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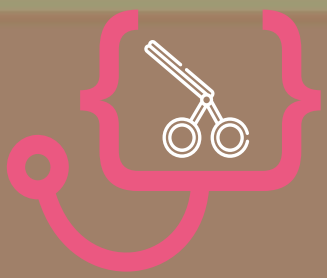

STANDARD TREATMENT WORKFLOWS *of India*

SPECIAL EDITION ON PAEDIATRIC AND EXTRAPULMONARY TUBERCULOSIS

PARTNER

Central TB Division
Ministry of Health and Family Welfare
Government of India

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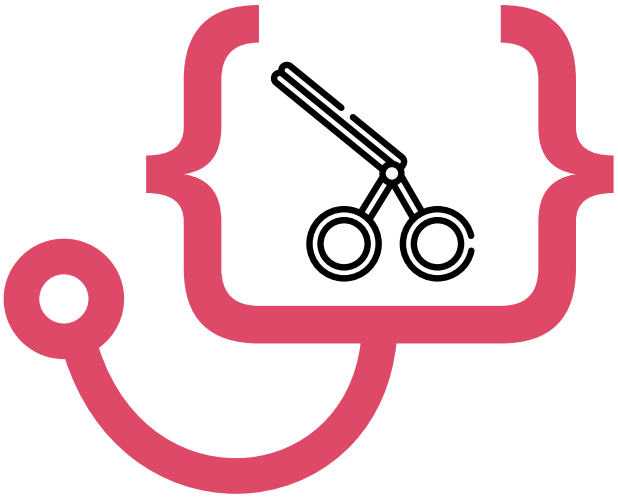


STANDARD TREATMENT WORKFLOWS *of India*

Special Edition on Paediatric and Extrapulmonary Tuberculosis

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

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.

CONTENTS

INTRODUCTION

GOAL

To empower the primary, secondary and tertiary care physicians/surgeons of all specialties towards achieving the goal of TB elimination by increasing detection of Paediatric TB and Extrapulmonary TB with disease management protocols and pre-defined referral mechanisms.

OBJECTIVES

- To formulate comprehensive algorithms for detection and management of Paediatric and Extrapulmonary TB at primary, secondary and tertiary level health care system
- To improve implementation of the National TB Elimination Programme guide lines by doctors working in peripheral health care and also guide the National Programme to put resources optimally for the management of these conditions

METHODOLOGY

PROCESS OVERVIEW

TOPIC PRIORITIZATION

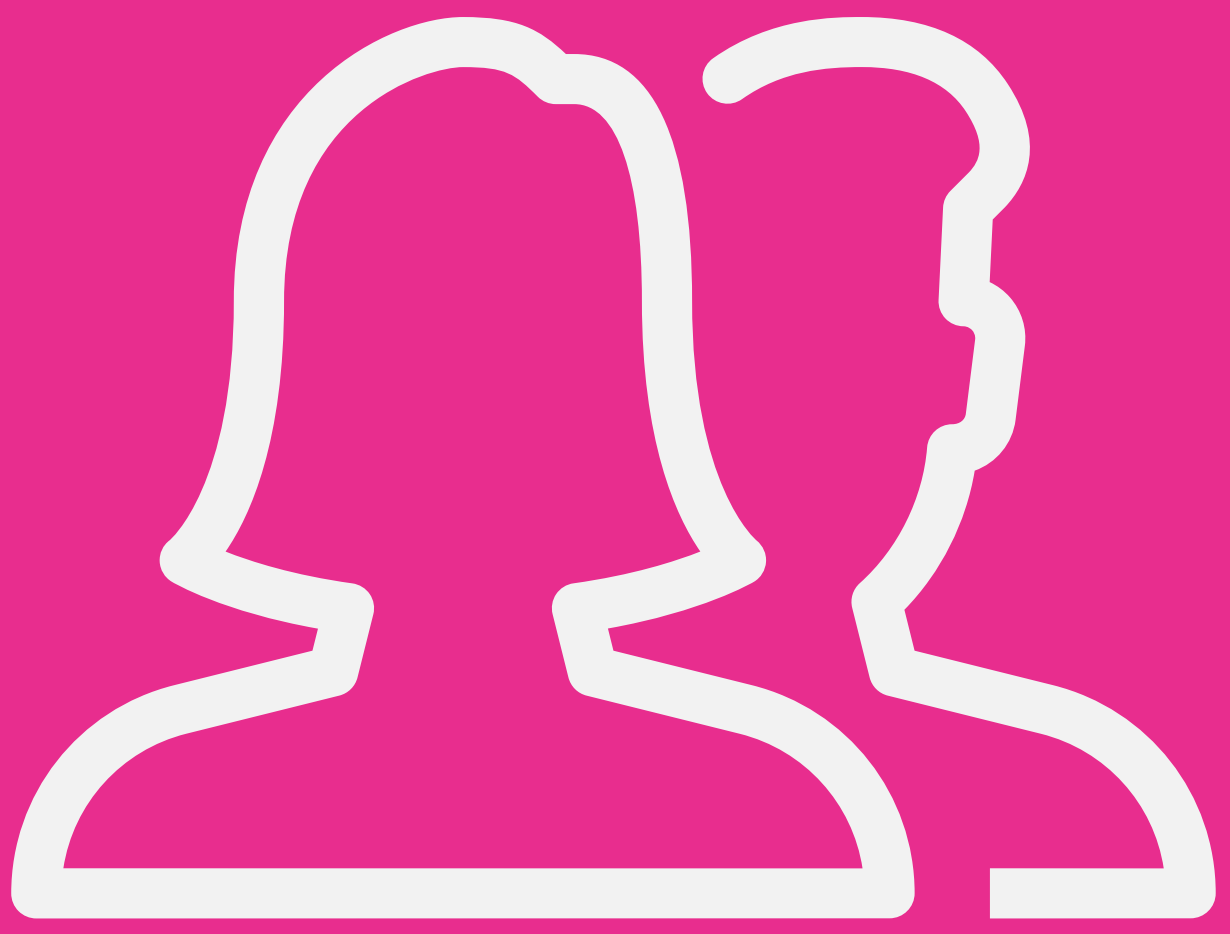
- Prevalence studies
- Global burden of diseases studies
- HBP of AB-PMJAY
- Existing guidelines

DEVELOP STWS & CONVERT THEM INTO INFOGRAPHICS

- 16 Meetings
- Participation also from
  - Public Health Specialists
  - Search Strategists
  - Clinical Scientists
  - Graphic Designers

REVIEW OF CURRENT GUIDELINES & FEASIBILITY AS PER HEALTH SYSTEM

- Review by Editorial Committee



Adult Extrapulmonary Tuberculosis

March/ 2022

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Standard Treatment Workflow (STW) for the Management of

ADULT ABDOMINAL TUBERCULOSIS

ICD-10-A18.3

WHEN TO SUSPECT

Any organ in abdominal cavity, including gut lumen & peritoneum may be affected

PERITONEAL	INTESTINAL	ESOPHAGEAL	GASTRO-DUODENAL	PERIANAL	PANCREATIC	HEPATO-BILIARY
• Abdominal distension • Pain abdomen • Fever	• Recurrent intestinal colic • Partial/ incomplete intestinal obstruction • Chronic diarrhoea • Weight loss • Palpable mass abdomen • Lower gastrointestinal bleeding	• Dysphagia • Odynophagia • Hematemesis • Constitutional symptoms	• Gastric outlet obstruction • Gastrointestinal bleed	• Simple/ Complex peri-anal fistula • Persistent discharge • Fistulae which recur after multiple surgeries	• Abdominal pain • Obstructive jaundice • Dilated pancreatic or bile duct with (peri)-pancreatic mass or cyst • Constitutional symptoms	• FUO • Hepatomegaly • Jaundice • Elevated ALP • SOL • Hepatic abscess

EVALUATION FOR SUSPECTED ABDOMINAL TUBERCULOSIS

Peritoneal TB

Ascitic tap
- Cytology (lymphocyte predominance, absence of malignant cells)
- SAAG: <1.1 gram/dL
- Culture, NAAT
- Ascitic ADA: >39 U/L

Imaging
- Ultrasound: Ascites, lymph nodes, bowel thickening, for tissue acquisition for cytology & microbiology

If diagnosis unclear
Refer for Laparoscopy

Gastrointestinal TB

- **Imaging:**
  - CT or MR enterography (preferred): bowel thickening, strictures, necrotic LN
  - CT chest may also be done
- **Endoscopic biopsies:** UGIE for esophageal/gastroduodenal/ileo-colonoscopy for intestinal TB is mandatory to acquire tissue
- **Histology:** Caseating granuloma specific; confluent granuloma & ulcers lined by histiocytes suggestive
- **Microbiology:** Culture, NAAT
- **Barium studies:** if endoscopy/CT unavailable

Perianal TB

- Uncommon
- Imaging: MRI pelvis/Endoanal ultrasound/EUS
- Tissue acquisition for histology & microbiology

Pancreatic Hepatobiliary TB

- Malignancy more important concern
- Needs imaging/ Endoscopic ultrasound guided tissue acquisition
- Refer to higher centre

If diagnosis unclear
Refer for further evaluation (differentiating Crohn's disease is challenging)
Trial of Anti tubercular therapy with careful follow-up

HIV & blood sugar test should be done in all suspected patients as per NTEP guidelines

FOLLOW UP

Definitive Abdominal TB
(Microbiological positive, Caseating granulomas)

Clinically Diagnosed Abdominal TB
(Consistent clinical/radiological picture, Elevated ascitic ADA, granuloma on histology, exclusion of differential diagnosis)

START ATT (2HRZE, 4HRE)

Clinical Assessment (4 & 8 weeks)
- No fever/pain, disappearance of abdominal distension, weight gain
- Assess ATT induced hepatotoxicity with serial LFTs

Improvement + → **Complete ATT**

No Improvement at 8 weeks → **Assessment for clinically diagnosed cases**
- Peritoneal TB: Ultrasound for ascites (4-8 weeks)
- Intestinal TB: Ileo-colonoscopy (8-12 weeks)

No Improvement → **Refer (Exclude MDR)**

Refer (Exclude alternative diagnosis)

Improvement + → **Complete ATT**

- End of therapy: Document mucosal healing in colonic & upper GI TB
- Imaging in small bowel disease to document healing

TREATMENT:

- Start treatment & follow-up as per NTEP guidelines
- 1st line treatment for adults & children with abdominal TB: 2HRZE/4HRE
- Extend duration of treatment in cases of inadequate response
- Refer for surgical management for complications [intestinal obstruction (due to strictures), perforation]. Consider endoscopic dilatation for treatment for accessible strictures
- Refer for biliary drainage in case of Jaundice due to biliary obstruction (hepatobiliary obstruction/pancreatic TB)

ABBREVIATIONS

ADA: Adenosine Deaminase
ALP: Alkaline phosphatase
ATT: Anti-Tubercular treatment
CT: Computed Tomography
EUS: Endoscopic ultrasound
FUO: Fever of Unknown Origin
GI: Gastro-intestinal
HRZE: Isoniazid; Rifampicin; Pyrazinamide; Ethambutol
LFT: Liver function tests
MDR: Multi-drug resistance
MR: Magnetic Resonance
Mtb: Mycobacterium Tuberculosis
NAAT: Nucleic Acid Amplification Test
NTEP: National TB Elimination Programme
Rif: Rifampicin
SOL: Space occupying Lesion
SAAG: Serum Ascites Albumin Gradient
UGIE: Upper gastrointestinal endoscopy

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Standard Treatment Workflow (STW) for the Management of
ADULT LYMPH NODE TUBERCULOSIS
ICD-10-A18.2

WHEN TO SUSPECT?

- Swelling (>1 cm) in neck, armpit or groin (>2 cm) +/- redness, fluctuation, sinus discharge
- May or may not be associated with fever, weight loss, night sweats or cough
- History of similar swelling in the past / past history of tuberculosis
- History of contact with a patient with a diagnosis of TB

DIAGNOSTIC ALGORITHM

Lymphnode enlargement > 1cm ± systemic symptoms*

PERIPHERAL (ACCESSIBLE)
→ FNAC / LN aspirate
→ Send for NAAT#
- +ve → Treat as LN TB
- -ve → LN biopsy (refer if indicated) → **LN tissue for** • NAAT • Cultures$/ LPA

ABDOMINAL/MEDIASTINAL (INACCESSIBLE)
→ Sputum / induced sputum
→ Send for NAAT#
- +ve → Treat as LN TB
- -ve → Refer for FNAB → **Tissue for** • NAAT • Cultures/ LPA

**Tender LN, fluctuation, pain, fever, weight loss, night sweats*
#Xpert/TrueNat/ ICMR or CTD approved test
$MGIT/LJ

Treatment : As per NTEP Guidelines

ASSESS RESPONSE TO THERAPY AT 3-4 MONTHS

- **Resolution**: Decrease in size of LN with settling of systemic symptoms
- **Delayed response -Paradoxical reaction**: Increase in size of LN or new signs of inflammation (up to 3 months of starting treatment) OR appearance of new LN at same/other site
- May require tissue cultures, if not done, to rule out treatment failure/resistance
- Therapeutic drug monitoring to ensure adequate drug levels
- **If cultures reveal susceptible TB it is likely due to paradoxical worsening**: May require anti-inflammatory agents (inaccessible)/ surgical removal (accessible)

Response to therapy at 3 months
- **Yes** → Symptom resolution → Continue ATT
- **No**
  - Increase in size of LN ± signs of inflammation → Check old culture report / Send new cultures if not available
    - Susceptible TB
      - Paradoxical worsening → Refer to higher centre
      - Therapeutic drug monitoring → Refer to higher centre
    - Drug resistant TB → Refer to DOTS plus centre
  - Constitutional symptoms persist → R/o alternate diagnosis

COMPLICATIONS

- Abscess formation
- Rupture may lead to sinus formation

REFER TO HIGHER CENTRE IF

- Non responders
- Needs treatment for Drug Resistance
- Large Nodal Mass/Abscess requiring surgical intervention

BCG LYMPHADENITIS

- Age is usually < 2 years
- Axillary and/or supraclavicular LN on same side as BCG vaccination (usually given on left)
- No systemic symptoms in immunocompetent children
- **Treatment:**
  - Wait & watch if small
  - If large & suppurative, repeated aspiration or rarely incision & drainage is required

NAAT/AFB smear positivity can not differentiate between BCG & MTB

ABBREVIATION

ATT: Anti Tubercular Treatment
BCG: Bacille Calmette Guerin
CTD: Central TB Division
DOT: Directly Observed Treatment Short-course
FNAB: Fine Needle Aspiration Biopsy
FNAC: Fine Needle Aspiration Cytology
LJ: Lowenstein Jensen
LN: Lymph Node
LPA: Line Probe Assay
MGIT: Mycobacterial Growth Indicator Tube
MTB: Mycobacterium Tuberculosis
NAAT: Nucleic Acid Amplification Test
NTEP: National TB Elimination Programme
PCR: Polymerase Chain Reaction
TB: Tuberculosis

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Standard Treatment Workflow (STW) for the Management of
ADULT MUSCULOSKELETAL TUBERCULOSIS
ICD-10-A18.0

WHEN TO SUSPECT?

SPINE TUBERCULOSIS

- Persistent localized pain in spine region >6 weeks, night pains
- Local tenderness/cold abscess
- Recent onset deformity in the back
- Recent neurological deficit (better to refer*)
- Persistent heaviness around the waist/Girdle pain
- Fever, cough, weight loss & night pains
- History of close contact with TB

OTHER JOINTS/BONES

- Persistent localized pain & swelling >6 weeks
- Mono-articular joint involvement
- Discharging sinus (+/-)
- Fluctuant swelling with or without inflammation
- Painful restriction of involved joint movements
- Wasting around the area
- Fever, cough, weight loss & night pains
- History of close contact with TB

DIAGNOSTIC ALGORITHM

Presumptive TB

ESR, CRP, LFT, KFT, HIV

Imaging : X-rays spine & chest, (MRI, if feasible)

Features s/o TB

In case of psoas abscess or soft tissue abscess: USG guided biopsy, bone/joint biopsy (open or percutaneous)

Biopsy facilities not available: Refer
Lesion not accessible for biopsy : Refer*

Send samples for: Gram staining & Culture sensitivity, AFB staining, HPE, NAAT, Solid & liquid mycobacterium culture, LPA if feasible

MTB +ve → **Start ATT**

MTB -ve → **Refer to higher centre**

Paravertebral shadow | Obliterated disc space & bone loss in X-rays | T_1WI and T_2WI images bone edema with VB destruction | T_2WI septate pre/para vertebral abscess in MRI

Findings S/o TB

- **X-ray findings(spine):**
  - › Regional Osteopenia
  - › Decreased/obliterated disc space
  - › Vertebral erosions +/- reduced vertebral height
  - › Paravertebral shadow
- **MRI findings (Spine):**
  - › Contagious VB involvement with relatively preserved disc
  - › Pre & paravertebral septate collection (Abscess)
  - › Epidural encroachment +/- intraosseous abscess
- **X-ray & MRI Finding (extraspinal):**
  - › Regional osteoporosis with bone destruction on X-rays
  - › Inflammation of bone(T1WI & T2WI) +/- abscess on MRI

TREATMENT

Treatment should be started & follow-up should be conducted as per NTEP guidelines
The following algorithm provides additional guidance for follow-up

TB +ve on any test

NAAT sensitive to Rifampicin: Start 4 drug first line ATT

- Clinical symptoms improvement
- CRP decreasing continue for standard 12 months regime
- Intensive 4 drug regime (not more than 4 months)
- Stop ATT after 12 months if all three parameters clinical, Lab(ESR, CRP) & radiological return to normal
- In case of spine decision to stop ATT to be taken by evaluating healed status on contrast MRI
- Mildly elevated ESR, CRP (non specific tests) can be ignored
- Follow up every month with CRP, LFT during intensive phase
- Follow up every 3 months during continuation phase with CRP/LFT
- On treatment worsening of symptoms
  - › Early (<3 months): Paradoxical
  - › Late (>4 months): ?drug resistance
- Any aberrance in course such as appearnce of nerual deficit: Refer*

GeneXpert resistant to Rifampicin: refer*/culture for TB and sensitivity to other drugs

TB -ve on all tests

Index of suspicion high ESR, CRP raised: Refer*

Index of suspicion low CRP normal: Reassurance

Clinical symptoms not improving ESR, CRP increasing: Refer*

?Suspected drug resistance

***Refer to higher centre where advanced diagnostic, & therapeutic facilities including surgical procedures are available.**

ABBREVIATIONS

AFB: Acid-fast Bacillus
ATT: Anti-Tubercular Treatment
CRP: C-Reactive Protein
ESR: Erythrocyte Sedimentation Rate
HIV: Human Immunodeficiency Virus
HPE: Histopathological examination
KFT: Kidney Function Tests
LFT: Liver Function Tests
LPA: Line Probe Assay
MRI: Magnetic Resonance Imaging
NTEP: National TB Elimination Programme
TB: Tuberculosis
USG: Ultrason bography
VB: Vertebral body
WNL: Within Normal Limits

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Standard Treatment Workflow (STW) for the Management of

ADULT PERICARDIAL TUBERCULOSIS

ICD-10-A18.84

WHEN TO SUSPECT

SYMPTOMS

- Cough, fever, breathlessness or pleuritic chest pain
- May be associated with weight loss, night sweats or difficulty lying down
- Past history or a history of contact with a patient with a diagnosis of tuberculosis
- Examination reveals tachycardia, increased jugular venous pressure, hepatomegaly, ascites, & peripheral edema
- A pericardial friction rub and distant heart sounds present on cardiovascular examination
- If clinical picture +/- heart US suggest pericarditis or pericardial effusion refer for echo-cardiogram

COMPLICATIONS

Constrictive pericarditis: Clinical signs for recognition include

- Kussmaul's sign (lack of an inspiratory decline in jugular venous pressure)
- Elevated & distended jugular veins with a prominent Y descent (second inward deflection of internal jugular pulse due to diastolic inflow of blood into the right ventricle)
- Pericardial knock (rare)

Cardiac tamponade: Clinical signs include

- Sinus tachycardia
- Hypotension with a narrow pulse pressure
- Elevated JVP jugular venous pressure
- Muffled heart sounds
- Pulsus paradoxus (a decrease in systolic blood pressure by >10 mmHg on inspiration)
- Ascites

Other complications:

- **Myopericarditis:** Abnormal ejection fraction with evidence of myocarditis and pericarditis (elevated cardiac enzymes & ST elevation on ECG)
- **Effusive constrictive pericarditis:** Mixed clinical picture. Main clue is elevated JVP clinically & right atrial pressure on ECHO in spite of removal of pericardial fluid

INVESTIGATION

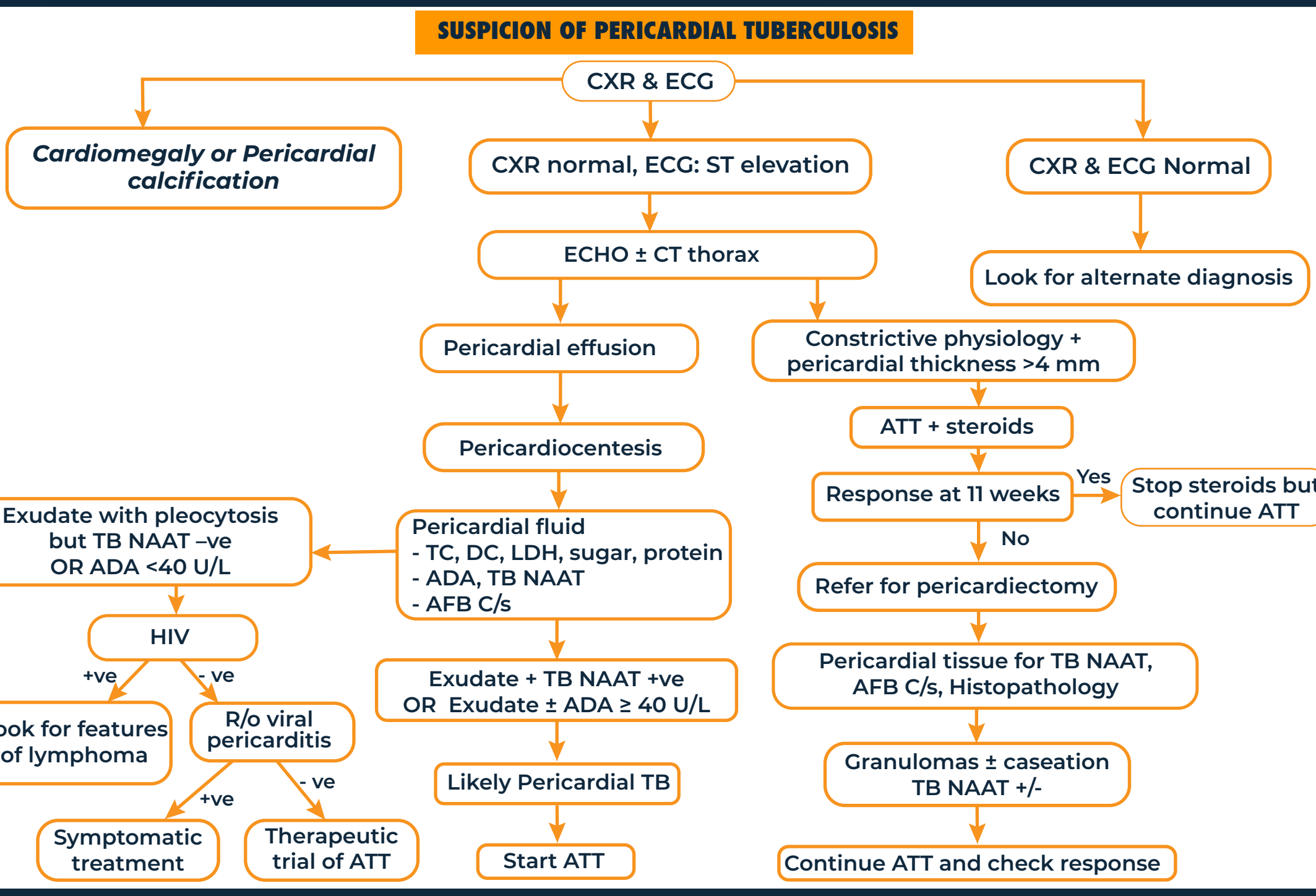
Essential tests:

- Chest X-ray
- ECG
- Echocardiogram

Desirable:

- Cardiac enzymes
- CT/MRI of Thorax
- Pericardiocentesis
- Pericardial biopsy

DIAGNOSIS



MANAGEMENT

TREATMENT

- Antitubercular therapy is advised as per NTEP
- Steroids are recommended in large pericardial effusions, prominent pleocytosis & pericardial fluid with high inflammatory markers or early constriction
- Give Prednisolone 60 mg/day for 4 weeks, 30 mg/day for 4 weeks, 15 mg/day for 2 weeks & 5 mg/day for 1 week
- Total duration of systemic steroids is 11 weeks

NON RESPONSE TO STEROIDS & ATT

- Should prompt a referral to a specialist center for confirmation of diagnosis
- Should prompt an evaluation for alternative causes of effusio-constrictive pericarditis: viral infections, systemic lupus erythematosus, primary effusion lymphomas or pericardial malignancies
- Non response of cardiac symptoms to anti-tuberculous therapy cardiac surgical evaluation may be required

ABBREVIATION

ADA: Adenosine Deaminase
ATT: Antituberculous Therapy
CXR: Chest X-ray
ECG: Electrocardiogram
ECHO: Echocardiogram
JVP: Jugular Venous Pressure
NTEP: National Tuberculosis Elimination Programme
TB: Tuberculosis

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Standard Treatment Workflow (STW) for the Management of

ADULT PLEURAL TUBERCULOSIS

ICD-10-A15.6

WHEN TO SUSPECT?

HISTORY

- Fever
- Pleuritic chest pain
- Cough
- Breathlessness
- Anorexia
- Weight loss
- History of TB contact

EXAMINATION

- Dullness to percussion
- Decreased/absent breath sound

INVESTIGATIONS

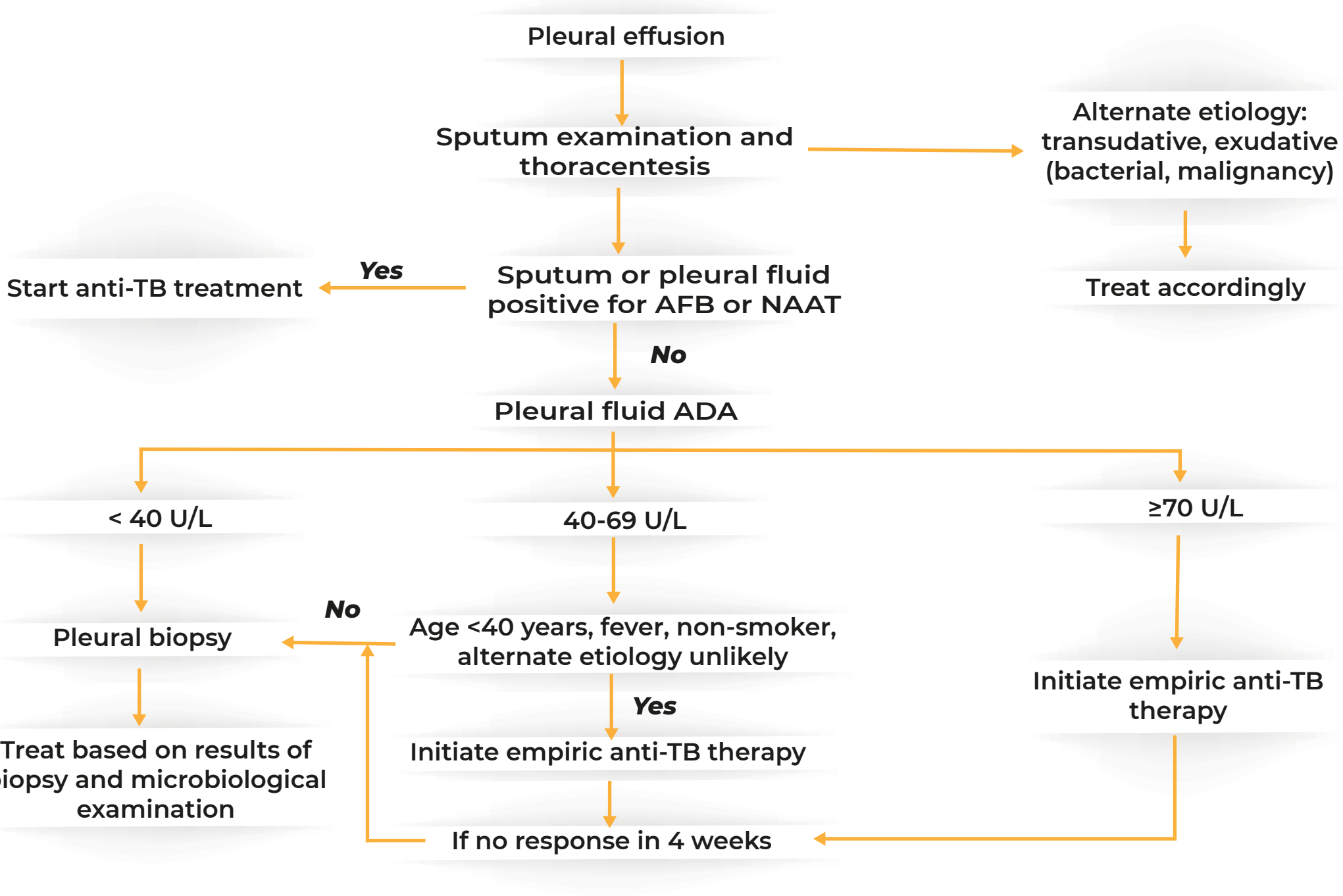
ESSENTIAL

- CXR (to confirm pleural effusion)
- Sputum for AFB/NAAT
- Refer immediately for pleural tap
- Thoracentesis (ultrasound-assisted)
- **Pleural fluid analysis :**
  - › Cell count (total and differential)
  - › Protein
  - › Glucose
  - › Gram stain
  - › Bacterial cultures
  - › Stain for acid-fast bacilli
  - › Adenosine deaminase (ADA)
  - › NAAT
  - › Cytology evaluation

DESIRABLE

- CT chest (before pleural biopsy)
- Pleural biopsy (image-guided/thoracoscopic) (If diagnosis is uncertain)
- Histopathology
- MGIT

DIAGNOSTIC



MANAGEMENT

TREATMENT AND RESPONSE

- As per NTEP
- Therapeutic pleural tap can be done under ultrasound assistance if the effusion is large, and the patient is breathless

WHEN TO REFER?

- Facility for ultrasound assistance is not available
- Diagnosis is not established after thoracentesis and facilities for pleural biopsy is not available
- Drug-resistant TB is detected: according to NTEP
- Worsening pleural effusion on follow up

FOLLOW UP

- Most patients who respond to treatment will have improvement in their general condition by 2 weeks, and significant improvement in pleural effusion by 4-8 weeks
- Disappearance of constitutional symptoms with decrease in pleural effusion suggests responsiveness to treatment
- Increase in pleural effusion can suggest
  - › Paradoxical reaction or
  - › Drug-resistant TB or
  - › Alternative etiology
- A follow up CXR at 4-8 weeks after starting ATT is useful to assess progress

ABBREVIATIONS

ADA: Adenosine Deaminase
AFB: Acid-fast Bacilli
ATT: Anti Tubercular Treatment
CT: Computed Tomography
CXR: Chest Radiograph
MGIT: Mycobacterial Growth Indicator Tube
NAAT: Nucleic Acid Amplification Test
NTEP: National Tuberculosis Elimination Programme
TB: Tuberculosis

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Standard Treatment Workflow (STW) for the Management of
ADULT TUBERCULAR MENINGITIS

ICD-10-17.0

SUSPECT TBM WITH FOLLOWING CLINICAL FEATURES

- Fever (Duration of 5 days or more#†)
- Headache & Vomiting
- Altered sensorium
- Cranial nerve palsy
- Hemiparesis/any limb weakness
- Seizures
- Neck pain and stiffness

ALWAYS ENQUIRE FOR ASSOCIATED FEATURES

- Constitutional symptoms
- Active TB elsewhere
- Past history of TB & ATT
- Contact with TB patient
- HIV seropositivity
- Low socio-economic status
- High endemic area

#This is to increase sensitivity for diagnosis of TBM. The duration could be variable from days to weeks to months.
†Clinical judgement & evaluation of other conditions is also required as fever can be associated with headache in other medical conditions. Delaying work up for meningitis is not recommended.

IF TBM SUSPECTED

Refer to a centre where facility of evaluation (at least Lumbar puncture & CT scan) is available.

EVALUATION AT CENTRE OF CARE

CLINICAL HISTORY & EXAMINATION

- Symptoms type & duration, onset & progression
- Headache, altered sensorium, focal deficits
- Neck rigidity, Kernig's sign
- Cranial nerve palsy
- Fundus examination - papilledema

LABORATORY EVALUATION

- CBC, ESR, CRP
- LFT, RFT, Electrolytes
- Blood sugar, HIV
- Chest X Ray- PA view
- USG whole abdomen
- Mantoux (optional)

IMAGING

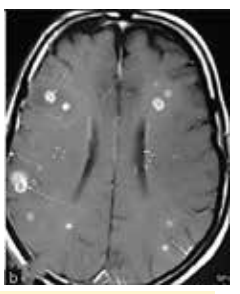
- NCCT/CECT head- Preferred as initial investigation
- MRI brain (and spine if indicated) in selective cases

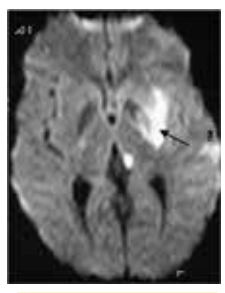
CSF

- Mandatory- Should be sent for essential analysis (Box 1)
- Prudent to perform CT head prior to CSF in presence of papilledema & /or focal deficits

COMMON NEUROIMAGING FINDINGS IN TBM


Basal exudates and Hydrocephalus


Tuberculomas


Infarction


Arachnoiditis


Pott's spine

CSF EVALUATION*

01 ESSENTIAL
- Cell count & type
- Protein
- Sugar (& Correspon-ding blood sugar)
- NAAT
- Grams stain
- Bacterial culture
- AFB stain
- AFB culture/sensitivity
- India Ink**
- Cryptococcal antigen**

02 DESIRABLE
- Fungal smear & culture
- Cytopathology#

03 OPTIONAL
- Wet mount
- VDRL
- Toxoplasma PCR†
- Viral PCR

If some tests are not available at site, store sample in sterile container, keep in refrigerator & transport in icebox to other facility

*CSF samples should be sent to the lab as soon as possible for examination of cells, protein, sugar and cytology.
**Cryptococcal meningitis should be excluded wherever possible as it is a close differential diagnosis of TBM.
#In ideal settings, it may be prudent to exclude a diagnosis of carcinomatous meningitis.
†Especially in patients with HIV.

CSF FINDINGS IN TBM AND OTHER MENINGITIS

MENINGITIS TYPE	CELL COUNT	PREDOMINANT CELL TYPE	PROTEIN	SUGAR	SPECIFIC TESTS FOR CONFIRMATION
Tubercular	Usually <500	Lymphocytic Neutrophilic in some acute cases	High	Low	AFB smear & culture NAAT*ϕ
Pyogenic	In thousands	Neutrophilic	Moderately High	Very low	Gram stain, culture
Fungal	Variable	Lymphocytic	High	Low	India Ink, Fungal Culture, Cryptococcal antigen
Viral	50-500	Lymphocytic	Normal to marginally high	Normal	PCR for specific virus

**A negative NAAT result does not rule out TBM. The decision to give ATT should be based on clinical features and CSF profile.*
ϕNAAT: Xpert/TrueNat

MANAGEMENT

ANTI-TUBERCULAR TREATMENT

- Intensive Phase: 2 months of RHZE or RHZS
- Continuation phase: 3 drugs: RHZ# for at least 10 months*

STEROIDS

- Preferably Dexamethasone 0.4 mg/kg/day intravenously in 3-4 divided doses during hospital stay
- If not feasible, give oral Dexamethasone 0.4 mg/kg/day in divided doses or oral Prednisolone 1 mg/kg/day in single morning dose
- Discharge on oral steroids on tapering doses for a total duration of 8-12 weeks

**treatment duration may be increased in some cases as per the clinician decision*
#This is as per strong recommendations of concerned specialty experts in view of high toxicity of Ethambutol on TBM. These recommendations have been sent to NTEP

FOLLOW UP

- Regular follow up is essential every month for at least first 3 months & can be increased thereafter till treatment is stopped
- Monitor liver function tests & any other features of drug toxicity
- Observe for clinical improvement or any deterioration
- Closely observe for development of any complications

SUSPECT COMMON COMPLICATIONS

Hydrocephalus and raised ICP: Worsening of headache with vomitings and/or altered sensorium
Optico-chiasmatic arachnoiditis: Complaints of vision loss in one or both eyes with or without headache
Myelitis and or arachnoiditis: Development of paraparesis or quadriparesis with/without sensory disturbances, bladder involvement
Epidural abscess/Pott's spine: Complaints of back pain and/or weakness in one/ both lower limbs/ bladder/ bowel disturbances
Tuberculoma: Seizures, new onset focal focal deficits, worsening headache
Seizures: Consider tuberculoma/electrolyte or metabolic imbalance/ cerebral infarction
Cerebral infarction and stroke: Sudden onset weakness of one half of body, new onset confusion, altered mental status, seizures
Hyponatremia, SIADH: Persistent or worsening mental status

ABBREVIATIONS

ATT: Antitubercular therapy
CBC: Complete Blood Count
CECT: Contrast Enhanced CT
CRP: C Reactive Protein
CSF: Cerebrospinal Fluid
E: Ethambutol
ESR: erythrocyte sedimentation rate
H: Isoniazid
ICP: Intracranial pressure
LFT: Liver function tests
MRI: Magnetic resonance imaging
NAAT: Nucleic Acid Amplification Test
NCCT: Non-contrast CT
NTEP: National TB Elimination Programme
PCR: Polymerase Chain Reaction
R: Rfimapicin
RFT: Renal function tests
S: Streptomycin
SIADH: Syndrome of inappropriate antidiuretic hormone
TBM: Tubercular meningitis
Z: Pyrazinamide

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Standard Treatment Workflow (STW) for the Management of CUTANEOUS TUBERCULOSIS

ICD-A18.4

ETIOLOGY

- M.tuberculosis
- M.bovis
- NTM
- BCG (rarely)

WHEN TO SUSPECT

- Presence of ulcer or discharging sinus over lymph node, bone & joints
- Persistent asymptomatic reddish/ reddish brown lesion of >6 months duration which may show scarring
- Persistent warty or verrucous lesion of >6 months duration

OTHER FEATURES

- Extracutaneous involvement
- Lymph node & lungs involvement
- Other organ systems involvement (bones, GIT & CNS)

TYPES OF CLINICAL DISEASE

- Primary Inoculation tuberculosis
- Tuberculosis verrucosa cutis
- Lupus vulgaris
- Scrofuloderma
- Acute miliary tuberculosis
- Orificial tuberculosis
- Metastatic tuberculous
- Abscess (tuberculousgumma)
- Normal primary complex–like reaction
- Postvaccination
- Perforating regional adenitis
- Lichen scrofulosorum
- Papulonecrotictuberculid
- Facultative tuberculids
- Nodular vasculitis & Erythema nodosum


Lupus Vulgaris


Lupus Vulgaris


Scrofuloderma


Scrofuloderma


Verrucous TB


Verrucous TB

INVESTIGATION

INVESTIGATIONS

- **Histopathology**: Granulomas with epithelioid histiocytes & Langerhans - type giant cells
- **FNAC**: If indicated
- **IGRA/PCR**: Not recommended for diagnosis

SCREENING FOR SYSTEMIC INVOLVEMENT

- **Examination:**
  - › Lymph node to be examined (FNAC)
  - › Other organ system can be done if indicated
- **Essential:**
  - › Chest X-ray
  - › FNAC from the indurated part of lesion
- **Desirable:**
  - › Histopathology
  - › Culture from biopsy sample (Not swab)

CASE DEFINITION

A) Confirmed case:

- › M.tuberculosis complex identified by either culture or NAAT or histology shows typical morphology
- › Full course of ATT which led to complete clearance of lesions

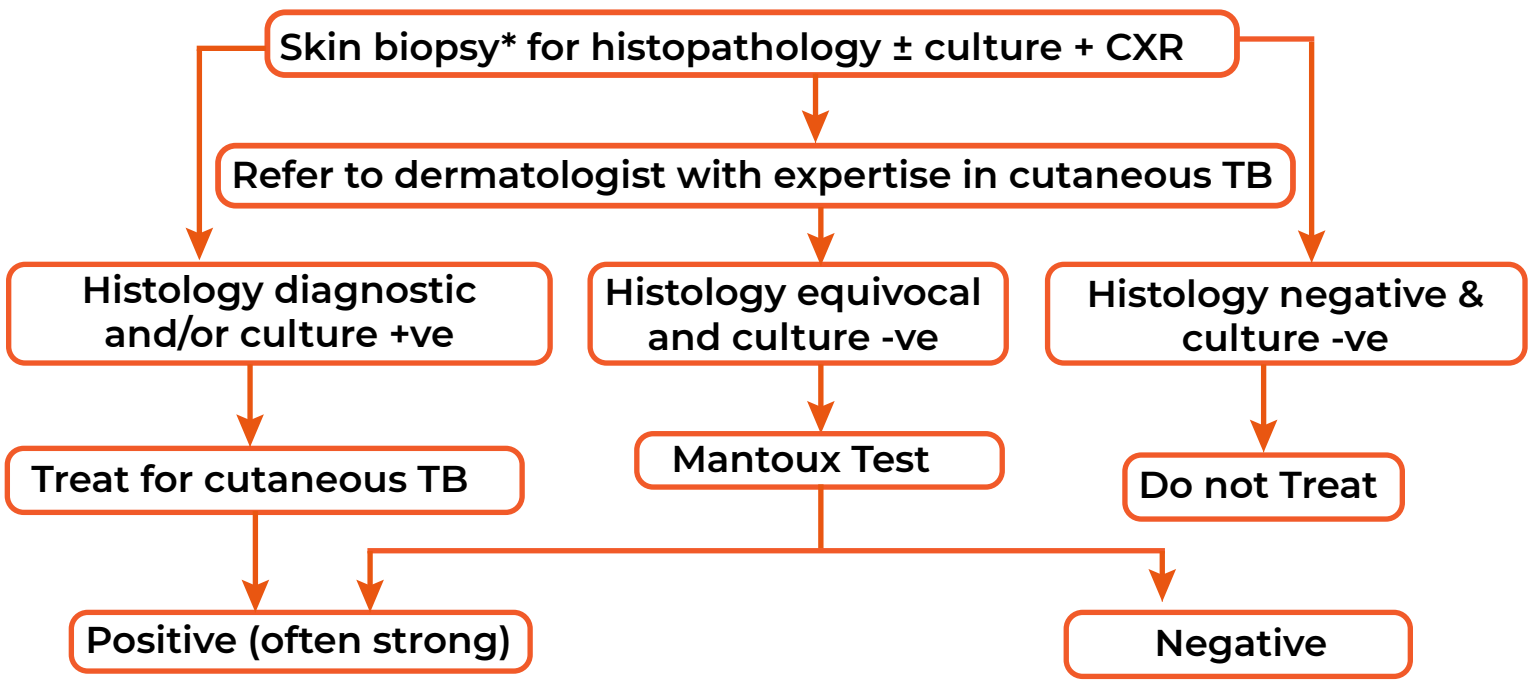
B) Probable case:

- › Typical skin lesion with no positive features/investigation as mentioned above (A)

DIAGNOSTIC ALGORITHM

Suspected TB case based on presence of clinical signs

- Ulcers/discharging sinuses over sites of LN, bones & joints
- Persistent, asymptomatic raised reddish/reddish brown lesion of >6 months' which may show scarring at one end
- Persistent, warty skin lesion of >6 months'



- **Strong clinical suspicion**
  - **› Start ATT**

*FNAC can be done if facilities for skin biopsy are not available

MANAGEMENT

TREATMENT

- Similar to Pulmonary TB as per NTEP
- DR -TB to be kept in mind
- No role of steroids, oral or topical, in management of CT

FOLLOW UP

- 1st follow-up after 4-6 weeks; majority improves
- If no response after 8 weeks
- Alternate diagnosis/DR-TB; refer to higher centre

ABBREVIATION

ATT: Anti-Tubercular treatment
BCG: Bacille Calmette Guerin vaccine
CNS: Central Nervous system
CT: Cutaneous Tuberculosis
CXR: Chest X-ray
DR-TB: Drug resistant Tuberculosis
FNAC: Fine needle aspiration cytology
GIT: Gastro-intestinal tract
IGRA: Interferon Gamma Release assay
LN: Lymph node
NAAT: Nucleic acid amplification test
NTEP: National TB Elimination Programme
NTM: Non-Tuberculous Mycobacterium
PCR: Polymerase chain reaction test
TB: Tuberculosis

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Standard Treatment Workflow (STW) for the Management of

FEMALE GENITAL TUBERCULOSIS

ICD-10-A18.17

WHEN TO SUSPECT?

SUSPECT

Consider following symptoms in history :

- H/O infertility (primary or secondary)
- Chronic lower abdominal or pelvic pain
- Amenorrhoea or other menstrual disturbances
- Abnormal vaginal discharge
- Constitutional symptoms of TB (low grade fever, weight loss etc.)
- Other symptoms related to extra-genital TB (abdominal, CNS, bone and lymph nodes etc.)

In addition, standard investigations for TB to be carried out

Clinical Examination
- General Physical Examination
- Pelvic Examination (cervical growth, uterine size and mobility, adnexal tenderness & mass)

Abdominal and Pelvic USG (TVS)
- Uterus, adnexa & pelvis to be evaluated preferably by transvaginal scan
- Endometrial cavity & vascularity to be looked carefully with colour Doppler

Specific Investigations
- Endometrial sampling or biopsy with Pipelle device or Karman cannula (4 mm) for microbiological & histopathological examination
- **Endoscopy** :
  - › Hysteroscopy & laparoscopy to evaluate uterus, adnexa & other pelvic organs along with lower abdomen
  - › Laparoscopic biopsy from peritoneum or abdominal/pelvic lesions
- MTB diagnosis from biopsy specimen (endometrium & other tissues) by
  - › Smear microscopy (AFB smear) & culture
  - › Gene Xpert or other NAAT
  - › HPE of biopsy specimen

DIAGNOSIS

SUGGESTIVE FINDINGS IN FGTB

Imaging and Radiological

- **HSG** : to be avoided in acute phase
  Findings : blocked fallopian tubes, usually cornual; tobacco pouch appearance of the tubes; beaded tubes; filling defect in the uterine cavity (Asherman syndrome)
- **USG** : cogwheel appearance of tubes; uterine cavity may show thin diffuse endometrium with irregular borders
- **CT/MRI** : can be used for tubo-ovarian mass

Endoscopy

- **Hysteroscopy** : To look for tubercles, pale endometrium & endometrial adhesions
- **Laparoscopy** : Direct visualization of tubercle like lesions on the uterus, tubes and other pelvic organs including peritoneum, & caseous nodules

FEMALE GENITAL TB (STEPWISE DECISION)

- Clinical history
- General physical and pelvic examination
- Pelvic ultrasound
- HSP as indicated in infertility HSG

Definite FGTB needing ATT if any of the following tests are positive

- AFB microscopy positive
- AFB culture positive
- Gene Xpert or other NAAT +ve
- Histopathological demonstration of epithelioid granuloma

Probable FGTB needing ATT if any of following positive

- Clinical findings/suspicion of TB with tubo-ovarian masses on imaging studies
- Clinical findings/suspicion of TB with laparoscopic findings of beaded tubes, caseous nodules, tubercles, adhesions, hydrosalpinx & pyosalpinx etc.
- Clinical findings/suspicion of TB with hysteroscopic findings of tubercles, caseous nodules, pale endometrium, intrauterine adhesions etc.

Negative FGTB : No ATT

- No microbiological, histological, radiological, laparoscopic & hysteroscopic evidence of FGTB

Menstrual blood should not be used for NAAT.

MANAGEMENT

TREATMENT

- Treatment of FGTB should be as per NTEP
- Patients requiring specific treatment such as infertility, Asherman syndrome & tubo-ovarian mass etc. should be referred to higher centres

FOLLOW UP

Follow-up of the patient should be flexible depending on the clinical presentation and response to ATT

- 1 month : Clinical Evaluation (General & Gynaecological)
- 3 months : Clinical Evaluation (General & Gynaecological)
- 6 months : Clinical Evaluation & Investigations (endometrial biopsy, hystero-laparoscopy & USG as needed)

ABBREVIATION

AFB: Acid-Fast Bacilli
ATT: Anti-Tuberculosis Therapy
CNS: Central Nervous System
CT: Computed Tomography
FGTB: Female Genital TB
FNAC: Fine-needle Aspiration Cytology
HSE: Histopathology Examination
HSG: Hysterosalpingography
MRI - Magnetic Resonance Imaging
MTB: Mycobacterium Tuberculosis
NAAT: Nucleic Acid Amplification Test
NTEP: National Tuberculosis Elimination Programme
PCR: Polymerase Chain Reaction
TB: Tuberculosis
TVS: Transvaginal Scan
USG: Ultrasonography

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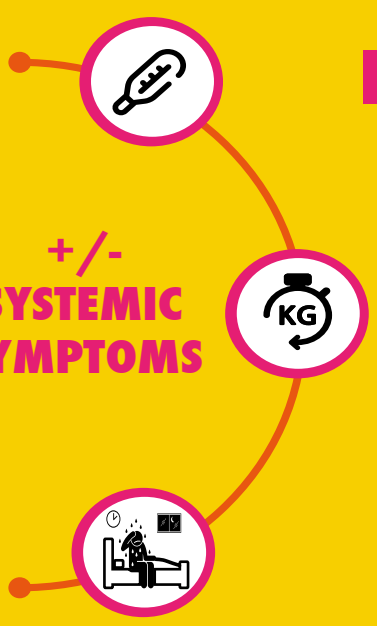
Standard Treatment Workflow (STW) for the Management of GENITOURINARY TUBERCULOSIS

ICD-A18.10



WHEN TO SUSPECT?

- Fever
- Weight loss
- Night sweats

PRESENTING SYMPTOMS

Urinary Tuberculosis

- LUTS (frequency, urgency and nocturia) with dysuria and/or haematuria for at least 2 weeks
- Not responding to a 3–7 day course of antibiotics

Male Genital Tuberculosis (MGTB)

- Scrotal pain or swelling for 2 weeks or more
- Not responding to a 7–14 day course of antibiotics, or
- Discharging sinuses in the scrotum
- Rarely infertility

INVESTIGATION

Essential
- CBC
- KFT*
- LFT
- ESR
- Chest X ray
- Urine R/M and Culture
- Urine for AFB x 3-5 days (early morning, first void)
- Urine Culture for MTB x 3-5 days (early morning, first void)
- NAAT assay (GeneXpert MTB/RIF)
- USG KUB**
- USG Scrotum (for MGTB only)

***Deranged renal function**
****HDN/HDUN**

Refer to higher centre/Urologist

Specific Investigations
- **If normal renal function**
  - › IVP/CT urography
- **If deranged Renal Function**
  - › MR Urogram
  - › Retrograde Pyelography
  - › Nephrostogram

Optional (If other tests are inconclusive with high suspicion of GUTB)
- FNAC/ Biopsy- from accessible mass lesions or fluid collections
- Cystoscopic biopsy of Genitourinary tract

TREATMENT

TYPE OF TB	TYPE OF REGIMEN	DRUGS	EXTENSION CRITERIA
DRUG SUSCEPTIBLE TB	DS-TB REGIMEN	2 MONTHS H,R,E,Z 4 MONTHS H,R,E	Extension packets of infection, concurrent smear positive cavitary pulmonary disease, CNS involvement, Delay in positive cultures converting to negative Duration can be increased up to 9 to 12 months
MDR/RR OR XDR-TB	**TREATMENT AS PER NTEP GUIDELINES**		

FOLLOW UP

At 8 weeks : Resolution of systemic symptoms, improved urinary symptoms, repeat culture if baseline culture positive

After completion of ATT: Repeat culture if baseline culture positive

Repeat imaging: If partial or impending ureteric stricture

Watch for the following complications at each Follow-up visit:
- Severe LUTS suggestive of small capacity bladder
- Deteriorating renal function

ABBREVIATIONS

ATT: Anti-tubercular treatment
CT: Computed Tomography
CBC: Complete Blood Count
CXR: Chest X- Ray
DJS: Double J Stent
DS-TB: Drug Susceptible Tuberculosis
E: Ethambutol
ESR: Erythrocyte Sedimentation Rate
H: Isoniazid
HDN: Hydronephrosis
HDUN: Hydroureteronephrosis
IVP: Intravenous Pyelogram
LFT: Liver Function Test
LUTS: Lower Urinary Tract Symptoms
MDR: Multi Drug Resistant
MTB: Mycobaterium Tuberculosis
MR: Magnetic Resonance
NAAT: Nucleic Acid Amplification Test
NTEP: National Tuberculosis Elimination Programme
RFT: Renal Function Test
R: Rifampicin
RR: Rifampicin Resistant
USG KUB: Ultrasonography Kidney, Ureter and Bladder
URINE AFB: Urine for Acid-fast Bacillus
XDR: Extensively Drug Resistant
Z: Pyrazinamide

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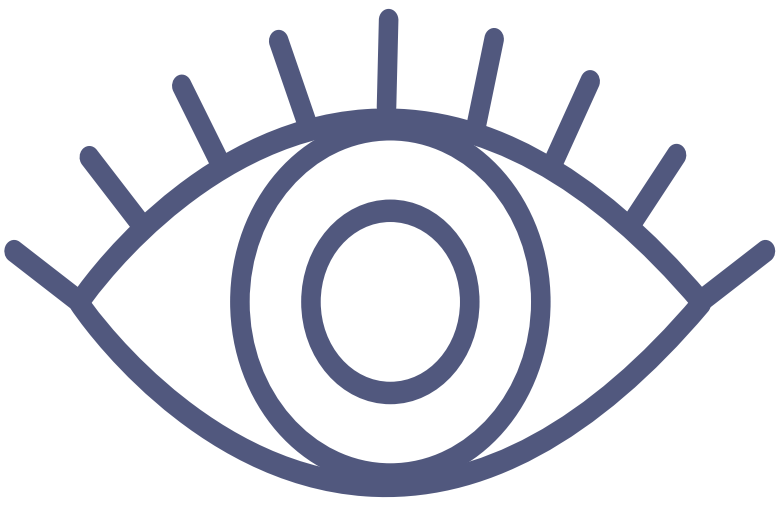
INTRAOCULAR TUBERCULOSIS

ICD-10-A18.3



When to suspect

Ocular Symptoms

- Blurred vision
- Redness
- Photophobia
- Pain in the eye
- Floaters
- Flashes of lights

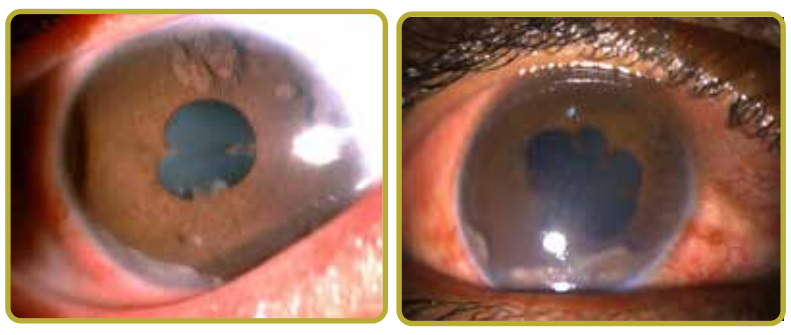
Refer to Ophthalmologist for detailed examination

Eye Care facility should have:

Mandatory: Slit lamp, ophthalmoscope (direct or indirect), intraocular pressure assessment device

Preferred: Fundus camera, Fundus fluorescein angiogram(FFA), Optical Coherence Tomography (OCT)

Granulomatous anterior uveitis



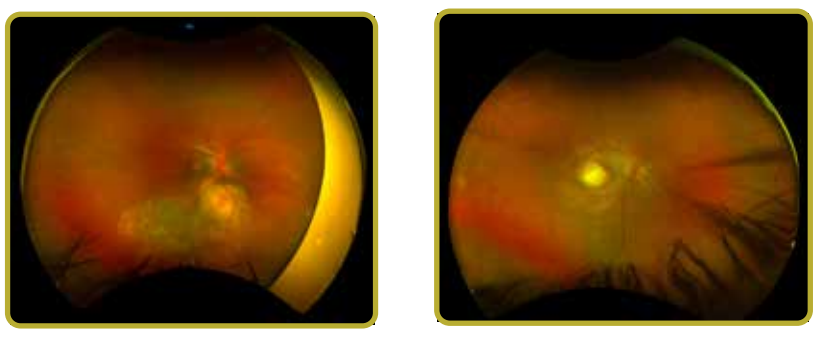
Examination of the eyes

Clinical signs

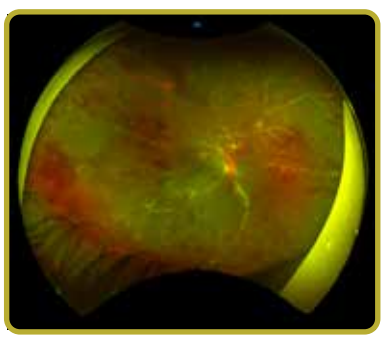
- Assess visual acuity
- Anterior chamber cells, Keratic precipitates, Synechiae, Irregular pupil, RAPD
- Complicated cataract, high or very low intraocular pressure
- Vitritis, Pars plana exudates, Retinal vasculitis, Retinitis, Choroiditis, Optic nerve head swelling

Intermeditate uveitis

Panuveitis/Posterior uveitis



Retinal vasculitis



Choroiditis

INVESTIGATIONS

Essential:
CXR for healed/ active pulmonary TB

Desirable:
Mantoux Test (standardised tuberculin units): 10 mm induration considered positive

Optional:
CT Chest (if available) for healed/active pulmonary TB

Investigations to rule out other causes of clinical presentation

Imaging of eye: Ascertaining diagnosis, extent of disease & follow up, teleconsultation

Retinal photographs using fundus camera

Optical coherence tomography scans (if available)

Fluorescein angiograms (if available)

MANAGEMENT

TREATMENT

- **ATT** : 2 months of RHEZ + 7 months of RH depending on clinical response & side effects to treatment
- Add pyridoxine 10 mg/day
- **Corticosteroids** : Topical steroids eye drops for severe/anterior chamber inflammation
- For treatment in children refer to paediatrician
- Systemic corticosteroids for severe inflammation in consultation with Uveitis expert

REFERRAL TO HIGHER CENTRE

- Not confident to treat
- Vision threatening
- Non-response to treatment
- Side effects due to treatment
- Atypical reaction

MONITORING AND FOLLOW UP

- **Frequency of follow up**: 1-2 weeks in 1st month followed by monthly for 3 months & then 3 monthly
- **Eye**: Clinical grading of inflammation using fundus photographs & OCT scans (if available)
- **Steroids**:
  - **Topical**: Monitor IOP, cataract and any signs of bacterial/ fungal infection
  - **Systemic steroids:** Monitor body weight, blood sugar & blood pressure

ABBREVIATIONS

ATT: Antitubercular treatment
E: Ethambutol
H: Isoniazid
IOP: Intraocular pressure
R: Rifampicin
RAPD: Relative Afferent Pupilary Defect
OCT: Optical coherence tomography
Z: Pyrazinamide

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