## Drug Resistant TB Outbreak in Correct A Case Stud

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#### Agenda

- Review three related cases of **designment** designment of the second se
- Discuss the impact of these cases on the corrections system and public health.
- Share lessons learned.
- Provide key takeaways on how to detect TB early and minimize transmission in correctional settings.





## Marathon County



#### Marathon County

- Largest County-1,584 square miles.
- Population 137, 916 (2023 Data)
  - White-85.7%
  - Asian6.4%
  - 2+ Races 5.1%
- TB cases average/gear
  - 2023 Case Rate: 3.6 (5 cases)
  - Higher than average rate of dregistant TB3 cases of MDR TB in 2021



#### Marathon County Jail

- Located in Wausau
- 279 Bed Facility
  - Average of 50100 inmates are housed out of county.
- July of 2019Found to have significant structural issues
  - Reduced capacity by approximately 50%.
  - Many inmates were housed out of county from July 1200 Page 19 2020.
- Inmates continue to be housed outside of Marathon County due to staffing.



#### Index Case Summary

- Asian Male in his 30s
- Country of Birth: United States
- No known exposure to an active case
- No history of a positive TST or IGRA
- History of previous incarceration and smoking
- Incarcerated in Marathon County Jail since July 2018
  - Transferred to Langlade County Jail to be housed in August 2019. Intake forms report:
    - No respiratory symptoms
    - Wt. #179
    - TB Testing not completed.



### **Clinical Summary November**

- November 8, 2019, saw jail provider:
  - Reported cough for 2 months.
  - Dx URI and started pak on Novemberth 1
- November 20, 2019:
  - Saw provider again with continued c/o cough.
  - Dx URI and repeated pak.
  - Wt. 178



### **Clinical Summary December**

- December 2, 2019 Notes indicated started on Augmentin.
- December 3, 2019 XR indicated RUL Pneumonia.
- December 4, 2019 Augmentin stopped and started on Levaquin.
- December 23, 2018 aw Provider "My cough is back."
  - Wt. 168#
  - Dx. URI vs. Pneumonia
  - Started on Augmentin and Doxy.



# What symptoms are suspicious for TB disease?

- Ongoing cough
- Weight loss
- RUL pneumonia
- Unresolved pneumonia/URI despite treatment with several courses of antibiotics



#### **December Continued**

- December 26, 201 Complaints of cough with yellow/brown sputum, fever, and chills.
  - Stopped Augmentin and Doxy and started Levaquin
  - CXR-RU airspace disease. Recommend f/u exam. Improved from 12/3/19.
  - Wt. 165
- December 31, 2019ST placed at 10am
  - January 2, 2020 at 8:30am read as negative with 0mm induration.
  - Progress indicated a "mild reaction" and "erythema, TB injection site"



### **Clinical Summary January**

- January 2, 202 GRA ordered and placed in "seclusion".
  Wt. 165
- January 7, 202-0CXR completed and noted "consider TB".
  - Call to Marathon County Health Department (MCHD).
- January 8, 2020<sup>fst</sup> Sputum specimen and IGRA collected by MCHD nursing staff.
- January 10, 2020 Confirmed Mycobacterium TB.







#### **Contact Investigation**

- Determined Next Steps:
  - Who's doing what? Who's paying for what?
  - What is the infectious period?
  - Who are priority contacts?



# When should contact testing start?

- a) Two weeks after last contact
- b) Eight weeks after last contact
- c) As soon as possible
- d) When the index case is released from isolation



#### First Group

Current inmates Testing completed on January 31, 2020

- 12 inmates tested
- 5 positive
- 2 Borderline
- 5 negative

#### Outreach to released inmates:

- 8 inmates from cell block were reached out to; 6 received testing.
- 1 positive TST (was not able to do blood draw).
- 5 negative IGRA tests



#### **Expanded Circle**

- Reviewed jail blueprints. Connected with facility and maintenance staff.
- Obtained Marathon County Jail cellblock list for timeframe of June 2019 to when transferred out.
- What other groups or inmates does he spend tim with?
- Other non-correctional staff or outside individuals that worked with inmate in the jail?
- Attorney?



#### And Don't Forget

#### Dane County resident is Wisconsin's first confirmed coronavirus case



Wisconsin health officials provide updates on a person in Madison, Wis. becoming the state's first confirmed coronavirus case (Source: WDHS). (NBC15) By NBC15 Staff

Published: Feb. 5, 2020 at 1:23 PM CST



#### Second GroupFebruary 2020

- Repeated borderline tests for 2 inmates that were tested in round.
  - Both returned positive
- 12 inmates from the church/Bible study group were tested.
  All were negative.
- 25 released inmates or staff from church/Bible study group had outreach from Langlade County.
  - Only 5 responded to outreach.
  - All 5 tested negative.



# How long does it take for a TB infection to show up?

- a) Up to 2 weeks
- b) Up to 4 weeks
- c) Up to 8 weeks
- d) Up to 16 weeks



### **Big Picture Summary**

150+ Contacts Identified Cell block mates

- 9 LTBI Cases Identified
- 51 Negative Test Results
- 41 Lost to follow up
- 1 Verbal report of a negative test
- 1 Previously positive and screened appropriately

Bible Study/Church Groups and Monrections Staff/Individuals

- 28 Negative Test Results
- 24 Lost to follow up
- 3 Negative Initial Test, but Zest Lost to follow up

**Corrections Staff** 

73 exposures; 2 tested positive



# What did we do with contacts that tested positive?

- Provided education about what results mean.
- Arranged for CXR and medical evaluation.
- Encouraged Treatment.
- Worked with Jail Staff to assure inmates had the support to complete treatment if released.
- Corrections staff were evaluated to rule out TB disease, and they completed LTBI treatment throug coordination with their LHD.



#### Lessons Learned

- Review policies and procedures regularly per protocol.
- TB Dispensary is an important resource to utilize for testing and treatment of contacts f you don't have a TB dispensary agreement, it's a good idea to establish one now.
- At minimum, have a core team fit tested and ready to respond to a case requiring airborne precautions.
- Correctional settings should have a plan for inmate placement.
- Importance of skilled staff in reading TSTs.
- Not all jails routinely screen inmates and staff for TB.
- If you have any suspicional your local health department!



# Index Case: What happened next?

- Case was moved to a hospital following high suspicion of TB disease
- Isolated at the hospital for 16 days; awaited placement with a correctional facility with a negative pressure cell
- •Started on RIPE regimen on Januałły 10 2020
- Moved to an outside correctional facility on 01/24/2020



#### **Ongoing TB Treatment**

**TB was found to be INHresistant** Isoniazid (INH) was stopped after dose on 2/5/20 Moxifloxacin (MFX) was started on 2/7/20

Continued to have "smear many" sputum samples

**Isolation Continued** 



## How Long Should Isolation Last for the index case? (INH resistant)

- a) Two weeks
- b) Two months
- c) Until client has 3 consecutive negative sputum smears an symptom improvement
- d) Until client has 2 consecutive negative sputum cultures ar symptom improvement
- e) C and/or D



#### Release from Isolation with Drug-Resistant TB

- If only INH resistant, release from isolation requirements do not change from standard
- If Multi-Drug Resistant (MDR) TB (resistant to at least rifampin and isoniazid), at least 2 consecutive negative sputum cultures are required



#### Treatment Continues...

Weekly sputum samples sent to WSLH

- Still smear positive in March 2020
- Still smear positive in April 2020
- Still smear positive in May 2020

Marathon County Jail completes negative pressure cell block. Case is transported back to MCJ on 05/04/2020.



#### Time, Cost and Resources

Total time spent in outside je01 days

Total cost to house inmate in outsid \$1011,000

Total cost to install negative pressure cell block: ~ \$100,000



#### Why Does it Matter?

- Acuity of illness
- Extensive contact investigation=time and money
- Many new infections
  - Can be difficult to complete LTBI treatment when individuals are released, and others who became infected were lost to follow up
- Cost of hospitalization, housing in another county, building of negative pressure cell
- Panic amongst corrections inmates and staff



#### When Will Isolation End?

Sputum samples are still smear positive throu May 2020

#### Is the case still infectious?



## What Does "Smear Positive" Mean for a Client on TB Treatment?

- a) The client is infectious
- b) The client is coughing up acid fast bacilli
- c) Treatment is not working
- d) The client will have a positive sputum cultur



#### **"Smear Positive" Sputum**

- After the first 2.5 months of treatment, case was coughing up dead TB organisms from his lungs.
- Not unusual in individuals with high bacterial load a diagnosis.
- He was released from isolation in May 2020 following two consecutive negative sputum culture results.
- He remained smear positive for more than 8 month after treatment initiation.



#### Implications of INH Resistance

- •Four drugs required for full course of treatment
- •Because of his high bacterial load, he was treated with 4 drugs for almost 10 months
- Drug regimen from 2/7/201/4/20:
  - Rifampin, Moxifloxacin, Ethambutol, Pyrazinamide
- Contacts of an individual with INTESistant TB cannot be treated with INTESISTENT



#### Let's take a break!



#### Case #2

- •Adult Male in his 20s.
- Born in Thailand
- Documented close contact to index case.
- Homeless in Minnesota during contact investigation; Interjurisdictional Notification (IJN) was completed



### Case #2: Testing and Diagnosis

- Arrested in January 2022 in Marathon County
- Per protocol, TST was placed for client and was abnormal.
- Denied symptoms of TB disease
- January 26, 2022: 157bbs
- February 1, 2022: CXR showed a "nonspecific abnormality i the left lower zone laterally" and reported stated "active tuberculosis is not excluded"
- February 8, 2022: Moved into his own jail cell
- February 16, 2022: QFT was completed ulted positive on February 19th



# Case #2: Testing and Diagnosis (cont'd)

- Marathon County Jail contacted MCHD requesting LTBI treatment
- MCHD reviewed CXR report; communicated need to rule out active TB disease
- February 23, 2022: Moved to a negative pressure cell; sputum samples collected.
- Repeat symptom screening completed; client endorsed night sweats at times since incarcerated



#### Case #2: What's Next?

 Diagnosed with TB disease on March 1, 2022. His TB PCR was initially below range and had to be run again to confirm the diagnosis

GeneXpert was run. What do you think the testing showed?

- a) Likely rifampin resistance
- b) Likely rifampin susceptibility
- c) Likely isoniazid resistance
- d) Likely isoniazid susceptibility



# Should Case #2 start treatment yet?

- a) Yes, he should start on RIPE
- b) Yes, he should start on RPE + moxifloxacin
- c) Yes, he should start on RIPE + moxifloxacin
- d) No, he shouldn't start until INH susceptibility testing is complete



#### **Treatment was started**

- Per recommendations by TB Nurse Consultant, was started on RIPE + MFX
- INH was discontinued when susceptibility testing confirmed INH resistance



# What should the continuation phase include for treatment?

- a) RIF and MFX
- b) RIF, MFX, EMB and PZA
- c) RIF and PZA
- d) MFX, EMB and PZA



#### **Duration of Treatment**

- •Will treatment need to be extended past 6 months total?
- •MFX was part of initial regimen due to suspected INH resistance.



#### End of Isolation

- Released from isolation 40 days after treatment initiation
- •Gained 21.2 pounds
- Night sweats resolved



#### Case #2 Questions:

Was case released based on negative sputures
 smears or negative sputum cultures?

•Was case #2 more or less infectious than the index case?



#### **Contact Investigation: Case #2**

•Who should be tested first?

**Priorities:** 

- Cell block/bunk mates
- Corrections Staff
- Individuals exposed before client was arrested



#### Case #2: Inmate Testing/Corrections Staff

- 47 Inmates were identified as close contacts at Marathon County Jail
- Most recent date of contact was 02/08/2022
- Outreach was attempted to all 47 inmates
- MCHD staff tested 21 current and previous inmates with Tspotests.
- 2 additional inmate contacts had IGRA testing done through their PCPs
- 1 additional contact had a negative TST at MCJ
- MC Human Resources coordinated corrections staff testing. All staff were negative.



#### Case #2: Household Testing

- Case was living with 6 people, including 3 young children, prior to being arrested in January 2022
- Testing offered for 3 adults (including case's pregnant girlfriend) and 3 young children
- 1 adult refused testing
- 2 adults were tested and tested negative
- 1 young child did not complete testing per parent's refusal
- 2 young children completed recommended testing with their pediatrician (medical exam, IGRA, cheaty) x 2; no indication of TB infection or disease



#### What went better with case #2?

- Initial TB Screening was completed (no refusal).
- Was separated from other inmates prior to significant symptom onset.
- There was a negative pressure cell at MCJ.
- MCJ communicated with LHD about case's abnormal test results and need for treatment.
- Was suspected to have INH resistance.
- LHD had experience with contact investigation in jail from 2020.
- No contacts were infected.



#### Lessons learned with case #2

- Relationships between corrections nursing staff and LHD staff are important in identifying and treating TB infection and disease in inmates
- Not all imaging will "scream TB."



#### Case #3

- Had a prior h/o LTBI before identified as a close contact to the index case.
- Was lost to f/u with 2020 exposure.
- No symptoms reported, picked up on screening into prison.
  - IGRA Drawn 9/8/2022
  - CXR 10/10/2022
  - Sample collected via bronchoalveolar lavage 10/20/2022.
- Notified by Dodge County that inmate from Marathon County was confirmed to have TB disease. Determined to b close contact to the index case.





- Was housed outside Marathon County during most of his identified infectious period.
- Worked with jail staff to identify dates he was housed in Marathon County vs. another jail.
- Notified DHS/Dodge County of additional exposures due housing outside of county.
- Provided support and shared knowledge gained from prior cases to jurisdiction that had housed client.



# Moving forward to detect early and minimize transmission

- Teach others to "think TB"
- Encourage jails to have staff fit tested (or a core group with plan to be able to quickly fit test more staff).
- Have a plan for where to house a suspect or confirmed TB case.
- Plan for large scale testing of inmates
- Relationship with jail staff responsible for health services
- Encourage others to consider having TB dispensary contraction in place.



#### **Questions?**

Thank yofor listening!

