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Department of Health Research

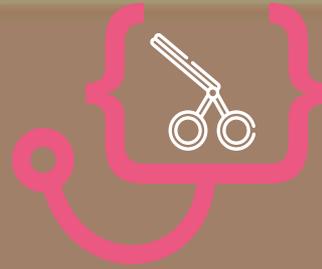
Ministry of Health and Family Welfare, Government of India



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STANDARD TREATMENT WORKFLOWS *of India*

SPECIAL EDITION ON
PAEDIATRIC AND
EXTRAPULMONARY TUBERCULOSIS

PARTNER



सत्यमेव जयते

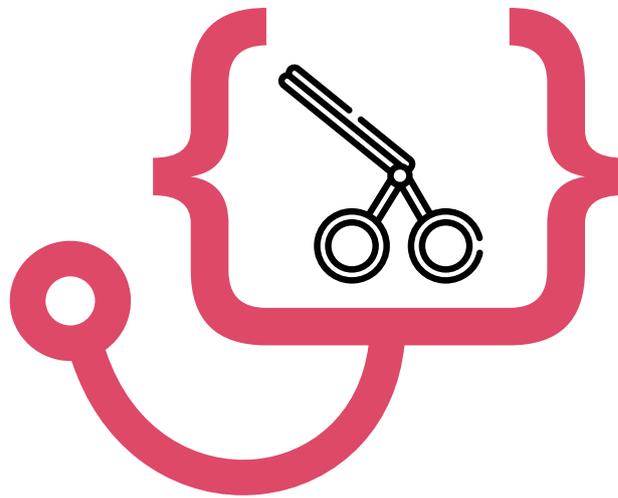
Central TB Division
Ministry of Health and Family Welfare
Government of India

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STANDARD
TREATMENT
WORKFLOWS
of India

Special Edition on
Paediatric and
Extrapulmonary Tuberculosis



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- **INTRODUCTION**
- **SPECIALITIES COVERED IN THIS EDITION**

Paediatric Tuberculosis

Paediatric Abdominal Tuberculosis
Paediatric Intrathoracic Tuberculosis
Paediatric Lymph node Tuberculosis
Paediatric Osteoarticular Tuberculosis
Paediatric Tubercular Meningitis



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



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INTRODUCTION

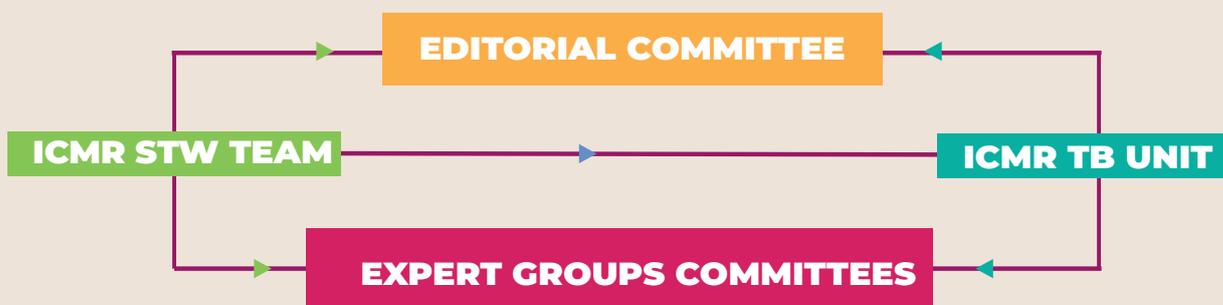
GOAL

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.

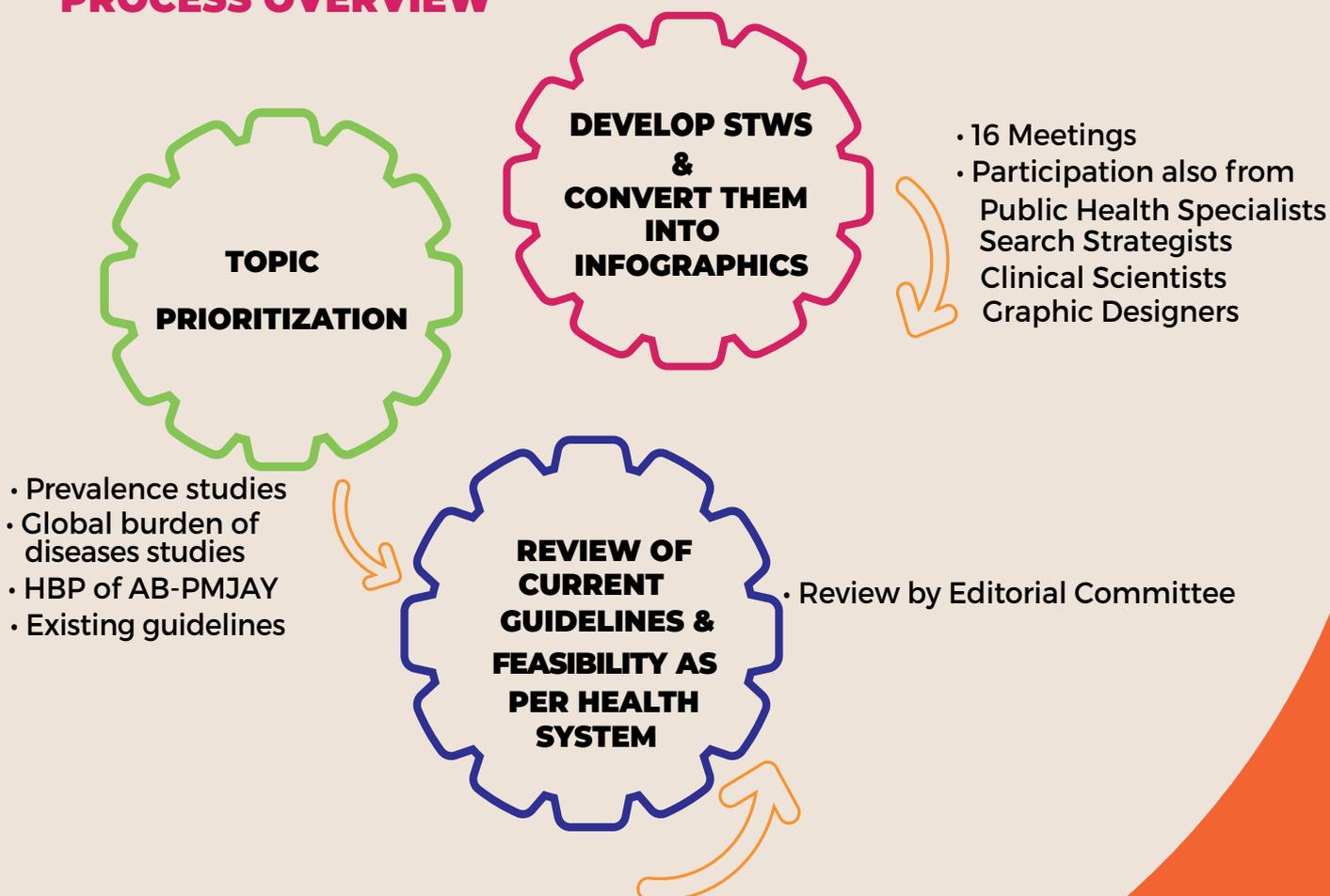
OBJECTIVES

- 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





Paediatric Tuberculosis



Standard Treatment Workflow (STW) for the Management of PAEDIATRIC ABDOMINAL TUBERCULOSIS ICD-10-A18.31

WHEN TO SUSPECT?

- One or more of following
 - › Recurrent/chronic abdominal pain in presence of red flag signs
 - › Abdominal distension/mass
 - › Altered bowel habits
- Constitutional symptoms like Presence of Fever >2 weeks, Anorexia, Unexplained weight loss or no weight gain in last 3 months despite adequate nutrition may be present
- History of contact with TB patient may also be present



CLINICAL FEATURES SPECIFIC TO TYPE OF ABDOMINAL TB

PERITONEAL TB	VISCERAL TB (LIVER, SPLEEN, PANCREAS)
<ul style="list-style-type: none"> • Abdominal pain, distension • Fever • Weight loss 	<ul style="list-style-type: none"> • Abdominal pain • Fever • Jaundice • Weight loss • Anorexia • Hepatomegaly • Splenomegaly • Hepatic abscess • Palpable abdominal lump • Abnormal LFTs
NODAL TB	
<ul style="list-style-type: none"> • Pain abdomen • Fever • Palpable abdominal lump 	
INTESTINAL TB	
<ul style="list-style-type: none"> • Recurrent intestinal colic • Altered bowel habits • Chronic diarrhoea • Partial/complete intestinal obstruction • Weight loss, anorexia • Palpable abdominal lump • Lower gastrointestinal bleeding 	

EXAMINATION FINDINGS

- Anthropometry
- General physical & systemic examination
- Look for peripheral LAP, ascites, hepatosplenomegaly, doughy feel of abdomen, palpable abdominal lump, visible peristalsis or a moving mass -"gola" formation due to partially obstructed dilated bowel loop

RED FLAGS

- Pain abdomen waking child from sleep
- Chronic, severe, or nocturnal diarrhea
- Presence of constitutional symptoms like fever, anorexia, weight loss, etc.
- Localized distension or mass

INVESTIGATIONS

ESSENTIAL

- Ultrasound abdomen

SUGGESTIVE FINDINGS

- Abdominal LN : measuring >15 mm in short axis, conglomerate and/or central necrosis
- Omental/mesenteric thickening >15 mm with increased echogenicity
- Ileocaecal wall thickening

NON SPECIFIC FINDINGS

- Intraabdominal fluid (free or loculated) or Inter-loop ascites
- Ascitic fluid with multiple septations
- Abdominal LAP with SAD <15 mm in absence of red flag signs

- Chest X Ray
- sputum/GA/IS (If CXR abnormal) for NAAT, TB culture
- Ascitic fluid (If present) for cytology, protein & albumin
- Peripheral LN-FNA (If size >2 cm) for cytology, NAAT, TB culture

Ascites

Essential

- If exudative ascites, ascitic fluid for NAAT, TB culture
- No role of ADA

Enlarged Abdominal mass

Desirable

- USG guided Abdominal mass-FNA for cytology, NAAT, TB culture

Optional

- USG/CT guided core biopsy of LN for histology, NAAT, TB culture

Intestinal involvement

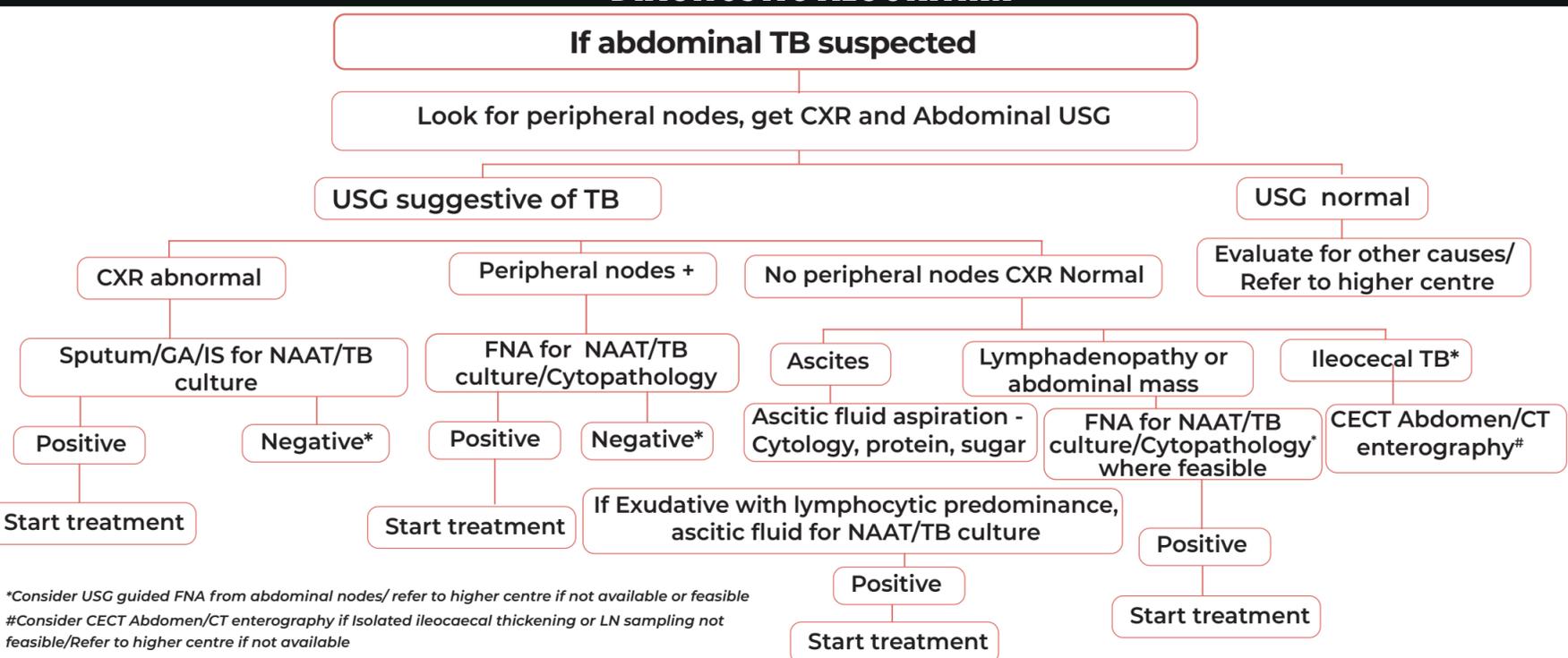
Desirable

- CECT Abdomen/CT enterography
- USG guided Abdominal Mass -FNA for cytology, NAAT, culture

Optional

- Ileocolonoscopy, tissue biopsy (HPE, NAAT)
- Laparoscopy, tissue biopsy for HPE, NAAT

DIAGNOSTIC ALGORITHM



MANAGEMENT

TREATMENT

- Start treatment & follow-up as per NTEP
- ATT for 6 months (2HRZE + 4HRE)
- Pyridoxine supplementation- 10 mg/day
- Steroids- Routinely not recommended (SAIO)
- Supportive treatment- Management of SAM/Malnutrition as per national guidelines
- Surgical treatment:
 - › Acute intestinal obstruction, Bowel perforation
 - › Persistence of obstructive symptoms despite conservative management & ATT
- **DO NOT** start Empirical ATT with isolated:
 - › Recurrent/Chronic abdominal pain without red flag signs
 - › Chronic diarrhoea without proper evaluation
 - › Failure to gain weight

MONITORING

- **Assessment of response to treatment:**
 - › Clinical follow up - every month during treatment & after that every 3 months
 - › Radiologically by USG - At the end of treatment or if worsening or non response to treatment
 - › Microbiological - If worsening or non response to treatment
- **Pointers towards DR TB investigation:**
 - › Non response to treatment or Worsening or deterioration of constitutional symptoms after initial improvement. Rule out Crohn's disease OR Inflammatory Bowel Disease
- **Obstructive symptoms may persist or worsen despite treatment with appropriate ATT**
- **Monitor for**
 - › Adherence to treatment (ATT)
 - › Adverse drug reactions- ATT induced

WHEN TO REFER?

- Diagnosis is uncertain & additional investigations are required
- Acute intestinal obstruction or bowel perforation
- DR TB
- No response to appropriate treatment
- Oral drug (ATT) intolerance/cannot be given

ABBREVIATIONS

ATT- Antitubercular treatment	E- Ethambutol	IS- Induced Sputum	R- Rifampicin
CECT- Contrast Enhanced Computed Tomography	FNA- Fine Needle Aspiration	LAP- Lymphadenopathy	SAD- Sagittal Abdominal Diameter
CT- Computed Tomography	GA- Gastric Aspirate	LN- Lymph Node	SAIO- Sub Acute Intestinal Obstruction
CXR- Chest X-Ray	H- Isoniazid	MGIT- Mycobacteria Growth Indicator Tube	SAM- Severe Acute Malnutrition
DR-TB- Drug Resistant tuberculosis	HPE- Histopathological Examination	NAAT- Nucleic Acid Amplification Test	USG- Ultrasonography
	IBD-Inflammatory Bowel Disease		Z- Pyrazinamide

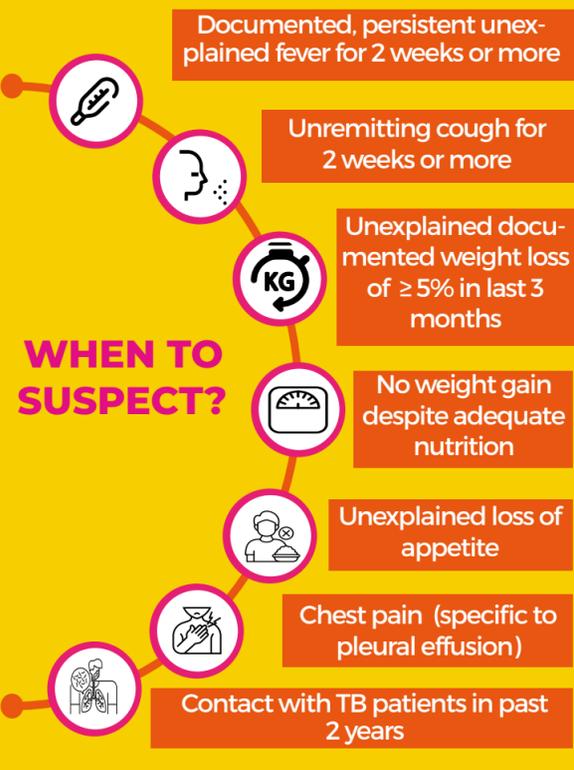
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Standard Treatment Workflow (STW) for the Management of PAEDIATRIC INTRATHORACIC TUBERCULOSIS (PULMONARY, PLEURAL, MEDIASTINAL) ICD-10-A15



EXAMINATION

- Temperature, Weight, Mid Arm Circumference (MAC), Lymphadenopathy, cold abscess, discharging sinus
- Chest examination findings depend upon underlying pathology like consolidation, pleural effusion etc.

INVESTIGATIONS

Essential

- Chest x-ray
 - TB suggestive: Hilar/ paratracheal lymph nodes, fibrocavitary disease, Miliary pattern
 - Non Specific : effusion, consolidation, bronchopneumonia, other shadows etc.
- Sputum/Induced Sputum/Gastric Lavage/ Aspirate /pleural fluid for NAAT
- Smear examination (if NAAT unavailable)
- If facilities exist, send aliquot of sample for culture, if NAAT negative for MTB
- Pleural tap*: Gross, Cytology, Biochemistry, NAAT, MGIT/LJ, ZN if NAAT not available
- *If can't be done at primary level then refer

Do HIV testing for all cases with TB

Desirable

- Chest x-ray of family members

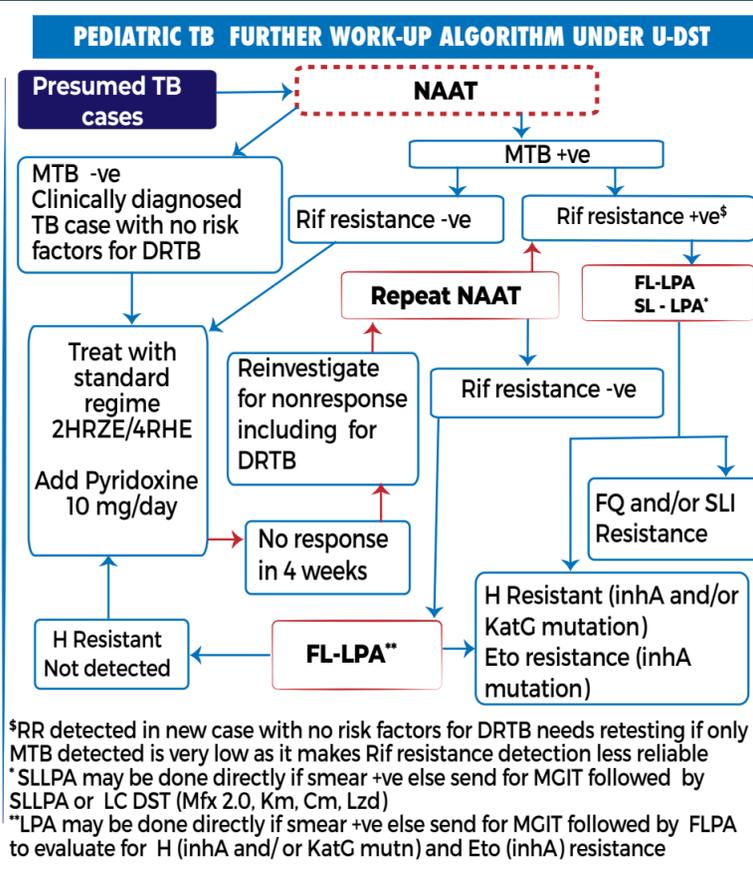
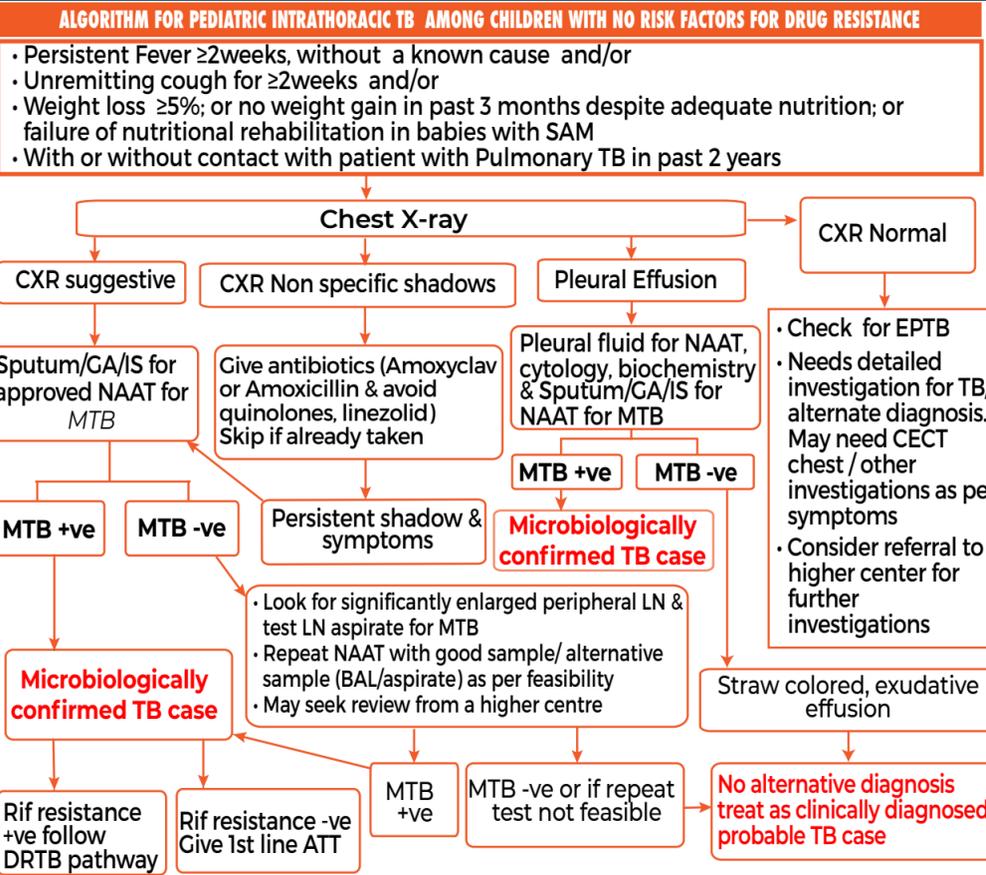
Optional (to be done in institutions)

- CECT scan
- Pleural Biopsy
- Image guided (USG/CT) mediastinal LN biopsy
- Bronchoscopy & BAL

DO NOT DO

- TST/Mantoux test
 - Overemphasized, supportive only
 - Not to diagnose TB or to start ATT on basis of +ve TST ONLY
- Serological tests- IGRA (Quantiferon/Quantiferon-Gold etc)
- Pleural fluid ADA

DIAGNOSTIC ALGORITHM



TYPE OF PATIENTS	TB TREATMENT REGIMENS
Microbiologically confirmed RS Pulmonary TB	2HRZE + 4HRE
Clinically diagnosed Pulmonary TB	
Drug sensitive previously treated TB (recurrent, failure, treatment after default)	

***DR TB algorithm-DST**

DRUG	Dose
ISONIAZID (H)	7-15 mg/kg (maximum dose 300mg/day)
RIFAMPICIN (R)	10-20 mg/kg (maximum dose 600mg/day)
PYRAZINAMIDE (Z)	30-40 mg/kg (maximum 2000mg/day)
ETHAMBUTOL (E)	15-25 mg/kg (maximum 1500mg/day)

WEIGHT BAND	Number of tablets (dispersible FDCs)			
	Intensive phase		Continuation phase	
	HRZ	E	HR	E
4-7 kg	1	1	1	1
8-11 kg	2	2	2	2
12-15 kg	3	3	3	3
16-24 kg	4	4	4	4
25-29 kg	3 + 1A*	3	3 + 1A*	3
30-39 kg	2 + 2A*	2	2 + 2A*	2

*A=Adult FDC (HRZE = 75/150/400/275; HRE = 75/150/275)

- Consider steroids in miliary TB with hypoxia, Endobronchial TB massive bilateral effusion with distress
- Prednisone dose 2 mg/kg daily or Dexamethasone 0.6 mg/kg/day for 4 weeks
- Reduce dose gradually over next 4 weeks before stopping
- Pyridoxine 10 mg/day for 6 months
- Nutritional support
- Treat co-morbid conditions: HIV, SAM

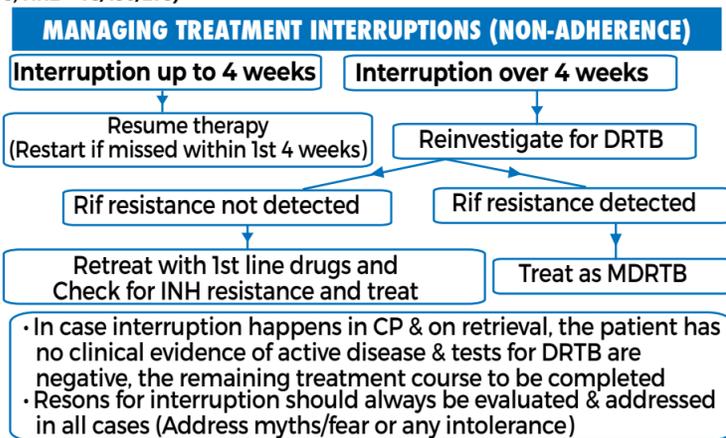
MONITORING

When to assess

- Within 2 weeks of starting therapy for checking that- correct dose, combination of drugs is being taken, adherence and tolerance to drugs
- Then every month till completion of treatment

What to assess

- Appropriateness of therapy:
 - Correct combination, acceptance/tolerance
 - Counsel about need to complete & not miss on doses (Inform, if doses are missed)
- Response to therapy:
 - Clinical (symptoms, adverse effects, weight, dose revision)
 - X-ray at end of therapy
 - Do X-ray for worsening at any time OR slow resolution OR persistent symptoms at end of IP
 - NAAT is not appropriate follow up tool for monitoring progress of disease
 - Smear examination at end of treatment (to declare outcome)
 - Repeat microbiological test (smear, MGIT, NAAT) at end of IP & at end of therapy, if still symptomatic or any deterioration/failure to respond
- After treatment completion: follow up patients clinically at end of 6, 12, 18 & 24 months



ABBREVIATIONS

ADA: Adenosine Deaminase	DRTB: Drug resistant TB	FQ: Fluoroquinolones	IS: Induced sputum	RIF: Rifampicin
BAL: Broncho-alveolar lavage	DST: Drug sensitivity test	GA: Gastric aspirate	LN: Lymph node	SAM: Severe acute malnutrition
CBNAAT: Cartridge-based Nucleic Acid Amplification test	EPTB: Extra-pulmonary TB	H: Isoniazid	MAC: Mid Arm Circumference	SLI: Second line injectables
CECT: Contrast enhanced CT	ETO: Ethionamide	HIV: Human Immunodeficiency virus	MTB: Mycobacterium Tuberculosis	SL-LPA: Second line - Line probe assay
CP: Continuation phase	FDC: Fixed dose combination	HRZE: Isoniazid; Rifampicin; Pyrazinamide; Ethambutol	NAAT: Nucleic acid amplification test	TST: Tuberculin skin test
CT: Computed tomography	FL-LPA: First line - Line probe assay	IGRA: Interferon Gamma Release assay	PPD: Purified Protein Derivative	USG: Ultrasonography
				ZN: Ziehl Neelson

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

WHEN TO SUSPECT?

- Persistent enlargement of lymph node for >2 weeks in one or more areas in cervical/axillary/inguinal regions
 - Size > 2 cm or matted lymph nodes ± chronic sinus
- With/without associated systemic symptoms: fever, cough, poor appetite, weight loss
- With no evidence of recent scalp/skin lesions of draining area
- Cold abscess / chronically discharging sinus over neck, axilla, or groin



TB is unlikely if: the lymphnodes are small (< 2 cm) AND are persisting for a long time (months to years) without any systemic symptoms

INVESTIGATIONS

Essential

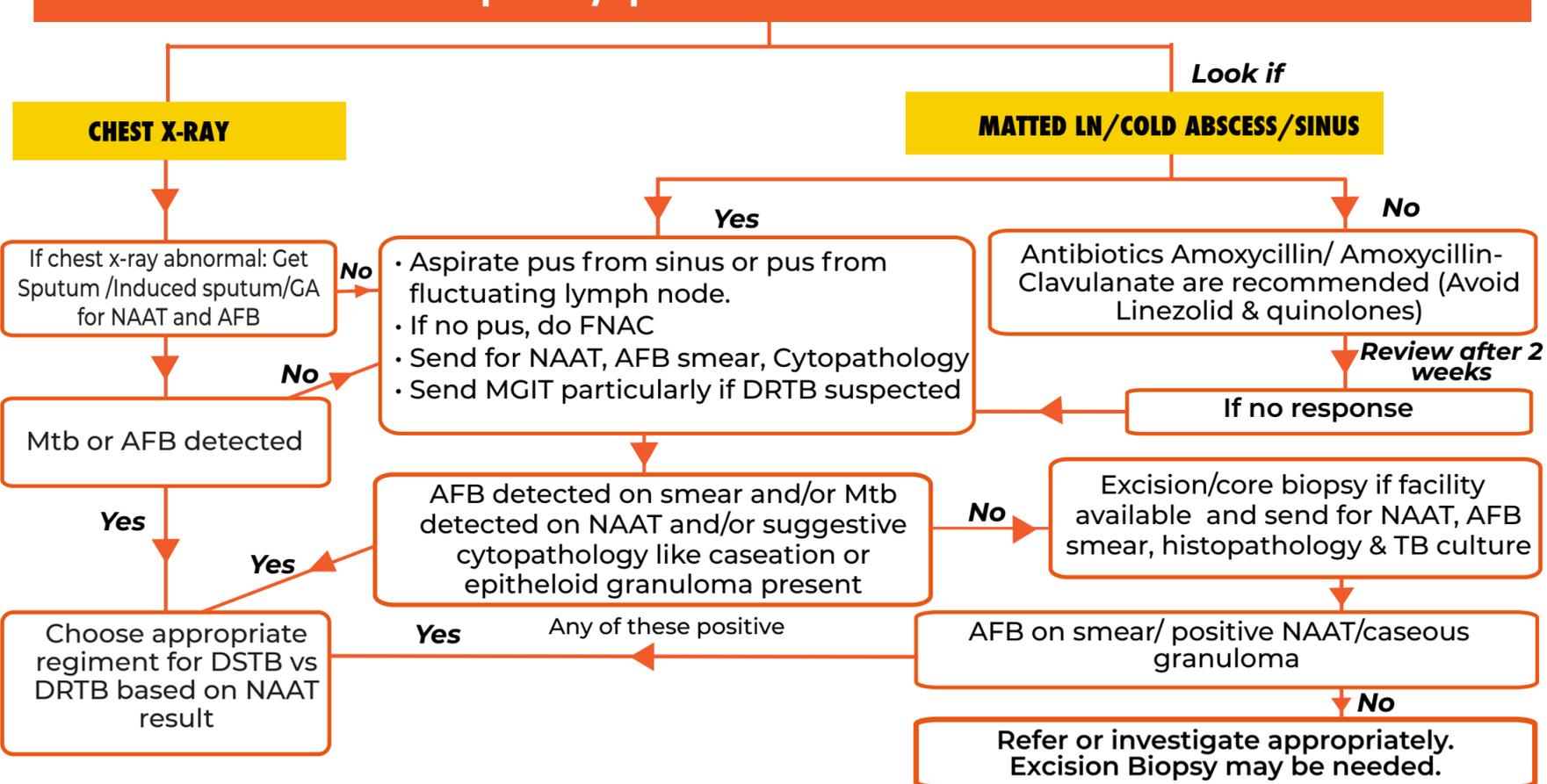
- Lymphnode aspirate:**
 - Send for NAAT (also MGIT culture, particularly if the patient is at risk of DRTB)
 - Smear for AFB

Desirable

- Lymphnode cytopathology (If NAAT and smear negative)
- Lymphnode Biopsy (Core/Excision)
- Chest X-ray - should particularly be done if FNAC not possible
- Hemogram with peripheral smear
- Cytopathology

DIAGNOSTIC

Peripheral Lymph node > 2cm in one or more sites



TREATMENT AND MANAGEMENT

TREATMENT AND RESPONSE

- Treatment should be started and follow-up should be conducted as per NTEP guidelines
- Treat with 2 HRZE + 4 HRE (standard doses) if new case & Rifampicin resistance not detected or not known
- If retreatment case or any other risk factor for DRTB, detailed & swift investigations for DRTB are advised before starting treatment
- Disappearance of constitutional symptoms with decrement or no increment in lymph node size suggests response to treatment
- Increment in lymph node size with disappearance of constitutional symptoms may suggest paradoxical reaction, provided drug resistance has been ruled out
- Increment in lymph node size without disappearance of constitutional symptoms suggests drug resistant TB/alternate cause



- Do not treat for TB based on only positive mantoux test or FNAC suggestive of reactive lymph node with negative NAAT/AFB on smear
- Children with disappearance of constitutional symptoms with no increase in lymphnode size at the end of 6 months therapy, can be kept on follow-up with no extension of therapy

WHEN TO REFER TO AN EXPERT?

- Diagnosis is not established with FNAC/NAAT
- Surgical facility is not available to do excision or core biopsy
- DR is suspected due to any reason including non-response and the facility for DRTB testing are not available
- If there is any pointer towards possible malignancy e.g. skin or mucosal bleed or significant pallor or generalised adenopathy irrespective of the size or associated hepato-splenomegaly

BCG LYMPHADENITIS

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

*NAAT or AFB smear positivity can not differentiate between BCG and MTB

ABBREVIATIONS

AFB: Acid fast bacillus

BCG: Bacille Calmette Guerin vaccine

DR: Drug resistant

FNAC: Fine needle aspiration cytology

HRZE: Isoniazid; Rifampicin; Pyrazinamide; Ethambutol

MGIT: Mycobacteria Growth Indicator Tube

NAAT: Nucleic acid amplification test

NTEP: National TB Elimination Programmet

TB: Tuberculosis

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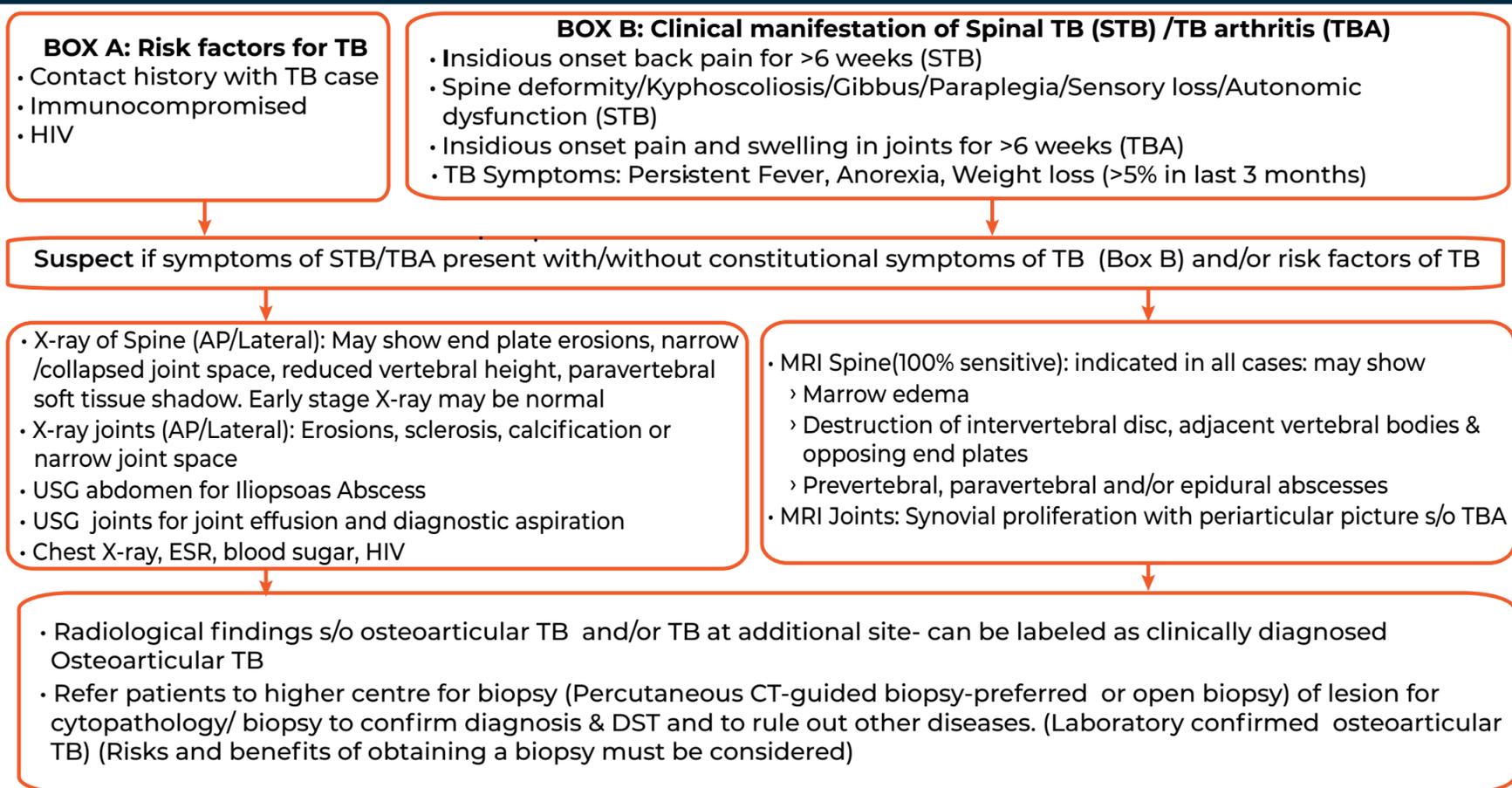
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Standard Treatment Workflow (STW) for the Management of PAEDIATRIC OSTEOARTICULAR TUBERCULOSIS ICD-10-18.0

	POTT'S SPINE (COMMONEST, 50% OF OSTEOARTICULAR TB)	DACTYLITIS (SHORT BONES)	ARTHRITIS (LARGE JOINTS-HIP/KNEE COMMONEST)
WHEN TO SUSPECT	<ul style="list-style-type: none"> Insidious onset back pain for >6 weeks (Commonest thoracic > lumbar >cervical) Localized/Referred root pain TB Symptoms: Fever/anorexia/weight loss CNS complications like Paraparesis (20-50%), cauda equina syndrome, paraspinal muscle wasting, severe pain Examination: Local tenderness/Gibbus-Neurological abnormality like exaggerated DTRs or deficit may be present 	<ul style="list-style-type: none"> Swelling of short tubular bones of hands & feet (Proximal phalanx or metacarpals of index/middle/ring fingers are commonly affected) In children multiple or consecutive bones are involved, compared to a single bone in adults May present without pyrexia or signs of inflammation 	<ul style="list-style-type: none"> Insidious onset joint pain, swelling Monoarticular arthritis Commonly associated with pulmonary or lymph node TB
INVESTIGATION	<p>ESSENTIAL</p> <ul style="list-style-type: none"> X-ray Spine <ul style="list-style-type: none"> In early stage X-ray may be normal May show end plate erosions, joint space narrowing/collapse, decreased vertebral height, paravertebral soft tissue shadow MRI Spine preferred, if not feasible do CT <ul style="list-style-type: none"> Marrow edema Destruction of intervertebral disc, adjacent vertebral bodies & opposing end plates Pre/para vertebral or epidural abscess Sputum/GA for NAAT, MGIT/LJ (if CXR abnormal) FNAC (if peripheral lymphnodes enlarged) for Cytology, NAAT & MGIT/LJ <p>DESIRABLE</p> <ul style="list-style-type: none"> Image guided (USG/CT) aspiration of abscess (if feasible) for NAAT & MGIT/LJ. 	<p>ESSENTIAL</p> <ul style="list-style-type: none"> Plain X-ray of involved parts <ul style="list-style-type: none"> Diaphyseal expansile lesion Periosteal reaction is uncommon Healing is by sclerosis (usually gradual) X-ray film of chest <ul style="list-style-type: none"> Sputum/GA for NAAT & MGIT/LJ, if CXR abnormal FNAC (if peripheral lymphnodes enlarged) for Cytology, NAAT & MGIT/LJ <p>DESIRABLE</p> <ul style="list-style-type: none"> Image guided (USG/CT) aspirate from involved bones for NAAT & MGIT/LJ. 	<p>ESSENTIAL</p> <ul style="list-style-type: none"> X-ray of the involved joint(s): A triad of X-ray abnormalities (Phemister's triad) may be seen <ul style="list-style-type: none"> Peri-articular osteoporosis Peripherally located osseous erosion Gradual joint space narrowing Early stage synovitis & arthritis imaging may show wide joint space due to effusion Bony ankylosis development is rare in TB arthritis in contrast to Pyogenic arthritis USG/ MRI of joint X-ray film of chest GA/Sputum for CBNAAT, MGIT (if CXR abnormal) FNAC (if peripheral lymphnodes enlarged) for Cytology, NAAT & MGIT/LJ <p>DESIRABLE</p> <ul style="list-style-type: none"> Image guided (USG/CT) aspirate from joint fluid for NAAT & MGIT/LJ.

DIAGNOSTIC ALGORITHM



MANAGEMENT

TREATMENT & MONTORING

- Start treatment for microbiologically /Lab confirmed TB and probable TB
- Regimen : 2HRZE + 10HRE (Standard doses) + Pyridoxine 10 mg/day
- Follow up every month during treatment & subsequently every 3 months: Pott's spine with X-ray or MRI & Tubercular dactylitis or arthritis with plain X-ray
- Monitor on each visit :
 - Symptomatic improvement, weight gain, side effects of medicines
 - Microbiology : sputum/GA if CXR abnormal at end of IP. Site samples like aspiration of pus from lesions including psoas abscess (if worsening of symptoms/poor response)
- Imaging: MRI/CT/X ray of affected parts: at end of treatment or early if worsening

Surgical Indications in Potts Spine

- Progressive neurological deficit
- Paraplegia of recent onset or severe paraplegia
- Persistent pain with spinal instability
- Spinal deformity-severe kyphotic deformity at presentation, or in children (<10 years of age) at high risk of progression of kyphosis with growth after healing of disease

WHEN TO REFER

- Suspected osteoarticular disease if essential investigations are not available
- Diagnosis (microbiological or probable) not established by investigations
- Surgery needed: imaging suggest compressive myelopathy, motor deficits
- No improvement with appropriate treatment
- DR TB : diagnosed or high suspicion

Confirm microbiologically in all cases, if possible, before ATT

OTHER INFORMATION

- In case of synovial fluid or cold abscess aspiration (against gravity), send samples for confirmation of TB in following 3 ways
 - Two dry slide for demonstration of AFB (ZN staining)
 - Two samples in formalin for histopathological examination
 - Two samples in saline for culture followed by DST and/or NAAT
- Confirmed cases to undergo HIV/blood sugar testing/parent counselling *MGIT/LJ (if MGIT not available)

ABBREVIATIONS

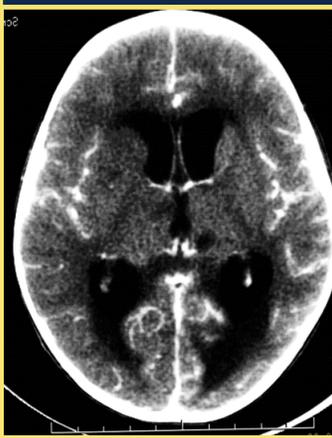
AFB: Acid fast bacillus	DST: Drug Sensitivity Test	HRZE: Isoniazid; Rifampicin; Pyrazinamide; Ethambutol	NAAT: Nucleic Acid Amplification Test
AP: Antero-Posterior	ESR: Erythrocyte Sedimentation Rate	IP: Intensive Phase	s/o: Suggestive of
CT: Computed Tomography	FNAC: Fine Needle Aspiration Cytology	LJ: Lowenstein Jensen	STB: Spinal TB
CXR: Chest X-ray	GA: Gastric Aspirate	MGIT: Mycobacteria Growth Indicator Tube	TBA: TB Arthritis
DR: Drug Resistant TB	HIV: Human Immunodeficiency Virus	MRI: Magnetic Resonance Imaging	USG: Ultrasonography
			ZN: Ziehl Neelson

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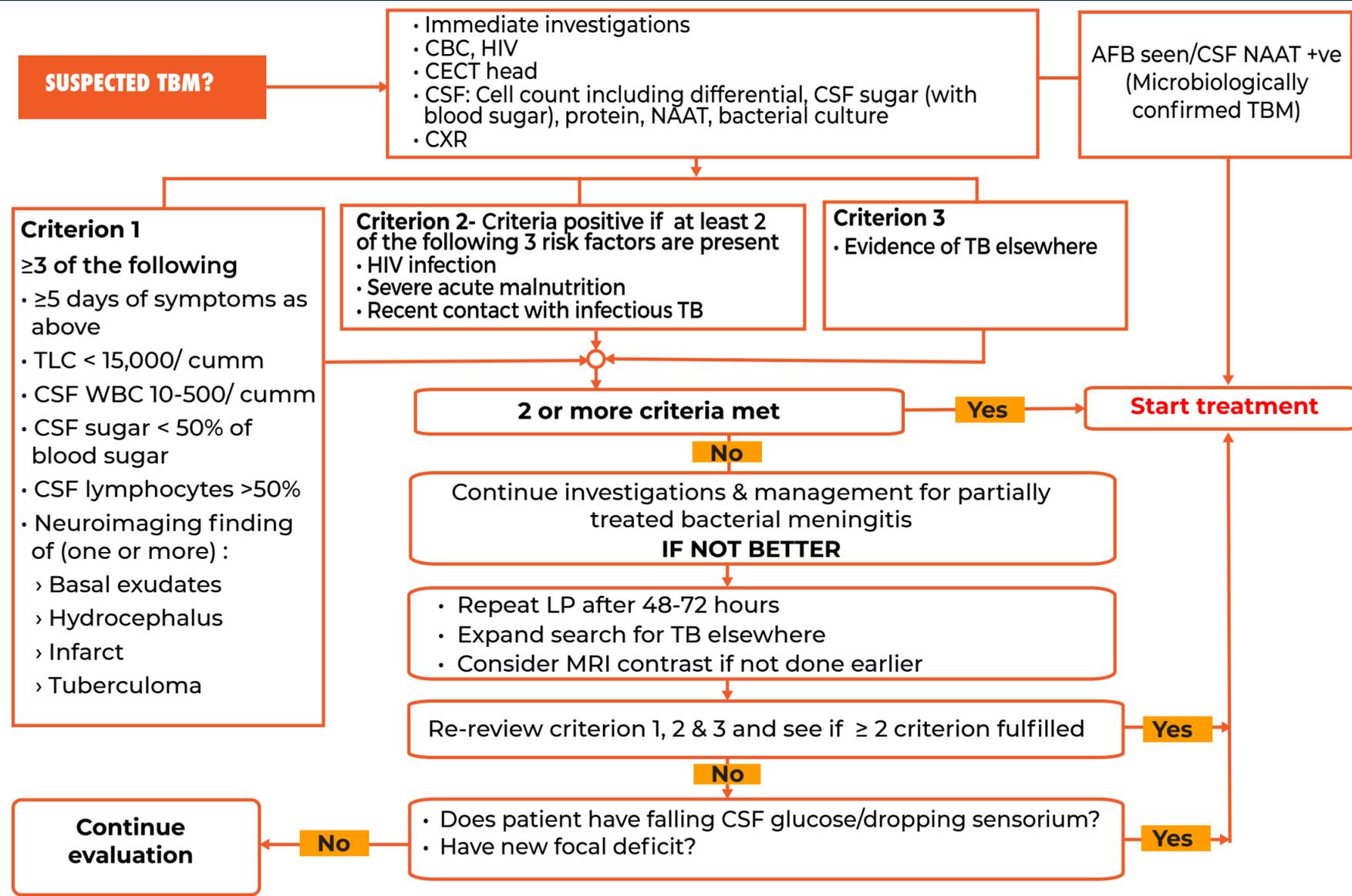
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Standard Treatment Workflow (STW) for the Management of PAEDIATRIC TUBERCULAR MENINGITIS ICD-10-A17.0

WHEN TO SUSPECT?	EXAMINATION	INVESTIGATIONS	NEUROIMAGING IN TB
<ul style="list-style-type: none"> Fever with one or more of the following <ul style="list-style-type: none"> Headache Vomiting Seizures Irritability/Lethargy/Drowsiness Loss of function e.g. recent onset deviation of eyes/mouth and/or weakness of arm/leg and/or altered mentation Malaise, Anorexia, Weight loss Symptoms are usually of 5 to 7 days duration with insidious onset, particularly with history of exposure to infectious TB in past 2 years 	<ul style="list-style-type: none"> Assessment of sensorium* Full/bulging anterior fontanelle Meningeal irritation- Neck stiffness, Kernig's sign & Brudzinski's sign Examine eye, if feasible for papilloedema/ choroid tubercles/ optic atrophy Cranial nerves Motor system including power, reflexes plantar responses Peripheral lymph nodes Chest examination for signs of pulmonary involvement <p><i>*Use any standardized scale including Glasgow Coma scale/ AVPU scale</i></p>	<p>Essential</p> <ul style="list-style-type: none"> CBC CSF examination <ul style="list-style-type: none"> Cell count and differential Sugar (with simultaneous blood sugar) Protein NAAT* MGIT culture Bacterial culture HIV Contrast enhanced CT scan of head CXR Gastric lavage/ Induced sputum in patients where CXR is abnormal and CSF NAAT is negative <p><i>*ICMR/NTEP approved NAAT test, use 3-5 ml CSF if possible</i></p> <p>Desirable</p> <ul style="list-style-type: none"> MRI brain with contrast when CECT head is not contributory <p>Optional</p> <ul style="list-style-type: none"> CSF cryptococcal antigen Contrast CT chest/abdomen to look for extracranial sites of infection 	 <p>CECT showing</p> <ul style="list-style-type: none"> Hydrocephalus (ventricular dilatation) Thick basal exudates Tuberculoma

DIAGNOSTIC ALGORITHM



TREATMENT

<ul style="list-style-type: none"> Treatment should be started & follow-up to be done as per NTEP guidelines Anti TB drug regimen <ul style="list-style-type: none"> 2 HRZE and 10 HRE (in appropriate doses) Pyridoxine 10 mg/day Corticosteroids <ul style="list-style-type: none"> Prednisolone 2 mg/kg/day for 4 weeks & then taper over 4 weeks* Slower taper needed in some patients <p><i>*Equivalent dose of another steroid formulation may be used either injectable/oral</i></p>	<ul style="list-style-type: none"> Other supportive therapy <ul style="list-style-type: none"> Care of unconscious child Nasogastric feeding, if indicated Anti edema measures (mannitol/hypertonic saline/glycerol/acetazolamide) Anticonvulsants, if seizures Surgical therapy, if indicated <ul style="list-style-type: none"> External ventricular drain VP shunt 	<ul style="list-style-type: none"> Cases should be managed at least at a district hospital Early referral to Medical College/ higher centre to be considered if <ul style="list-style-type: none"> Unresponsive child/rapid deterioration indicating need for intensive care No diagnosis after initial evaluation Surgical treatment needed MDR TB meningitis No improvement/deterioration after 2-4 weeks of treatment Need for ICU care
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ABBREVIATIONS

AFB: Acid-fast Bacillus	CXR: Chest X-ray	MDR: Multi-drug Resistant	TB: Tuberculosis
CBC: Complete Blood Count	HIV: Human Immunodeficiency Virus	MGIT: Mycobacteria Growth Indicator Tube	TBM: Tubercular Meningitis
CECT: Contrast Enhanced Computed Tomography	HRZE: Isoniazid; Rifampicin; Pyrazinamide; Ethambutol	MRI: Magnetic Resonance Imaging	TLC: Total Leucocyte Count
CSF: Cerebro-spinal Fluid	ICU: Intensive Care Unit	NAAT: Nucleic Acid Amplification Test	VP: Ventriculo-peritoneal
CT: Computed Tomography	LP: Lumbar Puncture	NTEP: National TB Elimination Programme	WBC: White Blood Cells

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