Research on digital health and applications in the management of LTBI
Recommendations

• Promote digital tools for information and education to clients and clinicians.

• Develop digital tools for LTBI programmatic management.

• Promote research to assess the effectiveness of digital tools.

Haileyesus Getahun, Yohhei Hamada
Topics

• Contact tracing
• Identifying risk of reactivation
• Decision support
• Monitoring
• Education and knowledge
• Not intended to be a comprehensive review
• Not an endorsement
Contact Tracing
Epidemic Contact Tracing via Communication Traces

Correlating Badger Social Networks with Tuberculosis Infection

Quantifying social contacts in a household setting of rural Kenya using wearable proximity sensors

Identifying Risk of Reactivation
Biomarkers for Identification of Latent Tuberculosis

Active-disease monkeys have more gross pathology at necropsy than latently infected monkeys.

PET CT Identifies Reactivation Risk in Cynomolgus Macaques with Latent M. tuberculosis
Decision Support
Computerized Clinical Decision Support for LTBI Screening

- CDC LTBI guidelines were encoded into a computerized clinical decision support system
  - Recommends further assessment of LTBI risk with certain criteria
  - A guided web-based documentation tool to facilitate appropriate adherence to the LTBI screening guideline
- 8463 patients at 2 primary care, outpatient clinics
- Baseline data collected for 15 weeks and study-phase data collected for 12 weeks.

Adherence with LTBI screening guideline improved significantly from 8.9% at baseline to 25.2% during the study phase. (183% increase, p < 0.001)
A decision aid for treatment of latent tuberculosis infection

52-year-old female, born in Vietnam, migrated to the USA at age 40 years, TST 10mm, IGRA positive, BCG<age 2 years, on hemodialysis for rare kidney disease, no diabetes. No known TB contact. The chest x-ray is clear.

Results from the TST/IGRA calculator show the following risk estimates:

- The cumulative risk of active tuberculosis disease, up to the age of 80, is: 48.87%
- If treated with INH, the probability of clinically significant drug-induced hepatitis is 2.3%, and the associated probability of hospitalization related to drug-induced hepatitis is 0.6%.
Monitoring
WelTel LTBI: Effect of weekly messaging on LTBI treatment completion

Patient receives “Are you OK?” text message

“Yes”
“No”

No response (after 48 hrs)

Patient receives “Haven’t heard from you. How’s it going?” text message

Clinician calls patient and triages:
- provides counselling or advice
- provides support
- refers to clinic or hospital

Patient doing OK

Mia L van der Kop et al. BMJ Open 2014;4:e004362
Promoting adherence to treatment for latent TB infection through mobile phone text messaging (TXT4Med)

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**Texting Arm** includes same visit schedule as well as daily text messages.

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VDOT for Monitoring Adherence to LTBI Treatment (VMALT): A Randomized Controlled Trial of Cell Phone Video Directly Observed Therapy to Monitor Short-Course LTBI Treatment (2015-2020)

Funded by NIAID grant U01-AI116392; PI: Richard S. Garfein, PhD, MPH
www.ClinicalTrials.gov. Study Identifier: NCT02641106
Education and Knowledge
OnPar: A Challenging Case-Based Learning Game

Variety of Real Life Cases
Diagnose real life cases, created by Mayo Clinic physicians, and see how the experts solved the case.