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# TB in Children

URC

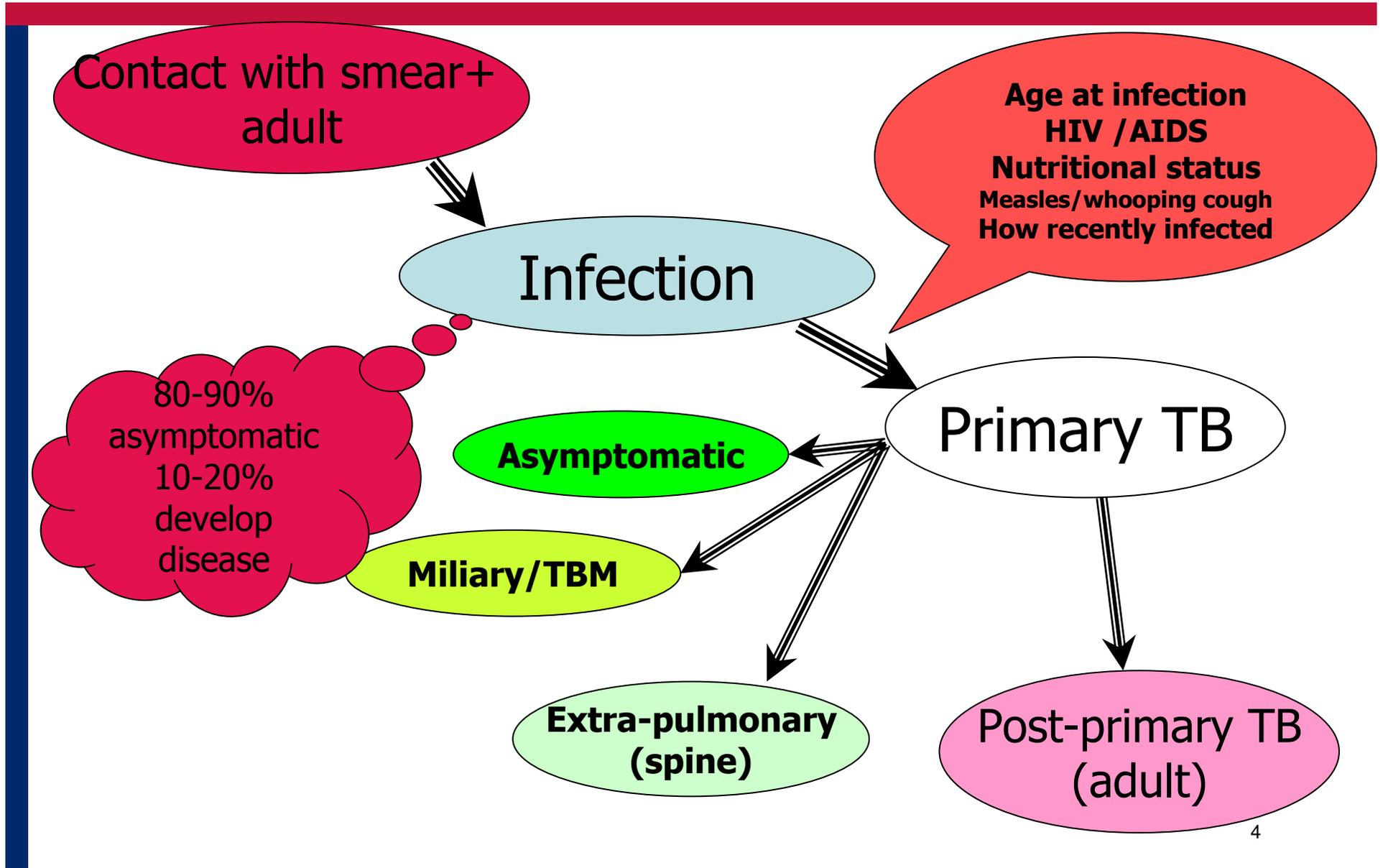
# TB IN CHILDREN



# LEARNING OUTCOMES

- Identify children at risk of developing TB disease
- Correctly manage and refer children suspected of TB
- Manage child contacts

# TB Infection and Disease in Children



# Risk of TB infection in children

**Depends on contact with a newly diagnosed smear positive adult:**

- Extent and duration of exposure, ie family member has active smear positive TB disease
- Susceptibility to infection, very young <2yrs
- HIV infection

## **Risk of TB infection in children ( 2 )**

**Risk of progression from infection to active disease : (often within 12 months of infection)**

- Age of child, <2yrs under-developed immune systems
- Severe malnutrition
- Worm infestation
- HIV infection
- Other viral infections - eg measles
- BCG immunization

# Primary TB infection in children

- Asymptomatic in 80-90%  
5-10% may develop disease
- Extra Pulmonary TB common
- Transmission of TB: source of infection mostly adults.

*Children represent about 5-15% of all TB cases*



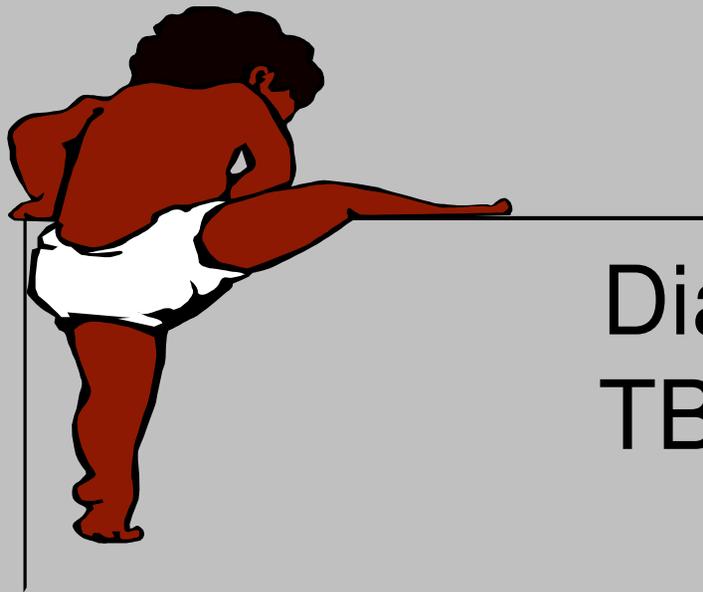
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# Diagnosing TB children

URC

# How to diagnose TB in children

## Difficult!

- Children rarely cough up sputum - gastric aspiration not always possible
- Under 2 years of age
- HIV infection masks TB

# Recommended Approach

- Careful history – identify index case
- Clinical examination
- TB Skin Test
- Bacteriology whenever possible
- Investigations relevant to the suspected type of TB
- HIV testing (whenever possible)

# How to diagnose TB in children

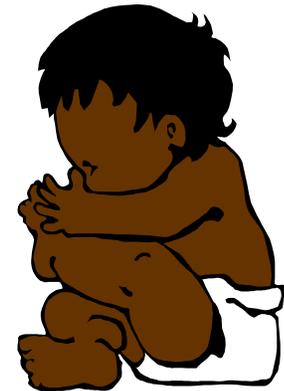
## Diagnosis depends on:

- History of contact with a smear positive adult
- Chronic symptoms
- Clinical picture – suggestive symptoms
- Positive tuberculin skin test
- Chest X-ray suggestive of TB

# Clinical signs and symptoms

## Symptoms and signs are non specific

- Physical examination important
- Can present as acute pneumonia
- Road to Health Card important



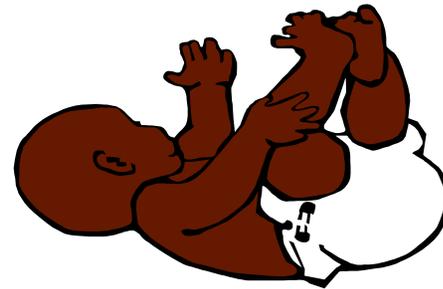
## Clinical signs and symptoms ( 2 )

### General – most common clues are:

- Failure to gain weight/ failure to thrive
- Loss of appetite without obvious cause
- Chronic cough for 2 weeks or more, not responding to a course of antibiotics
- Painless swelling of the lymph nodes
- An audible wheeze due to airway compression
- Unexplained fever

# Tools to help with the diagnosis

- Tuberculin Skin Test (TST) Mantoux Test
- Score System
- Chest X Ray



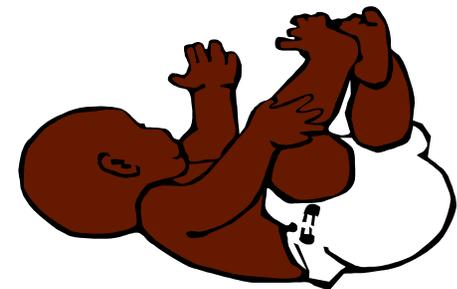
# Tools to help with the diagnosis ( 2 )

**Tuberculin Skin Test (TST): Mantoux** - Purified Protein Derivative (PPD) intra-dermal injection, read 48-72 hours later

- It measures the body's immune response to TB.
- Infected not necessarily active TB disease

**Possible results: positive if**

- Induration 10mm or more
- Induration 5mm or more in HIV+
- Positive in young child - high risk
- After BCG -weak positive

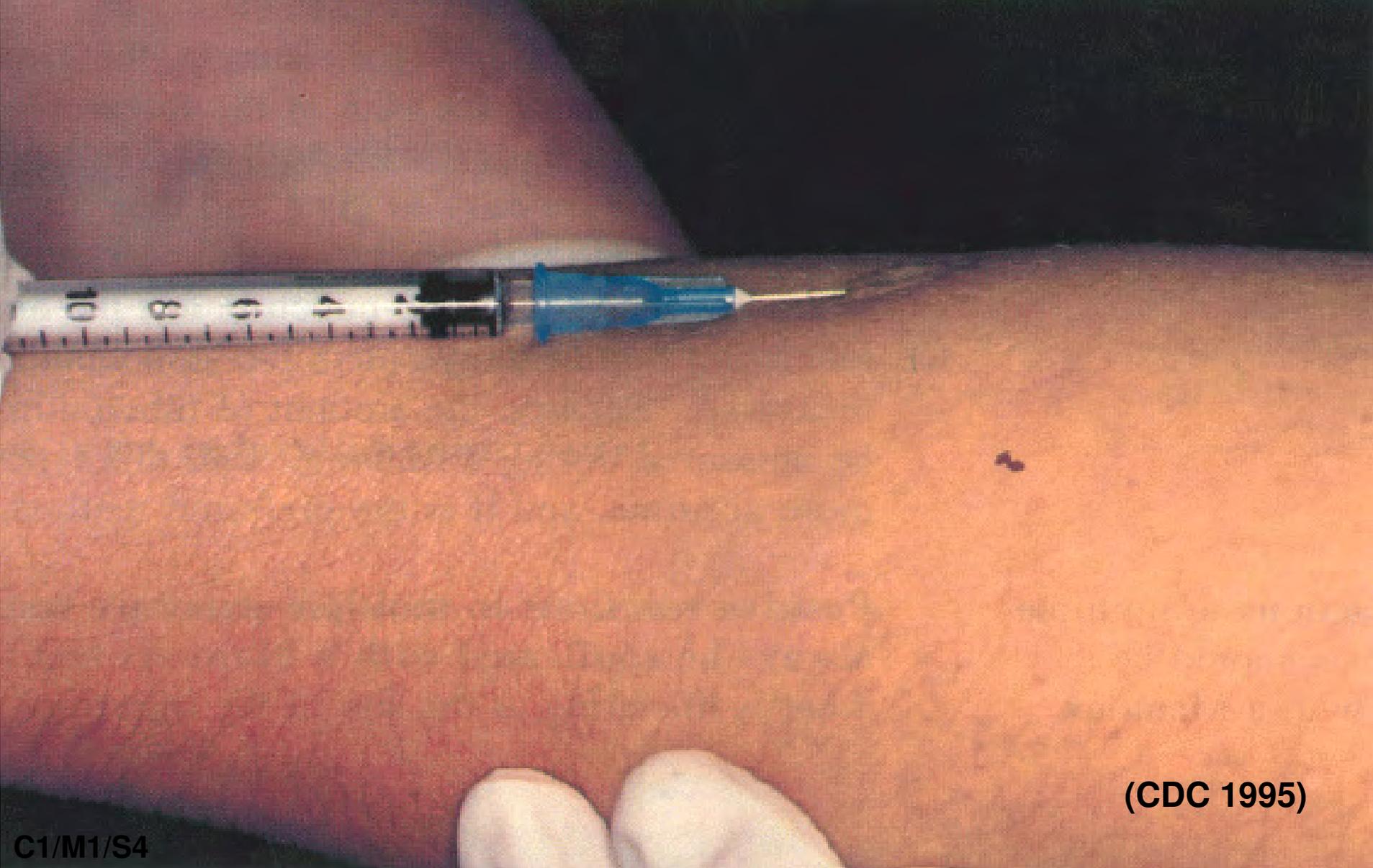


## Tuberculosis Skin Test reading

- Measure INDURATION 48-72 hrs later
- A positive result means infection, not disease!!

<i><b>Tuberculin Test</b></i>	<i><b>Previous BCG</b></i>	<i><b>No previous BCG</b></i>	<i><b>HIV infected</b></i>
<b>Mantoux</b>	≥ 15mm	≥ 10mm	≥ 5mm

Mantoux Skin Test (PPD skin test)



C1/M1/S4

(CDC 1995)



**CORRECT**

**Only the  
induration is  
being measured.**



**INCORRECT**

**The erythema is  
being measured.**

**(CDC 1995)**

# Score System for diagnosis of TB in children

- Is one way of trying to improve the diagnosis of TB in children.
- It can help but may also lead to over diagnosis, especially in HIV+
- Do skin test before completing score sheet.
- A score system helps in your clinical judgement.
- Score of 7 or more indicates a high likelihood of TB disease

# Score System TB diagnosis in Children

- Weeks of illness
- Nutrition (% weight for age)
- Family history of TB
- Tuberculin test results
- Malnutrition
- Unexplained fever
- Radiography signs - suggestive
- Local features:
  - Lymph nodes
  - CNS symptoms
  - Joint swellings
  - Abdominal ascites

## Score system for TB in children

General feature	0	1	2	3	4	Score
Weeks of illness	<2	2-4		>4		
Nutrition (% weight for age)	>80%	60-80		<60%		
Family history	None	Reported		Proven AFB+		
Tuberculin skin test				Positive		
Malnutrition				Not improving after 4 wks		
Unexplained fever			No response to Rx			

## Local signs in score system

Local feature	0	1	2	3	4	Score
				Lymph nodes		
				Joint or bone swelling		
				Abd. mass/ ascites		
				CNS signs, CSF abnormal		
<b>Radiography</b>				Broad mediastinum (hilar glands)	Angle deformity (spine)	
<b>Total</b>						

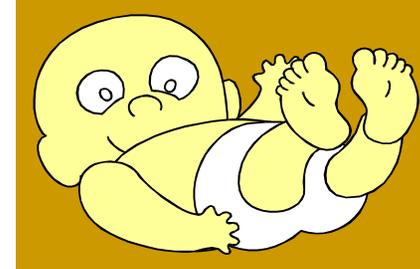
# Treatment of TB in children

- Same case definitions apply to both adults and children
- Same treatment principles as adults
- Note age and weight of child (<5, 5 – 14yrs) for reporting purposes
- 2 phases as in adults (intensive, continuation)
- 2(RHZ)/4(RH) under strict DOT
- **No Ethambutol if <8yrs**
- Monitor response to treatment monthly (weight, clinical condition, adherence)

# Treatment of TB in children

<b><i>Pre treatment body weight</i></b>	<b><i>2 months initial phase treatment</i></b>	<b><i>4 months continuation phase treatment</i></b>
	<b>RHZ 60,30,150</b>	<b>RH 60,30</b>
<b>3-4 kg</b>	<b>½ tab</b>	<b>½ tab</b>
<b>5-7 kg</b>	<b>1 tab</b>	<b>1 tab</b>
<b>8-9 kg</b>	<b>1½ tabs</b>	<b>1½ tabs</b>
<b>10-14 kg</b>	<b>2 tabs</b>	<b>2 tabs</b>
<b>15-19 kg</b>	<b>3 tabs</b>	<b>3 tabs</b>
<b>20-24 kg</b>	<b>4 tabs</b>	<b>4 tabs</b>
<b>25-29 kg</b>	<b>5 tabs</b>	<b>5 tabs</b>
<b>30-35 kg</b>	<b>6 tabs</b>	<b>6 tabs</b>

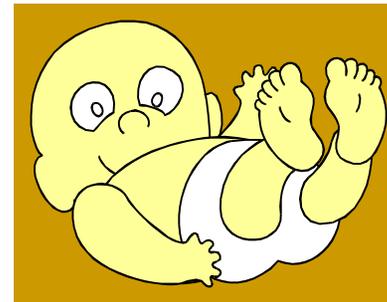
# Prevention

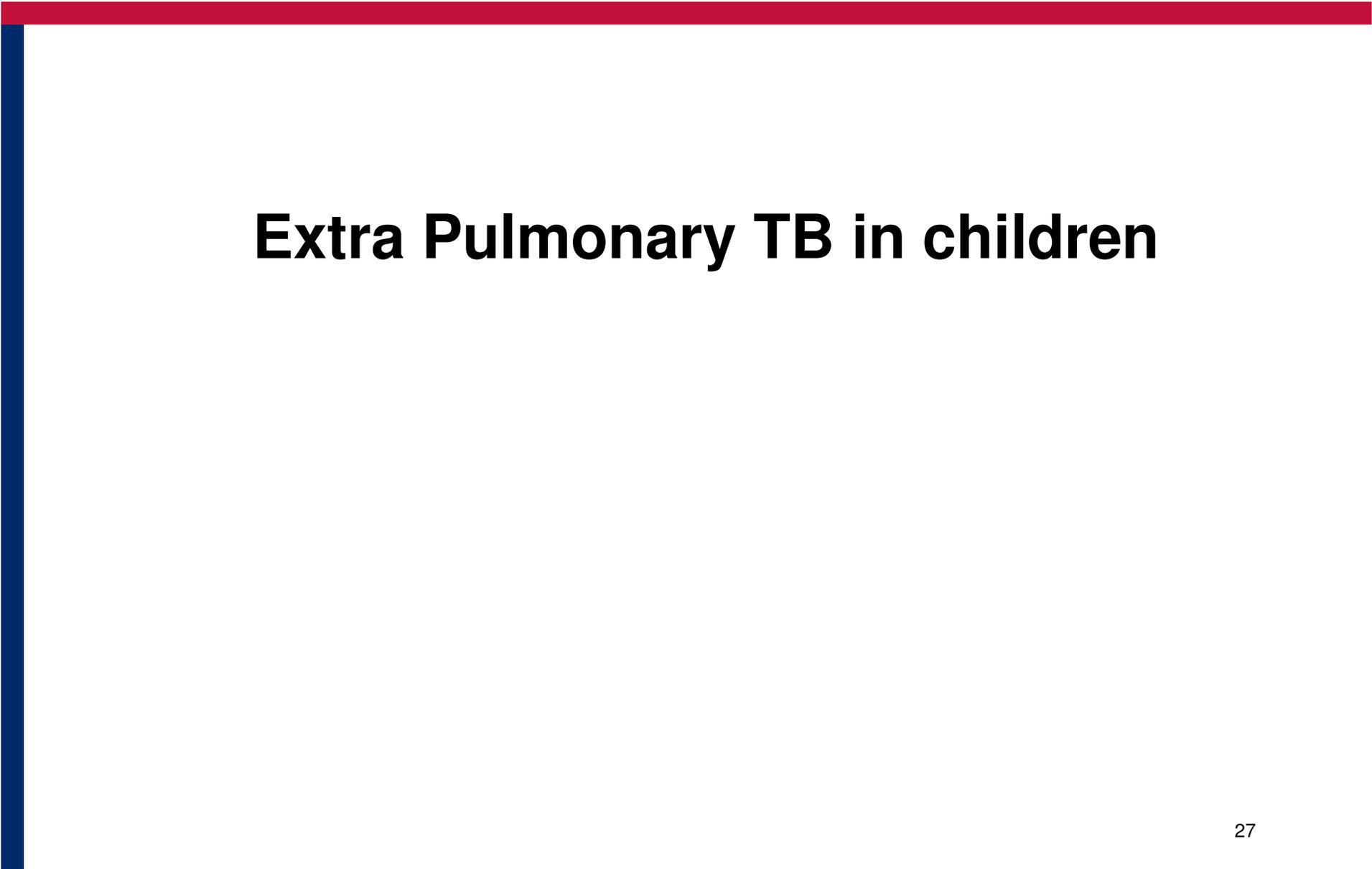


- Treat & cure adults with smear positive TB
- Always try to identify the index case
- BCG vaccination:
  - weakened *Mycobacterium Bovis*
  - intradermal injection - given at birth
  - protects against severe forms of TB eg. TB Meningitis, Miliary TB

## Prevention ( 2 )

- Treat all child contacts less than 5 years according to schedule INH 5mg/kg (6H)
- Immunise child fully
- A good National TB Control Programme protects children against TB
- Prevention of malnutrition
- Counseling for HIV





# **Extra Pulmonary TB in children**

# Most common forms of Extra Pulmonary TB in Children

- Miliary TB
- TB Glands
- TB Bones - long bones or spine
- TB Meningitis

***Refer to hospital as soon as possible***

# Signs and symptoms of Extra Pulmonary TB in children

## **TB Bones - often long bones or spine**

- Pain and swelling locally
- Lump (gibbus)
- May refuse to walk, or limps
- Stiff back
- Often abscess, paralysis or weakness of lower limbs

***Refer to hospital as soon as possible***

# Signs and symptoms ( 2 )

## **TB Meningitis**

- Life threatening disease
- May lead to irreversible serious complications, e.g. retardation
- TB affects brain, meninges and spinal cord

## TB Meningitis ( 2 )

- Often chronic longstanding irritability, the crying child
- Fever, headaches, vomiting
- Stiffness of the neck, increased drowsiness - refer for lumbar puncture immediately

***Refer for lumbar puncture immediately***

# Treatment of Extra Pulmonary TB

- Treatment regimens same as uncomplicated TB
- Treatment duration may be extended based on the severity of the disease and response to treatment
- Steroids may be added in severe forms, eg. TB Meningitis, Miliary TB and Pericarditis



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# Contact Management

*All asymptomatic children <5yrs of age who are in close contact with a smear positive adult should receive course of INH prophylaxis*

# Who are child contacts

- <5years
- Close contact with a smear positive adult
- Live in the same household or spends more than 4hrs with a smear positive client

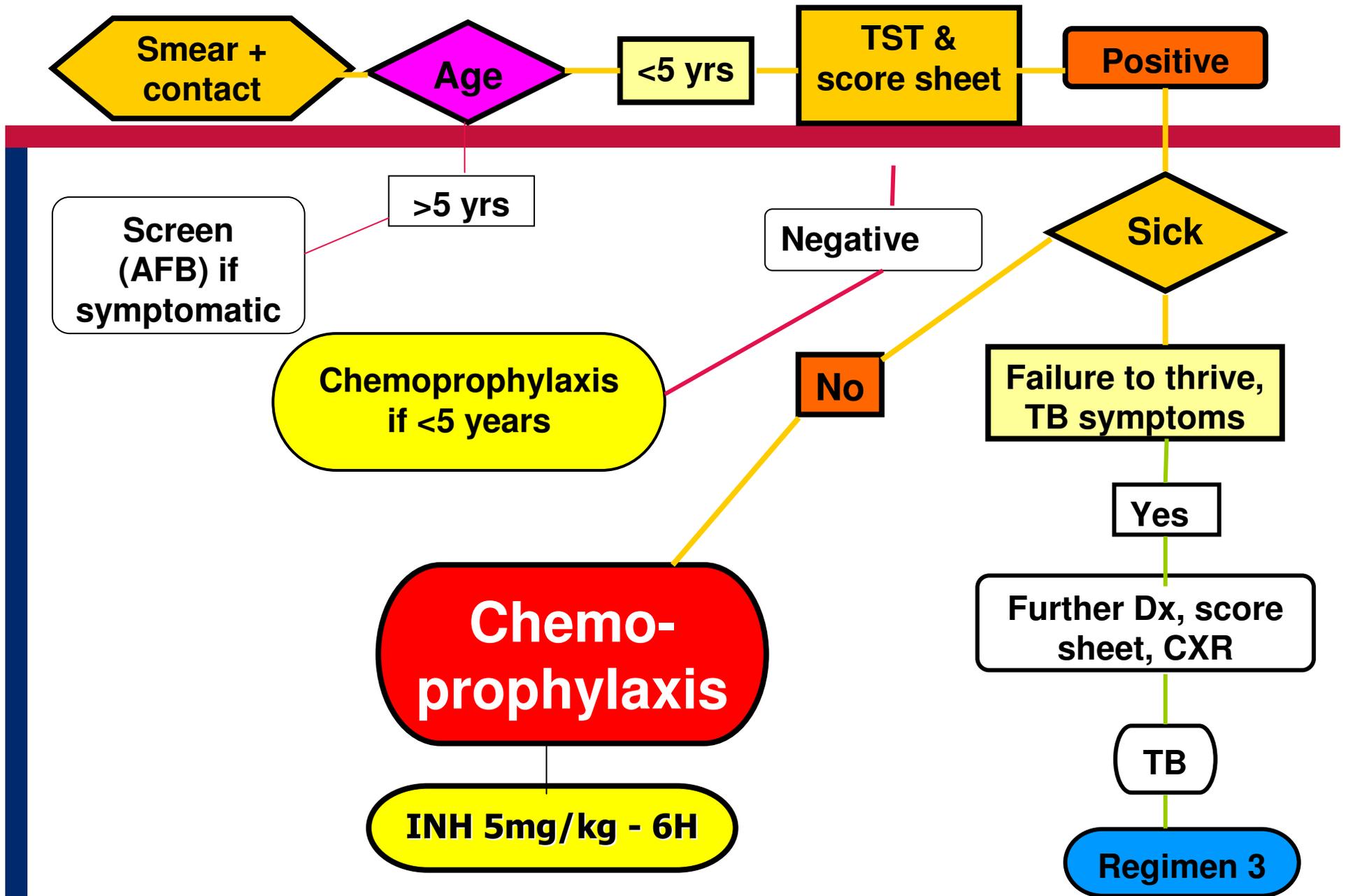
# Contact screening

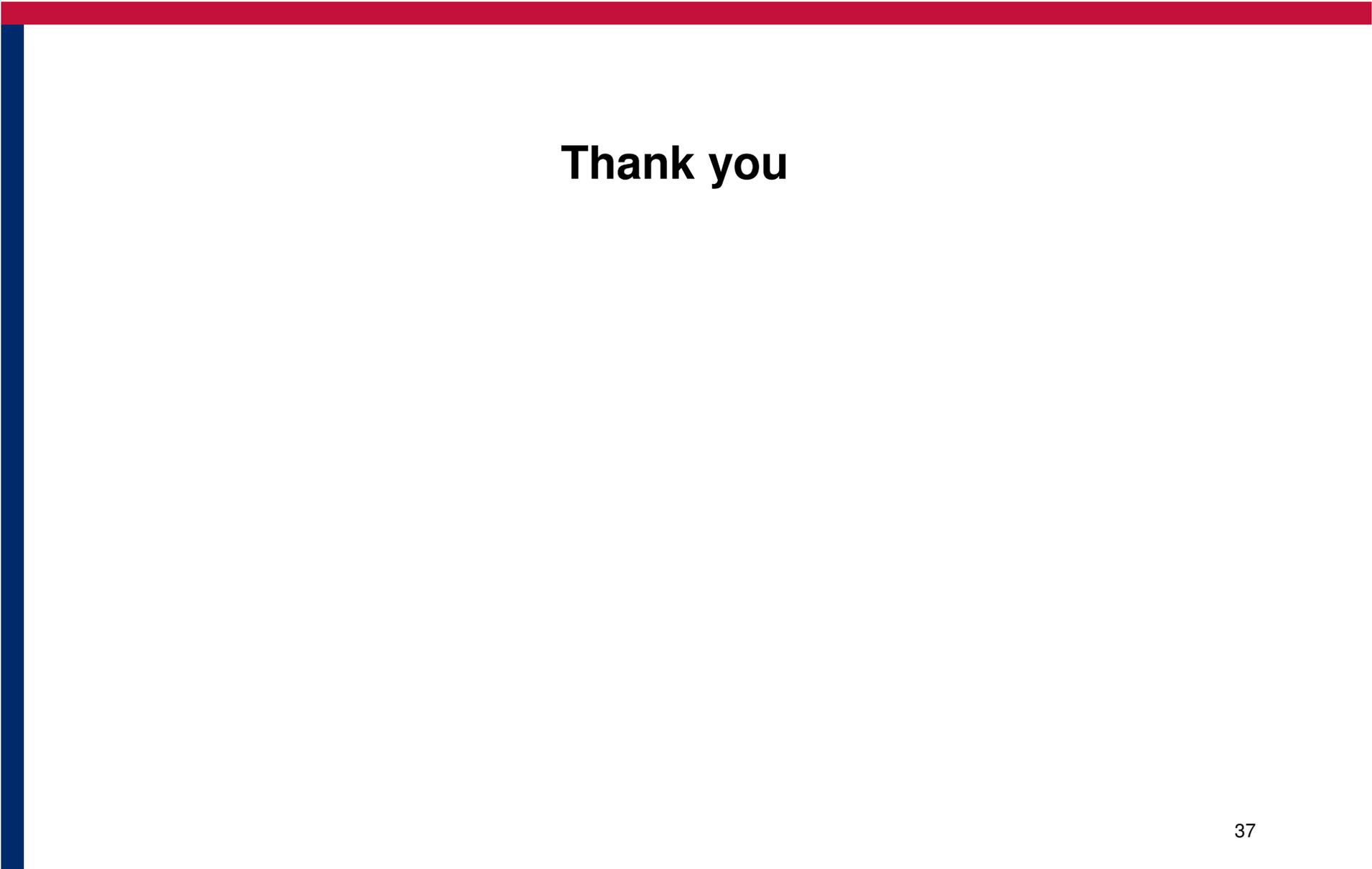
## ***Always exclude active TB disease:***

- Thorough history taking and clinical examination
- Skin test and chest X-ray
- If index case is the parent and is HIV+, check the status of the child as well

## ***Dosage***

- INH 5mg/kg/day X 6 months



A decorative L-shaped bar is located in the top-left corner of the slide. It consists of a thick red horizontal line extending across the top, and a thick dark blue vertical line extending down the left side, meeting at a right angle.

**Thank you**