TB Nurse Network Meeting
07/19/2017
10:00 – 11:45 a.m. ET
Minutes
Total Attendance: 38

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1. Announcements
    a. Next meeting Wednesday, October 18th 10 AM
        i. TB in the Lab; Angie Schooley, MDHHS BOL
        ii. Email mcguirkh@michigan.gov if you have questions for Angie or topics you'd like her to address.

2. Upcoming Webinars
    a. Southeastern National TB Center
        i. TB and Tobacco: Pharmacotherapy for Tobacco Cessation
            - 8/22/17 1-2 PM Eastern
            - 1 CE/CME credit
            - Part 4 of 4, updates TB Healthcare providers with the latest information regarding the link between tobacco and tuberculosis as reported by the CDC and the WHO.
        ii. Archived Parts 1-3
            - Part 1: TB and Tobacco: What you Need to Know
            - Part 2: Help Them Quit: Tobacco Cessation Interventions for TB Patients
            - Part 3: TB and Tobacco: Assessment and Practical Counseling Skills

3. Upcoming In-Person Trainings
    a. Mayo Clinic Center for TB
        i. 2017 Tri-State TB Clinical Intensive
        ii. Registration and agenda coming soon
        iii. September 28-29th, Indianapolis Indiana
        iv. Location and lodging TBD

    b. Southeastern National TB Center (SNTC): *Note: The following trainings are generally reserved to those within the given RTMCC states. However, Mayo TB Clinic (Michigan's RTMCC) will generally not repeat a training that is done by another RTMCC. If you are interested in attending the following two in-person trainings, please contact Helen McGuirk (mcguirkh@michigan.gov) and she will get you in touch with the training coordinator at SNTC to help you get registered.*
        i. "Arresting TB: Contact Investigation and Release Planning"; 8/22-8/24/17, South Florida
            - This 3-day course focuses on key concepts for conducting contact investigation and release planning in a correctional setting to improve outcomes and halt further transmission of tuberculosis. The training is designed to enhance

communication and collaboration between local health departments and corrections custody and medical personnel to improve contact investigation outcomes.

ii. "Enhanced Skills for Public Health Corrections Liaisons"; 8/25/17
- This one-day course is designed for staff who fulfill the role of the "Public Health Corrections Liaison" or who work closely with public health and corrections facilities to control TB. Attendees of this training learn from experts in the field about the key roles of the Corrections Liaison and acquire skills accessing and establishing strong collaborations between agencies. Homework, class activities, group exercises, and a jail tour are included.

4. Recently Archived Webinars

a. Curry International Tuberculosis Center

i. Pediatric TB Radiology: It's Not Black and White (5/5/17)
- This webinar was created for physicians, nurses, and other health professionals who diagnose and treat patients with TB. The training focused on the diagnosis and follow-up of pediatric cases along with reading of the chest x-rays. This 60-minute presentation was followed by a 15-minute Q and A session.

b. Heartland National TB Clinic

i. Practical Aspects for the Interferon Gamma Release Assays (7/14/17)
- Will be archived soon
- Intended for prescribing physicians and healthcare staff who may be involved with the decision to utilize an IGRA test when screening individuals for TB

ii. Access to Care Along the U.S. – Mexico Border (6/20/17)

5. New Self-Paced Online Trainings

a. Southeastern National TB Center

i. *Advanced Concepts in Pediatric TB* (8.0 CE/CME credits)
- 8-part series
- Content is intended for clinicians and nurses who work with children infected with TB.
- Topics include pathogenesis and epidemiology, latent TB infection, diagnostic tools, TB and HIV, MDR TB, pharmacotherapeutics of TB drugs, and infection control, source case, and contact investigations.
- Participants who complete this training will be able to recognize, evaluate, and manage *Mycobacterium tuberculosis* infections in children.

ii. *Treating LTBI in Special Situations* (4.0 CE/CME credits)
- Topic areas include contact to drug-resistant case, hepatitis, HIV/AIDS, infants & children, pregnancy, renal failure, TNF-antagonists and transplantation.

- The course also includes five reference books that provide additional information to participants.

6. TB in the News
    a. Why state officials want hunters to help control bovine tuberculosis (Michigan Radio 6/29/17)
        i. Bovine TB found at a dairy farm in April 2015 in Alpena, MI
        ii. MI is the only state in the nation where bovine TB is established in wild deer
        iii. MDNR proposed antler point restrictions to decrease deer in the "TB zone"
        iv. Antler point restrictions were denied at a Natural Resource Commission meeting in Lansing on 7/13/17 (mLIVE 7/13/17)

7. Interesting Publications
    a. Repeat IGRA Testing in Canadian Health Workers: Conversions or Unexplained Variability?
        i. Background: Although North American hospitals are switching from tuberculin testing (TST) to interferon-gamma release assays (IGRAs), data are limited on the association between occupational exposure and serial QuantiFERON-TB Gold In-Tube (QFT) results in healthcare workers (HCWs).
        ii. Methods: In a cohort of Canadian HCWs, TST and QFT were performed at study enrolment (TST1 and QFT1) and 1 year later (TST2 and QFT2). Conversion and reversion rates were estimated, and correlation with TB exposure was assessed.
        iii. Results: Among 258 HCWs, median age was 36.8 years, 188/258 (73%) were female and 183/258 (71%) were Canadian-born. In 245 subjects with a negative QFT1 we found a QFT conversion rate of 5.3% (13/245, 95% CI 2.9–8.9%). Using more stringent definitions, QFT conversion rates ranged from 2.0 to 5.3%. No TST conversions were found among the 241 HCWs with negative TST1, and no measure of recent TB exposure was associated with QFT conversions. In the 13 HCWs with a positive QFT1, 62% reverted.
        iv. Conclusion: Using the conventional QFT conversion definition, we found a higher than expected rate of conversion. Recent occupational exposures were not associated with QFT conversions, and no TST conversions occurred in this cohort, suggesting the 'conversions' may not reflect new TB infection.

8. Presentation: Summary of 2017 Diagnosis of TB in Adults and Children
    a. The authors synthesized relevant evidence that was used for making recommendations about the diagnosis of TB disease and LTBI in adults and children. They came up with 20 questions that were graded as either strong (recommendation) or weak/conditional (suggestion). The stronger recommendations were made based on a good amount of evidence; the weaker suggestions were mainly due to a lack of good evidence. The ultimate recommendation or suggestion is bolded for each question. Question 13 was omitted because we felt it was not pertinent to the audience, however, if you have questions about

#13, or any of the other recommendations/suggestions, then please contact either Peter Davidson or Helen McGuirk.

b. Testing for LTBI
   i. Q1: Should an IGRA or a TST be performed in individuals 5 years or older who are likely to be infected with Mtb, who have a low or intermediate risk of disease progression, and in whom it has been decided that testing for LTBI is warranted?
      - **IGRA recommended** if history of BCG or unlikely to return for TST reading
      - **IGRA suggested** for all others
      - TST is an acceptable alternative, especially if IGRA is not available, too costly, or too burdensome

   ii. Q2: Should an IGRA or a TST be performed in individuals 5 years or older who are likely to be infected with Mtb, who have a high risk of progression to disease, and in whom it has been decided that testing for LTBI is warranted?
      - **Insufficient data** to recommend preference
      - Based on local availability of IGRA or TST

   iii. Q3: Should an IGRA or a TST be performed in individuals 5 years or older who are unlikely to be infected with Mtb, but in whom it has been decided that testing for LTBI is warranted?
      - Testing with either method **not recommended** in this population
      - If testing is obligated (by law or credentialing bodies), **suggest IGRA**
      - If initial test positive, **suggest second test** (either IGRA or TST)
         a. Consider infected with Mtb only if both tests are positive

   iv. Q4: Should an IGRA or a TST be performed in healthy children less than 5 years of age in whom it has been decided that testing for LTBI is warranted?
      - **Suggest** TST
      - TST might be more sensitive
      - IGRA might be more specific (especially w/ BCG)
      - Many other considerations elaborated in the guidelines

c. Testing for Suspected Pulmonary TB
   i. Q5: Should AFB smear microscopy be performed in persons suspected of having pulmonary TB?
      - Yes, **recommended**
      - A negative AFB smear result does not exclude pulmonary TB
         a. False-negatives are sufficiently common
      - A positive AFB smear result does not confirm pulmonary TB
         a. False-positives are sufficiently common
      - CDC and NTCA recommend testing 3 specimens
         a. Providers should get a sputum of at least 3 mL; optimal volume is 5-10 mL

b. Concentrated respiratory specimens and fluorescence microscopy are preferred

ii. Q6: Should both liquid and solid mycobacterial cultures be performed in persons suspected of having pulmonary TB?
- Yes, **suggest** both, rather than one or the other.
- Liquid cultures give a more rapid answer
- Solid cultures serve as safeguard against contamination
- Performing both liquid and solid cultures likely improves the sensitivity of the cultures

iii. Q7: Should a nucleic acid amplification test (NAAT) be performed on the initial respiratory specimen in persons suspected of having pulmonary TB?
- Yes, **suggested**
- In AFB smear-positive patients, a negative NAAT makes TB disease unlikely.
- In AFB smear-negative patients with an intermediate to high level of suspicion for disease, a positive NAAT can be used as presumptive evidence of TB disease.
    a. A negative NAAT should not be used to exclude pulmonary TB.
- Appropriate NAATs include the Hologic Amplified Mycobacteria Tuberculosis Direct (MTD) test and the Cepheid Xpert MTB/Rif test.

iv. Q8: Should rapid molecular drug susceptibility testing for isoniazid and rifampin be performed as part of the initial diagnostic evaluation for all patients suspected of having pulmonary TB or only in selected subgroups?
- **Recommended** only in selected subgroups.
- Rapid molecular DST for RIF with or without INH using respiratory specimens of persons who are either AFB smear positive or Hologic Amplified MTD positive and meet one of the following criteria:
    a. Have been treated for TB in the past
    b. Were born or have lived for at least 1 year in a foreign country with at least moderate TB incidence
    c. Are contacts of patients with MDR-TB, or
    d. Are HIV infected – we were unclear why this last point was important, and Dr. Kissner thought it had to do with how the HIV-epidemic was poorly controlled in the 90s, which lead to drug resistant TB in this population.

v. Q9: Should respiratory specimens be collected from children with suspected pulmonary TB disease?
- Yes, **suggested**
- In low-incidence settings like the US, it is unlikely that a child identified during a contact investigation was infected by a different individual with a strain with a different susceptibility pattern.

- Therefore, under some circumstances, microbiological confirmation may not be necessary for children with uncomplicated pulmonary TB identified through a recent contact investigation if the source case has drug-susceptible TB.
- Note: The clinical context of this question is important. Do you trust a negative result if they have paucibacillary TB (low number of TB)?

vi. Q10: Should sputum induction or flexible bronchoscopic sampling be the initial respiratory sampling method for adults with suspected pulmonary TB who are either unable to expectorate sputum or whose expectorated sputum is AFB smear microscopy negative?
- **Suggest** sputum induction.
- Induced sputum has equal or greater diagnostic yield than bronchoscopic sampling, has few risks, and is less expensive.
- Note: Is this worth the risk for a negative result? If the case is high risk and tests positive, you would most-likely treat for TB, even if the result is negative. Bronch is dangerous, expensive, and time consuming with slightly better results than sputum induction.

vii. Q11: Should flexible bronchoscopic sampling be performed in adults with suspected pulmonary TB from whom a respiratory sample cannot be obtained via induced sputum?
- Yes, **suggested**
- In the committee members' clinical practices, BAL plus brushings alone are preformed for most patients
- For patients who need a rapid diagnosis, transbronchial biopsy is also performed
- Note: For the bronch questions, it really depends on the case. In some cases, the bronch is warranted and worth the risk to get that specimen for drug susceptibility tests.

viii. Q12: Should postbronchoscopy sputum specimens be collected from adults with suspected pulmonary TB?
- Yes, **suggested**
- Postbronchoscopy sputum specimens are used to perform AFB smear microscopy and mycobacterial cultures.

d. <u>Testing for Suspected Pulmonary TB</u>

i. Q14: Should cell counts and chemistries be performed on amenable (i.e., liquid) specimens collected from sites of suspected extrapulmonary TB?
- Yes, **suggested**
- Specimens amenable to cell counts and chemistries include pleural, cerebrospinal, ascitic, and joint fluids.

ii. Q15: Should adenosine deaminase (ADA) and free IFN-γ levels be measured on specimens collected from sites suspected of extrapulmonary TB?
    - Yes, **suggest measuring both**
    - Measure ADA levels on fluid collected from patients with suspected pleural TB, TB meningitis, peritoneal TB, or pericardial TB. ADA is produced as a result of TB infection.
    - Measure INF-γ levels on fluid collected from patients with suspected pleural TB or peritoneal TB. INF-γ is produced to help the body fight TB.

iii. Q16: Should AFB smear microscopy be performed on specimens collected from sites of suspected extrapulmonary TB?
    - Yes, **suggested**
    - A positive AFB smear result can be used as evidence of extrapulmonary TB
        a. False-positives are uncommon
    - A negative AFB smear result should not be used to exclude TB
        a. False-negatives are common

iv. Q17: Should mycobacterial cultures be performed on specimens collected from sites of suspected extrapulmonary TB?
    - Yes, **recommended**
    - A positive mycobacterial culture result can be used as evidence of extrapulmonary TB
        a. False-positives are uncommon
    - A negative mycobacterial culture result should not be used to exclude TB
        a. False-negatives are common

v. Q18: Should NAAT be performed on specimens collected from sites of suspected extrapulmonary TB?
    - Yes, **suggested**
    - A positive NAAT result can be used as evidence of extrapulmonary TB
        a. False-positives are uncommon
    - A negative NAAT result should not be used to exclude TB
        a. False-negatives are common
    - At present, NAAT testing on specimens other than sputum is an off-label use of the test.

vi. Q19: Should histological examination be performed on specimens collected from sites of suspected extrapulmonary TB?
    - Yes, **suggested**
    - Both positive and negative results should be interpreted in clinical context.
        a. Both false-positive and false-negative results are common.

- Note: Sometimes you don't get enough specimen to perform a histological exam. This really depends on how much specimen you have, the quality of it, and your priority tests for with the specimen.

vii. Q20: Should genotyping be performed on a culture isolate from culture-positive patients with TB?
   - Yes, recommended
   - Recommend one culture isolate from each culture-positive patient be submitted to a regional genotyping lab for genotyping.
   - Public health benefits far outweigh the cost and burden of genotyping.

9. Open Forum
   a. Page 9, Boosting of IGRAs – "…prior placement of a TST can boost an IGRA, particularly in those individuals who were already IGRA positive to begin with…. Additionally, it was found that this could be observed in as little as 3 days post-TST administration, and that the boosting effect may wane after several months. …suggest when dual testing is to be considered that the IGRA be collected either concurrently or prior to TST placement."
      i. What to make of this? Two papers were used to cite this section, listed here:
         - van Zyl-Smit RN, Zwerling A, Dheda K, Pai M. Within-subject variability of interferon-g assay results for tuberculosis and boosting effect of tuberculin skin testing: a systematic review. PLoS One 2009; 4:e8517.
            a. This systematic review analyzed 17 publications on the effect of TSTs boosting IGRAs. They determined that "Although the effect of TST on IGRA results is likely to be inconsequential in IGRA-positive subjects, in IGRA-negative subjects, the interpretation of results may be confounded by a preceding TST if administered more than 3 days prior to an IGRA."

         - van Zyl-Smit RN, Pai M, Peprah K, et al. Within-subject variability and boosting of T-cell interferon-gamma responses after tuberculin skin testing. Am J Respir Crit Care Med 2009; 180:49–58.
            a. This was an actual study done to determine short-term IGRA variability and the impact of TST on subsequent IGRA results. The authors determined that, "When using a two-step screening strategy it appears safe to perform a QuantiFERON-TB-GIT or T-SPOT.*TB* IGRA within 3 days of performing the TST."

      To be honest, Peter and I felt that these two publications did not prove their theory of boosting IGRAs "…in as little as 3 days post-TST administration". We concluded more research needs to be done to confirm or deny that TSTs may boost IGRAs.

   b. For a hospitalized patient with suspect TB, do you use AFB testing to determine if the patient should remain in airborne isolation?

i. In short, yes, the patient will need to submit a sputum specimen for AFB testing, among a few other tests. The type and frequency of tests depends on the patient characteristics at diagnosis. Heartland had a great cheat-sheet for this: http://www.heartlandntbc.org/assets/products/guidelines_home_hospital_infectious_patients.pdf

ii. For more information, here is the NTCA/APHL Consensus Statement for using nucleic acid amplification techniques to help make decisions when to discontinue airborne infection isolation (AII) in healthcare settings: http://www.tbcontrollers.org/docs/resources/NTCA_APHL_GeneXpert_Consensus_Statement_Final.pdf. There are two points made:

- It is important to note that the process described herein is not to be used alone to rule out TB; Xpert negative or acid-fast bacilli (AFB) smear-negative sputum may contain viable organisms and represent infectious tuberculosis.
- Furthermore, NAA testing should not be used to monitor response to treatment or to release a newly confirmed TB patient from A.I.I.