



Small Patients, Big Decisions:

A Clinician's Guide to Pediatric Tuberculosis Treatment

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Accreditation Statement

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Available Credit

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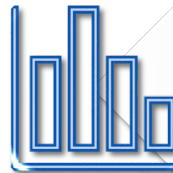
Disclosure:

No relevant financial disclosures to report and no mention of off-label use of any medications or products

Learning Objectives



Apply weight-based dosing of first-line anti-TB drugs and select the correct a practical dosage form for children



Recognize key adverse effects of pediatric TB therapy and apply an evidence-based monitoring plan

Epidemiology in Pediatric Patients

Global

- ~1.2 million children and young adolescents developed TB in 2024 (11% of global incidence)
- Underdiagnosis – more than half (~51%) of childhood cases go undiagnosed or unreported

United States

- ~9000 new cases annually
- From 2010 to 2017, less than 35% of children/adolescents with TB were born in other countries

What makes pediatrics different?

Pediatrics is a special population

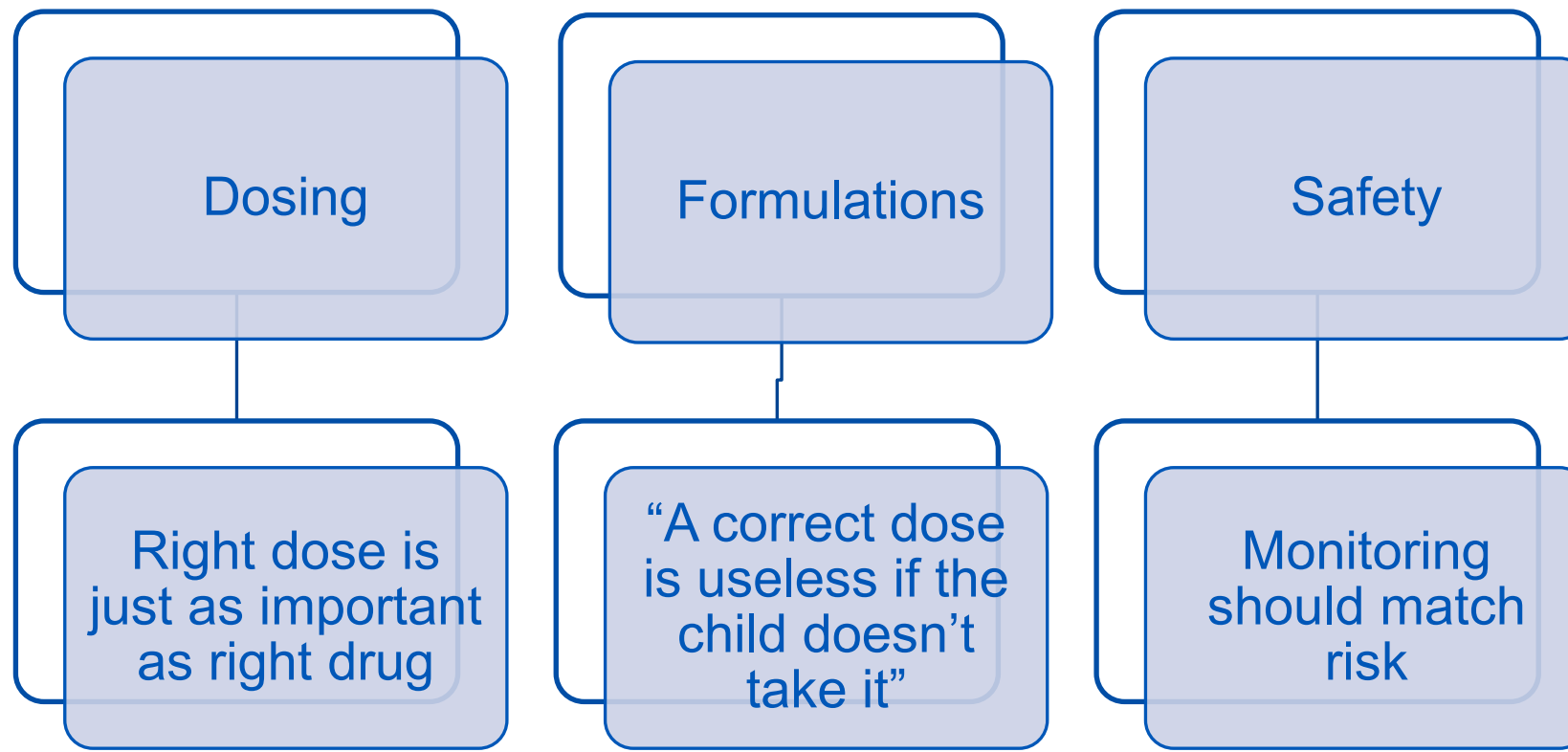
- Prone to over or under respond to usual dosing regimens
- Less able to recognize or communicate adverse effects

Differences in drug metabolism

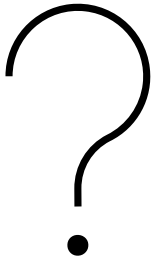
Higher risk for dissemination in children < 4 years old

Need for adequate bactericidal concentrations in body fluids

Three Main Pillars



Polling Question



How often should you routinely order baseline and monthly liver transaminases for otherwise healthy pediatric patients starting on TB treatment according to the AAP?

- A. Always
- B. Only when symptomatic or risk factors present
- C. Never
- D. Unsure



Apply weight-based dosing of first-line anti-TB drugs and select the correct a practical dosage form for children

“How much does the patient weigh?”

- Why is there no US weight-band chart for clinicians in the US?
 - Fixed-dose combination (FDC) tablets are not FDA approved
- Each first-line agent is dosed individually to actual body weight for each patient

Dosing for First Line Agents

Drug	Daily dose (mg/kg)	Max daily dose	Available US strengths
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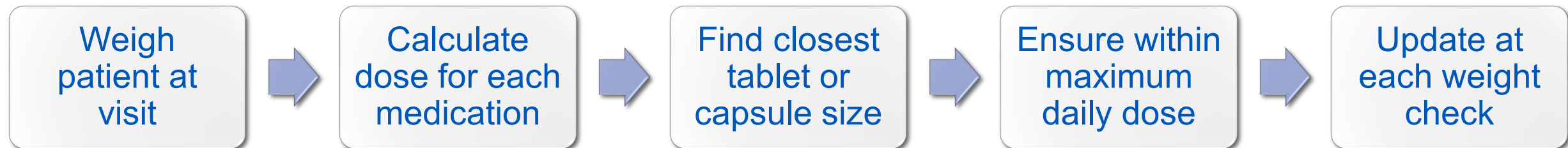
Don't forget the pyridoxine!

Higher doses may be considered in TB meningitis

Dosing for Second Line Agents

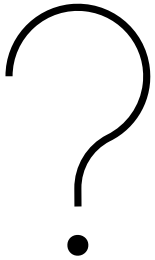
Drug	Daily dose (mg/kg)	Age/weight threshold	Available US strengths
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Practical Dosing Workflow



Isoniazid	Rifampin	Pyrazinamide	Ethambutol
100 mg tablet 300 mg tablet 50 mg/5 mL solution	150 mg capsule 300 mg capsule Compounding	500 mg tablet	100 mg tablet 400 mg tablet

Polling Question



A 3yo male patient, 14kg, with drug-susceptible pulmonary tuberculosis is starting therapy. Using isoniazid 10-15mg/kg once daily, which daily isoniazid dose is most appropriate?

- A. 140 mg once daily
- B. 150 mg once daily
- C. 200 mg once daily
- D. 210 mg once daily

You want it – you build it

US formulations – significant gap for children

- No fixed-dose formulation capsules/tablets available on the market
- Few pediatric dosage forms available
- Difficult to find compounding pharmacies – insurance, ability to ship, etc

Making it swallow-able

Crush tablets or open capsules into a teaspoon of soft food (applesauce, pudding, yogurt) or a few mL of liquid.

- Taste can be bitter/unpleasant – trial masking the flavor (chocolate syrup, Starbursts candy, etc)

Give the full small portion first, then follow with the rest of the meal

- Avoid burying the dose in a large volume the child may not finish.

Isoniazid oral suspension (50 mg/5 mL) is **high-sorbitol**

- Can cause nausea, cramping, or diarrhea if >5 mL is given or if dosed fasting. A crushed tablet is often better tolerated.

Clofazimine for Pediatrics

Only available as 100mg gelatin-based spherical capsules.



- Place gelatin capsule in small dose cup with 15 mL of hot water



- Crush capsule to release into water and mix

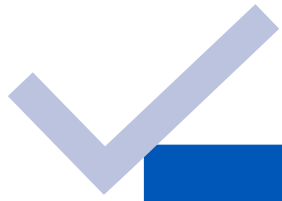


- 100 mg / 15mL suspension
- Can be further diluted as appropriate for dosing



- Draw up appropriate dose for patient and administer PO

Should it be taken with food?



- Clofazimine
- Bedaquiline
- Rifapentine



- Rifampin
- Isoniazid

Fluoroquinolones
Linezolid
Pyrazinamide
Ethambutol
Pretomanid



Recognize key adverse effects of pediatric TB therapy
and apply an evidence-based monitoring plan

Drug-Specific Effects

Hepatotoxicity

- Isoniazid
- Rifampin
- Pyrazinamide

Optic neuritis

- Ethambutol

Orange secretions

- Rifampin

Myelosuppression and neuropathy

- Linezolid

QT prolongation

- Bedaquiline
- Fluoroquinolones
- Clofazimine
- Pretomanid

Skin discoloration

- Clofazimine

Who needs LFT monitoring?

Transient asymptomatic transaminase rises in 3-10% of patients

Clinical hepatitis in < 1% of patients

ALL children: monthly clinical/symptom evaluations

Routine labs not “required” in otherwise healthy children

- Underlying hepatotoxic drugs
 - Other I
 - Clinical
- AST/ALT >5× ULN —
asymptomatic → STOP all
hepatotoxic drugs, normal LFTs
AST/ALT >3× ULN — WITH
symptoms or jaundice → therapy
STOP, evaluate compromise

QT Effects Stack

QT prolongers

- Bedaquiline, moxifloxacin (>levofloxacin), clofazimine

Effect is ADDITIVE

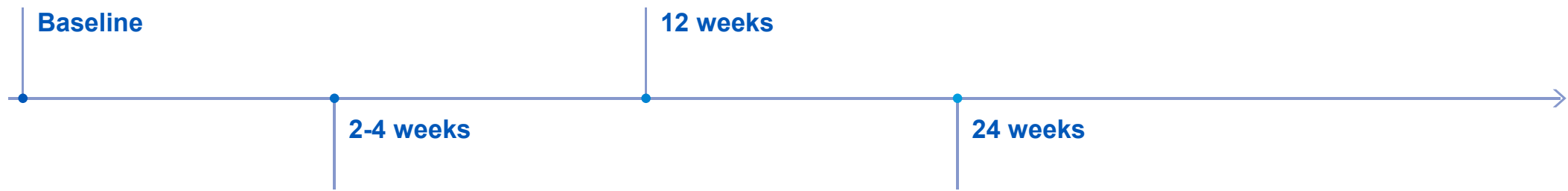
- DELIBERATE – bedaquiline +11.9 ms, delamanid +8.6 ms, combined +20.7 ms QTcF

Consider drug half-life

- QT effects of bedaquiline will persist for weeks after stopping

How often to get an ECG

For patients on bedaquiline:



Add monthly ECG if additional QT-prolonging agent (MFX, CFZ, pretomanid) co-administered

BDQ + DLM together → consider twice-monthly ×8 wk, then monthly

Monitor and replace K, Mg, Ca as needed

QTcF >450 ms → repeat and average; QTcF >500 ms → HOLD the QT-prolonging drug(s)

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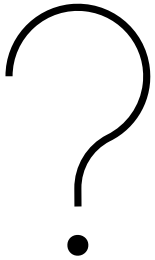
Ethambutol – visual acuity + color-vision screening in cooperative children

Linezolid – vision/neuropathy checks

Neutropenia

- Clofazimine

Polling Question



A 9-year-old (28 kg) with MDR-TB is on bedaquiline, moxifloxacin, clofazimine, and linezolid. At the week-12 visit she is asymptomatic and feels well. Routine EKG shows QTcF 515 ms (baseline was 430 ms). What is the best next step?

- A. Continue all drugs unchanged and repeat EKG at week 24
- B. Reduce the bedaquiline dose and continue the other agents
- C. Hold the QT-prolonging agents, check and replace K/Mg/Ca, and repeat the EKG
- D. Permanently discontinue all TB therapy

Questions and Answers





Thank you