HIGH THRESHOLD FOR INVASIVE PROCEDURES



PAEDIATRICS



Standard Treatment Workflow (STW) for the Management of ACUTE ENCEPHALITIS SYNDROME (AES) IN CHILDREN ICD-10-G04



EXAMINATION

VITAL SIGNS

- Temperature
- Pulse rate
- Respiratory rate
- Blood pressure

GENERAL EXAMINATION

- Pallor
- Petechiae
- Rash
- Icterus

NEUROLOGICAL EXAMINATION

- Level of consciousness by Glasgow Coma Scale (GCS)
- Abnormal posturing: decerebrate, decorticate
- Active seizures
- Cranial nerves: pupil size and reaction, doll's eye movements, squint, facial deviation
- Focal neurological deficits
- Meningeal signs

INVESTIGATIONS

ESSENTIAL

CBC, LFT, KFT, blood sugar, CECT Brain, CSF examination* (cytology, biochemistry, culture, AFB staining, Gene Xpert), peripheral smear for malarial parasite, Rapid Malarial Antigen Test

DESIRABLE

MRI Brain, CSF PCR for Herpes simplex encephalitis, JE serology, EEG, Dengue serology and NS1 testing, HIV testing

OPTIONAL

CSF Neurovirology panel, anti-NMDA receptor antibody testing, PCR viral testing of other samples (throat swab, nasopharyngeal aspirates, stool etc), Blood Tandem Mass Spectrometry and urine gas chromatography, antinuclear antibodies

*Lumbar puncture is contra-indicated or neuroimaging must be obtained before lumbar puncture

1. Fundus: papilledema 2. Platelet count <math>< 50,000</math> 3. Focal neurological deficits 4. Asymmetric/unreactive pupils 5. Decerebrate/decorticate posturing

MANAGEMENT

All patients need to be admitted.

If any of the following signs are present, the child should be referred to tertiary care facility with PICU and facilities for mechanical ventilation:

- Glasgow Coma Scale <math>< 8</math>
- Abnormal breathing pattern
- Shock not responding to fluid bolus
- Decerebrate or decorticate posturing
- Seizures persisting despite benzodiazepine and phenytoin

Step I: Rapid assessment and stabilization

- Establish and maintain airway: Intubate if GCS<math>< 8</math>, impaired airway reflexes, abnormal respiratory pattern, signs of raised intracranial pressure, SpO₂ <math>< 92\%</math> despite high flow oxygen and fluid refractory shock
- Ventilation, oxygenation
- Circulation: Establish IV access, take samples for relevant investigations, fluid bolus if in circulatory failure (20 mL/kg NS), inotropes if required
- Identify signs of cerebral herniation or raised ICP
- Temperature: treat fever and hypothermia
- Treat ongoing seizures- Benzodiazepine, followed by phenytoin loading

Step II: History, Examination and Investigations as given above

Step III: Empirical Treatment (must be started if CSF cannot be done/ report will take time and patient sick)

- Ceftriaxone:** 100 mg/kg/day in 2 divided doses X 10-14 days
- Acyclovir** (use in all suspected sporadic viral encephalitis):
3 mo to 12 y: 500mg/m² 8 hourly (min 21 days)
>12 y: 10mg/Kg 8 hourly (14-21 days in confirmed cases)**
- Artesunate combination therapy** (stop if peripheral smear and RDT are negative): 3mg/kg in child <math>< 20</math> kg, and 2.4mg/kg in child > 20kg IV/IM at 0,12 and 24 hours, followed by once daily parental/oral X 3-7 days

**If therapy was started empirically stop acyclovir, in case an alternative diagnosis is confirmed, or HSV PCR of CSF is negative on two occasions (24-48 h apart) and MRI imaging not suggestive of Herpes Simplex Encephalitis

Step IV: Supportive care and treatment

- Maintain euglycemia, hydration and control fever
- Treat raised intracranial pressure#, mild head-end elevation-15-30°
- Treat seizures##; Give anticonvulsant if: history of seizures / GCS <math>< 8</math> / child has features of raised ICP
- Steroids: Pulse steroids (methylprednisolone) to be given in children with suspected acute disseminated encephalomyelitis or autoimmune encephalitis

Step V: Prevention/treatment of complications and rehabilitation

- Physiotherapy, posture change, prevent bed sores and exposure keratitis
- Complications: aspiration pneumonia, nosocomial infections, coagulation disturbances
- Nutrition: early feeding
- Psychological support to patient and family

#Management of raised intracranial pressure

- Intubate if: GCS <math>< 8</math> / evidence of herniation / irregular respirations and inability to maintain airway
- Signs of impending herniation: patient to be hyperventilated to a target PaCO₂ of 30-35 mmHg
- Initial bolus of Mannitol(0.25 g/kg), then 0.25 g/kg q 6 h as per requirement, up to 48 hours.
- In the presence of hypotension, hypovolemia, and renal failure: hypertonic (3%) saline (preferable to mannitol) 0.1-1 mL/kg/hr by infusion; serum sodium to be targeted to 145-155 meq/L
- Adequate sedation and analgesia
- Avoid noxious stimuli
- Administer nebulized lignocaine prior to endotracheal tube suctioning

##Treatment of seizures

- 1st Line:** IV Lorazepam 0.1mg/kg or Midazolam 0.2 mg/kg or Diazepam 0.3 mg/kg).
If no IV access: IM Midazolam 0.2 mg/kg
2nd Line: Inj. Phenytoin 20 mg/kg (in Normal saline 1mg/kg/min)
If seizures still persist:
Refractory status: Transfer to PICU -> midazolam infusion (1-18 microgram/kg/min)
If ICU facilities not available: sodium valproate (20 mg/kg) or levetiracetam (20-40 mg/kg) or phenobarbitone (20mg/kg)

DISCHARGE CRITERIA

Hemodynamically stable

Improvement in consciousness

Afebrile

Has started eating and drinking orally

Seizures have subsided

Parents have been explained the supportive care and physiotherapy to be continued at home

KEEP A HIGH THRESHOLD FOR INVASIVE PROCEDURES

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This STW has been prepared by national experts of India with feasibility considerations for various levels of healthcare system in the country. These broad guidelines are advisory, and are based on expert opinions and available scientific evidence. There may be variations in the management of an individual patient based on his/her specific condition, as decided by the treating physician. There will be no indemnity for direct or indirect consequences. Kindly visit our web portal (stw.icmr.org.in) for more information.

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Standard Treatment Workflow (STW) for the Management of ACUTE DIARRHEA ICD-10-R19.7

DIARRHEA IS

- >3 loose or watery stools/ day
- Acute Diarrhea <14 days
- Persistent diarrhea >14 days
- Dysentery - blood in stools



ASK FOR

- Duration
- Blood in stool
- Vomiting, fever, cough, recent measles, HIV status (if known)
- Immunization status and pre illness feeding practices
- Fluids/ food/ drugs and other remedies taken during illness

EXAMINATION

- General condition of child
- Nutritional status (weight/ weight for height / MUAC)
- Classify malnutrition if any
- Signs of dehydration & classify dehydration

SKIN PINCH TEST

- Locate the area on the child's abdomen halfway between the umbilicus and the side of the abdomen.
- Use thumb and first finger to pinch and not finger tips.
- The fold of the skin should be in a line up and down the child's body.
- Firmly pick up all layers of the skin and tissue under them.
- Pinch the skin for one second and then release it. Look to see if the skin pinch goes back:
 - Very slowly (longer than 2 seconds)
 - Slowly (skin stays up even for a brief instant)
 - Immediately (normal)

REFER TO HOSPITAL

- Severe malnutrition/ HIV
- Severe dehydration
- Hypernatremic (Na >145mmol/L) / hyponatremic dehydration (Na <135 mmol/L)
- Dysentery with age <1 yr/ measles in past 6 weeks/ dehydration/ sick
- Dysentery with no improvement on antibiotics
- Persistent diarrhea with dehydration
- Persistent diarrhea with serious systemic infection such as pneumonia, sepsis, infants <4 months of age, or when there is no improvement with treatment over 5 days

MANAGEMENT

CLASSIFY DEHYDRATION

Not enough signs to classify some or severe dehydration

2 of following:

- Restless, irritable
- Sunken eyes
- Drinks eagerly, thirsty
- Skin pinch - goes back very slowly

2 of following:

- Lethargy / unconscious
- Sunken eyes
- Not able to drink/ drinking poorly
- Skin pinch - goes back slowly

NO DEHYDRATION: PLAN A

- Fluids
 - Give extra fluids (as much as child will take) until diarrhea stops.
 - Use WHO ORS after each loose stool (in addition to usual fluid intake)
 - Upto 2 yrs → 50 -100 ml
 - 2 yrs or more → 100 -200ml
 - On ORS packet check whether 200ml or 1 litre of clean water is needed
 - Frequent small sips with spoon or cup.
 - If child vomits, wait 10 minutes then continue slowly.
 - Homemade fluids- salted rice water, salted yogurt drink, vegetable or chicken soup with salt and clean water, unsweetened fresh fruit juice and coconut water
 - Unsuitable fluids - carbonated beverages, commercial fruit juice, sweetened tea & coffee, other medicinal teas / infusions.
 - Zinc supplement (Zinc sulphate/ carbonate / acetate)
 - 2-6 months → 10mg/day x 2 weeks
 - >6 months → 20mg/day x 2 weeks
 - Counsel Mother/ Attender
 - Feeding advise
 - Infants on breast feed, to continue more frequent breast feeding than usual.
 - Those not on breast feed to continue their usual milk feed/ formula at least once in 3 hours.
 - Give age appropriate foods to >6 months old based on their pre illness feeding pattern
- Danger signs (return immediately)
 - Passing many watery stools
 - Repeated vomitings / very thirsty
 - Eating / drinking poorly
 - Develops fever / blood in stools
- Follow up in 5 days if no improvement

SOME DEHYDRATION: PLAN B

- Manage in clinic /daycare facility with recommended amount of ORS (75ml /kg) over 4 hour period
- If weight is not known

AGE	< 4 months	4 -11 months	12 -23 months	2 - 4 years	5-14 years	15 years or older
WEIGHT	<5kg	5 - 7.9 kg	8 - 10.9 kg	11 - 15.9 kg	16 - 29.9 kg	30 kg or more
IN ml	200 - 400	400 - 600	600 - 800	800 - 1200	1200 - 2200	2200 - 4000

- After 4 hours reassess the child, classify dehydration and select appropriate plan (A/B/C)
- Give extra fluids, zinc supplement, feeding advise and counselling regarding danger signs* as in plan A
- Follow up in 5 days if no improvement

PATIENT EDUCATION

- Danger signs*
- Hygiene practices
- Hand washing, proper disposal of excreta
- Safe drinking water
- Appropriate feeding practices
- Vaccination as per IAP guidelines

INVESTIGATIONS

- Some dehydration:
 - Preferable Tests- electrolytes
- Severe dehydration:
 - Essential tests- CBC, electrolytes
 - Preferable Tests- Renal Function Tests, VBG
- In suspected cholera cases:
 - Preferable tests- stool for hanging drop and stool culture
- Dysentery: (no response to antibiotic in 2 days)
 - Preferable test- stool culture & stool routine for trophozoites of Ameoba
- Persistent diarrhea:
 - Preferable test- stool routine microscopy, urine routine microscopy, urine culture, sepsis screen

WHEN CONSIDERING ALTERNATIVE DIAGNOSIS OF PERSISTENT DIARRHEA AND DYSENTERY

PERSISTENT DIARRHEA

- Appropriate fluids to prevent or treat dehydration
- Nutrition:
 - If breastfeeding, give more frequent, longer breastfeeds, day and night.
 - Other milk: replace with increased breastfeeding, or with fermented milk products, such as yogurt, or half the milk with nutrient-rich semi-solid food.
 - For other foods, follow feeding recommendations for the child's age: give small, frequent meals (at least 6 times a day), and avoid very sweet foods or drinks.
- Zinc for 14 days
- Supplement vitamins / minerals
- Antimicrobial to treat diagnosed infection
 - Intestinal infection:
 - If blood in stool: Treat like dysentery
 - If stool routine suggestive of Amoebiasis: Treat for it
 - If stool suggestive of cyst/ Trophozoite of Giardia: Give Metronidazole 5mg/kg/dose x 8hrly x 5 -7 days
 - Treat Non intestinal such as UTI / Otitis Media
- Follow up in 5 days
- Refer to hospital (See box)

SEVERE DEHYDRATION: PLAN C

- Urgent referral to hospital
- Mother to continue rehydration by giving frequent sips of ORS during transport or use NG tube when possible in patients with poor drinking

NO

CAN YOU GIVE INTRAVENOUS (IV) FLUIDS IMMEDIATELY?

NO

- Start IV fluid immediately
- Ideal fluid is Ringer lactate solution / Normal saline (DNS in malnourished)

AGE	FIRST GIVE 30 ML/KG IN	THEN GIVE 70 ML/KG IN
Infant (< 12 months)	1 hour	5 hours
Older	30 minutes	2.5 hours

- If child can drink, give ORS by mouth while the drip is set up
- Assess heart rate/ respiratory rate/ BP/ CFT/ consciousness and recognize early shock
- Refer for hospitalization
- If prevalence of cholera - Doxycycline single dose 300mg or Tetracycline 12.5mg/kg 4 times a day x 3 days. For young children Erythromycin 12.5mg/kg 4 times a day x 3 days
- Associated vomitings - Ondanstetron 0.15 mg/kg/dose IV/oral in addition to rehydration therapy
- Reassess every 15-30 minutes till a strong radial pulse is present and then every hour. If hydration status is not improving, give IV drip more rapidly
- After 6 hours (infants) and 3 hours (older patients) - evaluate for dehydration and choose the appropriate plan (A, B, or C) to continue treatment
- Give ORS (about 5 ml/kg/hour) as soon as the child can drink: usually after 3-4 hours (infants) or 1-2 hours (children)
- Observe for 6 hours after the child has been fully rehydrated.
- In hypernatremic and hyponatremic dehydration child appears relatively less ill / more ill respectively and needs to be referred for hospitalization

DISCHARGE CRITERIA

- Sufficient rehydration (indicated by wt gain &/or clinical status)
- IV fluids no longer needed
- Oral intake = / > losses
- Medical f/u available

DYSENTERY

- Treat dehydration according to assessment.
- Ciprofloxacin 15mg/kg twice a day and reassess after 2 days. Improvement: 3 days of treatment
- No improvement → Cefixime 10 mg//kg/d, 2 div doses. Reassess after 2 days. If better complete 3-5 days of treatment.
 - If stool routine positive for Ameobiasis : Metronidazole 10mg/kg/dose 8 hourly x 7 days (10 days in severe cases)
- Refer to hospital (See box)

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2. WHO Treatment for Diarrhea - A manual for physicians and other senior health workers 2005.
3. WHO GLOBAL TASK FORCE ON CHOLERA CONTROL 2010.

KEEP A HIGH THRESHOLD FOR INVASIVE PROCEDURES



Standard Treatment Workflow (STW) for the Management of DENGUE FEVER ICD-10-A90

WHEN TO SUSPECT?



SYMPTOMS

Fever and two of the following criteria:

1. Nausea
2. Vomiting
3. Rash
4. Myalgia
5. Headache
6. Retro orbital pain
7. Arthralgia
8. Hemorrhagic manifestations

Live in /
travel to
dengue
endemic
area

WARNING SIGNS

- Abdominal pain or tenderness
- Persistent vomiting
- Clinical fluid accumulation – pleural effusion, ascites.
- Mucosal bleed – malena, epistaxis, gum bleed
- Liver enlargement > 2 cms
- Shock (DSS) – weak rapid pulse, pulse pressure < 20mm Hg hypotension, cold clammy skin, restlessness.

ASSESSMENT

Dengue without
warning signs

Dengue with
warning signs

Severe
dengue

TREATMENT OF PROBABLE DENGUE WITHOUT WARNING SIGNS

- Symptomatic ambulatory treatment
- Paracetamol for fever: avoid NSAIDs
- Daily monitoring: clinical, PCV, platelets

SEVERE DENGUE

- Fluid accumulation with respiratory distress
- Severe bleeding
- Impaired consciousness

REASONS FOR REFERRAL

- Cold extremities, restlessness
- Acute abdominal pain
- Decreased urine output
- Bleeding and hemoconcentration
- Rising PCV & thrombocytopenia without clinical symptoms

INVESTIGATIONS

ESSENTIAL

- Hb, TLC, DLC, Platelets, PCV
- Positive tourniquet test
- NS1 antigen (ELISA method)

DESIRABLE

- Chest X-ray
- LFT, RFT,
- CPK, albumin
- USG abdomen
- Dengue IgM

OPTIONAL

- Echocardiography
- PCR - dengue
- CVP monitoring
- USG guided measurement of collapsibility of IVC for monitoring hypovolemia

SHOCK

Assess airway, breathing, circulation & start oxygen inhalation

COMPENSATED SHOCK

(tachypnea, tachycardia, normotensive)

Ringer's Lactate/ NS 10 ml/kg/hr

Assess after every hour by checking HR, RR, BP, CVP and PCV

No Improvement

RL 10-15ml/kg/hr

Assessment at second hour

No Improvement

RL 15ml/kg/hr

Assessment at third hour

Colloids 10ml/kg/hr

No Improvement

Look for anemia, acidosis, myocardial dysfunction and treat accordingly

Improvement

RL 5-7ml/kg/ 1-2hr

Further Improvement

RL 3-5ml/kg/hr

Continue IV fluids till stable for 24 hours

Once stable, observe for 24 hours, then discharge if the discharge criteria is fulfilled

HYPOTENSIVE SHOCK

(tachypnea, tachycardia, hypotension, peripheral pulses not palpable)

20 ml/ kg crystalloid or colloid in 15 minutes

Assessment of Shock
(monitor HR, RR, BP, PCV and CVP)

No Improvement

PCV Increased

Colloids 10-20ml/kg

PCV Decreased

Blood Transfusion

Assessment

No Improvement

Look for blood loss, acidosis cardiac dysfunction and treat accordingly

Improvement

Improvement

Gradually decrease infusion rate

10ml/kg/hr 1-2 hr

7ml/kg for 2-3 hrs

5ml/kg for 2-4 hrs

3ml/kg for 2-4 hrs

Stop at 48 hours

In case of shock, start bolus and arrange for urgent referral with continuous monitoring by a health professional to facilities with a PICU.

INDICATION FOR PLATELET TRANSFUSION & PACKED RED CELLS

PACKED RED CELLS

- Loss of blood (overt blood) 10% or more of total blood volume.
- Refractory shock
- Fluid overload

PLATELETS

- Prolonged shock
- Prophylactic platelet transfusion (PLT <10,000/cumm)
- Systemic massive bleeding

FRESH FROZEN PLASMA/CRYOPRECIPITATE

Coagulopathy with bleeding

DISCHARGE CRITERIA (ALL OF THE FOLLOWING CONDITIONS MUST BE PRESENT)

CLINICAL

- No fever for 48 hours
- Improvement in clinical status (check for general well-being, appetite, haemodynamic status, urine output, respiratory distress)

LABORATORY

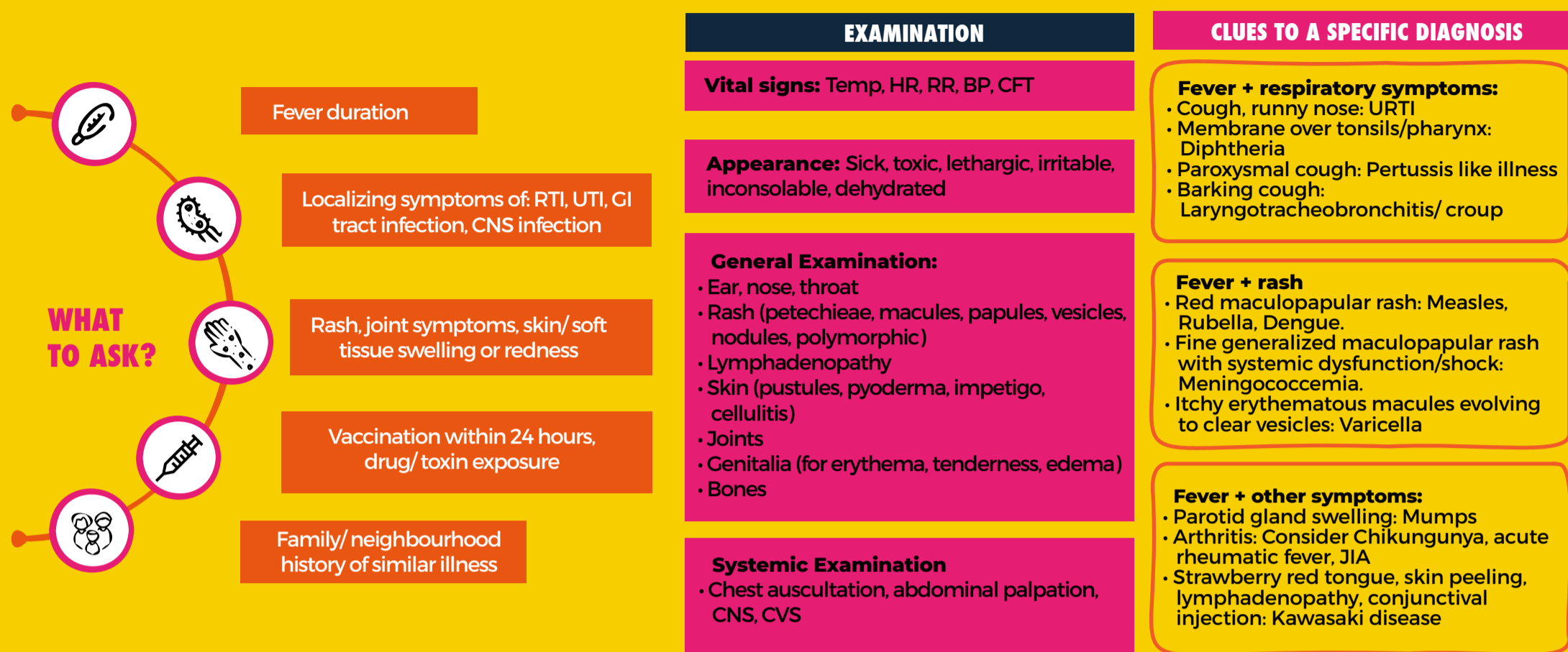
- Increasing trend of platelet count
- Stable haematocrit without intravenous fluids

👉 KEEP A HIGH THRESHOLD FOR INVASIVE PROCEDURES



Standard Treatment Workflow (STW) for the Management of FEVER IN CHILDREN ICD-10-R50

FEVER IS Core (rectal) temperature $\geq 38.0^{\circ}\text{C}$ (100.4°F) or axillary temperature $> 37.5^{\circ}\text{C}$ (100.4°F).

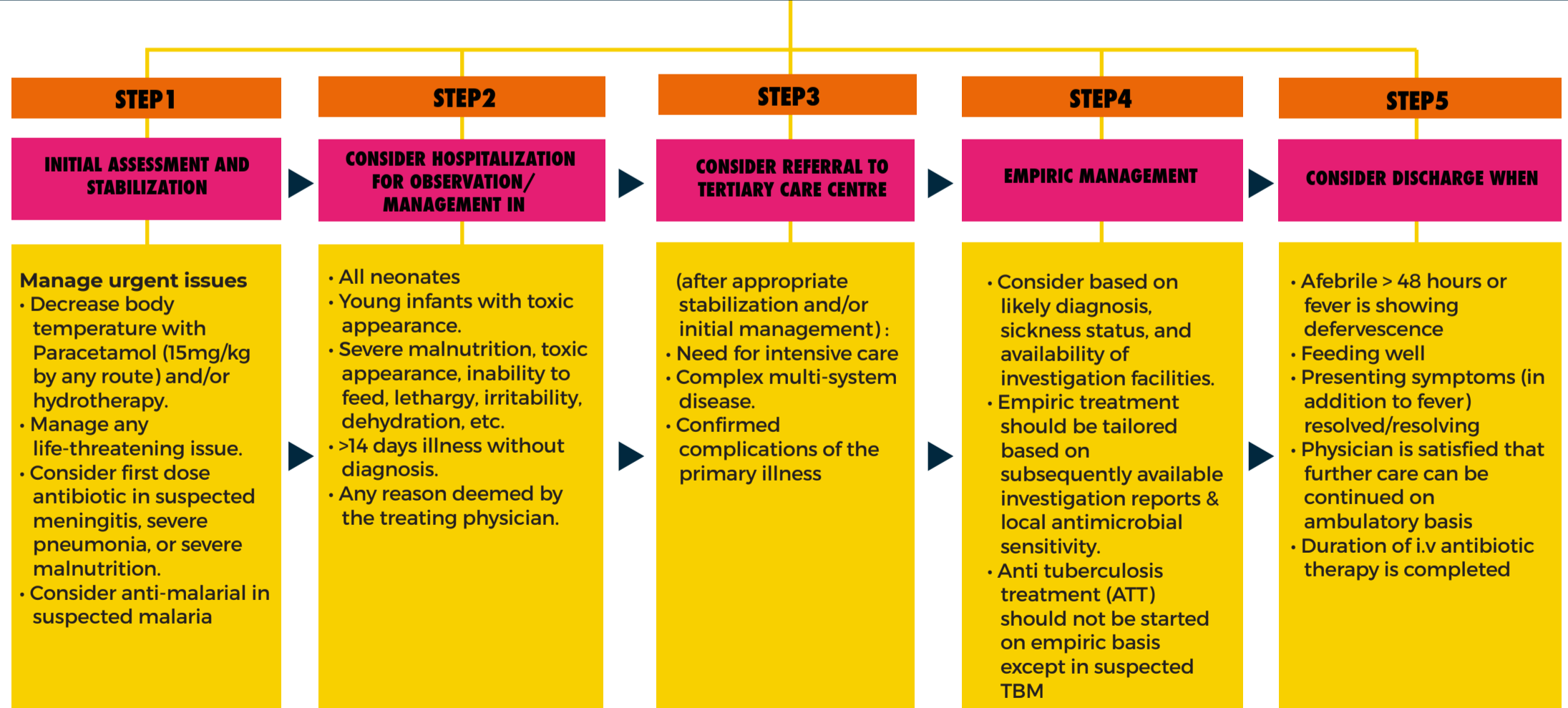


INVESTIGATION OF THE FEBRILE CHILD

(Consider if one or more of the following are warranted. Perform investigations only where result impacts management)

<7 DAYS FEVER ALONE	<7 DAYS AND LOCALIZING SYMPTOMS PRESENT	<7 DAYS AND NON SPECIFIC SYMPTOMS	>7 DAYS AND FEVER ALONE OR WITHOUT LOCALIZING SYMPTOMS	>7 DAYS AND LOCALIZING SYMPTOMS PRESENT
<p>ESSENTIAL: If fever <72 hours and child not looking sick: No investigations If fever >72 hours, consider: TLC, DLC, P.S for leukocyte morphology, malarial parasite & platelet count</p> <p>DESIRABLE: Rapid antigen test for malaria, NSI antigen and dengue IgM antibody, blood culture</p> <p>OPTIONAL: C reactive protein, procalcitonin</p>	<p>ESSENTIAL: As given in the first box</p> <p>DESIRABLE: As given in the first box + consider: (Clean-catch) urine microscopy & culture, chest Xray, CSF analysis</p> <p>OPTIONAL: As given in the first box + consider: ultrasonography, throat/pharyngeal swab, pus aspiration.</p>	<p>ESSENTIAL: As given before</p> <p>DESIRABLE: As given before. Additionally consider: serology for specific viral infection, rapid antigen test for malaria, NSI antigen and dengue IgM antibody, blood culture, serology for scrub typhus</p> <p>OPTIONAL: As given before</p>	<p>ESSENTIAL: All mentioned in Essential & Desirable list in the prior boxes. Additionally consider Widal test.</p> <p>DESIRABLE: Consider Mantoux test, ultrasonography</p> <p>OPTIONAL: As given before. Additionally consider: Ultrasonography of abdomen, chest, pericardium, joint(s), abscess, lymph node clusters, parotid gland etc, for microscopy, Xpert MTB RIF assay, Mycobacterial culture. Consider: bone marrow, ANA-profile, HIV serology, echocardiography, CT PET scan.</p>	<p>ESSENTIAL: All investigations mentioned in the prior boxes</p> <p>DESIRABLE: All investigations mentioned in the prior boxes. Additionally consider: serology for Brucella, CMV, Herpes, Japanese encephalitis. CT scan in deep seated abscess or lung abscess, Bone marrow examination, ANA profile, HIV serology, PET scan.</p> <p>OPTIONAL: All investigations mentioned in the prior boxes</p>

MANAGEMENT



ABBREVIATIONS

ANA: Anti-nuclear antibody	CSF: Cerebro-spinal fluid	HR: Heart rate	RTI: Respiratory tract infection
BP: Blood pressure	CT: Computed tomography	JIA: Juvenile idiopathic arthritis	TLC: Total leukocyte count
CFT: Capillary filling time	DLC: Differential leukocyte count	PET: Positron emission tomography	URTI: Upper respiratory tract infection
CMV: Cytomegalovirus	CVS: Cardiovascular system	PS: Peripheral smear	UTI: Urinary tract infection
CNS: Central nervous system	GI: Gastro-intestinal	RR: Respiratory rate	

KEEP A HIGH THRESHOLD FOR INVASIVE PROCEDURES

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2. Mahajan P, et al. Consensus Guidelines on Evaluation and Management of the Febrile Child Presenting to the Emergency Department in India. Indian Pediatr 2017; 54: 652-60.
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Standard Treatment Workflow (STW) for the Management of SEPSIS AND SEPTIC SHOCK IN CHILDREN

ICD-A41.9, R65.21

Sepsis to be suspected: in children with any infections (fever with or without rashes/ pneumonia/ diarrhoea) and they are at risk of life threatening organ dysfunction



WHEN TO SUSPECT (2-59 MONTHS)?

Poor Feeding	Lethargy	Decreased responsiveness	Unconsciousness
Cold/ bluish peripheries	Rapid or shallow breathing	Chest in drawing	Stridor
Excessive vomiting	Decreased urine output	Convulsions	Stiff neck

CHECK FOR HISTORY OF

Prior treatment
Previous recurrent infections
Prior hospitalisation
Chronic systemic illness (congenital or acquired)
Immunization (age appropriate)

EXAMINATION

GENERAL PHYSICAL EXAMINATION

VITAL SIGNS

SYSTEMIC EXAMINATION

Lethargy	Petechial rash
Decreased alertness	Mucosal bleeding
Activity	Rapid breathing
Pallor	Chest in drawing
Cyanosis	Cold peripheries
Skin mottling	Assess nutritional status

Pulse volume (High volume as well as low volume/feeble pulse)	Heart rate and respiratory rate (outside the age range)
Capillary refilling time > 3 seconds	Pulse oximetry (saturation <95%)
Blood pressure* (Systolic blood Pressure < 70 in <1 year)	>1 year child if systolic BP < 70+ Age (yrs) x2) or (lower than age range)

Respiratory: Signs of respiratory distress - retraction, nasal flaring, grunting, crepitation on auscultation
CVS: Murmur, gallop rhythm
Per abdomen: Abdominal distension
CNS: *AVPU scale, signs of meningitis, seizures
Skin: Rashes
Bone & joints: Swelling, redness, tenderness

SIGNS OF SEVERE DEHYDRATION

Diarrhoea plus any two of these: Lethargy or unconscious, not able to drink or drinks poorly, Sunken eyes, skin pinch goes back very slowly

INVESTIGATIONS- (Based on symptoms and available facility)

Essential - Complete blood counts, peripheral blood film, urine routine, blood sugar, CRP, serum electrolytes, renal function test, liver function test

Desirable - Blood culture, blood gas, relevant cultures (based on symptoms), chest X-ray, specific illness- Malaria - rapid malarial antigen test, Dengue- dengue NS1, IgM, CSF study

Optional- PCT, USG to guide the fluids

MANAGEMENT

DIAGNOSTIC ALGORITHM

CHILD (2-59 MONTHS OF AGE WITH FEBRILE ILLNESS (WITH WARNING SIGNS))

GOOD PERIPHERAL PERFUSION

Admit or initiate treatment as per IMNCI guidelines²

POOR PERIPHERAL PERFUSION**

With fast pulse, cold peripheries, poor pulse volume, CRT >3 seconds (Fast pulse: HR > 180 in <12 month old child, HR >120 in >12 month old child)

Admit, initiate treatment, refer to centre with facility of ICU, ventilation, 24 hour monitoring (if required)

Start O₂ with face mask @ 4-6 lit/min, or hood @8-10 lit if not available nasal prongs 1-2 lit/min to maintain SpO₂ >95%, Insert two IV cannulas, give first dose of antibiotics within first one hour

Give 20 ml/kg of normal saline fluid bolus over 20- 30 minutes.

Reassess for decreases in heart rate, improvement in pulse volume and warm peripheries

If no improvement

Repeat bolus of 20 ml/kg over 30 minutes, with careful monitoring for hepatomegaly, oxygen saturation, crepitation's in chest (if any of above appears then stop fluids)

If shock persists

Start Inj Adrenaline infusion @0.1 microgram/kg/min and refer to higher centre

#For severe acute malnutrition - consider SAM STW
 #For suspected Dengue follow Dengue Fever STW

**If there is improvement after 1st bolus and history of diarrhea present then:

Give 70 ml/kg over 5 hours in infants and over 2 ½ hours in a child with hypovolemic shock. Give additional fluids if losses continue.

Start maintenance fluid in case of other illness

Antibiotics

- >3 months Inj Ceftriaxone 100mg/kg/day (2 divided doses)
- <3 month Inj Cefotaxime 200mg/kg (divided 6-8hrly),
Inj Gentamicin 5-7.5 mg/kg single dose /day
- If soft tissue infection: consider Inj Cloxacillin 200mg/kg divided 6 hourly or Inj Amoxicillin- Clavulanic acid 30 mg/kg/dose 8hrly)

Inj Adrenaline- 0.3x body weight in mg in 50 ml NS or 5% dextrose at 1 ml/hr will give 0.1 microgram/kg/min

When to refer

- Shock does not improve after 2nd fluid bolus
- Signs of fluid overload
- No facility for continuous monitoring.
- Before referral counsel the parents and inform referring facility

When to Suspect Cardiac Failure

- History of underlying heart disease
- History of forehead sweating/ suck rest suck cycle
- Murmur
- Hepatomegaly or basilar crept

If it is suspected be careful in giving fluid bolus

Complications

- Respiratory failure** (excessive increase in the respiratory rates and inability to maintain saturation > 94% with oxygen) -non-invasive (CPAP/BIPAP) or invasive ventilation
- Congestive heart failure**- Dobutamine / Milrinone infusion and Furosemide
- Infections on other sites**- explore and treat accordingly

DISCHARGE CRITERIA

Completion of antibiotics as per culture sensitivity	Afebrile for 48 hours	Vitals within normal limit for age	Good oral intake	Adequate urine output >1ml/kg/hr
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👉 KEEP A HIGH THRESHOLD FOR INVASIVE PROCEDURES

*DISABILITY (AVPU SCALE)

A Is the child Alert? If not; **V** Is the child responding to Voice? If not; **P** Is the child responding to Pain?; **U** The child who is Unresponsive to voice (or being shaken) AND to pain is Unconscious *Anything below A should be classify as danger sign



Standard Treatment Workflow (STW) for the Management of SEVERE ACUTE MALNUTRITION WITH COMPLICATIONS ICD-10-E43

WHEN TO SUSPECT?

COMMON PRESENTATION

- Faulty feeding
 - Not exclusively breastfed for 6 months
 - Bottle feeding
 - Delayed/Inadequate complementary feeding
- Poor appetite
- Not gaining weight
- Lethargic
- Disinterested in surroundings
- Delayed development

Additional symptoms of complications

- Loose motions
- Jaundice
- Seizures
- Inter-current infections:**
 - Pneumonia
 - Diarrhea
 - Sepsis
 - Skin infections
 - Severe dehydration
 - Untreated tuberculosis
 - HIV
 - Social challenges

DIAGNOSTIC CRITERIA FOR SAM & MAM

0-6 months

- Consider SAM if MUAC <11.0 cm

6-59 months

- Consider SAM if MUAC <11.5 cm or WHZ <-3 SD or bilateral pitting oedema
- Consider MAM if MUAC is between 11.5- 12.4 cm or WHZ is between -2 to -3 SD

>5 years

- Consider SAM if BMI ≤ 3SD (severe thinness)
- Consider MAM if BMI ≤ 2 SD (thinness)

EXAMINE FOR

- Vital signs: PR, RR, CRT
- Lethargy/ irritability
- Loss of subcutaneous fat
- Muscle wasting
- Pallor
- Signs of Vitamin B, K and A deficiencies
- Respiratory distress
- Dehydration

TRIAGE

SAM + GOOD APPETITE + NO MEDICAL COMPLICATION

Home based treatment + oral amoxicillin 50 mg/kg/dose twice a day for 7-10 days

SAM + COMPLICATIONS/ POOR APPETITE/ FAILED HOME TREATMENT

Hospitalize

INVESTIGATIONS

ESSENTIAL

Hemogram, RBS, LFT, KFT, Chest X-Ray, RDT-HIV, Gastric aspirate for CBNAAT/AFB

DESIRABLE

EKG, Stool pH, Stool microscopic, Urine culture, Serum electrolytes (Na, K, Ca), Serum B12, Serum Folate levels

OPTIONAL

Blood Culture, Blood gases, Ultrasound (inferior vena cava to ascending aorta ratio)

TREATMENT

A. STABILISATION PHASE: Monitor vitals, urine frequency, stool/vomitus volumes

INTAKE: IVF (DNS) 4 ml/kg/hr for 2-3 days with early/concomitant initiation of oral feeds (130 ml/kg/day)

CONDITION	PLACE OF TREATMENT	TREATMENT
INFECTIONS (empirically)	Facilities for supportive monitoring, investigations and IVF	<ul style="list-style-type: none"> Inj.. Ampicillin - 50 mg/kg/iv or im X 6hrly Plus inj. Gentamicin- 7.5 mg/kg iv or im, OD for 7-10 days If no response within 48 hrs or critically ill give inj. Ceftriaxone 50 mg/kg, OD for 7-10 days When accepting orally, switch to oral amoxicillin 40-45 mg/kg/dose twice a day for 7 days If prolonged diarrhea (>7 days): Metronidazole 10-12 mg/kg, 8 hrly for 7-10 days (inj.ectable or oral)
HYPOGLYCEMIA (RBS <54mg/dL)	Facilities for supportive monitoring, investigations and IVF	Conscious: 50 ml of 10% Dextrose or 1 tsf sugar in 3 tsf water orally
	Transfer to intensive care facility to manage shock	Unconscious: 5 ml/kg of 10% Dextrose IV NO IMPROVEMENT treat as shock
HYPOTHERMIA (<35.5 °C or 96 °F)	Facilities for supportive monitoring, investigations and IVF. Plus warmer	Skin to skin care with mother (infants) Warming under warmer, incandescent lamp or warmer
	Intensive care facility to manage shock	NO IMPROVEMENT treat as shock
SEVERE DEHYDRATION	Facilities for supportive monitoring, investigations and IVF	Conscious: 50 ml of 10% Dextrose or 1 tsf sugar in 3 tsf water orally
	Transfer to intensive care facility to manage shock	Unconscious: 5 ml/kg of 10% Dextrose IV NO IMPROVEMENT treat as shock
ELECTROLYTE IMBALANCE (empirically)	Facilities for supportive monitoring, investigations and IVF	Potassium: 3-4 mmol/kg/D, orally for 2 wks Magnesium: 0.4-0.6 mmol/kg/D1 IM followed by oral for 2 wks
ANEMIA	Facilities for supportive monitoring, investigations and IVF	Whole blood /PRBC transfusion (10 ml/kg over 3 hrs): if Hb <4 gm/dL or Hb 4-6.5 gm/dL with respiratory distress with close monitoring and hy. Furosemide (1 mg/kg) at start of transfusion

B. REHABILITATION PHASE (Transfer to NRC when child meets criteria for discharge* & accepts home available foods)

FEEDING

Place of treatment: Facilities for supportive monitoring

Treatment:

- 6 months and above: F75 at least 5 times/day gradually increasing to give 150-200 kcal/kg/day (usually 2-3 days) then switch to F100 for next 5-7days with introduction of home available food
- Below 6 months: same as above with return to exclusive breastfeeding where ever possible

ELECTROLYTES

Place of treatment: Facilities for supportive monitoring

Treatment:

- Zinc: 2 mg/kg/day X 2wks orally
- Copper: 0.3 mg/kg/day X 2 wks orally
- Iron: 3 mg/kg/day once weight gain has started orally for 6 weeks

VITAMINS

Place of treatment: Nutritional rehabilitation center (NRC)

Treatment:

- Vitamin A: >12 months- 2 lac iu, 6-12 months: 1 lac iu, <6 months: 0.5 lac iu if food not fortified
- Vitamin D, A, B Complex: RDA

***CRITERIA FOR DISCHARGE FROM HOSPITAL TO OUTPATIENT CARE:** Clinically well and alert; no or resolving medical complications; no or resolving oedema (if present); satisfactory oral intake has a good appetite (taking at least 75% of target calorie intake of 150- 200 kcal/kg/day & 0-6 months old have weight gain of 3-5 gm/kg/day for three days).

PRIMARY FAILURE OF TREATMENT: (a.) Failure to regain appetite by day 4 (b.) Failure to lose oedema by day 4 (c.) Oedema still present Day 10 (d.) Failure to gain at least 5g/Kg/day for 3 consecutive days on catchup diet. Look for unrecognized congenital abnormality, inborn errors of metabolism, immune deficiency, other major organ dysfunction, and malignancy.

APPETITE TEST: Passed if, a child not fed for last 2 hours, when fed by mother in a quiet place consumes in 1 hour:

• 7-12 months: of ≥ 25 ml/kg of F100

• > 12 months: of locally prepared ready to eat food **

AMOUNT TO BE GIVEN: 15 gms or more if < 4 kg; 25 gms or more if 4 - 7 kg; 35 gms or more if 7-10 kg

**[Mixture of Roasted groundnut 1000 gm , Milk powder 1200 gms, Sugar 1120 gms, Coconut oil 600 gms. To be kept refrigerated for not more than 1 week.]

HOW TO PREPARE F75 AND F100

	F75	F100
FRESH WHOLE CREAM MILK	300 ml	900 ml
SUGAR	100 gm	75 gm
VEGETABLE OIL	20 ml	20 ml
ADD WATER TO GET TOTAL VOLUME OF	1 Litre	1 Litre

ABBREVIATIONS

WHZ: Weight for Height Z-score
SAM: Severe Acute Malnutrition

MUAC: Mid-upper Arm Circumference
SD: Standard Deviation (from median)

MAM: Moderate Acute Malnutrition
BMI: Body Mass Index

👉 **KEEP A HIGH THRESHOLD FOR INVASIVE PROCEDURES**

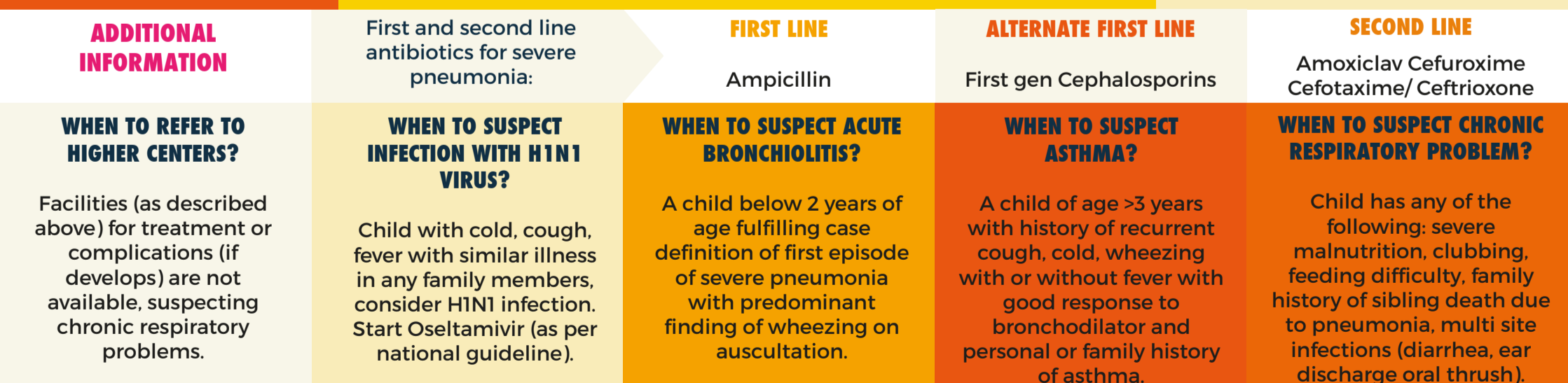
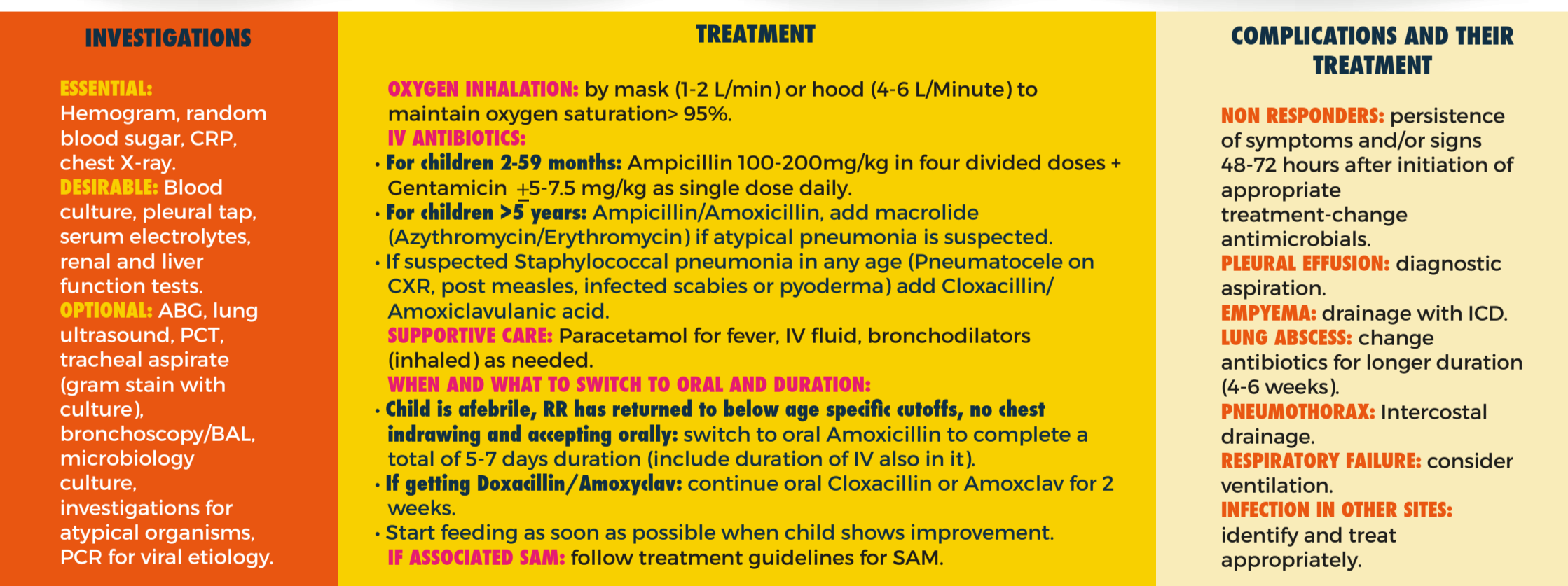
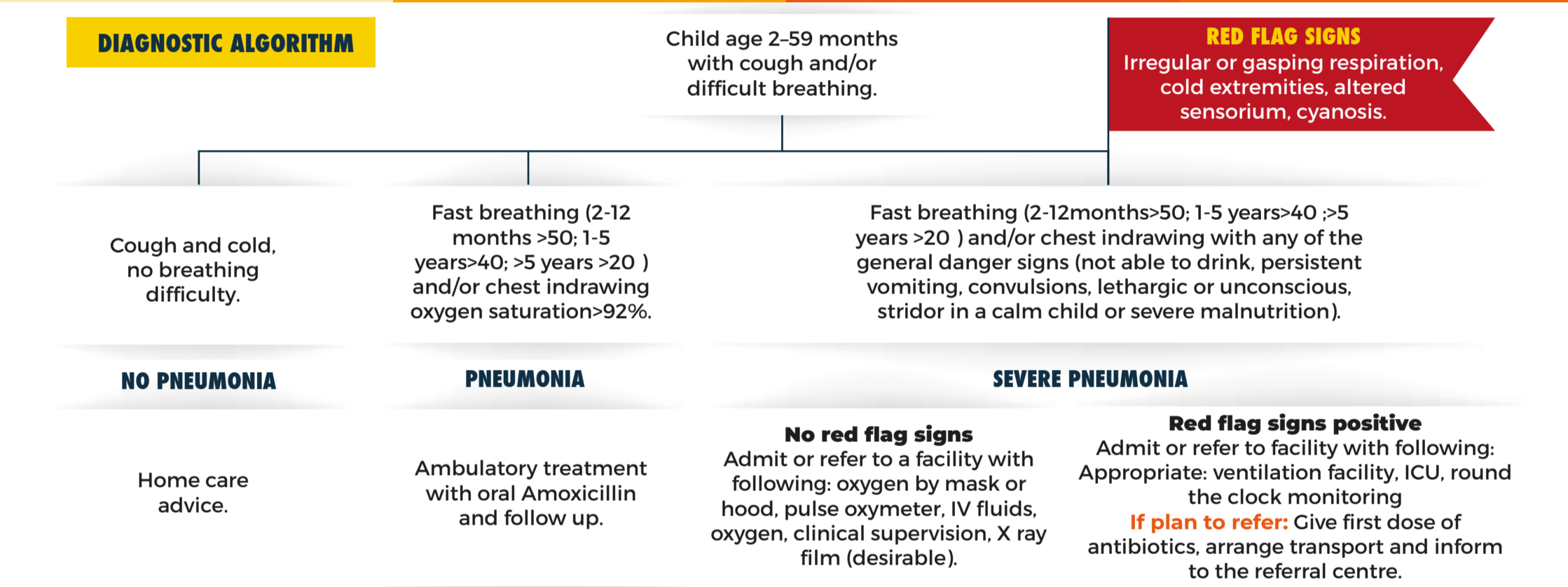
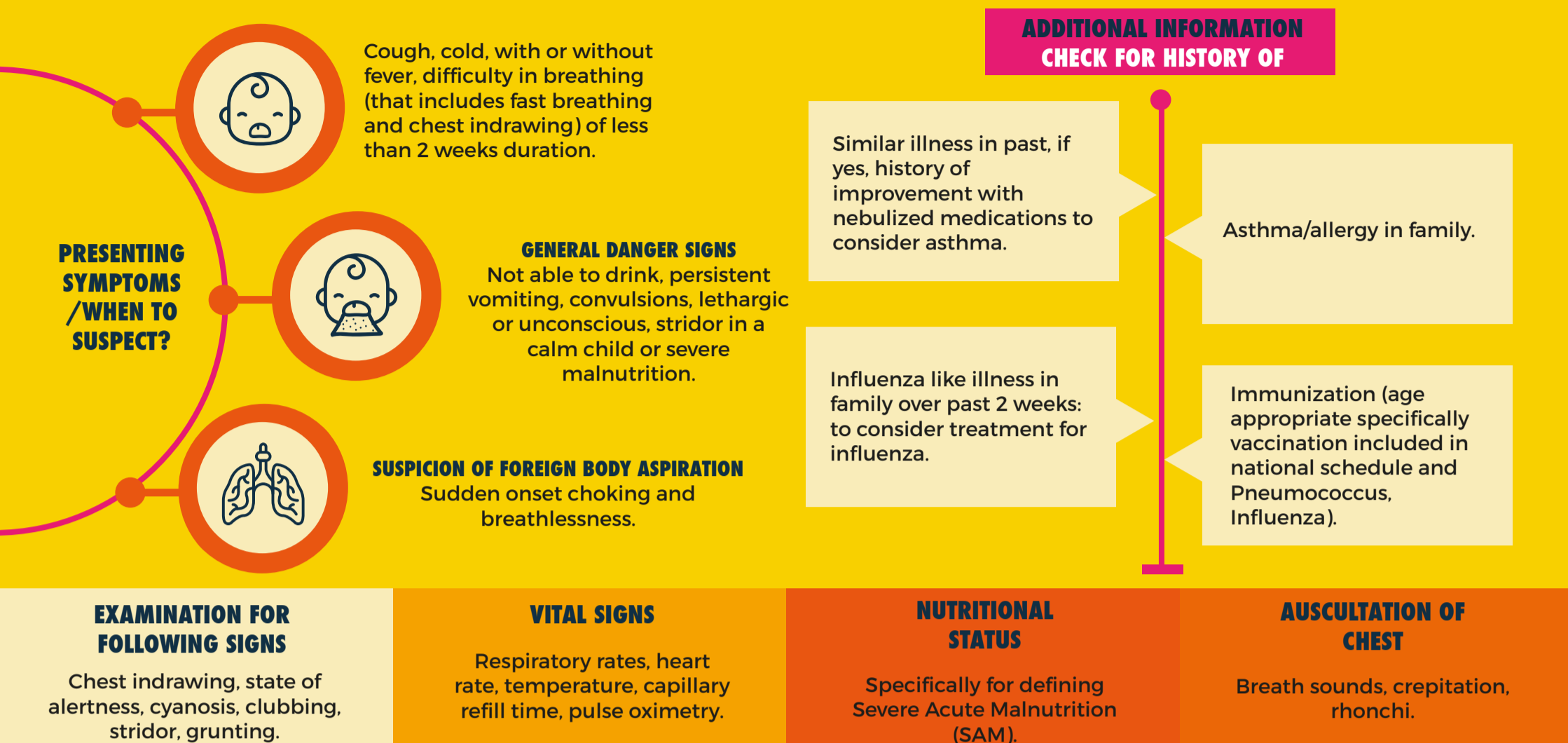
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- Management of severe acute malnutrition in children 6-59 months of age with oedema. Available at http://www.who.int/elena/titles/oedema_sam/en/
- Operational guidelines on Facility Based Management of Children with Severe Acute Malnutrition. Available at <http://nhm.gov.in/nrhm-components/rmnc-h-a/child-health-immunization/child-health/guidelines.html>
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Standard Treatment Workflow (STW) for the Management of SEVERE PNEUMONIA IN CHILDREN

ICD10-J18.9



Discharge when child is switched to oral medications, accepting oral for 24 to 48 hours

KEEP A HIGH THRESHOLD FOR INVASIVE PROCEDURES

REFERENCES

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PSYCHIATRY



Standard Treatment Workflow (STW) for the Management of ALCOHOL USE DISORDERS ICD10-F10

Special attention to: (AUDIT can be used for screening)

- H/o head injury
- Appearing under influence of alcohol
- H/o impaired social, occupational functioning
- Daily alcohol consumption
- Drinking in large quantities (men: 5 or more drinks/day; women: 4 or more drinks/day)

Universal screening for every patient attending any healthcare facility

ASSESSMENT (DETAILED HISTORY)

- Age at initiation, quantity, frequency and progression (daily use and/or morning drinking)
- Time of last alcohol use and amount
- Binge drinking (men: 5 drinks over 2 hours; women: 4 drinks over 2 hours)
- Withdrawal state: insomnia, restlessness, anxiety, tremors. Use of alcohol (or benzodiazepines) to relieve or avoid withdrawal symptoms.
- Tolerance: increased doses of alcohol taken to achieve effects produced by earlier intake
- Craving
- Difficulty in controlling duration of drinking or amount of use
- Preoccupation with alcohol use with neglect of alternative pleasures or interests
- Increased time spent to obtain/ take alcohol/ recover from its effects
- Continued use despite patient being aware of evidence of harmful consequences that have occurred
- Abstinence and treatment attempts in past and reasons for relapse
- Co-morbid medical illness or psychiatric illness and their treatment
- Complications:
 - Physical- gastritis, peripheral neuropathy, hepatic dysfunction, accidents/injuries
 - Psychosocial - loss of work, fights at home, financial, legal problems

EXAMINATION

VITALS	WITHDRAWAL SIGNS	SIGNS OF HEPATIC DYSFUNCTION	NEUROLOGICAL SIGNS
<ul style="list-style-type: none"> • BP • Pulse Rate • Temperature 	<ul style="list-style-type: none"> • Tremor • Sweating • Tachycardia 	<ul style="list-style-type: none"> • Enlarged liver • Icterus • Abdominal swelling 	<ul style="list-style-type: none"> • Cerebellar signs • Peripheral neuropathy • Confusion

DIAGNOSIS

Hazardous or Harmful use

- Involvement in risky behaviours such as binge drinking, driving under the influence of alcohol
- It should have resulted in harmful physical or psychosocial consequences

Alcohol dependence (three of the following six criteria to be present for at least one month)

- 1) A strong desire or sense of compulsion to take alcohol
- 2) Difficulty in controlling alcohol use
- 3) Withdrawal state when alcohol use has stopped or been reduced or use of the alcohol (or benzodiazepines) to relieve or avoid withdrawal symptoms
- 4) Evidence of tolerance
- 5) Preoccupation with alcohol use
- 6) Alcohol use persisting despite clear evidence of harmful consequences

INVESTIGATIONS

CBC	Liver function test	Blood sugar	Electrolytes	CT head (in case of seizure/delirium tremens)
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MANAGEMENT

PRIMARY CARE

- Alcohol Hazardous/ Harmful users - Brief Intervention* to reduce/stop consumption
- Alcohol Dependent users - Advice to stop use and motivate for treatment using Brief intervention*

SECONDARY CARE

- Treatment of withdrawal symptoms
- Management of withdrawal seizure
 - Inpatient management with benzodiazepines (diazepam or lorazepam)
 - Frequent titration of medication. Higher dosage may be required.
 - Closer monitoring and nursing care
- Treatment of additional psychiatric disorder or substance use disorder

- H/o withdrawal seizures/hallucinations
- Additional psychiatric disorder
- Recurrent failed attempts at treatment

REFER TO SECONDARY CARE IF

TERTIARY CARE

- Treatment of delirium tremens
 - R/o head injury, hepatic encephalopathy, Wernicke's encephalopathy
 - R/o other causes of delirium
 - Manage on similar lines as withdrawal seizures
 - Management in ICU setting when indicated
- Consult with other medical specialists (like gastroenterology or medicine for hematemesis).
- Management for suicidality or violence when emergent threat

REFER TO TERTIARY CARE IF

- H/o delirium tremens
- Major medical problems
- Additional substance use

*BRIEF INTERVENTION

Inquire using open ended questions in a non-judgmental manner. Help patient to evaluate the risks versus the perceived benefits and to arrive at a decision to reduce or stop alcohol use.

Includes (FRAMES) :

- Feedback about alcohol related problems
- Responsibility - acknowledging that the patient is responsible for making the decision about their alcohol use
- Advice regarding the harms associated with continued use
- Menu of alternative change options (includes identifying alternative activities such as hobbies, involving the family in treatment)
- Empathetic attitude
- Self efficacy - to encourage patients' confidence that they can make changes in their alcohol use and lifestyle

WITHDRAWAL MANAGEMENT

- Tab Diazepam (20-40mg/day in divided doses) based on severity of withdrawals.
- Monitor and titrate dose.
- If patient comfortable, reduce dose of medication by 10% to 20% per day, taper within 7 to 10 days
- Thiamine 100 mg OD
- Significant liver dysfunction: Lorazepam (2 mg Lorazepam equal to 5 mg Diazepam)

RELAPSE PREVENTION

(Long term goals- abstinence and socio-occupational integration)

- **Disulfiram (250 mg OD)**
 - Pre-requisites:
 - Motivated patient
 - Patient's written consent
 - Under supervision of family members.
 - Inform patient and family about unpleasant, potentially serious reaction with even small amounts of alcohol (flushing, headache, vomiting, reduction of blood pressure, arrhythmias)
 - Ability of health personnel in the area to handle a potential reaction
- **Relapse prevention counselling:**
 - Identify cues leading to craving (like person, place, situation etc)
 - Develop strategies to deal with them effectively

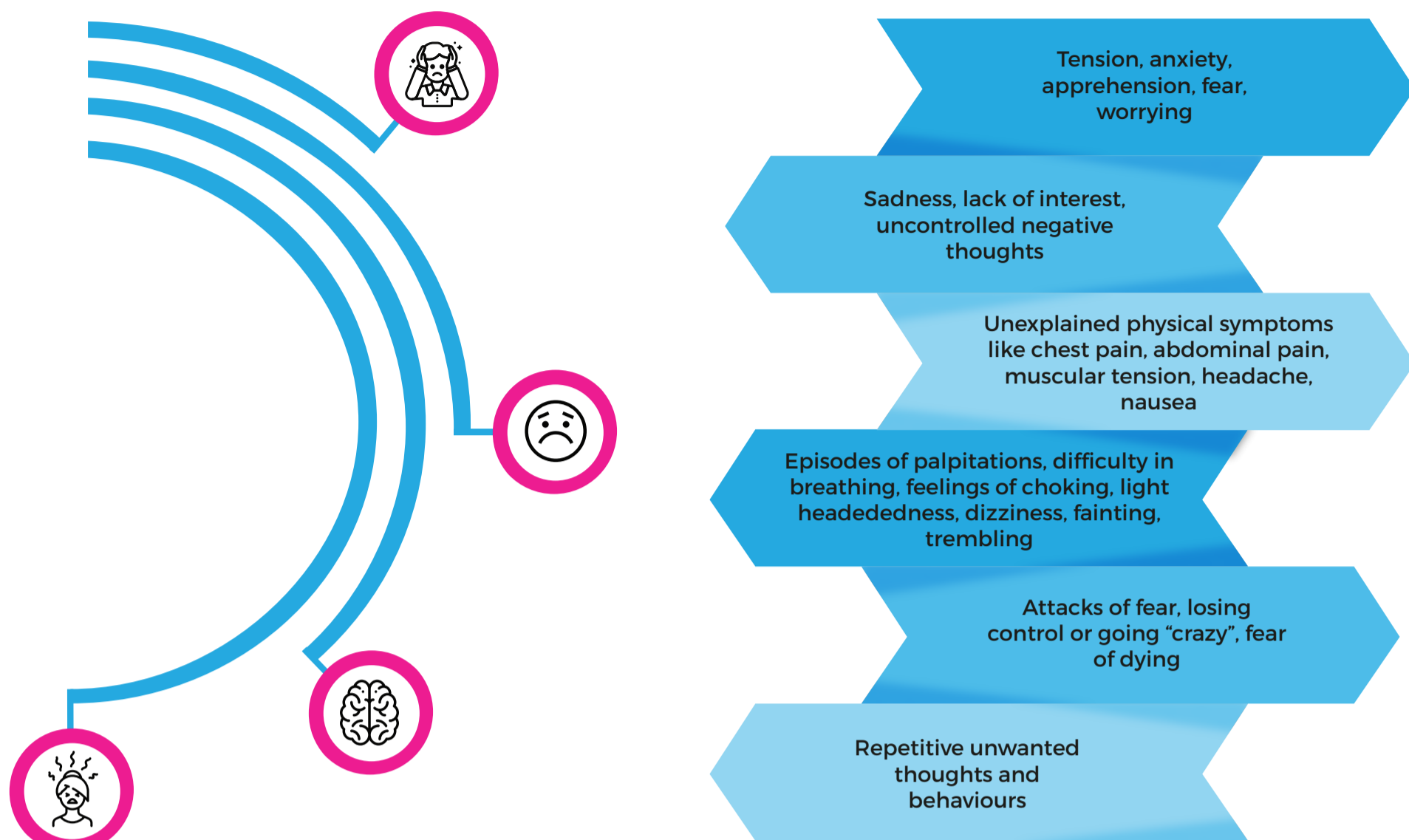
INDICATIONS FOR ADMISSION

Failure of outpatient treatment	H/o withdrawal seizures/delirium tremens	Co-morbid significant medical illness and/or psychiatric illness	Poly-substance use
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KEEP A HIGH THRESHOLD FOR INVASIVE PROCEDURES



Standard Treatment Workflow (STW) for the Management of ANXIETY DISORDERS ICD-10-F40-F42



DIAGNOSIS

Generalized Anxiety Disorder (GAD): Chronic feeling of tension, apprehension, anxiety or worrying about a number of events or activities that involve every day routine life circumstances (e.g., work, school, health, finance, household chores etc.)

Agoraphobia: Fear of going out of home alone, being in enclosed spaces (e.g., malls, cinemas etc.), open spaces (e.g., bridges, vast playgrounds etc.), using public transportation (e.g., trains, buses, planes etc.)

Panic Disorder: Recurrent unexpected attacks of intense fear/ anxiety along with physical symptoms (palpitations, feelings of "choking", trembling, chest pain feeling dizzy/faint etc.)

Social Phobia: Marked fear and avoidance of social situations (e.g., interaction with strangers, meeting unfamiliar people, performing in front of others)

Obsessive-compulsive disorder (OCD): Recurrent and persistent unwanted thoughts (e.g., unwanted sexual and blasphemous thoughts, fear of harming self or others, fear of contamination, doubts about daily activities etc.) and repetitive behaviours (e.g., excessive washing / cleaning, checking, ordering etc.)

ASSESSMENT

- Duration of anxiety
- Degree of distress, and impairment of day-to-day functioning
- Symptoms of depression
- Substance and alcohol misuse
- Physical disorders: thyrotoxicosis, pheochromocytoma and hypoglycaemia
- Psychosocial factors: ongoing stress and other issues pertaining to work, family

MANAGEMENT

PRIMARY CARE LEVEL

Psychoeducation

- Reassurance
- Explain symptoms are of anxiety/ fear and mimic symptoms of physical illnesses (e.g., heart attack)
- Do not investigate excessively. Few investigations like ECG, ECHO maybe necessary in some patients
- Discourage doctor shopping
- Do not avoid triggers of panic attacks (e.g., physical exertion, agoraphobic situations) and fear (e.g., travelling by public transport).
- Emphasize avoidance maintains fears and phobias.
- OCD: Educate that the unwanted thoughts are a part of illness, and not a reflection of character or hidden intentions.

Pharmacological treatment

- Mild illness: Spending time, reassurance, and psychoeducation. May not need any medications.
- No improvement (few weeks): Escitalopram 5mg / day at night, with increase to 10 mg/d in a week. No satisfactory improvement in 4-6 weeks, may increase to 20 mg / day. If there is no significant improvement in another 4-6 weeks, refer to a specialist.
- Severe and unbearable anxiety: Diazepam (5-10 mg) may be given at night. Do not continue for > 1 month. Taper and stop over 2 weeks. Long-term treatment with benzodiazepines to be avoided
- Escitalopram to be continued for at least 1-2 years after remission
- Side-effects (sexual dysfunction, sedation, weight gain): monitor and address periodically

SECONDARY CARE LEVEL (DISTRICT HOSPITAL)

- Review diagnosis and treatment history if there is no improvement with a trial of Escitalopram.
- Check whether the patient has taken medication at prescribed dose and on a regular basis
- Second SSRI (either of them for about 2-3 months):
 - Sertraline upto 200 mg/day,
 - Fluoxetine upto 60 mg/day,
 - Paroxetine upto 50 mg/day,
 - Fluvoxamine upto 300 mg/day
- No response to second SSRI: cognitive behaviour therapy (CBT) if trained therapists available.
- Refer to tertiary centre if unsatisfactory response after second SSRI and / or addition of CBT.
- If referral to tertiary centre is not feasible, psychiatrists may try other strategies (other than Deep Brain Stimulation and surgery for OCD) mentioned under the "tertiary care" at the secondary level itself.

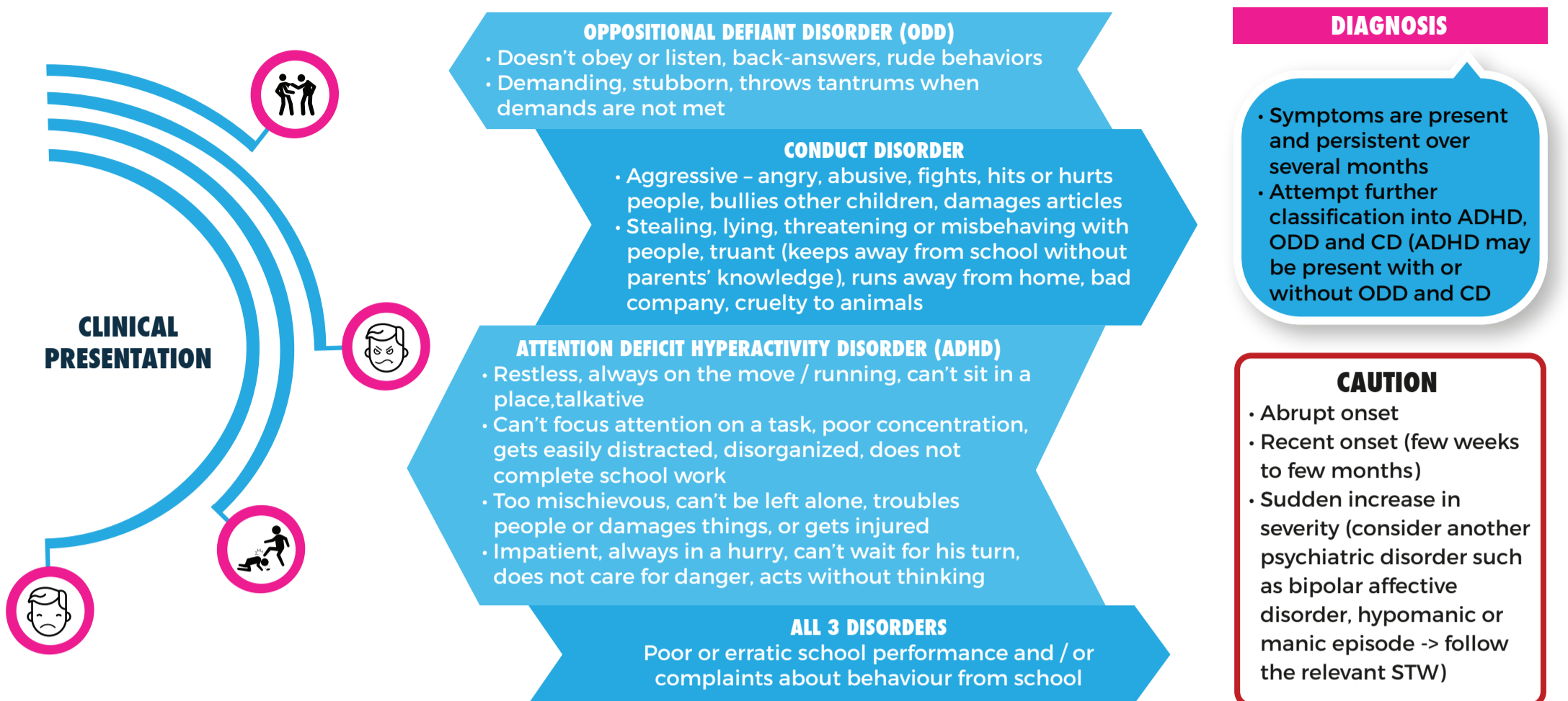
TERTIARY CENTRE (MEDICAL COLLEGE, REGIONAL MEDICAL CENTRE, PSYCHIATRIC HOSPITAL)

- Evaluate reasons for treatment resistance like
 - Wrong diagnosis
 - Inadequate drug treatment,
 - Poor adherence to treatment
 - Inadequate CBT,
 - Presence of comorbid conditions such as personality disorders and organicity
- Panic disorder: evaluate any medical conditions that mimic panic disorder (hyperthyroidism, hyperparathyroidism, pheochromocytoma, vestibular diseases, seizures, arrhythmias, etc.)
- OCD: Trial of third SSRI or clomipramine
- Treatment resistant OCD: inpatient treatment for intensive therapist-assisted daily CBT and for rationalization of medication regimen.
- Other anxiety disorders: Trial of non-SSRIs (e.g., venlafaxine, duloxetine, pregabalin etc.) and tricyclic antidepressants
- If response to medications is poor or unsatisfactory:
 - CBT is the preferred mode of treatment alone or in combination with medications.
 - Treat comorbid psychiatric disorders (e.g., personality disorders)
 - Pharmacological augmenting strategies if antidepressants and CBT do not provide relief.

KEEP A HIGH THRESHOLD FOR INVASIVE PROCEDURES



Standard Treatment Workflow (STW) for the Management of CHILDHOOD BEHAVIORAL DISORDERS ICD10- F90-98



ASSESSMENT (History From Multiple Sources)

PARENT INTERVIEW

- Symptoms- onset, duration, type(ODD, Conduct, ADHD-as above) and severity
- Developmental problems, emotional disturbances and stress
- Alcohol and substance use /misuse
- Impact on child and family

FAMILY SITUATION

- Health (including mental health) and wellbeing of family members
- Cohesion, mutual understanding and harmony in the family
- Parenting and childrearing practices: caring and disciplining, criticism, unfair comparison and physical punishments, mutual blaming of parents for child's problem

SCHOOLING

- Attendance
- Performance
- Learning problems,
- Classroom behaviors
- Recent changes in syllabus and/or school

CHILD INTERVIEW

- Develop rapport(discuss neutral topics; avoid direct tackling of misbehaviors)
- Observe:
 - Features of ADHD (restless, fidgety, easily distracted, attention keeps shifting)
 - Speech and language ability, intelligence, academic skills and mood
- Enquire about any stress or difficulties child is facing at home, school, and with peers and anger control

MANAGEMENT

WORK WITH FAMILY

- PSYCHOEDUCATION**
 - Explain the child's behaviours are not intentional
 - Not child's fault, do not blame the child
 - Multifactorial causes-lack of self-regulation, and adverse environment
 - Can be improved with proper management
 - Parents can directly contribute to the child's improvement
- Help parents deal with their own worries and stress (listening, giving space to ventilate, validate and empathize their difficulties, reassure)
- Recognize and manage mental health problems such as depression and alcohol problem in parents
- Parent management training*

WORK WITH THE CHILD

- Avoid advice
- Anger management (count from 10 -1 backwards, move away from situation, deep breaths, relax, self-talk to cool down)
- Children with ADHD: "stop-think-act" or "halt and proceed" technique

WORK WITH THE SCHOOL

- Feedback to school regarding child's condition
- Teachers to give extra attention, help and support for the child
- Extra coaching, if needed in case of learning problems

*PARENT MANAGEMENT TRAINING

- Analyse the problem behaviors and understand patterns : time of occurrence, triggers, duration and consequences
 - Engage with child in mutually enjoyable, pleasurable activities (playing games, discussing interesting things or doing activities together)
 - Set clear do's and don'ts and explain to child in clear, simple, short instructions the consequences (like withholding privileges following misbehavior; use star-charting (contingency management) and rewards based on number of stars earned
 - In children with ADHD, develop clear daily routines, supervise activities and appreciate on completion of tasks
 - Limit screen time/ monitor use of electronic devices
- | | |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <ul style="list-style-type: none"> Dos Consistency in enforcing rules Catch the child being good and praise Ignore negative behaviours Child can be put in a boring place till he/ she becomes quiet for a few minutes (time-out) Encourage age appropriate responsibilities | <ul style="list-style-type: none"> Don'ts Bribe False promises and threats Harsh punishments Excessive criticism and blaming especially in front of others Unfair comparison Yielding to unreasonable demands |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

MEDICATION (AVOID BEFORE 5 YEARS)

- Severe and persistent aggression:**
 - T. Risperidone** under close supervision (starting dose-0.25 mg, single daily morning dose after breakfast. Based on response, increase by 0.25 mg weekly up to 1 mg single daily dose).
 - Not to exceed 1 mg/day**
 - Response + :** continue 3 months f/b slow taper
 - Response - :** 4 weeks trial, then refer
 - Monitor adverse effects: weight gain, extra-pyramidal symptoms (EPS) [if EPS : add 1 mg Trihexyphenidyl OD morning]
- Severe hyperactivity and impulsivity:**
 - T. Clonidine (starting dose-25 µg single daily dose before sleep, increase by 25 µg weekly up to 100 µg per day in 2-3 divided doses
 - Monitor BP and drowsiness
 - Advise against sudden discontinuation

REASONS FOR REFERRAL

Severe, complicated presentation Lack of response to treatment Severe aggression Highly dysfunctional family Alcohol and substance abuse

SECONDARY CARE (DISTRICT HOSPITAL)

TERTIARY CARE (MEDICAL COLLEGE / REGIONAL REFERRAL CENTRE)

- Review and reassess diagnosis (clinical evaluation using Rutter's multi-axial system) and all the pointers given above
- If failed trial of Clonidine/ Moderate ADHD: T. Atomoxetine (starting dose-10 mg single daily morning dose after breakfast. Increase up to 1mg/ kg/day under close supervision). Monitor adverse effects and response
- Systematic parent management training / behavioral management and individual therapy (as given above)

- Evaluate and manage severe behavior disorders – severe ADHD, ODD, and CD, if necessary on short-term inpatient basis
- Multi-modal management with clear individualized plan
- Trial of Methylphenidate in moderate / severe ADHD under expert supervision
- Recognize and treat comorbid disorders such as bipolar disorder, substance use disorder, and internalizing disorders and manage
- Pharmacological management of older children / adolescents with severe aggression / impulsivity with Risperidone and/or Lithium
- Family therapy for dysfunctional / discordant families, contributing to child's condition
- Management of children in difficult circumstances with mental health issues (children in need of care and protection; children in conflict with law)

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KEEP A HIGH THRESHOLD FOR INVASIVE PROCEDURES

This STW has been prepared by national experts of India with feasibility considerations for various levels of healthcare system in the country. These broad guidelines are advisory, and are based on expert opinions and available scientific evidence. There may be variations in the management of an individual patient based on his/her specific condition, as decided by the treating physician. There will be no indemnity for direct or indirect consequences. Kindly visit our web portal (stw.icmr.org.in) for more information.



Standard Treatment Workflow (STW) for the Management of CHILDHOOD EMOTIONAL DISORDERS

DIAGNOSIS

CLINICAL PRESENTATION - Recent Onset Behavioral Changes

SOMATIC (PHYSICALLY UNEXPLAINED) SYMPTOMS

- Weakness and tiredness
- Aches and pains
- Headache
- Non-epileptic attacks of fainting
- Chest pain and stomach pain
- Hyperventilation- often triggered by stress or distress

SYMPTOMS OF DEPRESSION

- Loss of interest in usual activities
- Recent deterioration in school performance
- Wanting to be alone, withdrawn, not interacting with people
- Looks unhappy, "off mood", crying for trivial or no reason, irritable, sensitive to any criticism
- Decreased sleep, loss of appetite and weight loss
- Talking about death and dying, self harm (eg. self-cutting) or suicidal attempt

SYMPTOMS OF ANXIETY

- Always worrying, tense
- Exam tension, performance anxiety, worries about marks and ranks
- Excessive fear and avoidance of some objects or situations (insects, animals, ghosts)
- Reluctance or refusal to go to school
- Very shy, avoids social situations, scared of talking or interacting with strangers,
- Clinging to mother, scared of being separated from mother

- Persistent symptoms of emotional disturbance for several weeks, significantly affecting the child's life
- Unexplained by medical condition such as hypothyroidism
- Depression and anxiety symptoms can co-occur
- Depression more common in adolescents, may have features similar to adult onset depression

CAUTION

- Assessment of suicidal risk and a plan of action is important in children with emotional disorders, especially depression (refer to appropriate STW)
- Elicit h/o hypomania/mania in children with moderate to severe depression (consider diagnosis of bipolar disorder)
- Physical conditions can cause similar symptoms (anemia and thyroid disturbance)

ASSESSMENT

PARENT INTERVIEW AND HISTORY TAKING

- Onset, duration, severity and full range of symptoms
- Home environment, family life and relationships, parenting practices and stressors
- Information (from parents and school) about school performance, behavior, school refusal, bullying experiences, peer relations and any recent change

CHILD INTERVIEW

- Develop rapport
- Ask subjective distress (low mood, irritability, sadness, lack of enjoyment of activities, worries, fears, tensions, autonomic symptoms)
- Stressful events (loss, death in the family, separation, frightening experiences, traumatic abusive or shocking events, humiliating experiences, bullying in school, academic stress) and interpersonal difficulties
- Explore parent-child relations and interactions and any undue punishment or criticism

PHYSICAL EXAMINATION

(Rule out)

- Post-viral syndrome
- Recurrent attacks of malaria
- Chronic infections, chronic physical illness, anaemia, PCOD or thyroid disturbance

MANAGEMENT

WORK WITH PARENTS

- **PSYCHOEDUCATION:**
 - Child is emotionally disturbed and not able to function well
 - Not the child's fault
 - Avoid undue criticism, over expectation, unfair comparison, scolding and punishment
 - Parents' support, encouragement and understanding is important
- Counsel about suicidal risk in depression and to be alert to pointers to suicidality
- Evaluation and management of the mental health issues in parents
- Discuss about specific steps to reduce undue stress the child is facing

WORK WITH THE CHILD

- Psycho-education of the child- explain they are suffering from an emotional problem and it is not their fault and they will get better with proper treatment
- Anxiety management and emotional regulation skills
 - Muscle relaxation
 - Deep breathing exercises
 - Praanaayaama / yoga
 - Substituting distressing thoughts with more comforting thoughts
- Counsel the child to confide any distressing thoughts, including thoughts of death and dying
- Encourage the child to gradually return to the usual life and activities in a step-by-step manner with parental support and encouragement

WORK WITH SCHOOL

- Give feedback to the school about child's condition and stress, need for support, encouragement and school's cooperation.
- If school refusal, graded return to school: encourage child to return to school gradually with the support of family and cooperation of school (e.g. initially for a few minutes in school compound, later for 1 period in school and moving on to longer duration)

MEDICATION (MODERATE CASE OF DEPRESSION OR ANXIETY IN ADOLESCENTS)

- Tab Fluoxetine - start at 10 mg OD morning, increase to 20 mg OD after 2 weeks depending on response
- Inform adverse effects: behavioral activation (marked restlessness and irritability), onset of hypomanic symptoms, and worsening of suicidal ideas. Stop drug if they are troublesome
- Avoid benzodiazepines (except as temporary measure for few weeks in severe anxiety attacks or panic attacks - Clonazepam 0.25- 1 mg /day)

REASONS FOR REFERRAL

- Frequent expression of suicidal ideation/ attempted suicide / self-harm behavior such as self-cutting
- Severe symptoms
- Complicated picture, or features of obsessive compulsive disorder (OCD)
- No response to interventions in 4-6 weeks

SECONDARY CARE (DISTRICT HOSPITAL)

- Review and reassess diagnosis through detailed clinical examination using Rutter's multi-axial system
- Review the treatment received and plan multi-modal treatment.
- Reconsider medications, and augmentation strategies
- Review child's and family's awareness of the illness and do psycho-education
- Ascertain the presence of psychosocial factors : disturbed home environment, parent-child relationships and severe stressors
- Screen parents for mental health problems and manage accordingly
- **Individual therapy** focussing on identifying and challenging negative thoughts, anxiety management and coping with stress, helping them face difficult situations in small steps, improving interpersonal relationships
- **Parent counselling** to address family issues, communication and interaction patterns
- Collaborate with school wherever necessary (get school report; explain problem in simple terms, and suggest ways by which school can help)
- Recognize and manage less common problems such as obsessive compulsive disorder, psychoses and bipolar disorders
- Manage adolescents with mild / moderate suicidal risk

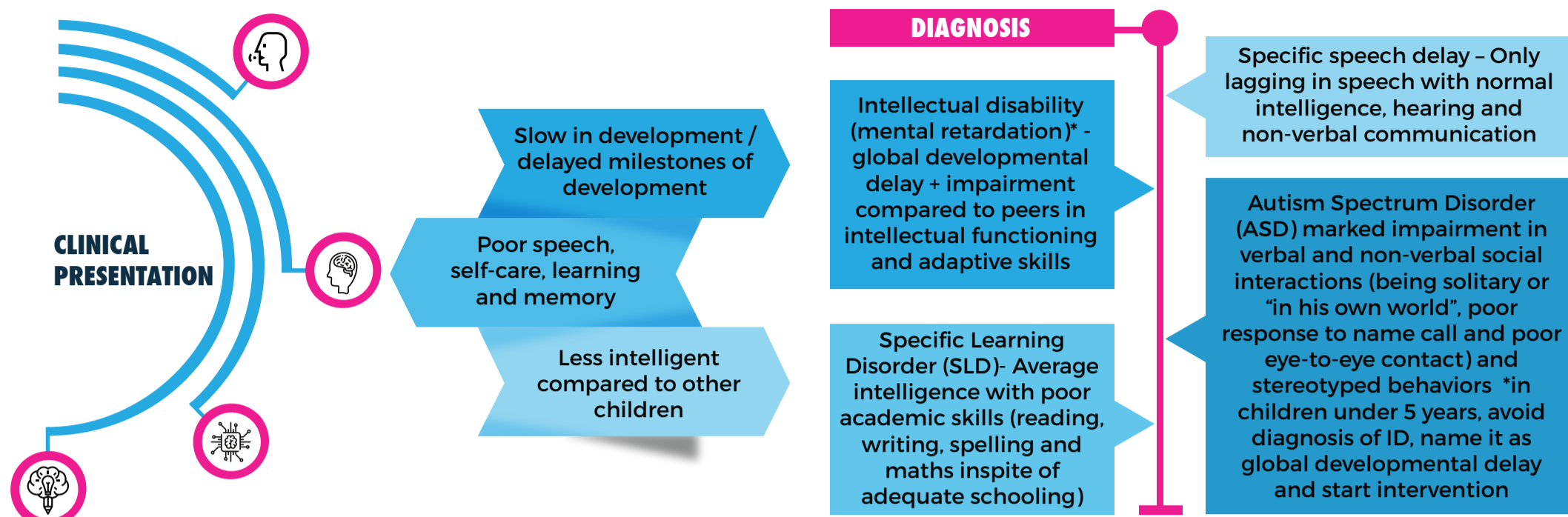
TERTIARY CARE (MEDICAL COLLEGE / REGIONAL REFERRAL CENTRE)

- Thorough diagnostic evaluation
- Manage severe mental disorders - psychoses, recurrent mood disorders, adolescents with severe depression, & treatment resistant cases, persistent suicidality, recurrent self-cutting, if necessary in inpatient setting
- Family therapy for dysfunctional / discordant families contributing to child's condition
- Cognitive behavior therapy for older children with severe OCD, depression, and anxiety disorders
- ECT on case to case basis (older adolescents with severe depression, mania, psychosis or catatonia unresponsive to adequate pharmacological management)
- Appropriate psycho-social steps if there is abuse, maltreatment or neglect
- Neurology referral in suspected cases of epilepsy and organicity

KEEP A HIGH THRESHOLD FOR INVASIVE PROCEDURES



Standard Treatment Workflow (STW) for the Management of CHILDREN WITH DEVELOPMENTAL PROBLEMS ICD10-F70-89



ASSESSMENT

DETAILED DEVELOPMENTAL ASSESSMENT:

- Assess if child is lagging behind in developmental attainments compared to same-age children
- Ask mother to estimate the mental age of child
- Ascertain if delay is global (all milestones) or restricted to one area (motor or speech)

PHYSICAL EXAMINATION:

- Height and weight,
- Head circumference,
- Vision and hearing
- Any noticeable physical anomalies (club-foot) or unusual facial appearance
- Motor abnormalities (stiffness / spasticity or weakness of limbs, unsteady gait)
- Any other problems (heart murmurs, organomegaly)

BEHAVIOURAL PROBLEMS:

- Hyperactive
- Impulsive behaviors
- Sleeping and feeding problems
- Aggression

EMOTIONAL PROBLEMS:

- Excessive crying
- Irritability
- Shyness and fears

OTHERS:

- Family situation
- Parents' awareness of the child's problems
- Quality of attention and care being given to the child,
- Past consultations and treatment educational history

MANAGEMENT

PSYCHO-EDUCATION OF PARENTS

- Normal** - reassure parents
- Mild delay** ("at risk") - early intervention and follow-up
- Explain causation due to some damage to brain before, during or after birth
- No medication can improve intelligence
- Teaching and training to improve skills and gaining independence
- Systematic, persistent and repetitive training as per the child's ability
- Treatment of associated problems (vitamin or mineral deficiency or epilepsy, ADHD, vision/ hearing issues,) - refer to appropriate STW
- Avoid overprotection, overindulgence and understimulation

EARLY INTERVENTION / SENSORY-MOTOR STIMULATION FOR YOUNG CHILDREN - UNDER 3 YEARS

- Create opportunities for the child to learn with interest and attention
- Engaging and spending time with child in activities
- Offer appreciation
- Engage the child to use eyes and ears (different types of sounds and sights), touch (eg., tickling, stroking, gentle massaging), movements (gentle movement of limbs, gentle bouncing, range of movement exercises) and improving hand functions (taking, holding, giving, pushing, pulling)
- Use play materials-rattles, paper balls, rubber balls, clay, soft dough, water play, soap bubbles, vegetables.
- Parallel vocalization to improve utterances (making the same sound as the child immediately).
- Improve conceptual skills by classifying, arranging, sorting, and recognizing and naming activities (for eg., vegetable sorting, grain sorting, arranging vessels by their size and shape)

HOME-BASED PARENT MEDIATED SKILLS TRAINING

- Develop and maintain regular, stimulating daily routines
- Teach parent to teach child : simple imitation, pointing, pretend-play; self-help skills (eating, toilet training, bathing, dressing), doing simple household chores (washing utensils, helping in cleaning house), social skills - skills of interaction, simple academic skills, simple vocational skills, helping in kitchen under supervision, self-protection
- Find current level of adaptive abilities of the child and choose a target skill
- Tell and show how to do things (modelling), make the tasks simpler, break activities in simple steps and teach one step at a time, notice and praise even minor efforts and improvements (rewarding or reinforcing), using hand-on-hand techniques (keeping your hand on the child's hand and making them do the activity)

EDUCATION AND TRAINING

- Liaise with schools and ensure child attends school that is most appropriate
- Assist in enrolment to special school
- Consider training in vocational skills (informal and formal) for older adolescents

SOCIAL WELFARE / LIAISON MEASURES

- IQ testing and certification for social welfare benefits
- Help parents to link with other agencies/ services that deal with such children such as CBR programs or parent associations

- Severe or multiple developmental problems
- History of regression (loss of acquired skills)
- Definite family history of developmental problems (h/o similar problem in the sibling)



REASONS FOR REFERRAL



- Co-occurring severe behavioral or emotional problems
- Suspected case of ASD
- Suspected SLD
- Genetic counselling
- Speech therapy or physiotherapy

SECONDARY CARE (DISTRICT HOSPITAL)

- Psychological testing for ID, SLD and diagnosis of ASD
- Basic management of ASD - home-based parent-mediated training in social, communicative, and self-help skills
- Appropriate management of behavior problems with medication / psychosocial or behavioral intervention (see relevant STW's)
- Help parents access relevant services such as District Early intervention centres (DEIC's), parent organizations, and benefits

TERTIARY CARE (MEDICAL COLLEGE / REGIONAL REFERRAL CENTRE)

- Evaluate and manage children with severe IDD, ASD, multiple disabilities, and those with severe comorbid disorders such as ADHD, aggression, bipolar disorder, and psychotic disorders through multi-disciplinary approach
- Investigate for the cause - review tests already done; imaging, genetic tests, metabolic tests (as per requirement); arrange for genetic counselling
- Manage treatable disorders (like hypothyroidism and inherited metabolic disorders)
- Manage comorbid physical health problems (like epilepsy, visual /hearing impairment, locomotor/ orthopaedic problems)
- Assessment and management for SLD - psychoeducation of the child and parents, liaison with school, teaching basic remediation techniques to parents, helping parents access relevant organizations, issue of exemption certificates, and decisions about further schooling such as open schooling

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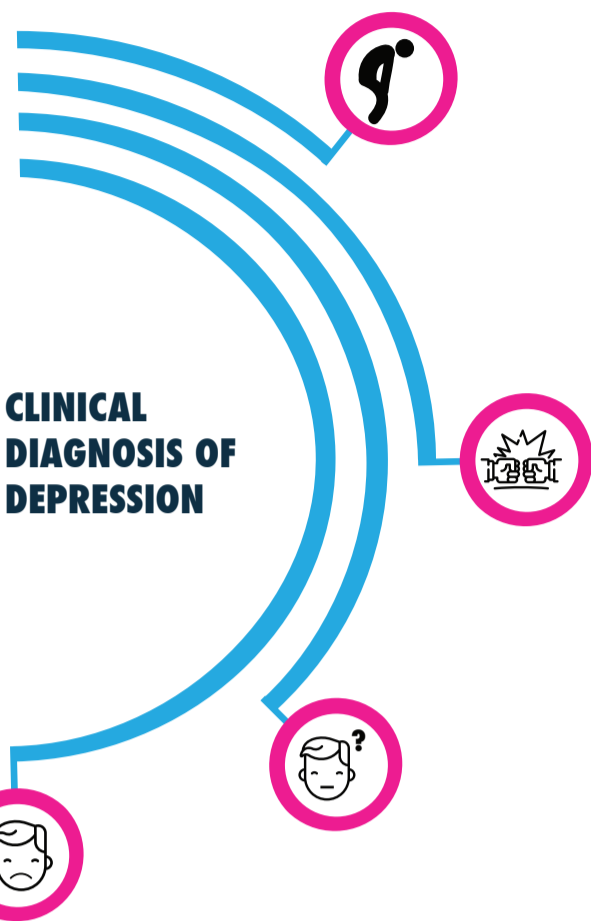
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KEEP A HIGH THRESHOLD FOR INVASIVE PROCEDURES

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Standard Treatment Workflow (STW) for the Management of DEPRESSION ICD10-F45



CORE SYMPTOMS

- 1 Depressed mood
- 2 Loss of interest and enjoyment
- 3 Easy fatigability/diminished activity

ADDITIONAL SYMPTOMS

- Reduced concentration and attention
- Reduced self-esteem and self-confidence
- Ideas of guilt and unworthiness
- Bleak and pessimistic views of the future
- Ideas or acts of self-harm or suicide
- Disturbed sleep
- Diminished appetite

To make a diagnosis of depression, symptoms must present for at least 2 weeks.

Severity of depression	Core symptoms	Additional symptoms
Mild depression	2	2 or more
Moderate depression	2	3 or more
Severe depression	3	4 or more

Rule out Bipolar Disorder / Grief / Adjustment Disorder

CLINICAL ASSESSMENT

Cognition

- Hopelessness (about future)
- Helplessness (about others)
- Worthlessness (about self)

Assessment of Depressive Cognition

Assessment of Suicide Risk

- Suicidal thoughts
- Suicidal idea
- Suicidal intent
- Immediate risk for attempt

Assess friend and family support

INVESTIGATION

- Haemogram
- Thyroid function tests
- Electro Cardiogram
- Electrolytes (Sodium)
- Rule out secondary medical cause of depression like Hypothyroidism
- Rule out use of anticancer drugs (Cyclophosphamide) / anti retroviral drugs (Efavirenz, Zidovudine)/ Antibiotics (Dapsone, Ethambutol)/ Anabolic Steroids/ Propanolol
- Rule out associated comorbid medical condition – Diabetes, Stroke, Epilepsy, Cancer, Coronary Artery Disease and Auto Immune disorder

AT PRIMARY CARE

MILD DEPRESSION

- Advise Behavioral Activation to patients
- Practicing activity monitoring - write down your activities / rate your depression / schedule activities that make you feel good / make a to do list/ set clear and specific goals
- Focusing on your value categories - make time for your family / friends / set clear goals at work / contribute to community
- Reccomend yoga & meditation
- Handling daily task - monitor sleep /diet and practice good personal hygiene
- Supportive psychotherapy / Brief Counselling
- Validate the problems and ensure frequent follow-up
- If no improvement in 4 to 6 weeks, consider pharmacotherapy

MODERATE / SEVERE DEPRESSION

- Tab Escitalopram 10 mg-20 mg /day or Cap. Fluoxetine 20mg -40mg /day
- Tab. Clonazepam 0.25mg - 0.5mg /day for sleep disturbance / anxiety symptoms and consider taper and stop after 2 weeks.
- If patient responds to SSRI in 2 to 4 weeks, then continue treatment for 6 to 9 months and taper and stop

REFERRAL TO SECONDARY CARE

- Difficulty in making diagnosis
- No improvement after 4 to 6 weeks of treatment with first line medications
- Depression in special population: Elderly / Pregnancy / Lactation / Children / Adolescents
- Comorbid medical illness / Substance use
- Suicidal risk assessment

BROAD MANAGEMENT PLANS

- Selective Serotonin Reuptake Inhibitors (SSRI) are usually first choice (watch for GI bleed and drug interaction)
- Improvement starts in in 2nd week and expect adequate response by 6 weeks
- Duration of treatment typically lasts 6-9 months and Gradual tapering of medication advised for first episode
- Restart SSRI, In case of resurgence and recurrence of depressive symptoms
- Observe for switch / activation with Antidepressants
- Watch for risk of overdose with TCA (Amitriptyline / Imipramine) and Mirtazapine

AT SECONDARY CARE

- Confirm Diagnosis and Suicide risk assessment
- Assess for other Medical Comorbidities
- Investigations - Haemoglobin, Thyroid Function Test, Electrocardiogram
- Non Responder - Switch over to SNRI (Venlafaxine 75 - 150 mg, Mirtazapine 30 mg) or TCA (Amitriptyline 75 - 225mg / Imipramine 75 -225mg)
- Cognitive Behavioral Therapy / Problem Solving Therapy
- Add on Yoga Therapy / Meditation

REFERRAL TO TERTIARY CARE

- No improvement in 2nd line treatment
- Immediate risk for suicidal attempt / thought
- Needing intense counselling/ psychotherapy
- Co Morbid Substance - Cannabis / Poly substance

SPECIAL POPULATION

- Pregnancy / Lactation period - Pre Conception counselling and preferred drug is Tab. Sertraline 50 mg - use lowest possible dose
- Elderly - Tab. Escitalopram 10 -20 mg or Tab. Sertraline 100 mg (monitor for hyponatremia)
- Avoid TCAs like Amitriptyline / Imipramine in Elderly (due to anticholinergic side effects)
- Adolescents- Cap. Fluoxetine 20 -40 mg /day (observe for switch / activation/ suicidality)

AT TERTIARY CARE

- Reconfirm Diagnosis
- Assess other psychiatric comorbidities
- Partial Responder - Optimise the SNRI /TCA or Augment with Tab. Lithium 300 to 600mg /per day or Tab. Thyroxine 25 - 50 ug per day.
- Non Responder - Add Tab. Sertraline 100mg or Tab. Bupropion 300mg to existing Venlafaxine 150mg / Tab. Mirtazapine 30mg / Amitriptyline 225mg / Imipramine 225mg.
- Add on Electro Convulsive Therapy for Catatonia / Suicidality
- Add on Cognitive Behavioural Therapy/ Inter Personal Therapy / Problem Solving Therapy
- Add on low dose antipsychotic treatment (Risperidone 2 -4 mg / Tab. Olanzapine 5 - 10 mg) for psychotic symptoms

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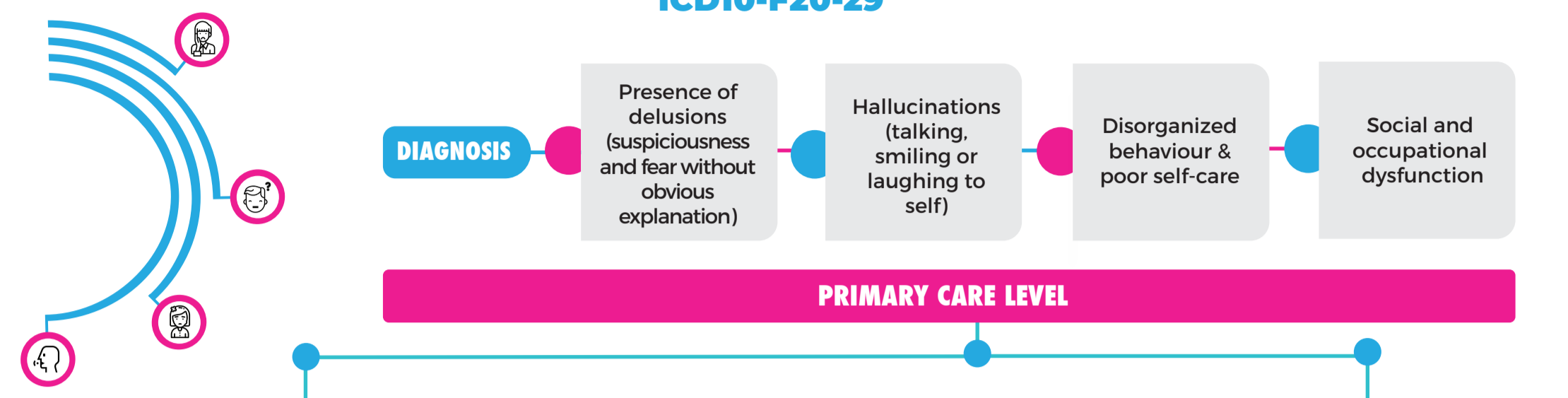
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Standard Treatment Workflow (STW) for the Management of PSYCHOSIS ICD10-F20-29



WELLNESS CENTERS	PHC
<p>Identify, educate and refer to PHC</p> <p>If immediate threat to self/ others, refer to Taluk / District center</p> <p>FOLLOW-UP AND REHABILITATION:</p> <ul style="list-style-type: none"> Monitor & manage challenges in treatment continuation If unsatisfactory outcome despite regular treatment: <ul style="list-style-type: none"> Liaise with higher centers for optimal outcome Liaise with social welfare department for disability certification & welfare benefits if continued poor outcomes 	<p>INITIATE TREATMENT:</p> <ul style="list-style-type: none"> T. Risperidone 2mg HSx1 week f/b 3 - 4 mg HS + Trihexyphenidyl (THP) 2mg(morning) Psychoeducation: <ul style="list-style-type: none"> medical model of psychosis address misconceptions & build hope inform about possible adverse effects of medications <p>FOLLOW UP:</p> <ul style="list-style-type: none"> 2 weeks after initial contact: Check for changes in symptoms and adverse effects (excess sleep, extrapyramidal symptoms (EPS), tiredness) adjust the dose of risperidone and THP accordingly; address questions if any; advise gradual return to work/school; give specific follow-up date; liaise with wellness center for ensuring continuity of care Once in 1 - 2 months: Check for symptoms, functioning and adverse effects (EPS, weight-gain, menstrual/sexual dysfunction); adjust the dose of Risperidone (range: 2 - 8 mg/day) and THP (range 2 - 6 mg/day); liaise with wellness center for ensuring continuity of care <p>REASONS FOR REFERRAL TO TALUK / DISTRICT LEVEL:</p> <ul style="list-style-type: none"> Diagnostic confusion / suspicion of organic condition Substantial risk of harm to self or others and catatonic symptoms Comorbid substance use, depression/anxiety, intellectual disability Poor symptom-control or functioning despite regular treatment or poor treatment adherence Significant adverse effects: weight-gain, metabolic adverse effects, tardive dyskinesia Questions regarding marriage, pregnancy, sexual dysfunction

SECONDARY CARE (TALUK/DISTRICT HOSPITALS)

INDICATION FOR REFERRAL FROM PHC	Diagnostic confusion	Poor response to Risperidone	Intolerance to Risperidone	Poor adherence to treatment	Comorbid conditions	Challenging situations	Rehabilitation needs	Pregnancy
<p>MANAGEMENT</p> <p>#Encourage follow up in primary care after addressing referral issues</p> <p>* Watch for adverse effects as SSRIs may increase serum levels of antipsychotics</p>	<p>Clarify diagnosis; neuroimaging if organicity is suspected</p>	<p>Positive symptoms: Follow algorithm</p> <p>Negative symptoms:</p> <ul style="list-style-type: none"> Rule out or manage depression/anxiety and extrapyramidal symptoms; Family counseling if understimulated/ over-protected Consider less-sedating antipsychotics and adding SSRIs* 	<p>Follow algorithm</p>	<ul style="list-style-type: none"> Assessment of factors causing poor adherence & specific management Consider depot anti-psychotics Liaise with primary care for assertive follow up 	<ul style="list-style-type: none"> Depression/ anxiety: Brief psychological intervention; consider SSRIs* Substance use: Detoxification and brief interventions (see SUD module) Developmental disabilities: Behavioral 	<ul style="list-style-type: none"> Suicidality: -Inpatient care, -Crisis management, -Management of comorbidity; -Consider ECT Violence: -Verbal de-escalation -IV sedation, -Brief inpatient care 	<ul style="list-style-type: none"> Assess disability & counsel about welfare benefits Rehabilitation counseling - Family intervention for expressed emotions and attitudes & behaviors interfering with functioning - Brief interventions for cognitive & social-skill deficits - Address vocational/ educational challenges involving governmental/ non-governmental 	<ul style="list-style-type: none"> Proactively address sexual and endocrine problems when relevant Educate about risk of obstetric outcomes, risk of relapse & risk of psychosis in the offspring

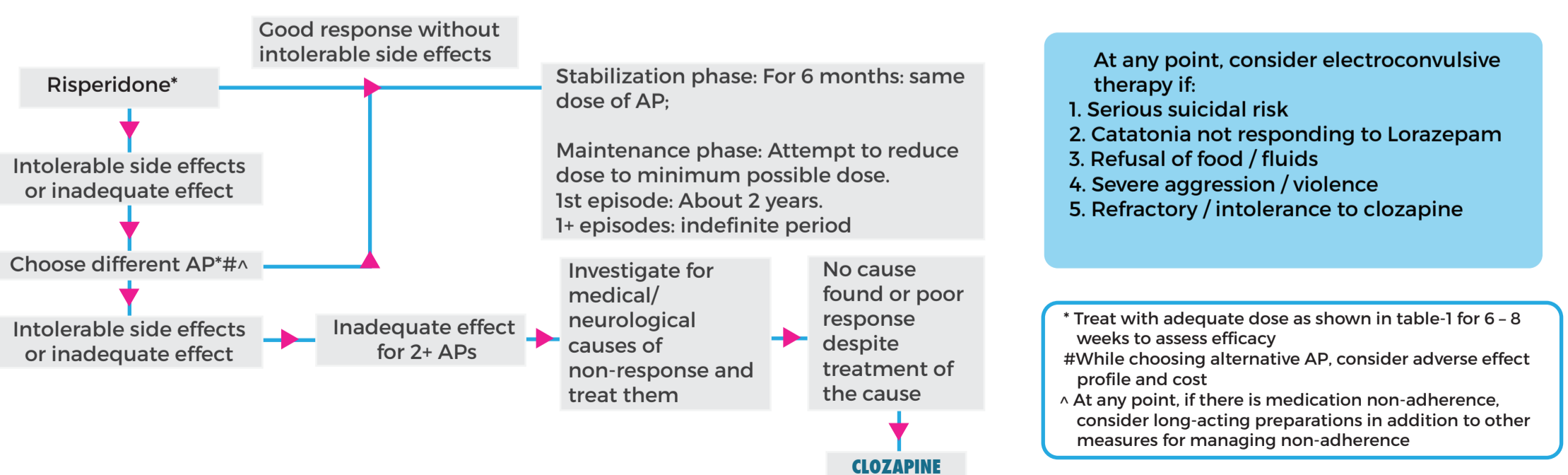
TERTIARY CARE CENTERS

Referral to tertiary care if

- 1. Diagnostic confusion:**
Inpatient observation for clarification of history, thorough neurological / mental status examination, diagnostic psychometry, brain CT Scan or MRI, neurology consultation and urine toxicology screen
- 2. Poor outcome:**
+Following psychosocial interventions may be offered in isolation or in combination depending on the context in inpatient, outpatient or day-boarding settings

INTERVENTION	CONTEXT IN WHICH USEFUL
Psychoeducation	Poor adherence; high family expressed emotions
Family therapy	High family expressed emotions; family discord
Cognitive remediation	Poor neuro and social cognitive functions
Cognitive behavior therapy	Depression, anxiety, obsessions, persistent psychotic symptoms
Social skills training	Poor social skills
Vocational rehabilitation and supported education	Poor occupational functioning, challenges in studying or getting / pursuing gainful occupation
Day care with interventions including vocational training, recreational activities, living-skill training, etc.	Negative symptoms, poor socio-occupational functioning, combination of other symptoms listed in the table
Interventions for substance-use	Hazardous use of substance or substance use disorder
Pregnancy - puerperium services	Pre-pregnancy, pregnancy and post-partum advise and interventions Pre-pregnancy, pregnancy and post-partum advise and interventions

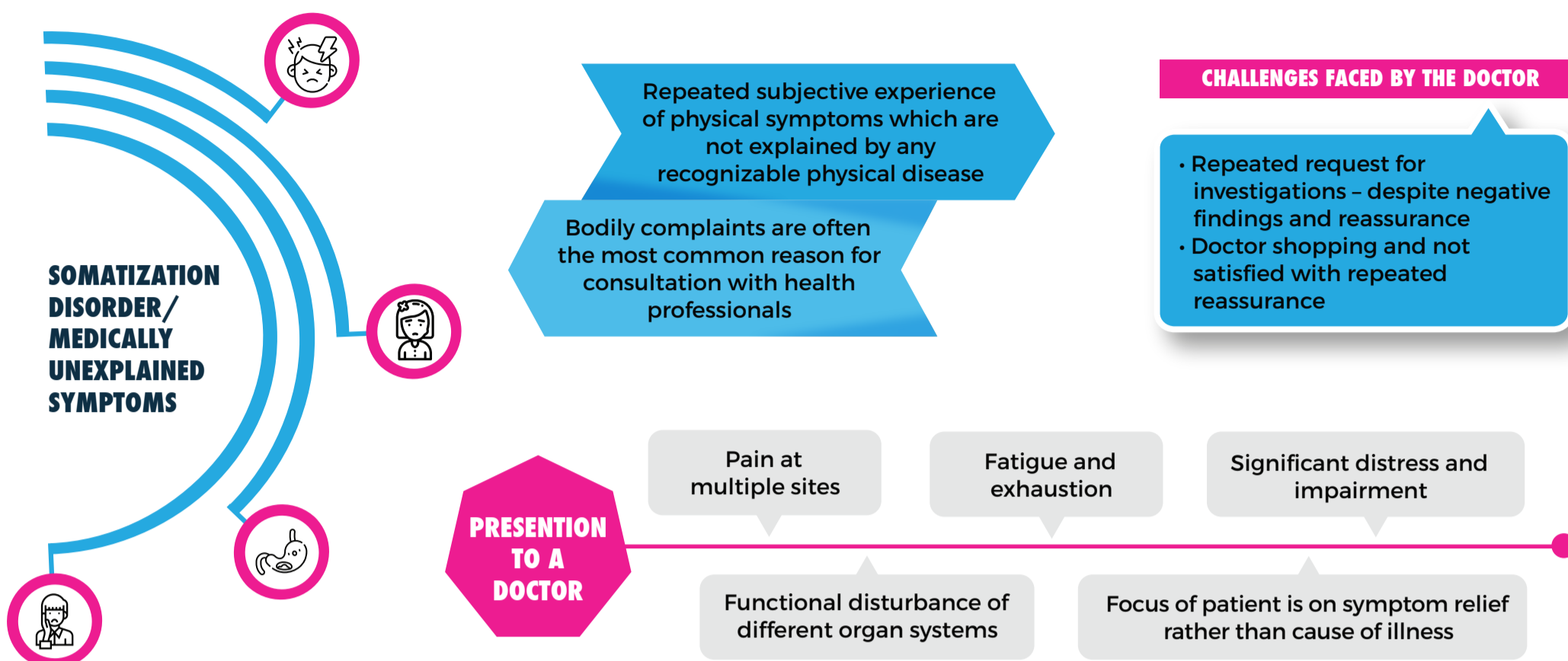
ALGORITHM FOR CHOOSING ANTIPSYCHOTIC MEDICATION (AP) FOR TREATMENT OF SCHIZOPHRENIA



KEEP A HIGH THRESHOLD FOR INVASIVE PROCEDURES



Standard Treatment Workflow (STW) for the Management of **SOMATIFORM DISORDER (SD)** ICD10-F45



DIAGNOSTIC CRITERIA

INITIAL ASSESSMENT

- Detailed clinical examination – to rule out any medical illnesses which might explain the symptoms
- Complete history of the onset of all symptoms, exacerbating and relieving factors
- Assessment for any other psychiatric illness such as depression or anxiety disorders

PSYCHOSOCIAL ASSESSMENT

- Encourage to talk about psychosocial stressors if any
- Individual factors – poor coping skills, anxiety, life events, health anxiety, medical illnesses
- Family related factors – Substance use in family, interpersonal relationship with family, financial status
- Environmental factors – support system, peer relationship, work environment

DIAGNOSTIC CRITERIA

- A. One or more somatic symptoms that are distressing or result in significant disruption of daily life.
- B. Excessive thoughts, feelings, or behaviours related to the somatic symptoms or associated health concerns as manifested by at least one of the following:
- Disproportionate and persistent thoughts about the seriousness of one's symptoms
 - Persistently high level of anxiety about health or symptoms
 - Excessive time and energy devoted to these symptoms or health concerns
- C. Although only one somatic symptom may not be continuously present, the state of being symptomatic is persistent (typically more than 6 months)
- A persistent course is characterized by severe symptoms, marked impairment, and long duration (more than 6 months)
- Severity:
- Mild – only one of the symptoms specified in criterion B is fulfilled
- Moderate – Two or more of the symptoms specified in criterion B is fulfilled
- Severe – Two or more of the symptoms specified in criterion B are fulfilled, plus there are multiple somatic symptoms (or one very severe somatic symptom)

Following list include the commonest symptoms

- Pain symptoms at multiple sites (such as abdominal, back, chest, dysmenorrhea, dysuria, extremity, head, joint, rectal) is often present
- Gastrointestinal sensations (pain, belching, regurgitation, vomiting, nausea)
- Abnormal skin sensations (itching, burning, tingling, numbness, soreness) and blotchiness
- Sexual and menstrual complaints (ejaculatory or erectile dysfunction, hyperemesis of pregnancy, irregular menses, menorrhagia, sexual indifference) are also common

MANAGEMENT

PRIMARY CARE

- Detailed physical examination
- Management of anemia and nutritional deficiencies
- Avoid irrational use of pain medications
- Low dose of antidepressant medications – Amitriptyline 12.5 mg to 50 mg (max) night dose
- Explain that onset of medication effect will take 2-3 weeks
- Validate the somatic symptoms
- Advise to engage in routine activities, physical exercise and relaxation techniques like deep breathing
- Discuss with family members that the symptom, distress and disability are genuine
- Strengthen supports
- Regular follow up

REFER TO SECONDARY CARE IF

- Difficulty in making diagnosis
- No improvement after 4 weeks of treatment with first line medications
- Comorbid medical illness
- Suicidal risk
- Comorbid psychiatric illness

SECONDARY CARE

- Investigations – to rule out any medical illnesses that might explain the symptoms
- Complete history with behavioural observation
- Use 2nd line medications – SSRIs (Escitalopram 10-20 mg, Sertraline 50-100 mg, Fluoxetine 20 mg) and SNRIs (Venlafaxine 75 – 150 mg, Duloxetine 30- 60 mg)
- Combination of two psychotropic medications (might be required if poor response to single medication)
- Brief counselling
- Psycho education – focusing on relationship between stress and physical symptoms
- Relaxation training, regular exercise, yoga and meditation

- No improvement in 2nd line treatment
- High suicidal risk
- Needing intense counselling/ psychotherapy
- Difficult patients

REFER TO TERTIARY CARE IF

TERTIARY CARE

- Inpatient care if needed
- Combination of two psychotropic medications (when required)
- Add on second and third line medications – Duloxetine, Mirtazapine, anticonvulsants (Lamotrigine, Pregabalin). Use of Gabapentin, Carbamazepine if chronic pain symptom predominates
- Structured Cognitive Behavioural Therapy, Cognitive restructuring, Mindfulness and acceptance based approach
- Use of alternative medicine approach – Yoga
- Collaborative approach – involve Physician, Neurology team and Pain Clinic referral (where indicated)
- Vocational rehabilitation if needed
- Physical therapies – guided exercise and physiotherapy

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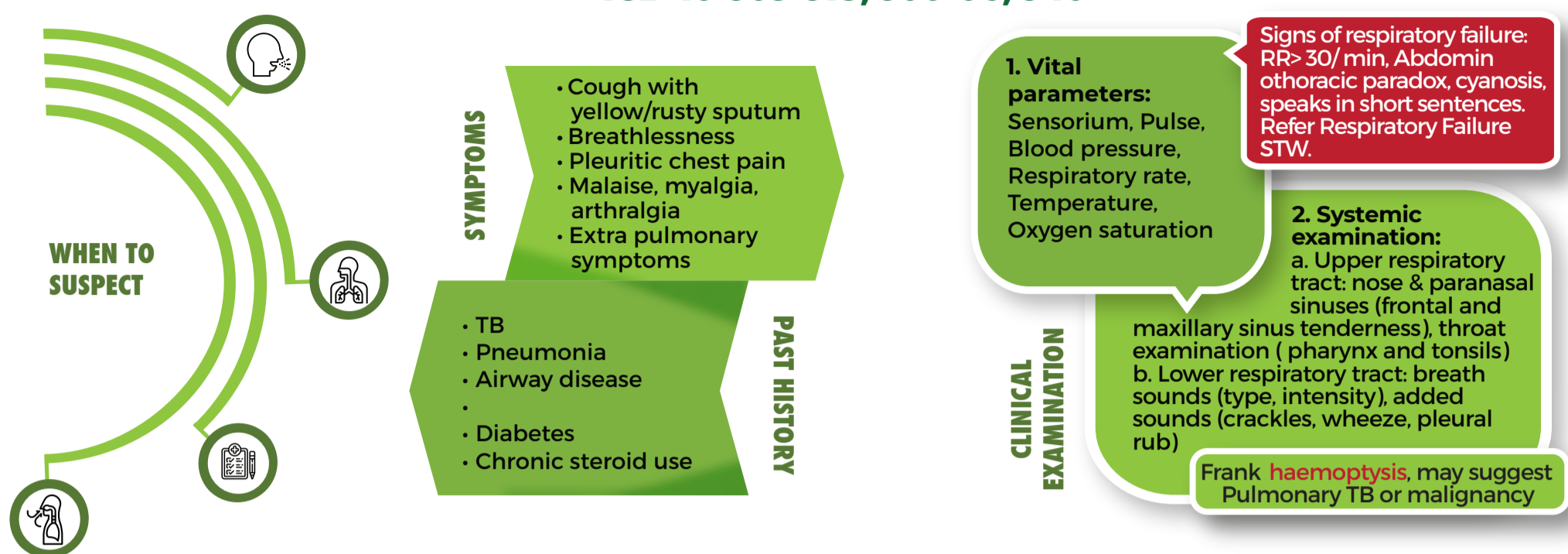


PULMONOLOGY



Standard Treatment Workflow (STW) for Management of ACUTE RESPIRATORY INFECTION IN ADULTS

ICD-10-J09-J18; J00-06; J40



PROCEED FOR FURTHER ASSESSMENT

- Fever, tachycardia, pharyngitis, suffusion of eyes, rhinitis, hoarse voice
- Respiratory system examination: Normal

- Fever, tachycardia
- Respiratory system exam: Wheeze
- * Consider acute exacerbation of asthma/COPD if there is a history of any of these 2 illnesses

- Fever, tachycardia, tachypnea
- Respiratory system exam: Crackles/ bronchial breath sounds
- * Consider acute exacerbation of asthma/COPD if there is a history of any of these 2 illnesses

PATHWAYS BASED ON INITIAL ASSESSMENT FINDINGS

PATHWAY 1: ACUTE URI (RESPIRATORY CATARRH)

LABORATORY INVESTIGATION:

- Total and differential count in suspected flu.

TREATMENT

- Symptomatic treatment for fever, myalgia (Paracetamol or other NSAID),
- Rest, Oral fluids (plenty)
- Oral antihistamines (Tab. CPM 4mg BD) for severe runny nose or sneezing
- Antibiotics in acute follicular tonsillitis: Amoxicillin/ Ampicillin 500mg tid X 5 days
- In penicillin sensitive individuals: Erythromycin estolate 250mg q 6 hrly X 5 days with food

Suspect epidemic flu

H/o recent travel, symptoms of upper respiratory infection, diarrhoea, myalgia, breathlessness Refer to higher centre for diagnosis, notification and treatment.

PATHWAY 2: ACUTE BRONCHITIS

LABORATORY INVESTIGATION:

- Total and differential count if sputum is purulent,
- X-ray chest PA view

TREATMENT

- Symptomatic treatment for fever (Paracetamol or other NSAID), Oral fluids (plenty)
- Inhaled bronchodilators: Salbutamol nebulization (5mg/2.5ml) 6-8 hourly
- Antibiotics if there is purulent sputum and polymorphonuclear leukocytosis
 - Amoxicillin 500mg tid X 5 days
 - In penicillin sensitive individuals: Erythromycin estolate 250mg q 6 hrly X 5 days with food
- If asthma is suspected refer to asthma STW

PATHWAY 3: COMMUNITY ACQUIRED PNEUMONIA

SEVERITY ASSESSMENT

- X-ray
- Use CRB-65* score for mortality risk assessment in primary care

CRB-65 SCORE

SCORE	RISK CLASS	SITE OF CARE
0	Low Risk	OP
1-2	Intermediate Risk	IP
3-4	High Risk	ICU

*65 in the scoring mnemonic refers to age > 65

Give 1 point for each of the following Prognostic features:

- Confusion
- Respiratory rate ≥ 30 /min
- Low BP (DBP ≤ 60 mm Hg or SBP ≤ 90 mm Hg)
- Age ≥ 65 years

OUT-PATIENT BASED CARE OF CAP (CRB-65 SCORE 0-1)

INVESTIGATIONS

Preliminary

Chest radiogram

Repeat if:

- Patient is not improving/ worsening clinically
- Suspected underlying malignancy

Desirable

- Pulse oximetry in outpatients
- Sputum microbiology: In suspected PTB & non-response after 48 hours of antibiotics

TREATMENT

- Targeted towards Streptococcus pneumoniae
- Oral antibiotics after checking for comorbidities* (Diabetes, CVDs, CKD, CLD, Hepatic Pathology, Cancer, Alcohol Abuse, H/o antibiotics within last 3 months.)
 - Without comorbidities: Cap. Amoxicillin (500 mg TDS)/Tab. Erythromycin 250mg QID/Tab. Doxycycline 100mg BD
 - With comorbidities: Cap. Amoxicillin 500mg TDS + Tab. Azithromycin 500 mg OD
- Duration: 5 days in (A); extend to a 7-10 days course if there is no response within 3 days of starting treatment and in (B).
- Do not give:**
 - Corticosteroids: unless other medical indications present
 - Fluoroquinolones: as they have anti-tubercular activity.

INPATIENT MANAGEMENT OF CAP

ANTIBIOTIC THERAPY IN THE HOSPITALIZED NON-ICU SETTING

- Single agent IV β -lactam
- If suspected atypical pathogens, other end organ disease, diabetes, malignancy, severe CAP, use of antibiotics in past 3 months: Combination of IV β -lactam (Cefotaxime 2 grams TID/ IV Ceftriaxone 1gram BD/ Amoxicillin-Clavulanic acid 1.2 grams TID) + ORAL macrolide (Tab Azithromycin 500 mg PO OD/ Tab Clarithromycin 500 mg PO BD)

ANTIBIOTIC THERAPY IN THE HOSPITALIZED ICU SETTING

- Patients without risk factors for Pseudomonas aeruginosa: Manage as above
- Suspected P. aeruginosa (diabetes, chronic lung disease like bronchiectasis, chronic steroid therapy): IV Cefepime (1G BD)/ IV Ceftazidime (2G TID)/ Piperacillin-tazobactam(4.5 G QID)/ IV Cefoperazone-sulbactam 1.5G IV TID/ IV Meropenem 1g TID; Combination therapy: Aminoglycosides(IV Amikacin)/ Antipseudomonal fluoroquinolones(Levofloxacin/ Moxifloxacin)

ADJUNCTIVE THERAPIES FOR THE MANAGEMENT OF CAP

- Steroids are not recommended for use in non-severe CAP
- Non-invasive ventilation may be used in patients with CAP and acute respiratory failure

CONTRA INDICATIONS FOR NON-INVASIVE VENTILATION

- Cardiorespiratory arrest
- Presence of severe upper airway inflammation & edema
- Severe haemodynamic instability - hypotension
- Eu-capnic (normal PaCO₂) coma
- Multiple organ dysfunction or severe psychomotor agitation

DISCHARGE CRITERIA

Accepting orally, Afebrile and Hemodynamically stable for a period of at least 48 h

REFERRAL TO A HIGHER CENTRE : CLINICAL CRITERIA

- Frank hemoptysis and /or Signs of respiratory failure [listed under in the history and evaluation sections]
- CRB-65 score > 1
- Oxygen saturation by pulse oximetry $\leq 92\%$ (patients ≤ 50 yrs) OR $< 90\%$ (patients > 50 yrs)
- Multi-lobar consolidation on chest X-ray
- Confusion/disorientation
- Hypothermia (core temperature $< 36.0^{\circ}\text{C}$)

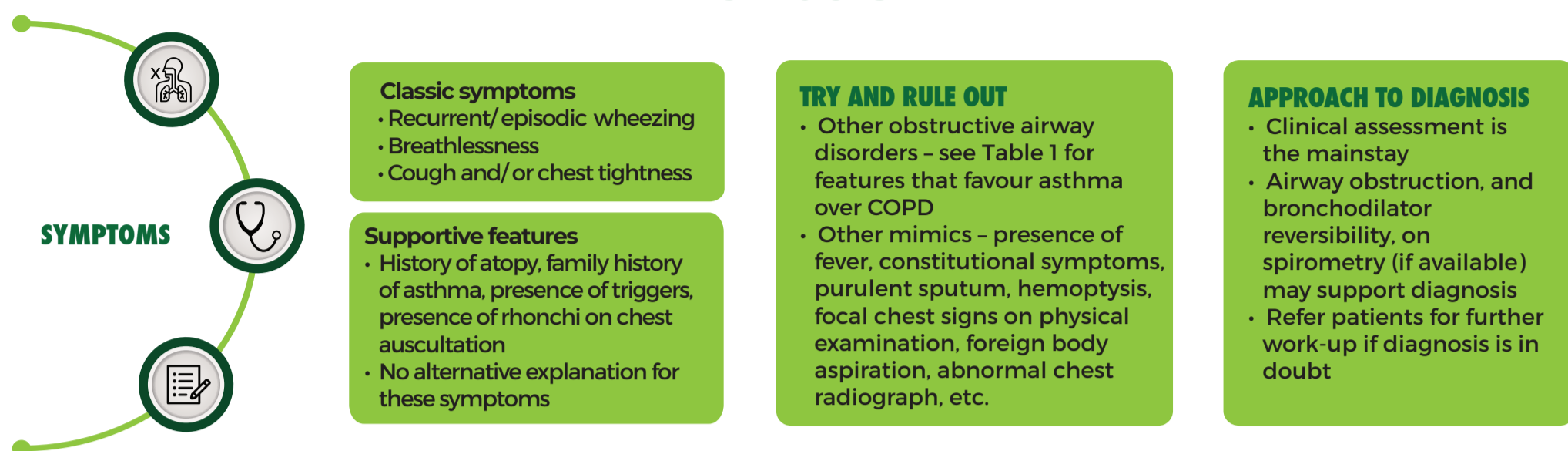
POINTS TO NOTE WHILE SHIFTING

- If referring to a higher center, give the first dose of antibiotic (oral and if available, parenteral), secure an IV line and start 0.9% Normal saline and oxygen supplementation through face mask at 4-6 litres per minute during shift
- If the patient is drowsy, has copious secretions, consider calling for help from the SUB-DISTRICT/ DISTRICT hospital for endotracheal intubation and shifting on a transport ventilator

KEEP A HIGH THRESHOLD FOR INVASIVE PROCEDURES



Standard Treatment Workflow (STW) for the Management of ASTHMA ICD-10-J45



INITIATION AND MODULATION OF ASTHMA PHARMACOTHERAPY

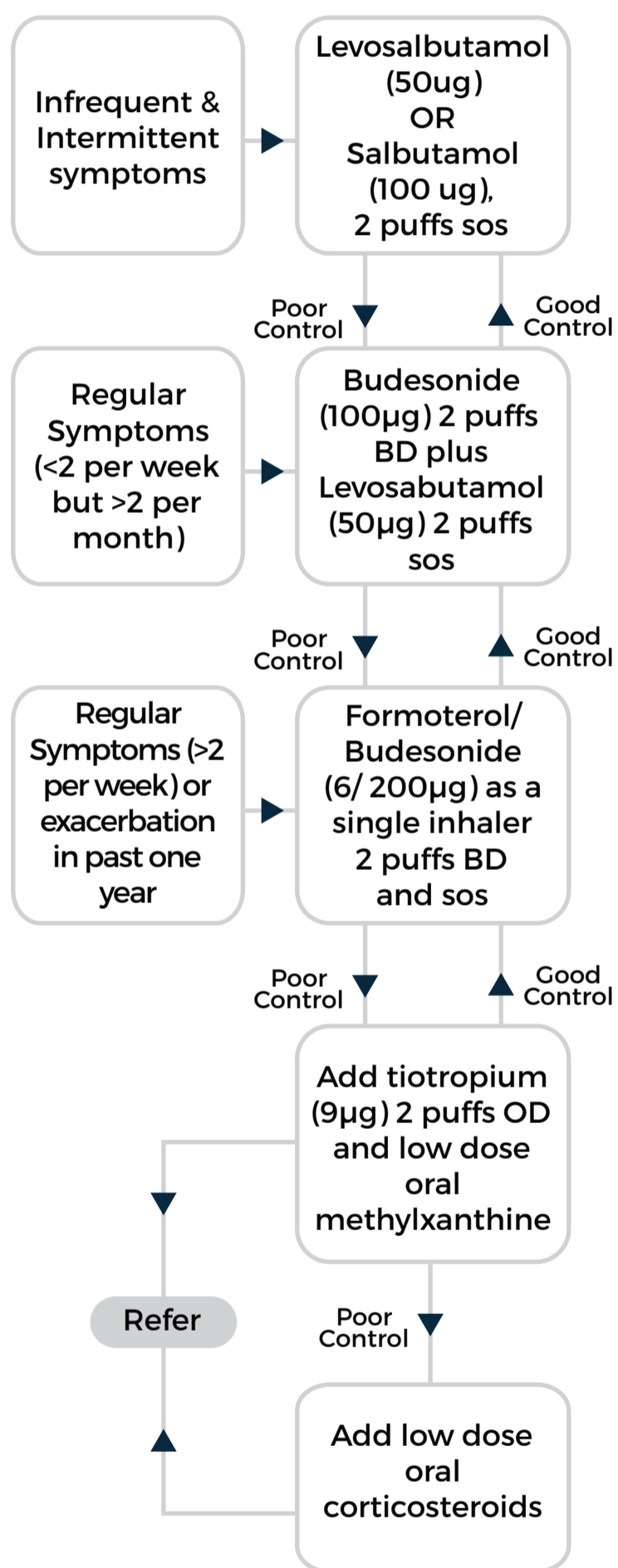


TABLE 1. DIFFERENTIATING BETWEEN ASTHMA AND CHRONIC OBSTRUCTIVE AIRWAY DISEASE (COPD)

	Asthma	COPD
Age of Onset	More often in childhood or early adulthood; variable	Usually later in life (4th or 5th decade)
Course	Episodic	Progressive
Smoking, other exposures	Uncommon	Common
Nasal Symptoms, Atopy	Common	Rare
Family History	Often	Uncommon
Triggers	Often Identified	None
Wheeze	Prominent and almost universal	May or may not be present

TABLE 2. LEVEL OF CURRENT ASTHMA CONTROL (OVER THE PRECEDING FOUR WEEKS)

Components	Inadequately controlled (any one)	Adequately controlled (all should be present)
Daytime symptoms or use of rescue medication	More than twice a week	Twice or less in a week
Night-time symptoms/awakening	Any	None
Limitation of activities	Any	None
Pulmonary function (if available)	FEV1 <80% of predicted or PEF <80% of personal best	FEV1 >80% of predicted or PEF >80% of personal best

FEV1 Forced Expiratory Volume in first second, PEF Peak Expiratory Flow

GUIDING PRINCIPLES

- Mainstay of pharmacotherapy: Inhaled drugs
- Frequency of symptoms determine treatment initiation (see figure 1 for details)
- Reassess at 3-4 weeks – good response: in favour of asthma diagnosis
- Patient education for compliance, warning signs, triggers, inhaler technique, PEF monitoring
- Inhaler technique to be monitored
- Follow-up at 4-12 weeks, assess disease control by clinical parameters (see Table 2)
- Step-up or step-down treatment as per level of asthma control (see figure 1)
- Follow up three-monthly and modulate treatment as needed
- Refer for further evaluation and management if asthma remains poorly controlled

DISEASE EXACERBATION

WHEN TO SUSPECT EXACERBATION

- Suspect if acute symptomatic worsening, or reduction in PEF to below 80% of personal best, while on continued treatment
- Take two additional puffs of the inhaler used if symptoms persist, and repeat if needed
- If no response after 24 hours, or symptomatic worsening, or further reduction in PEF, contact physician
- Physician to assess severity of exacerbation and manage accordingly

LIFE-THREATENING EXACERBATION

Altered sensorium, orthopnea, cyanosis, paradoxical breathing, hypotension, and/or bradycardia (heart rate <60 bpm) – immediately refer to higher centre with ICU facility

SEVERE ACUTE ASTHMA (PATIENT TO BE ADMITTED)

- Inability to complete sentences, agitation, use of accessory muscles, respiratory rate >30/ min, heart rate >110/ min, pulsus paradoxus >25 mm Hg, silent chest, and/ or room air sPo2 <92%
- Oxygen supplementation to maintain spO2 92-95%
- Nebulized levosalbutamol/ ipratropium (1.25 mg/ 0.5 mg) three doses at 20-minute interval, then 4-6 hourly or as needed
- Injection hydrocortisone 200 mg intravenously, then oral prednisolone 0.5 mg/ kg daily for five days
- Refer if no improvement
- Discharge** only when symptoms improve, wheezing absent or significantly reduced, heart rate <100 bpm, respiratory rate <30/ min, room air sPo2 >94%
- Schedule follow-up outpatient visit at one week

NON-SEVERE ACUTE ASTHMA

- If none of the above features present – manage on outpatient basis
 - Continue additional inhaler doses as needed
 - Oral prednisolone 0.5 mg/ kg daily for five days
 - Schedule follow-up outpatient visit at one week

KEEP A HIGH THRESHOLD FOR INVASIVE PROCEDURES

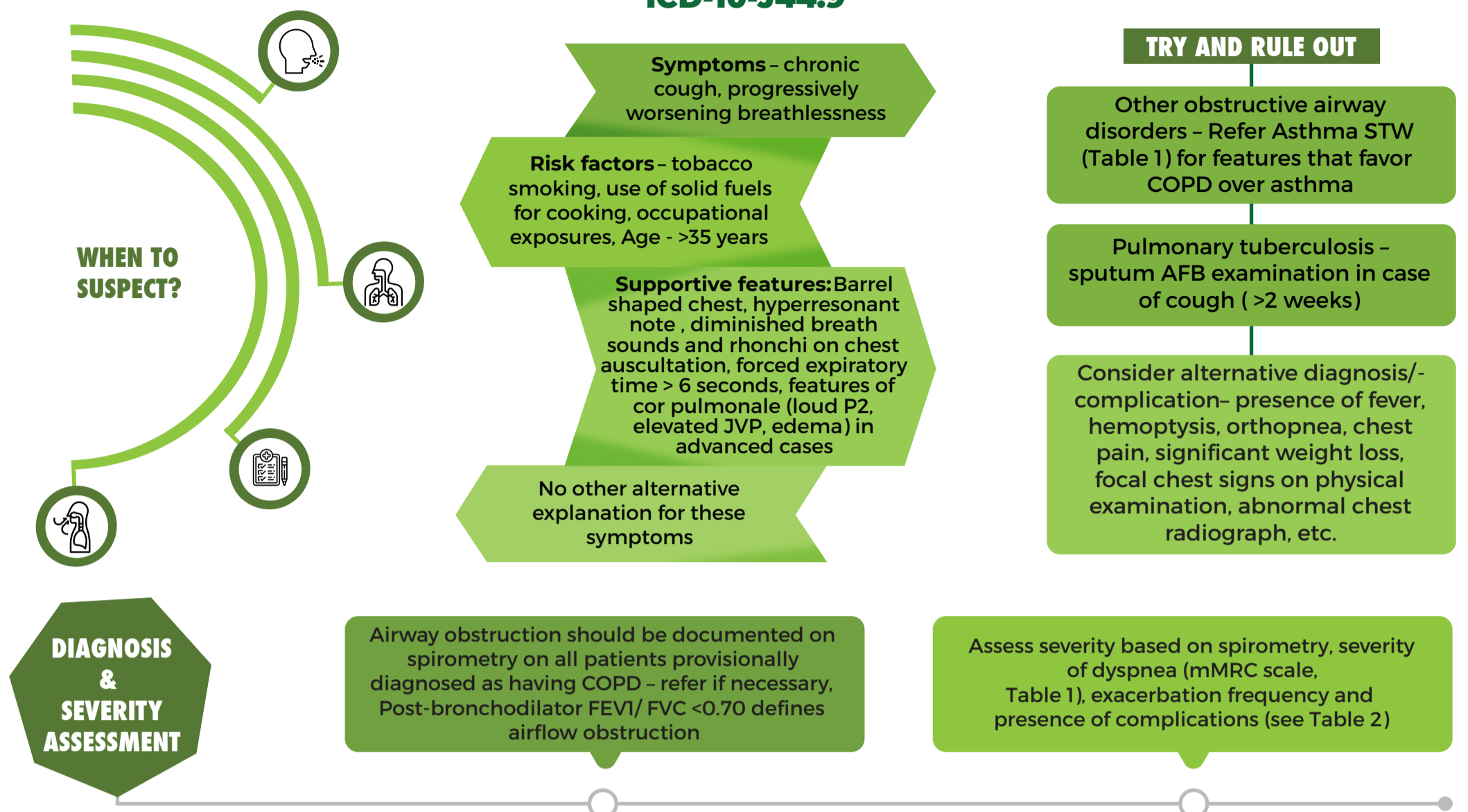
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Standard Treatment Workflow (STW) for the Management of CHRONIC OBSTRUCTIVE PULMONARY DISEASE

ICD-10-J44.9

TREATMENT

- Advice smoking cessation and counsel for other risk factors
- Inhaled drugs are the mainstay
- Treatment based on severity assessment (See adjacent figure)
- Follow up: Mild to moderate disease - 3 to 6 Months; Severe disease - 1-3 months
- Ensure compliance and proper inhaler technique at each visit.
- If uncontrolled/ complications develop, refer to higher center

DISEASE EXACERBATION
Three cardinal symptoms:

- Increase in dyspnea
- Increase in sputum volume and/or
- Increase in sputum purulence

Classify As:

- Mild Exacerbation
- Severe Exacerbation

Features Of Severe Exacerbation:

- Cyanosis
- Respiratory rate >30/ min
- Heart rate >110/min
- Systolic blood pressure <90 mm Hg
- SpO2 <90%
- Paradoxical respiratory movements
- Altered sensorium
- Asterixis
- Presence of severe co-morbid conditions (e.g. heart failure, arrhythmia)

MILD EXACERBATION

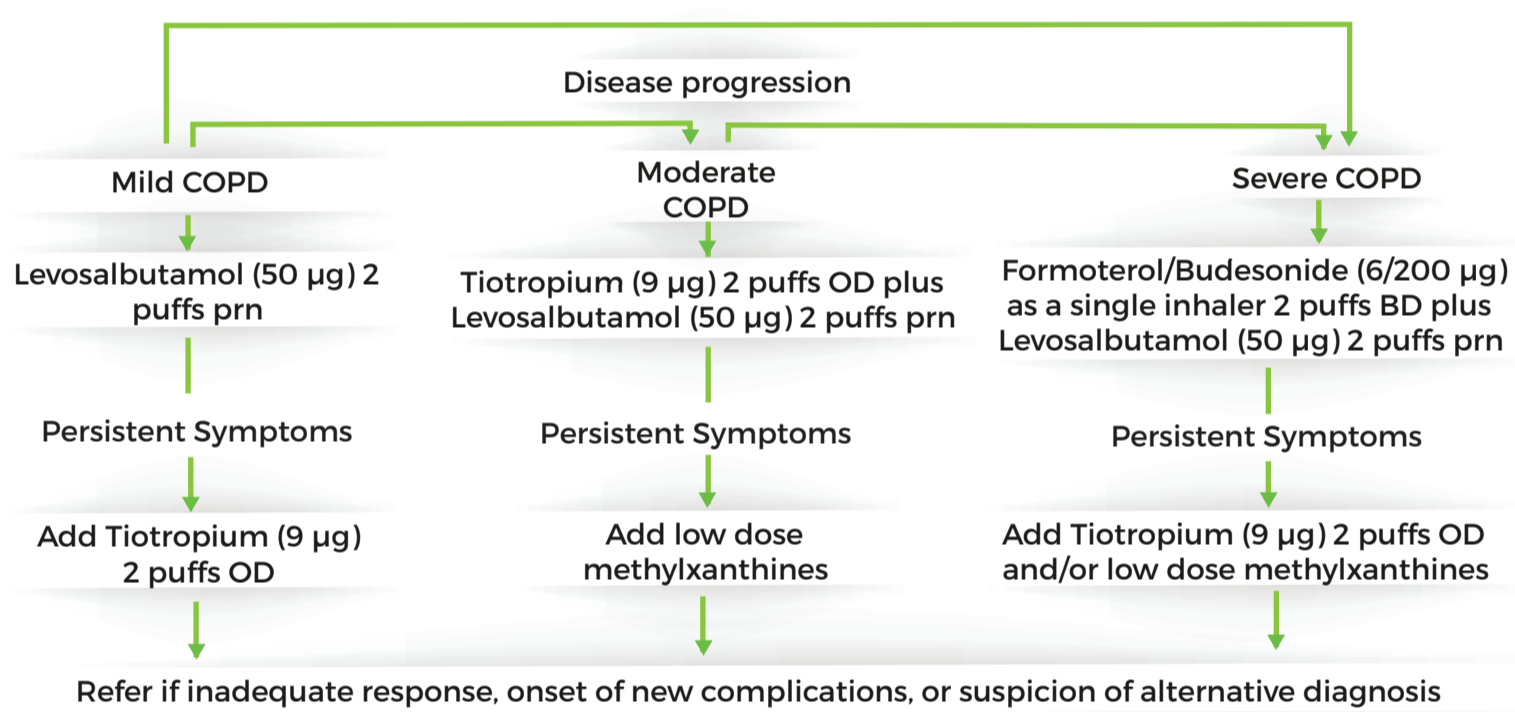
- Increase dose and/or frequency of levosalbutamol and/ or ipratropium inhalation, or nebulized levosalbutamol/ ipratropium (1.25 mg/ 0.5 mg), repeated as needed at 20-minute interval
- Amoxicillin 500 mg TDS/ Azithromycin 500 mg OD/ Doxycycline 100 mg OD (BD on day 1) X 5 Days
- Oral prednisolone 30 mg daily X 5 days

SEVERE EXACERBATION

Treatment as under Mild Exacerbation

+

Supplement oxygen with target spO2 of 92% (if spO2 monitoring available)


TABLE 1. GRADING OF BREATHLESSNESS USING MODIFIED MEDICAL RESEARCH COUNCIL (MMRC) SCALE.

GRADE	DESCRIPTION OF BREATHLESSNESS
0	I only get breathless with strenuous exercise.
1	I get short of breath when hurrying on level ground or walking up a slight hill.
2	On level ground, I walk slower than people of the same age because of breathlessness or have to stop for breath when walking at my own pace.
3	I stop for breath after walking about 100 yards or after a few minutes on level ground.
4	I am too breathless to leave the house or I am breathless when dressing.

TABLE 2. SEVERITY CLASSIFICATION FOR COPD

SEVERITY	POSTBRONCHODILATOR FEV1 (% PREDICTED)	DYSPNEA (MMRC GRADE)	EXACERBATIONS IN LAST ONE YEAR	COMPLICATIONS*
MILD	≥ 80	<2	<2	NO
MODERATE	50-79	≥ 2	<2	NO
SEVERE	<50	≥ 2	≥ 2	YES

The category with the worst value should be used for severity classification

*Complications include respiratory failure, cor pulmonale, and secondary polycythemia

RED FLAG SIGNS FOR PEOPLE HAVING EXACERBATION

- Altered sensorium
- spO2 <88% despite therapy
- Heart rate >110 bpm
- Systolic blood pressure <90 mm Hg
- High risk comorbid conditions (arrhythmia, congestive cardiac failure, poorly controlled diabetes, renal or liver failure)

Refer to higher centre for further management, and ensure continued supplemental oxygen and nebulization during transfer
SCHEDULE FOLLOW UP VISIT ONE WEEK AFTER DISCHARGE
ADMISSION CRITERIA

1. Severe symptoms; sudden worsening of resting dyspnea.
2. Fall in oxygen saturation, cyanosis, confusion, drowsiness.
3. Failure of an exacerbation to respond to initial medical management.
4. Presence of serious comorbidities (heart failure, newly occurring arrhythmias, etc.)

DISCHARGE CRITERIA

1. Normalization of clinical and laboratory data to pre-admission levels
2. Patient able to follow maintenance therapy
3. Completion of acute medications
4. Adequate control of comorbidities

KEEP A HIGH THRESHOLD FOR INVASIVE PROCEDURES
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2. Global Initiative for Chronic Obstructive Lung Disease (GOLD). Global strategy for the diagnosis, management, and prevention of chronic obstructive pulmonary disease. 2019 report.
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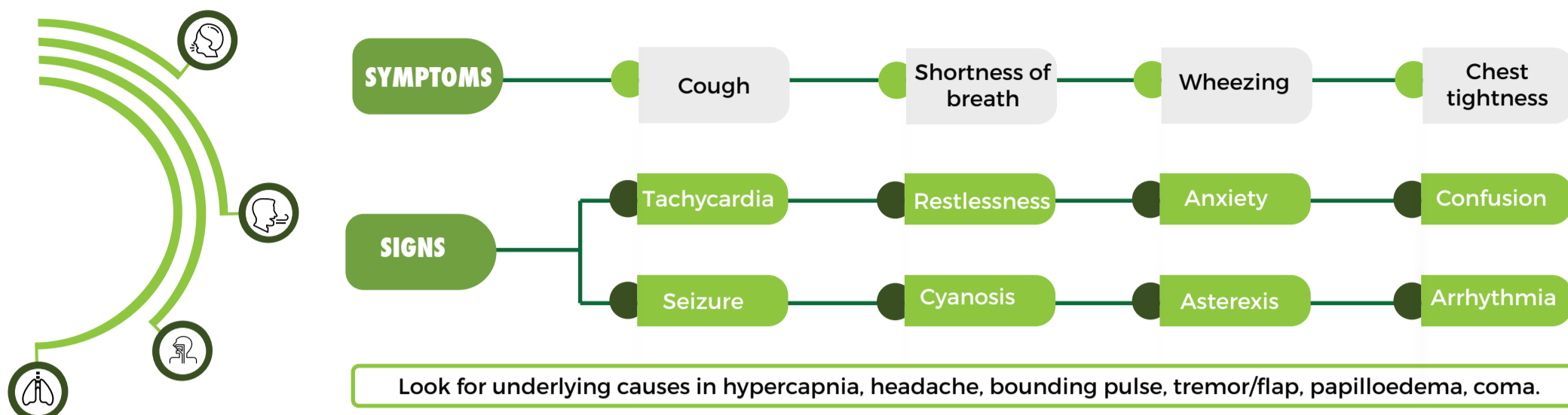
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Standard Treatment Workflow (STW) for the Management of RESPIRATORY FAILURE

ICD 10 : J96.0



HYPOXIA (SPO2 <90%)

HEART FAILURE

SYMPTOMS	SIGNS
<ul style="list-style-type: none"> Dyspnea or exertion or rest Chest Pain Wheezing Fatigue 	<ul style="list-style-type: none"> Tachycardia Pulsus Alterans Weak Rapid Thready Pulse Pink Frothy Sputum Cyanosis Pallor Distended Neck Veins

PNEUMONIA/ LRTI

SYMPTOMS	SIGNS
<ul style="list-style-type: none"> Cough with or without Sputum Chest Pain Fever with Chills, Fatigue, Malaise 	<ul style="list-style-type: none"> Tachypnea Tachycardia Crackles and Rhonchi Hypoxemia Pleuritic Chest Pain

PULMONARY EMBOLISM

SYMPTOMS	SIGNS
<ul style="list-style-type: none"> Sudden Shortness of Breath Chest Pain Calf Pain & or Swelling Hemoptysis 	<ul style="list-style-type: none"> Syncope Arrhythmia Tachycardia

AIRWAY DISEASE

ACUTE ASTHMA

SYMPTOMS	SIGNS
<ul style="list-style-type: none"> Wheeze Shortness of Breath Chest Tightness Cough 	<ul style="list-style-type: none"> Tachypnea Tachycardia Fall in SPO2 Use of Accessory Muscle

AE OF COPD

SYMPTOMS	SIGNS
<ul style="list-style-type: none"> Worsening of Dyspnea Increase in Sputum Production Increased Cough 	<ul style="list-style-type: none"> Tachypnea Hypoxemia Hypercarbia Confusion Drowsy Peripheral Edema

BRONCHIOLITIS

SYMPTOMS	SIGNS
<ul style="list-style-type: none"> Cough Shortness of Breath Wheezing 	<ul style="list-style-type: none"> Cyanosis Nasal Flares Tachypnea Paradoxical Breathing (children) Crackles and or Rattling sounds in Lung

INVESTIGATIONS

ABC, CRP, FBC, U&E

Chest Xray

Sputum culture, Blood culture (if febrile)

Spirometry(COPD, Neuromuscular disease)

TREATMENT

DIAGNOSIS	Heart failure	Acute Severe Asthma	AE COPD	ARI	Pneumonia LRTI	Pulmonary embolism
OXYGEN	Start oxygen therapy at SpO2 < 90% Monitor SpO2 during oxygen therapy to titrate flow rate: target SpO2 < 96% Oxygen delivery usign Nasal cannulae/ Simple face mask/ Venturi mask/ Non re-breathing mask (Note: for patients with AECOPD, keep lower target SpO2 = 88-92%)					
BRONCHODILATORS	SOS	SABA ± SAMA (Salbutamol ± Ipratropium neb q20 min X 1 hr then prn)	SABA + SAMA (Salbutamol neb hourly + Ipratropium neb 4 hourly)	SABA + SAMA	SOS	SOS
DIURETICS	Yes (IV Furosemide 40 mg or Torsemide 20 mg)	SOS	SOS	SOS	SOS	SOS
ANTIBIOTICS	---	---	No risk factor Pseudomonas: Ceftriaxone or levofloxacin or moxifloxacin Pseudomonas risk factor: levofloxacin or piperacillin tazobactam or ceftazidime or cefepime Influenza suspect: Oseltamivir	---	Mild/ Mod cases: Amoxicillin PO/ IV or Ceftriaxone IV Severe Cases: Amoxicillin IV or Ceftriaxone IV Atypical pneumonia: Azithromycin IV/ PO or Doxycycline IV/ PO	---
STEROIDS	---	Yes (Methylprednisolone IV 40 to 60 mg or Prednisolone PO 60 mg)	Yes (Methylprednisolone IV 60 to 125 mg IV q6-12 hourly)	Yes	Severe CAP (fiO2 > 0.5 AND pH < 7.3 OR lactate > 4 mmol/L-1 OR CRP > 150 mg/L-1); Methylprednisolone IV 0.5 mg/ kg q12h	---
LMWH	Prophylactic, if indicated	Prophylactic, if indicated	Prophylactic, if indicated	Prophylactic, if indicated	Prophylactic, if indicated	If high suspicion with low risk of bleeding: UFH (if thrombolysis anticipated), OR LMWH
REFERRAL	No relief OR Need for mechanical ventilation OR life threatening features: Stabilize CAB, transfer to higher center					

ABBREVIATIONS

• LRTI : Lower Respiratory Tract Infection
• LMWH: Low Molecular Weight Heparin

• SABA : Short Acting Beta Agonist
• SAMA: Short Acting Muscarinic Antagonist

• CAP: Community Acquired Pneumonia
• UFH : Unfractionated Heparin

👉 **KEEP A HIGH THRESHOLD FOR INVASIVE PROCEDURES**

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UROLOGY



Standard Treatment Workflow (STW) for the Management of ACUTE URINARY RETENTION IN MEN (AUR)

ICD-10-R33.9

DEFINITION:
Emergency condition characterized by a sudden and painful inability to void voluntarily despite having a full bladder

HISTORY

- Nature and duration of urinary symptoms prior to AUR
- Associated symptoms like fever, weight loss, sensory loss or weakness of lower limbs
- Past history of retentions
- Rule out precipitating causes like diabetes mellitus, alcohol consumption, recent surgery, UTI, constipation, cold exposure, prolonged travel and neurological conditions
- Medication history
- Look for risk factors

EXAMINATION

- Fever
- Enlarged tender palpable bladder dull on percussion
- Phimosis, meatal stenosis, urethral induration, stone, urethral discharge
- DRE for estimating prostatic size, consistency, tenderness ; exclude fecal impaction
- Focused neurological examination-anal tone, perianal sensation and bulbocavernous reflex

RISK FACTORS OF SPONTANEOUS AUR DUE TO BPH

- Old age
- Severe lower urinary tract symptoms (LUTS)
- Low peak flow rate
- High postvoid residual urine (PVR)
- Enlarged prostate or large median lobe
- High serum PSA
- Symptom worsening
- Increasing PVR during medical therapy

RISK FACTORS OF PRECIPITATED AUR

- Surgical procedure with general or loco-regional anaesthesia
- Bladder over-distension (eg prolonged journey)
- Exposure to cold
- Medications with sympathomimetic or anticholinergic effects, diuretics, alcohol intake
- Faecal impaction

CAUSES

THAT BLOCK THE PASSAGE

BPH

Urethral Calculus

Urethral Stricture

Acute Prostatitis

Ca Prostate

Vesical Calculus

Faecal impaction

THAT PARALYSE DETRUSOR

Neurological diseases e.g. spinal cord compression, transverse myelitis, stroke, head injury

Drug induced eg. opioids, anticholinergics, anti-histaminics, anti-diarrhoeals, flavoxate

INVESTIGATIONS

As AUR is an acute emergency, no investigation is required before catheterization to relieve symptoms. The volume of urine drained should be documented.

DESIRABLE

CBC, S. Glucose, S. Creatinine and Electrolytes, USG KUB Urine analysis & Urine culture of the drained urine

OPTIONAL (ONLY BY SPECIALISTS)

NOT TO BE DONE ROUTINELY

• Cystoscopy, CT / MRI, RGU + MCU, Urodynamic studies

MANAGEMENT ALGORITHM

Attempt gentle urethral catheterization

FOR CATHETERIZATION

- Use a 14 or 12 Fr Foley urethral catheter
- Do not remove catheter earlier than a day

COMPLICATIONS DUE TO AUR

- Urinary tract infection
- Acute kidney injury

COMPLICATIONS DUE TO CATHETERIZATION

- Post obstructive diuresis with dys-electrolytemia
- Transient decompression hematuria
- Urethral injury during catheterization

INDICATIONS FOR HOSPITALIZATION

- Patients of AUR with significant comorbidities
- Patient of AUR with complications listed above

Catheterization successful

Keep catheter 1-3 days*

Precipitated AUR due to

Drugs
Diabetes
Neurological disturbances
Urethral stricture
Pelvic and Perineal Surgery
Fecal impaction
Urinary/ peri anal Infection

Treat the cause

Trial without catheter

If fails, refer to urologist

Catheterization fails

Suprapubic cystostomy if adequately trained

OR

Refer to urologist

Spontaneous AUR due to BPH

No prior history of r/c acute retention ± severe obstructive lower urinary tract symptoms

Surgery

No prior history

α blockers for 2-4 days

T.W.O.C

Succeeds

Continue medical management

Fails

Surgery

ABBREVIATIONS

BPH: Benign Prostatic Hyperplasia

IPSS: International Prostate Symptom Score

TWOC: Trial Without Catheter

WW: Watchful waiting

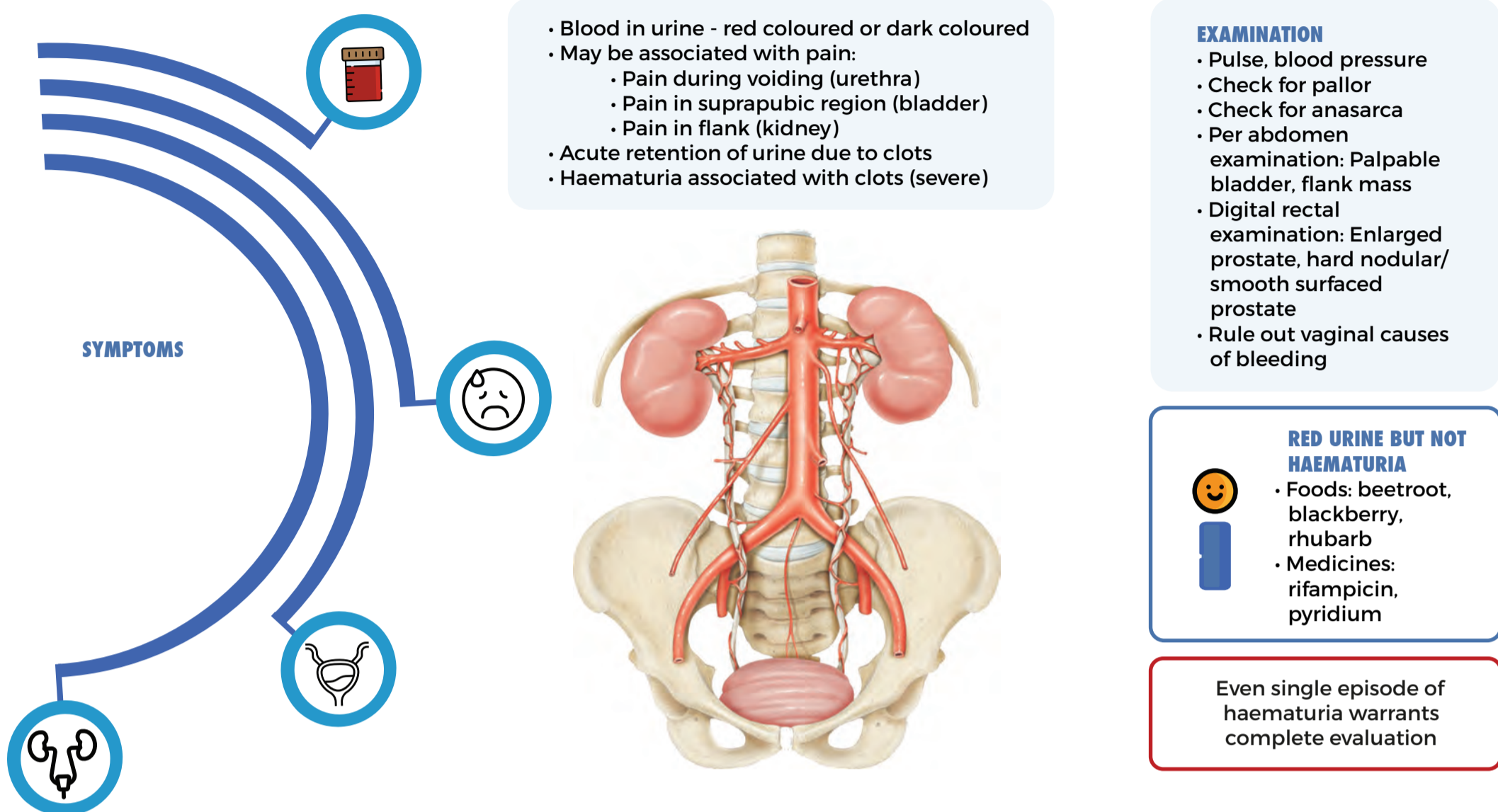
KEEP A HIGH THRESHOLD FOR INVASIVE PROCEDURES



Standard Treatment Workflow (STW) for the Management of GROSS HAEMATURIA

ICD-10-R31.0

PERFORM THOROUGH CLINICAL EVALUATION



MAKE A CLINICAL DIAGNOSIS: IS HAEMATURIA

INITIAL

- Urethra: stone, urethritis, stricture
- Prostate: inflammation, benign hyperplasia, malignancy

TOTAL

- Kidney: stone, malignancy (renal parenchyma, pelvis/ ureter), genito-urinary tuberculosis
- Ureter: stone, malignancy, genito- urinary tuberculosis
- Bladder: infection, genitourinary tuberculosis, stone, malignancy

TERMINAL

- Bladder: stone, tumor at bladder neck
- Prostate: inflammation, benign hyperplasia, malignancy

HOW TO INVESTIGATE

ESSENTIAL

- Urine examination - routine, microscopy
- Hemoglobin estimation
- Kidney function tests (KFT)
- Ultrasonography of kidney urinary bladder and prostate region

DESIRABLE

- Contrast enhanced computed tomography of kidney urinary bladder region/ intravenous pyelography (if KFT normal)
- Magnetic resonance imaging of Kidney urinary bladder region (if KFT deranged)
- Urine cytology if > 40yrs or smoker
- Cystoscopy if > 40 years or smoker

OPTIONAL

- Urine culture
- Urine for active sediments (if nephrotic/ nephritic syndrome suspected)
- PT/INR (if bleeding disorder suspected)
- Serum prostate specific antigen (if required)
- Urine for acid fast bacilli - 3 samples (if tuberculosis suspected)

WHEN TO REFER (WARNING SIGNS)

- Deranged kidney functions
- Suspecting malignancy
- Haematuria with hypertension / albuminuria
- Persistent severe haematuria

HOW TO TREAT

GENERAL

- Start intravenous fluids if required (primary level)
- If Anaemia - may transfuse blood as required (primary level)
- Manage clot colic / flank pain with analgesics (primary level)
- If Acute urinary retention - catheterise with 20/22Fr 3 way Foley and may start continuous irrigation with normal saline (Primary level)
- Cystoscopic clot evacuation may be performed if feasible (tertiary level)
- If basic evaluation and management facilities are unavailable - refer (tertiary level)

SPECIFIC

- Haematuria should be considered as a symptom of genitourinary malignancy in patients >40years old until proven otherwise
- Suspected nephrotic/nephritic syndrome: cola coloured urine, proteinuria, anasarca, hypertension - Refer to nephrologist (tertiary level)
- Suspect urinary tract infection : presents with dysuria, increased frequency of voiding and other irritative lower urinary tract symptoms with/ without fever- treat with broad spectrum oral antibiotics (primary level)

DIFFERENTIAL DIAGNOSIS FOR CHRONIC CONDITIONS LEADING TO HAEMATURIA

	Stones	Renal cell cancer	Bladder tumor	Genito-urinary tuberculosis
Symptoms	Flank pain Ureteric colic Recurrent urinary tract infection Haematuria	Flank mass Flank pain Haematuria	Haematuria Urinary retention	Dysuria Frequency Nocturia Haematuria
Investigations	Ultrasonography Xray KUB Intravenous pyelography or Computed tomography	Ultrasonography Computed tomography	Ultrasonography Computed tomography Urine cytology	Urine analysis Urine acid fast bacilli Urine tuberculosis culture Gene expert (optional) Intravenous pyelography or Computed tomography
Treatment	>5mm or symptomatic - refer to urologist	Mostly surgical treatment - refer to urologist	Mostly surgical treatment - refer to urologist	Oral Antitubercular treatment - 6months, refer to a urologist, close follow up

REFERENCES

- Standard treatment guidelines in urology: Ministry of Health and Family welfare

KEEP A HIGH THRESHOLD FOR INVASIVE PROCEDURES



Standard Treatment Workflow (STW) for the Management of MALE INFERTILITY

ICD-10-N46.9

HOW TO PROCEED?

- Both partners examined simultaneously*
- Ensure marriage is consummated, couple has frequent timed intercourse with the knowledge of ovulatory cycle.
- * Male factor is an under recognised problem and the failure to recognise often leads to social and psychological adverse effects. Often the male is evaluated once the female has been examined thoroughly and this delays the treatment. Greater the duration of infertility lesser the chance of success.

- ### AIM
- To ascertain contributory male factor
 - Identify potentially correctable conditions
 - Identify incorrectable conditions that may or may not be amenable to Assisted Reproductive Technique (ART)
 - Identify underlying medical conditions responsible for infertility

- ### PHYSICAL EXAMINATION
- Body habitus (obesity, Klinefelter's), Secondary sexual characters, gynecomastia
 - Penis: hypospadias, epispadias, chordee,
 - Testes: volume, consistency, masses, contours
 - Epididymis: flat, turgid, nodularity, Vas deferens -present/absent thickened or beaded
 - Cords-presence of varicocele, Inguinal or scrotal scar.
 - Rectal examination: cyst, dilated seminal vesicles.

- ### HISTORY
- Age of partners and duration of infertility.
 - Use of contraception and lubricants.
 - Knowledge of sexual cycle, technique, frequency.
 - Sexual and ejaculatory dysfunction, volume of ejaculate
 - Medical illness: STD, diabetes, recent fever, chronic bronchitis and any debilitating medical conditions
 - H/o Chemotherapy, Radiotherapy
 - Congenital anomalies, cryptorchidism, hypospadias, Chordee
 - Testicular torsion, drug history, trauma and swelling
 - H/o past surgeries(hernia repair, orchiopexy, retroperitoneal surgery)
 - Family history (infertility, consanguinity, genetic disorders),
 - Exposure to environmental toxins (pesticides, herbicides, chronic heat and radiation (sauna bath, tight non cotton undergarments, laptops & mobile)
 - Partner history: Any menstrual abnormality, infertility evaluation till date

- ### WHEN TO SUSPECT?
- Inability to conceive even after one year of regular unprotected intercourse.
 - Evaluation earlier than one year if female age is >35yrs, family history of infertility or very anxious couples.
 - Infertility Incidence is 10-15%. Male factor-contributory in 50% cases.

INVESTIGATIONS

SEMEN ANALYSIS (ESSENTIAL)

- At least two- samples 1-2 months apart; Abstinence of 1-3 days; Collected in sterile, medical grade plastic wide mouth containers.
- Provided within the lab or transported within an hour at room temperature and examined immediately
- WHO 2010 criteria for normal report. Volume: >1.5, ml, Sperm conc.: >15 million/ml, Sperm motility: >40%, Progressive > 32%, Sperm morphology: >4% normal forms, Leukocyte density: <1 million/mL

DIAGNOSTIC CATEGORIES ACCORDING TO SEMEN ANALYSIS REPORT

- Normal Semen Analysis:** Rule out sexual dysfunctions, Anatomic abnormalities, Female factor and unexplained
- Low volume semen:** Incomplete Collection, Retrograde ejaculation, Ejac. duct obstruction, Cong. Absence of VasDeferens, Hypogonadism
- Azoospermia:** Obstructive (Epididymal, vasal) Nonobstructive: (Genetic, Chromosomal, Hormonal, CT/RT, Post torsion testes, orchitis, Cryptorchidism, Idiopathic)
- Oligo-astheno-teratospermia:** Isolated Asthenospermia: Antisperm antibodies, Sperm structural defect, Hypogonadism Multiple defects: Varicocele, Cryptorchidism, Genital tract infection, Systemic illness, Prolonged abstinence, Drugs (Sulfasalazine, NFT, Colchicine, Chemotherapy, GnRh analogs, Spironolactone, Ketokonazole, Anabolic steroids, cocaine, alcohol, Chemicals: heavy metals, herbicides, organic solvents, fungicides, pesticides)

Note: If a patient is unable to produce semen consider retrograde ejaculation and anejaculation. Need further evaluation.

OPTIONAL INVESTIGATIONS

- Hormonal assay: Serum FSH, LH, Prolactin, Testosterone, Estradiol, T/E ratio
- Culture: Urine, Semen, Prostatic fluid, Antisperm antibodies, Viability assay, Sperm function tests, Scrotal USG & doppler, TRUS, Genetic studies,
- Testicular biopsy (Multiple bilateral preferable)

MANAGEMENT

PHC/CHC

- History and Physical examination (PE)
- Proper Semen analysis
- Normal Semen report: (Rule out unconsummation, sexual dysfunction, anatomic abnormalities)
- Abnormal Semen report:
- Refer to Urologist/infertility centre
- Preventive measures: Avoid gonadotoxins, gonadotoxic drugs, smoking, tobacco, chronic heat, excess use of mobiles; Encouraging healthy life style: Nutritious diet, regular physical exercise, avoid stress, use of antioxidants and vitamins (Vit. C, Vit E, Zinc)
- Female partner to be evaluated by gynecologist
- Management of reversible nonsurgical causes (Infections etc.) and surgical cause i.e. varicocele if surgeon available.
- For further evaluation refer to district/tertiary hospital.

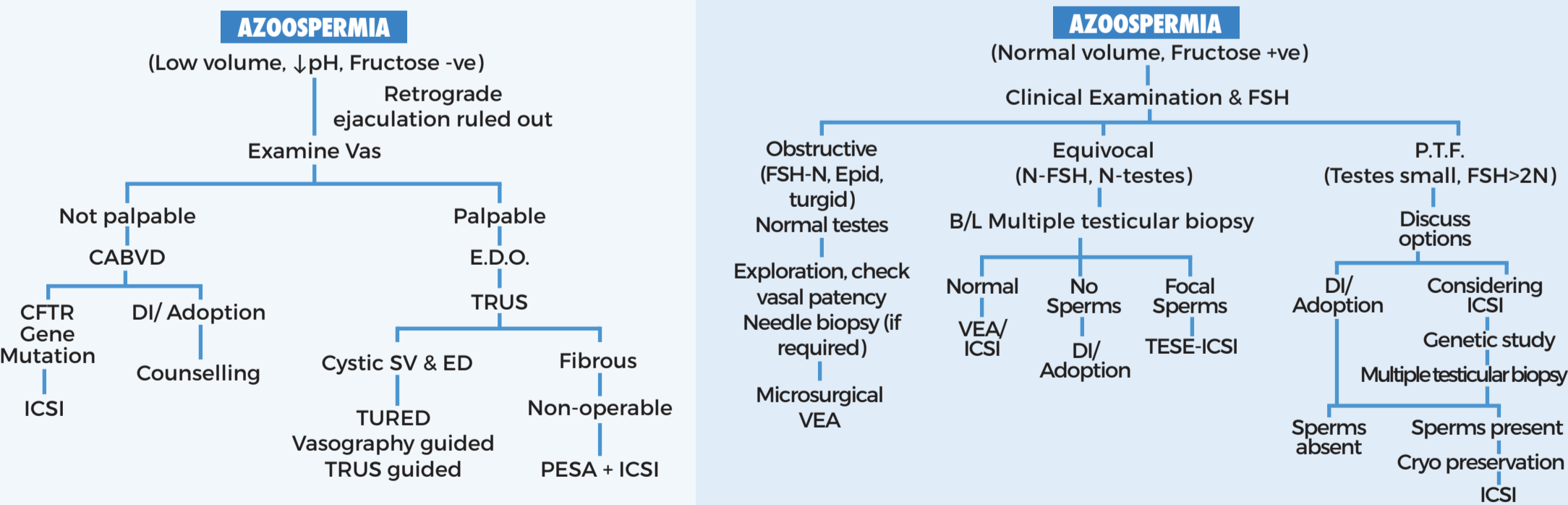
DISTRICT HOSPITAL

- Hormonal assay and Testicular biopsy
- Management of sexual and ejaculatory dysfunction
- Management of Varicocele and Hypogonadotropic hypogonadism
- ART: AIH/AID and counselling for adoption.

TERTIARY LEVEL

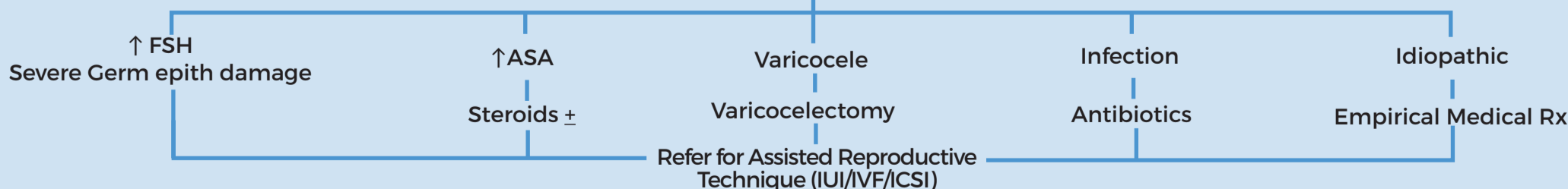
- Additional testing: TRUS, Genetic, ASA, Sperm function tests
- Advanced surgery: Microsurgical VVA, VEA, Varicocelectomy, TURED, Sperm retrieval techniques, Cryopreservation and sperm banking
- Advanced ART: IVF-ET/IVF ICSI

TREATMENT ALGORITHM



OLIGO-ASTHENO-TERATOSPERMIA

(↓ count, ↓ motility, poor morphology)



KEEP A HIGH THRESHOLD FOR INVASIVE PROCEDURES

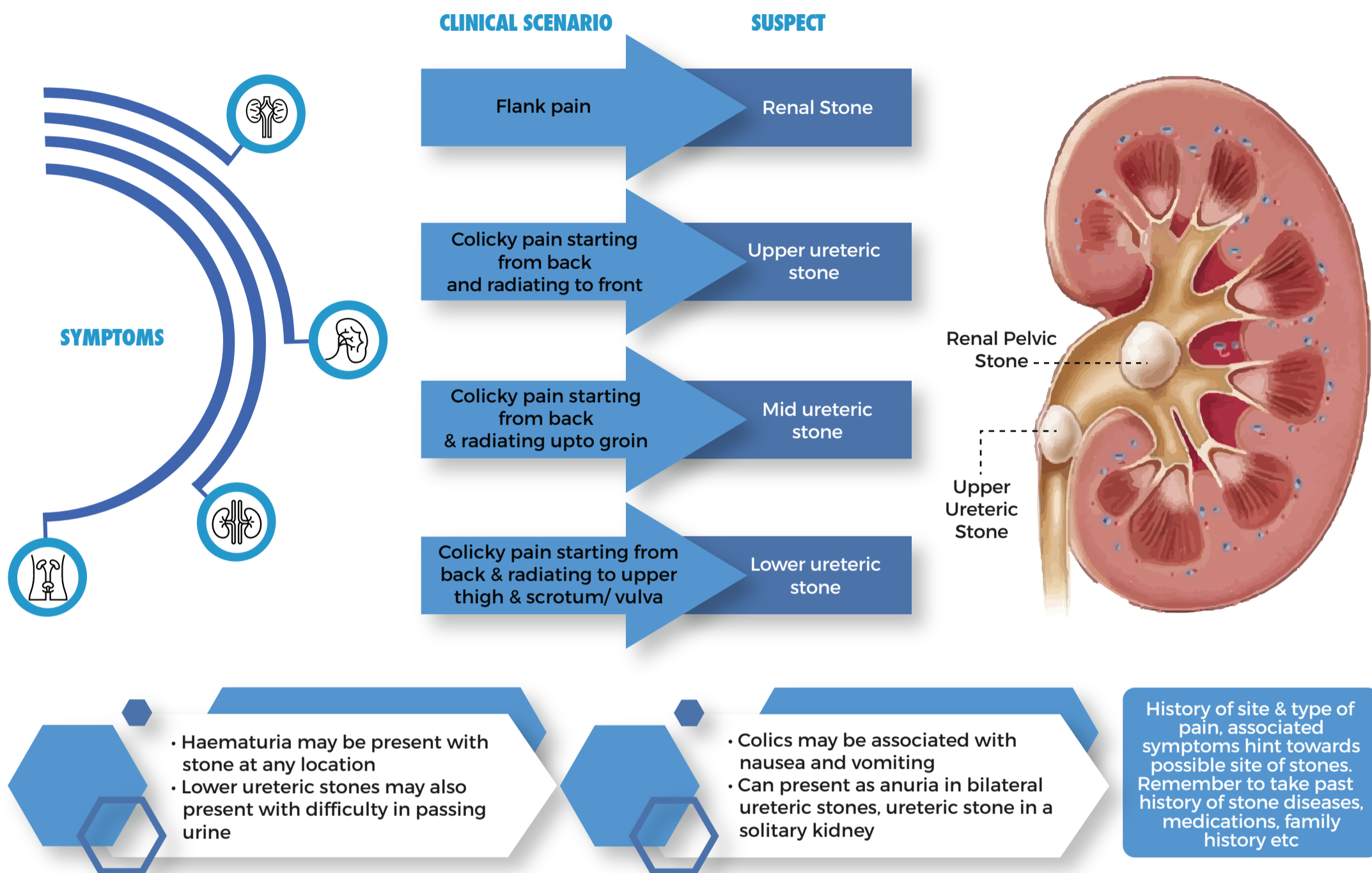
ABBREVIATIONS

- FSH:** Follicle Stimulating Hormone
- EDO:** Ejaculatory Duct Obstruction
- CABVD:** Congenital Absence of Bilateral Vas deferens
- VVA:** Vaso Vasostomy
- PTF:** Primary Testicular Failure
- VEA:** Vasoepididymal Anastomosis
- TRUS:** Trans Rectal Ultrasonography
- PESA:** Percutaneous Epididymal Sperm Aspiration
- ASA:** Anti Sperm Antibodies
- DI:** Donor Insemination
- TESE:** Testicular Sperm Extraction
- SV & ED:** Seminal Vesicle & Ejaculatory Duct
- TURED:** Trans Urethral Resection of Ejaculatory Duct
- ART:** Assisted Reproductive Technique
- AIH:** Artificial Insemination Husband
- AID:** Artificial Insemination Donor
- ICSI:** Intra Cytoplasmic Sperm Injection
- IVF-ET:** In vitro Fertilization - Embryo Transfer
- GUTB:** Genito Urinary Tuberculosis



Standard Treatment Workflow (STW) for the Management of RENAL AND URETERIC STONES ICD N20.0

HOW WILL YOUR PATIENT PRESENT AND WHAT TO SUSPECT



INVESTIGATION

RADIOLOGY

NAME	ADVANTAGES AND DISADVANTAGES
X-KUB	Readily available, inexpensive, minimal radiation but needs preparation hence may not be the preferred test in emergency settings
USG	Readily available, no radiation, safe test in pregnancy , detects radiolucent stones, high sensitivity for hydronephrosis. Can miss a ureteric calculus
IVP	Anatomical and functional imaging, aids in planning surgery but high radiation and needs preparation. Not useful in poor renal function
CT Scan	No contrast required, highly sensitive and specific, detect radiolucent stones, detect other causes of flank pain, but risks higher radiation and cost

TIPS FOR ORDERING INVESTIGATIONS

- Order X-KUB and Ultrasound in all patients of suspected renal stones (90% of renal stones are radio-opaque).
- In acute colic NCCT should be preferred if available
- Once the stone is detected, get Intravenous pyelography if stone is seen on X-ray
- CT urography if stone is radiolucent to aid further treatment

METABOLIC EVALUATION

Initial biochemical evaluation in all stone formers

Urine analysis, serum creatinine, electrolytes namely calcium, phosphorous and uric acid. Intact parathyroid hormone and stone analysis are preferable.

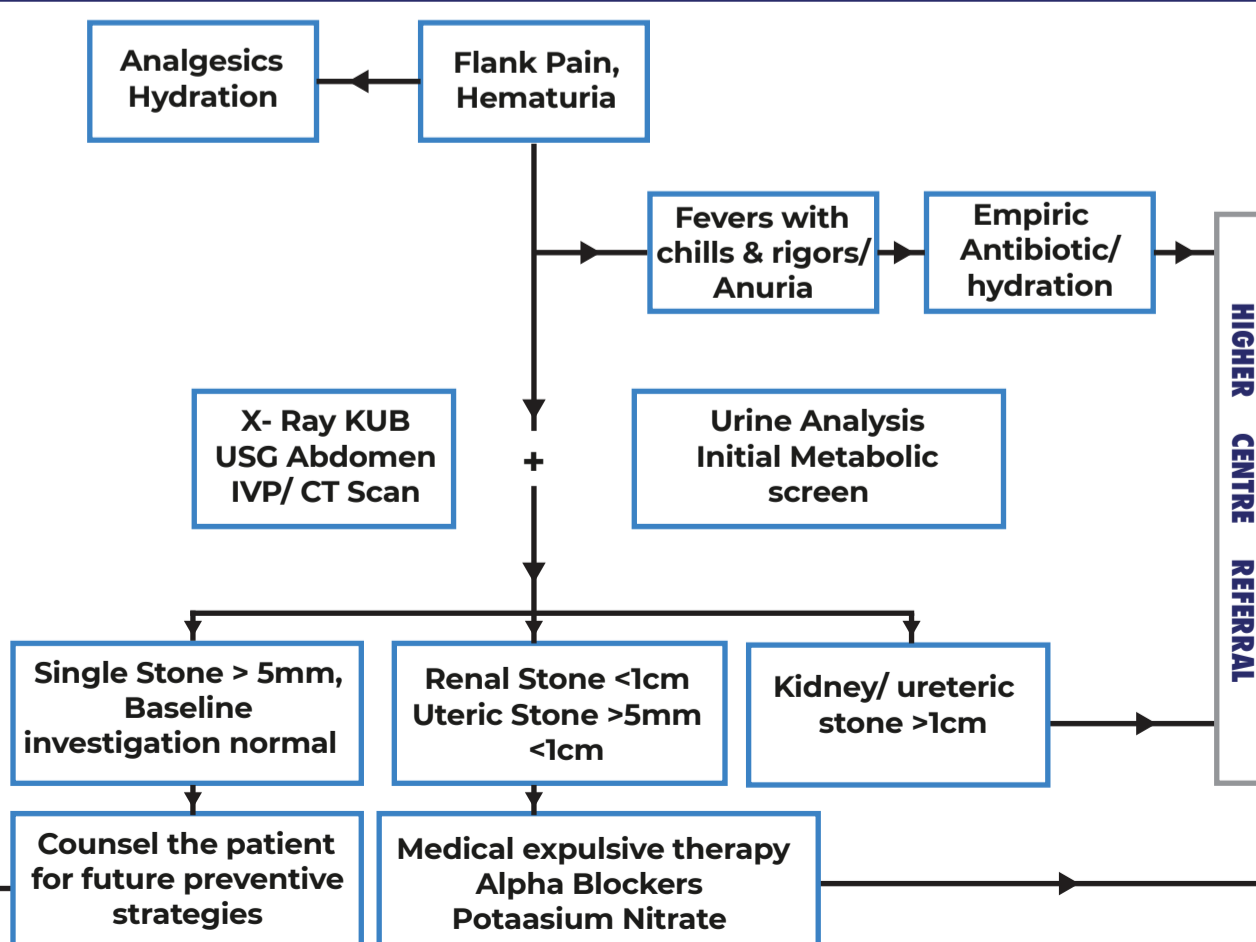
Extended Evaluation

To be done in recurrent stone former, stone in children, bilateral stones, family history of stone, history of gut surgery, solitary kidney and cysteine stones. Typically to be done at 3-4 weeks after stone clearance

Should include initial metabolic evaluation plus 24-hour urinary levels of calcium, uric acid, and creatinine. Preferable to do urinary oxalate and citrate levels too.

MANAGEMENT ALGORITHM

- Increase daily fluid intake to ensure a urine output >2 lit/day
- Restrict extra salt intake and increase dietary fibre.
- Do not restrict calcium intake.
- Increase citrate rich food such as lemon, orange juice etc.
- Decrease consumption of food rich in oxalates like spinach, nuts, beet root, potato chips, French fries.
- Avoid purine rich foods like animal protein, alcoholic drinks like beer



Warning signs for immediate referral

- Anuria
- Fever with chills and rigors
- Suspected renal failure
- Persistent haematuria

Medical Expulsive Therapy (MET)

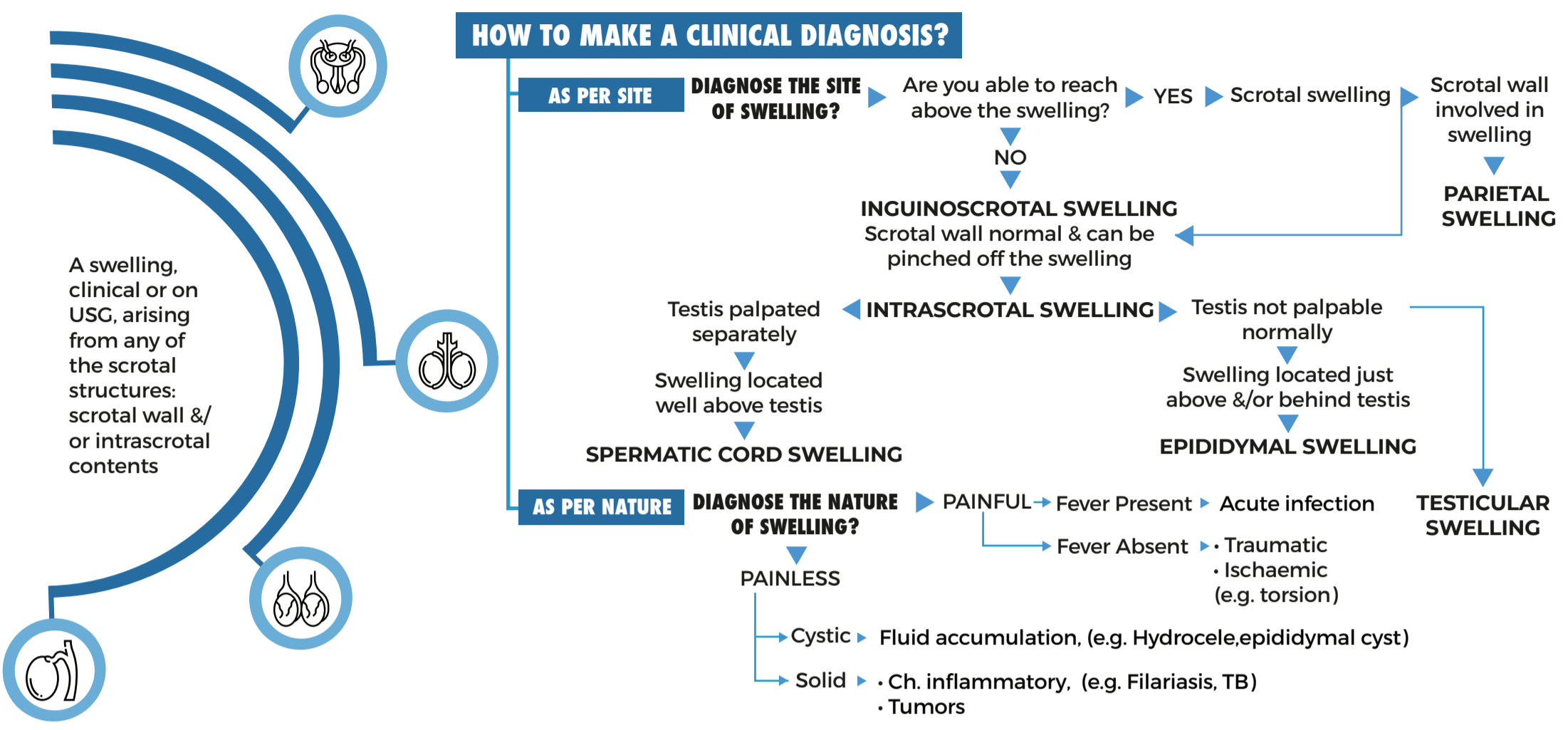
- Alpha blockers such as Tamsulosin(0.4mg/day); Alfuzocin(10mg/day); Doxazocin(4mg/day); Silodocin(8mg/day)
- MET should be offered
 - In Ureteric stones <10mm
 - In the absence of infection, obstruction or deranged renal function.
 - MET can be tried for upto 4 weeks

KEEP A HIGH THRESHOLD FOR INVASIVE PROCEDURES



Standard Treatment Workflow (STW) for the Management of SCROTAL SWELLING

ICD-10-N50.89



MAKE A CLINICAL DIAGNOSIS

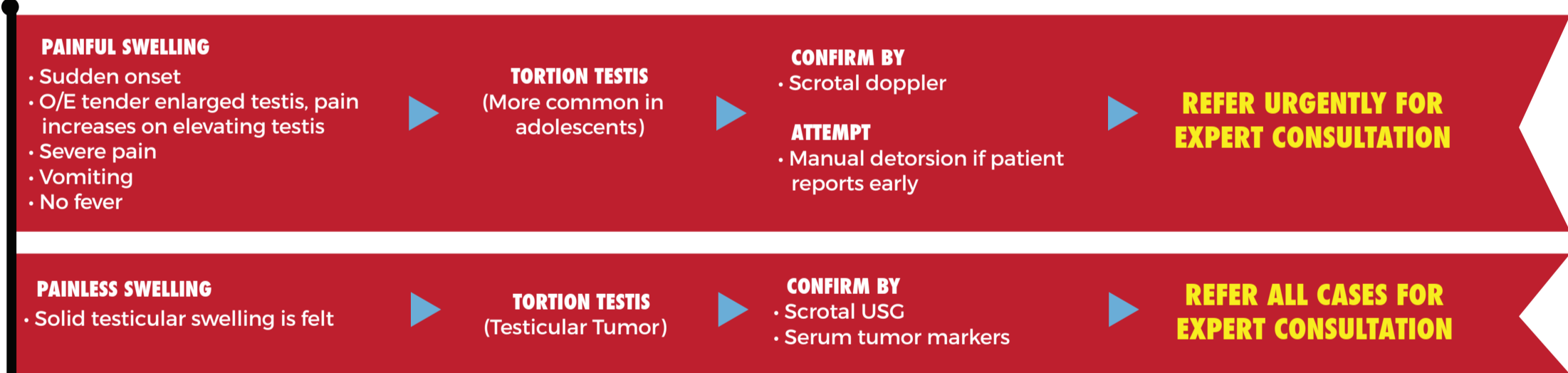
PARIETAL (SCROTAL WALL) SWELLINGS

	BILATERAL	UNILATERAL
Ac. Inflammation	• Cellulitis • Fournier gangrene	• Reactionary to epididymo-orchitis • Furuncle Abscess
Traumatic	Contusional	Blunt trauma
Ch. Inflammation	Filarial Elephantiasis	
Fluid Accumulation	• Edema in anasarca, IVC thrombosis • Urinary extravasation	Scrotal wall cysts
Neoplasm		Melanoma, Scrotal Carcinoma Dermatofibroma;

INTRASCROTAL SWELLINGS

	Testicular	Epididymal	Spermatic cord
Cystic	Hydrocele	• Epididymal cyst • Spermatocele	Varicocele
Solid	Painless • Testicular tumor	Painless • Ch. Filarial epididymitis • Ch. Tuberculous Epididymitis	Painless • Lipoma cord
	Painful • Torsion testis • Orchitis	• Adenomatoid tumor Painful • Ac. Epididymitis	Painful • Funiculitis





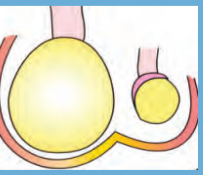
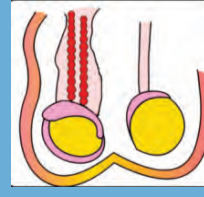
RED FLAG SIGNS



INVESTIGATIONS

SUSPECTING AC. INFLAM DISEASE	SUSPECTING CH. INFLAMMATORY DIS.	SUSPECTING TESTICULAR TUMOR	SUSPECTING TORSION	SUSPECTING VARICOCELE
Essential • TLC/DLC • Blood sugar Desirable • Anti filarial antibody	Essential • TLC/DLC • ESR Desirable • Anti filarial Ab • TB Gold test • Scrotal USG	Essential • Beta hCG • Alfa feto protein • Serum LDH Desirable • Scrotal USG • Abdomino-Pelvic CECT Scan	Essential • TLC/DLC Desirable • Scrotal doppler	Essential • TLC/DLC Desirable • Scrotal doppler

HOW TO TREAT COMMON CONDITIONS?

PARIETAL SWELLINGS	INTRASCROTAL SWELLINGS
FURUNCLE/ABSCESS <ul style="list-style-type: none"> • Broad Spectrum Antibiotic Amoxy + Clavulanic acid • Consider drainage if fluctuations+ or impending rupture REFER • If abscess appears part of underlying disease • Nonresponders • Immunocompromised patient 	AC. EPIDIDYMO-ORCHITIS <ul style="list-style-type: none"> • If patient had a urinary tract instrumentation or dysuria - suspect bacterial type, treat by - antibiotic and support REFER if no response in 48 hrs • Treat all other cases as filarial by - DEC 100 mg x TDS x20 days • Doxycycline 100 mg x BD x 20 days • Give anti inflammatory drugs to all 
FILARIAL ELEPHANTIASIS <ul style="list-style-type: none"> • DEC 100 mg TDS x 20 days • Doxycycline 100 mg BD x 20 days • Scrotal Elevation/support REFER • Non responders • Huge size 	CHRONIC EPIDIDYMO-ORCHITIS <ul style="list-style-type: none"> • Mostly filarial in origin but if - Patient has had H/O UTI or urethral catheterization, suspect bacterial • Patient has H/O TB, suspect tuberculosis • Treat by DEC 100 mg TDS + Doxycycline 100 mg BD for 20 days REFER if • No response to treatment • Epididymal abscess or local sinus discharging syrup like pus 
	HYDROCELE <ul style="list-style-type: none"> • Small size - no treatment • Moderate to large -Do hydrocelectomy • Aspiration can be performed under aseptic precautions in select cases REFER if not trained to do the surgery 
	VARICOCELE <ul style="list-style-type: none"> • Counsel for semen analysis (2-3 times) REFER if 'discrepancy in size of testis' and/or 'abnormal semen parameters present' • Rest all cases be given symptomatic treatment 

KEEP A HIGH THRESHOLD FOR INVASIVE PROCEDURES

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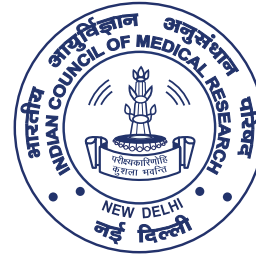
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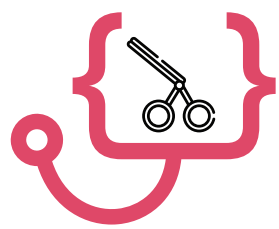
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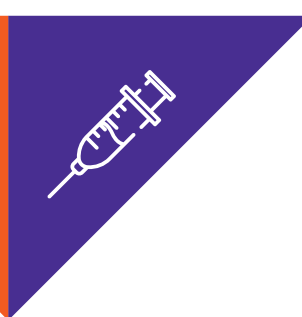
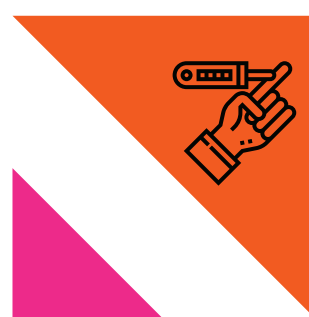
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STANDARD TREATMENT WORKFLOWS *of India*



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