**Pediatric Infectious Disease Checklist: Tuberculosis evaluation (Uploaded on 9/24/2023)**

TB infection vs. disease overview:

* Patients can be diagnosed with latent TB infection (LTBI), active TB, or no infection.
  + LTBI: An individual who was exposed and infected with TB, but whose immune system was able to contain the infection. This patient is not currently ill because of the infection and is NOT contagious, but may become so in the future with re-activation of infection.
  + Active TB: An individual who was exposed and infected with TB, and who was NOT able to contain the infection. In patients >2 years old, this generally manifests first as intrathoracic TB (primarily as lymphadenopathy; adult cavitary disease seen after age 10).

Diagnostic work-up outside of the infant period:

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| --- | --- | --- | --- |
| **Disease Status** | **PPD/Quantiferon** | **Chest X-ray** | **Management** |
| TB negative | Negative | Negative | - |
| LTBI | Positive | Negative | - Not contagious, no isolation need at all  - INH daily x 9 months or INH + rifapentine once weekly x12 weeks DOT |
| Active TB | Positive | Positive. This includes hilar adenopathy | - 4 drug therapy DOT  - Isolate (generally until on medications x2 weeks, though varies per DOH/Infection Control/ID evaluation) |

1. Patients will be placed in a negative pressure isolation room. Any healthcare provider who enters should wear an appropriate mask (N95, etc.). If patients need to leave the room (for medical purposes like imaging only) they should wear a surgical mask (not an N95, since they haven’t been fit tested). Unless already ruledout for active TB, all visitors with the child should be isolated to the room and wear a surgical mask when leaving. The risk of TB spread is minimal in the child, whereas the parent is generally the one to cause hospital outbreaks in these situations.
2. Young children/infants have difficulty producing sputum, even with induced sputums. We therefore obtain gastric aspirates. See the protocol below (borrowed from the Francis J. Curry National TB Center) for details:

SUPPORTIVE DATA: Gastric aspiration is a technique used to collect gastric contents that can be used in the diagnosis of tuberculosis. Tuberculosis continues to be a problem and children are disproportionately affected, in part because they are more likely to get sick when they are infected with the TB organism. The increase in drug-resistant strains of TB makes it important to try to culture and identify each patient’s TB organism. Since many young children have difficulty in expectorating sputum, gastric aspirates are frequently required to culture the organism in a pediatric patient. When children with pneumonia sleep, their muco-ciliary mechanism sweeps mucus up their airways into their throat. They swallow the mucus and unless the stomach empties, a pool of mucus in the stomach may be a source of the TB organism.

PATIENT PREPARATION:

1. Upon admission, place an NGtube using the following guidance. Ideally the tube is in place overnight, so that the aspirate can be collected first thing in the morning.
   * Do not use surgilube – it is bacteriostatic. Instead, moisten the tip of the tube in the child’s mouth before insertion.
   * Use as large a bore NG tube as is comfortable (ideally a minimum 10 french)
   * Avoid too deep a placement to prevent passage through the pylorus.
2. Patient to be NPO after midnight.
3. Specimen collection: Have the parent call the nurse as soon as the child awakens and long before eating. Using a 10-20cc syringe, aspirate the stomach contents. If less than about 10 cc of mucus is aspirated, instill 20–30 cc of **sterile water** (confirm the bottle is not bactericidal) into the tube and quickly withdraw. The organism is most viable when not exposed to saline or preservatives. Reposition the tube and/or the patient to maximize the yield of gastric contents. This may be done twice to allow for as much gastric content wash as possible.
4. Place the gastric aspirates in a special bicarbonate-containing gastric aspirate tube or regular specimen cup.
5. Transport the specimen to the microbiology lab as soon as possible to ensure survival of the mycobacteria if present.
6. Repeat this process for a total of three gastric aspirates at different time points:
   * Note: Infants who feed every few hours do not have a prolonged period of sleep. We therefore can collect aspirates from them every 6-8 hours, with multiple obtained per day. In infants, the specimen should be collected immediately before a feed, ideally 2-3 hours after the last feed.
   * Older children who sleep through the night should have aspirates collected immediately after waking up in the morning, with one aspirate collected per day x3 days.

Microbiology work-up:

1. Sputum
   * Acid Fast Bacteria (AFB) Smear: Analogous to a Gram stain. Sent to Microbio and immediately viewed under a microscope for any visible mycobacteria. Generally, if smear negative x3 and no other signs of active TB, patients are not considered contagious.
   * AFB Culture: Mycobacteria are incredibly slow growing. The culture is observed daily over weeks-months in the microbio lab for any sign of TB growth.

Treatment:

1. LTBI (2 treatment options exist):
   1. **INH once daily x9 months**. Does not require DOT. Generally used in children <2 years old with LTBI, but can also be used in older children.
      * Dosing: 10 to 20 mg/kg/dose once daily; maximum dose: 300 mg/dose
   2. **INH + rifapentine combined therapy** given by **DOT with once weekly dosing for 12 weeks**. Used in patients >2 years old. Note that dosing is different in HIV+ patients
      1. INH dosing:
         1. 15 mg/kg/dose once weekly. Round dose up to nearest 50 or 100 mg. Maximum dose: 900 mg/dose
      2. Rifapentine dosing:

Study Drug Doses of Rifapentine

Weight Range (kg) Dose (mg) Dose (mg/kg)

10.0-14.0 300 21.4 - 30.0

14.1-25.0 450 18.0 - 31.9

25.1-32.0 600 18.8 - 23.9

32.1-50.0 750 15.0 - 23.4

>50.0 900 ≤18.0

* 1. Consider adding Vitamin B6 in any patient taking INH
     1. <2 years old: 25mg once daily
     2. >2 years old: 50mg once daily

1. Active TB
   * + Note: **All medications should be given as TABLETS**, including during admission and when sent to the pharmacy! These can be crushed and given with food. Only the Vitamin B6 can be given in liquid form.
     + The family should bring the medication into the hospital for verification before discharge to home
   1. INH 15mg/kg once daily
   2. Rifampin 15mg/kg once daily
   3. Pyrazinamide 30-40mg/kg once daily
   4. Ethambutol 20mg/kg once daily
      1. Obtain Ophtho consult for a baseline eye exam in infants prior to starting the medication. Ethambutol treatment requires monitoring for development of optic neuritis
   5. Vitamin B6:
      1. <2 years old: 25mg once daily
      2. >2 years old: 50mg once daily