

**MCHENRY COUNTY  
TUBERCULOSIS CARE AND TREATMENT BOARD MEETING  
2200 N. SEMINARY AVE. BUILDING A  
WOODSTOCK, ILLINOIS 60098  
JUNE 23, 2020  
8:00 AM**

**AGENDA**

1. Call to Order
2. Public Participation
3. Minutes of January 2020 Meeting
4. Consent Agenda
  - A) Disbursements; January-May 2020
  - B) Income and Expense Report; January-May 2020
5. Contracts, Agreements, and/or Addendums
6. Monthly Reports
  - A) TB Nurse Report
  - B) Statistics
  - C) IDPH Report
  - D) TB Profile Report
7. Program Highlights
8. Old Business
9. New Business
  - A) Quorum Discussion/Meeting Schedule
10. Board Issues
11. Information and Communication

Guidelines for the Treatment of Latent Tuberculosis Infection: Recommendations from the National Tuberculosis Controllers Association and CDC, 2020. Centers for Disease Control and Prevention, Centers for Disease Control and Prevention, 13 Feb. 2020, [www.cdc.gov/mmwr/volumes/69/rr/tr6901a1.htm](http://www.cdc.gov/mmwr/volumes/69/rr/tr6901a1.htm).
12. Executive Session
13. Adjournment

**MINUTES  
AND  
CONSENT AGENDA**

MCHENRY COUNTY

TUBERCULOSIS AND TREATMENT

MINUTES • January 28, 2020

**1. CALL TO ORDER**

Meeting to order at 8:03 am by Fran Stanwood BSN, RN

PRESENT: Dr. James Mowery M.D., Fran Stanwood BSN, RN, Melissa H. Adamson MPH Administrator, Susan Karras MBA, BSN, RN Director of Nursing, Jennifer Schorsch BS, RN, NE-BC, Assistant Director of Nursing, Danielle Burck BSN, RN.

ABSENT: Rebecca Rockwood MT

**2. PUBLIC COMMENT**

**3. MINUTES APPROVAL**

RESULT:	ACCEPTED (UNANIMOUS)
MOVER:	James Mowery
SECONDER:	Fran Stanwood
ABSENT:	Rebecca Rockwood

A. Tuberculosis and Treatment- Board Meeting Minutes- November 19, 2019

**4. CONSENT AGENDA**

RESULT:	ADOPTED (UNANIMOUS)
MOVER:	James Mowery
SECONDER:	Fran Stanwood
ABSENT:	Rebecca Rockwood

- A. Disbursements: November - December 2019
- B. Income & Expenses: November - December 2019

Susan Karras MBA, BSN, RN Director of Nursing, introduced Hillary Huntington Accountant II, to the TB board. Hillary Huntington was in attendance in order to provide an update on the missing information within the income and expense report. Further explanation was provided in regard to some issues with the new D365 account system, and how quickly information can be provided to the TB board.

Hillary Huntington Accountant II, addressed the previous income and expense reports along with the disbursement reports.

The finance department is currently posting these reports internally, then reports can be generated with accurate salary and fringe numbers. Since switching to D365 there has been a delay to when finances can post those final numbers. Based on payroll labor distribution reports the numbers could be included, but there would not be a financial system-generated report to show the TB board members. Hillary Huntington Accountant II, asked the board if moving forward they would like to see what the numbers are, or proceed by excluding the salary and fringe from the reports.

Fran Stanwood BSN, RN, expressed that she would prefer to see what the numbers are.

Hillary Huntington Accountant II assured board members that numbers could be provided based on the payroll report that is obtained when the checks are cut. She restated that finance will not be able to have the final internal postings completed by the time the board meets. Therefore, a report generated from the financial system showing those postings will not be available. She noted that when the postings do become available they could be used to verify information that was provided to the board members.

Dr. James Mowery M.D., wanted to know, in terms of months, how far behind they are.

Hillary Huntington Accountant II addressed the question by stating they are currently quite a few months behind. There has been discussions with finance to try and remedy the situation and create a more functional cycle. When using the performance system there was only about a month delay, which was manageable as far as reconciliation. Currently since having switched to D365 they have been a few months behind, but reconciliation has been achieved based on payroll reports retrieved from ADP. Moving forward the hope is there will only be about a month delay which is common.

Susan Karras MBA, BSN, RN Director of Nursing, confirmed that in preparation for this meeting, Hillary did not have the postings from October and November salaries. Therefore Hillary needed to pull the disbursements from ADP, which is a different system, in order to provide numbers in the income and expense report. When the actual numbers are loaded then they can be cross-checked for accuracy and reviewed for any possible variance.

Dr. James Mowery M.D., further inquired about potential variances, and whether the board would be notified of such discrepancy.

Hillary Huntington Accountant II told the board that the only potential variance could be if someone received insurance benefits or withdrew from receiving insurance benefits. She assured the board that they would be notified of any variance found when verifying the information.

Susan Karras MBA, BSN, RN Director of Nursing, asked the board members if they would in fact like to proceed and have the numbers provided while noting any variance that could be identified.

Dr. James Mowery M.D., and Fran Stanwood BSN, RN, both agreed to proceed.

#### C. By-Laws

Susan Karras MBA, BSN, RN Director of Nursing, addressed the need to approve the by-laws because changes can't be made unless all board members are in attendance. It was also noted that a vacant position still remains on the TB board and the importance of filling that position promptly. There was also reference to the previous discussion about calling into the meeting but because a quorum would be required it would not be in their best interest to pursue this further at this point in time.

Fran Stanwood BSN, RN, directed a question at Susan, as to if anyone has demonstrated interest in the vacant TB board position.

Susan Karras MBA, BSN, RN Director of Nursing, stated that some who have shown interest has been directed to the website in order to apply. She has also made herself available to address any questions potential applicants may have. She then invited the board to proceed by approving the by-laws without making any changes.

Fran Stanwood BSN, RN, voted to approve the by-laws.

Dr. James Mowery M.D. had a question in regard to the income and expense statement, line item 9990 and what it represents.

Melissa H. Adamson MPH Administrator referring to the spreadsheet, clarified that line item 9990 refers to the utilization fund. This fund allows the expenditures to be reached, and balance out the revenue and expenses.

Dr. James Mowery M.D., wanted to know where the fund balance can be found.

Melissa H. Adamson MPH Administrator, mentioned that the fund balance is not reflected initially but it does become visible when the levy is completed.

Susan Karras MBA, BSN, RN Director of Nursing, added that when the budget is done there is a total of what was used for the utilization of funds in order to balance everything out. This may not be posted until needed, although it should appear in the 2019 report, therefore the thought is that for some reason it is not pulling from the D365.

Hillary Huntington Accountant II stated that she will look into this matter further in order to verify why the numbers are not being reflected on the spreadsheet.

Dr. James Mowery M.D. expressed concern about approving a budget without having the necessary information and then having a shortfall as a result.

Susan Karras MBA, BSN, RN Director of Nursing, addressed these concerns by retrieving the budget previously approved for the fiscal year 2020 and demonstrating line item 2502 which clearly indicates the utilization fund balance. Overall it was noted that at the time of budget they are notified how the utilization of funds was used in previous years and based on that information a flat amount is developed.

Dr. James Mowery M.D., and Fran Stanwood BSN, RN, were satisfied with the explanations given but they did express reservations about having sufficient money and the declining fund balance.

Melissa H. Adamson MPH Administrator also shared these concerns and made them aware that further discussion on this matter would take place later on in the agenda.

## 5. Contracts, Agreements, and/or Addendums

RESULT:	ADOPTED (UNANIMOUS)
MOVER:	James Mowery
SECONDER:	Fran Stanwood
ABSENT:	Rebecca Rockwood

### A. Boone County Service Partnership Agreement

Susan Karras MBA, BSN, RN Director of Nursing, presented the previously discussed contract with Boone County. This contract states that we agree to provide medical consultation for their clients.

Danielle Burck BSN, RN, informed the board that Dr. Hafiz has agreed to provide this medical consultation.

Susan Karras MBA, BSN, RN Director of Nursing, reviewed the contract and the fees that Boone County has agreed to. There are fees for everyone, and they are subject to change based on medication prices and lab contract pricing.

Fran Stanwood BSN, RN, asked if Dr. Hafiz was still agreeable to the payment that has already been established.

Susan Karras MBA, BSN, RN Director of Nursing, said that Dr. Hafiz has agreed to the payment as well as seeing these clients here in Mchenry County. Payment will be made to Dr. Hafiz and reimbursement will be provided by Boone County, in addition to any other fees incurred on their residents, such as labs and medication if needed. The primary need is having an infectious disease physician to order what they need, and being a consultant to the physician managing the case in Boone County.

Danielle Burck BSN, RN, inquired as to if Boone County has a contract with other counties.

Susan Karras MBA, BSN, RN Director of Nursing, stated that Boone County does currently have a contract with Winnebago County, but it is unknown whether they will be renewing that contract.

## **6. Monthly Report**

### **A. Coordinators Report**

Danielle Burck BSN, RN, reviewed the monthly nurse report including an update on the active client who was identified in December based on CT scans. This client is currently completing two months of RIPE. 3HP has been very successful, with ten clients completing this treatment.

Dr. James Mowery M.D. asked if the decrease in DOT numbers were a result of this increase in 3HP.

Danielle Burck BSN, RN, stated that the 3HP is not included in the DOT numbers, those are only the active clients, and the 3HP is for the latent clients coming into the clinic. One client was completed in approximately July and then another active client was started in December. She also included information regarding the nurses attending webinars, and currently conducting annual TB testing for all the staff.

Fran Stanwood BSN, RN, had a question about where the TB testing is taking place.

Danielle Burck BSN, RN, explained that the TB exam room is currently located in the back of all other intake and exam rooms. This purposeful planning allows for active TB clients to be escorted through the back stairwell and into the TB exam room. Although the room does have the appropriate filtration system built into the room, the clients would still be required to wear a mask as an extra measure of protection. She continued by reviewing the NIPHC report and providing an update on the XDR case in Cook County.

Fran Stanwood BSN, RN, discussed the article and the interesting findings of a vaccine preventing pulmonary tuberculosis, it is currently in the infant stages and being compared to BCG.

### **B. Statistics**

### **C. IDPH Report**

D. TB Profile Report

**7. PROGRAM HIGHLIGHTS**

**8. OLD BUSINESS**

**9. NEW BUSINESS**

A. TB Tax Levy

Susan Karras MBA, BSN, RN Director of Nursing, commenced by providing a spreadsheet generated by Melissa H. Adamson MPH Administrator, which provides an estimated projection of the 2022 numbers and potential variance.

Melissa H. Adamson MPH Administrator explained how numbers from years 2015 to 2019 were utilized to determine what the fund balance would be by the years 2021 and 2022. If the levy goes unchanged the deficit would be inevitable and significant increase in the amount of deficit would occur in the years to follow.

Susan Karras MBA, BSN, RN Director of Nursing, is expecting permanent changes to the levy which will have a significant impact on the TB program.

Melissa H. Adamson MPH Administrator stated the important of advocating for this program and requesting more go back into the levy. A decrease or nonexistent levy would have substantial ramifications, especially if there were to be an XDR case.

Susan Karras MBA, BSN, RN Director of Nursing, made it clear that regardless of the funds available we are financially responsible for treating these clients if they are unable to do so themselves.

Danielle Burck BSN, RN, emphasized these points by relating how much is needed in order to treat a basic TB client. Repeat CT scans and medication is required and because the client does not have the appropriate funding, the responsibility falls upon this program.

Dr. James Mowery M.D., would like to have further discussions and meet with the public health and human service committee in order to reach an adequate resolution. He emphasized the importance of preparing for the year 2021 by advocating on behalf of the TB board.

Melissa H. Adamson MPH Administrator agreed that creating awareness and commencing dialogue about the levy, and what the implications would be further down the road, is vital.

Susan Karras MBA, BSN, RN Director of Nursing, with the help of Melissa H. Adamson MPH Administrator, would like to proceed by scheduling dates to meet together and discuss what they will be presenting to the public health and human service committee. They would like to bring attention to the correlation between the increased number of latent TB clients being treated and the decreasing number of active TB clients. The intervention has been very successful in

preventing active TB within Mchenry County, therefore it is essential that people are made aware of its importance.

Dr. James Mowery M.D. highlighted the importance of prevention and that although there is an upfront cost to treat latent TB clients, the result is a decrease in active TB clients who would be at a significantly higher cost to treat.

**10. BOARD ISSUES**

**11. ADJOURNMENT**

A Motion was made by Dr. James Mowery, second by Fran Stanwood, to adjourn the TB board meeting at 8:45 am.

**MCHENRY COUNTY HEALTH DEPARTMENT  
TB - DISBURSEMENTS  
January 2020 (FY20) ~ as of 06/22/2020**

<u>Personal Service</u>	<u>ACCT #</u>	<u>PAYROLL</u>	
Engelbrecht, Renee (59% on TB)	3010	\$2,631.12	
Garcia, Sandra	3010	\$2,604.00	
Kurka, Amanda	3010	\$4,473.16	
Schoen, Faith	3010	\$4,492.39	
Vilchis, Brenda (.75 FTE)	3020	\$1,616.17	
	3025	<i>Included in above</i>	
SOCIAL SECURITY	3105	\$980.64	6.20%
MEDICARE	3106	\$229.35	1.45%
IMRF	3110	\$1,518.42	9.60%
 INSURANCE	 3146	 \$2,010.18	 \$10.10 variance from Inc&Exp; working to correct
	<b>Payroll Total</b>	<b>\$20,555.43</b>	

<u>Invoice #</u>	<u>VENDOR</u>	<u>ACCT #</u>	<u>AMOUNT</u>
OSV000001998080	VERIZON CONNECT NWF INC	409600	\$ 18.95
9845446783	VERIZON WIRELESS	409620	\$ 46.40
9000100560120	MERCY HEALTH SYSTEMS CORP	424800	\$ 372.00
T1293855	QUEST DIAGNOSTICS TB LLC	444140	\$ 203.64
9185366232	QUEST DIAGNOSTICS TB LLC	444140	\$ 25.47
9185818696	QUEST DIAGNOSTICS TB LLC	444140	\$ 22.11
T1304250	QUEST DIAGNOSTICS TB LLC	444140	\$ 50.91
51-010220	SCRIPTCLAIM SYSTEMS LLC	508500	\$ 38.92
	<b>Expense Total</b>		<b>\$778.40</b>
	<b>Grand Total</b>		<b>\$21,333.83</b>

**MCHENRY COUNTY HEALTH DEPARTMENT  
TB - DISBURSEMENTS  
February 2020 (FY20) as of 06/22/2020**

<u>Personal Service</u>	<u>ACCT #</u>	<u>PAYROLL</u>	
Engelbrecht, Renee (59% on TB)	3010	\$2,660.62	
Garcia, Sandra	3010	\$2,604.00	
Kurka, Amanda	3010	\$4,473.16	
Schoen, Faith	3010	\$4,511.62	
Vilchis, Brenda (.75 FTE)	3020	\$1,616.16	
	3025	<i>Included in above</i>	
SOCIAL SECURITY	3105	\$983.66	6.20%
MEDICARE	3106	\$230.06	1.45%
IMRF	3110	\$1,523.09	9.60%
INSURANCE	3146	<u>\$2,010.18</u>	 \$10.10 variance from Inc&Exp; working to correct
			\$54.56 overall variance from Inc&Exp; working to correct
		Payroll Total	<u>\$20,612.56</u>

<u>Invoice #</u>	<u>VENDOR</u>	<u>ACCT #</u>	<u>AMOUNT</u>
28064	CITY OF MADISON	400600	\$ 50.00
OSV000002026134	VERIZON CONNECT NWF INC	409600	\$ 18.95
9847515893.00	VERIZON WIRELESS	409620	\$ 35.91
9038157421-021920	ANSERCALL 24 LLC	413000	\$ 28.26
9000100560220	MERCY HEALTH SYSTEMS CORP	424800	\$ 186.00
2020-01	HAFIZ IRFAN MD SC	424800	\$ 500.00
380144.00	METRO INFECTIOUS DISEASE	424800	\$ 500.00
T1314275	QUEST DIAGNOSTICS LLC	444140	\$ 313.42
13852	HEALTHCARE WASTE MANAGEMENT	444900	\$ 79.90
CM3436924413	STAPLES CONTRACT & COMMERCIAL INC	501000	\$ (88.59)
3436460890	STAPLES CONTRACT & COMMERCIAL INC	501000	\$ 88.59
77379426.00	MCKESSON MEDICAL	508000	\$ 87.54
13181	SCRIPTCLAIM SYSTEMS LLC	508500	\$ 673.77
3440077739	STAPLES CONTRACT & COMMERCIAL INC	513510	\$ 52.85
		Expense Total	<u>\$2,526.60</u>
		Grand Total	<u><u>\$23,139.16</u></u>

MCHENRY COUNTY HEALTH DEPARTMENT  
 TB - DISBURSEMENTS ~ as of 06/22/2020  
 March 2020 (FY20)

<u>Personal Service</u>	<u>ACCT #</u>	<u>PAYROLL</u>
Engelbrecht, Renee (59% on TB)	3010	\$2,666.52
Garcia, Sandra	3010	\$2,631.00
Kurka, Amanda	3010	\$4,557.16
Schoen, Faith	3010	\$4,511.62
Vilchis, Brenda (.75 FTE)	3020	\$1,619.77
	3025	<i>Included in above</i>
SS	3105	\$991.14 6.20%
MEDICARE	3106	\$231.80 1.45%
IMRF	3110	\$1,534.66 9.60%
INSURANCE	3146	\$2,010.18

\$182.68 overall variance  
 from Inc&Exp; working to  
 correct

Payroll Total \$20,753.85

<u>VD</u>	<u>VENDOR</u>	<u>ACCT #</u>	<u>AMOUNT</u>
AL00000922	TB reimb HD Admin Charge - Q1	400100	\$ 5,000.00
OSV000002052945	VERIZON CONNECT NWF INC	409600	\$ 18.95
9849592850	VERIZON WIRELESS	409620	\$ 46.40
9000100560320	MERCY HEALTH SYSTEMS CORP	424800	\$ 2,047.70
2020030106	AADVANCED BUSINESS SOFTWARE LLC	432100	\$ 5,875.00
9186775121	QUEST DIAGNOSTICS LLC	444140	\$ 16.74
20020072	SCRIPTCLAIM SYSTEMS LLC	508500	\$ 50.40
Total Expenses			<u>\$13,055.19</u>
Grand Total			<u><u>\$33,809.04</u></u>

MCHENRY COUNTY HEALTH DEPARTMENT  
 TB - DISBURSEMENTS as of 6/22/20  
 April 2020 (FY20)

<u>Personal Service</u>	<u>ACCT #</u>	<u>PAYROLL</u>
Engelbrecht, Renee (59% on TB)	3010	\$2,631.12
Garcia, Sandra	3010	\$2,604.00
Kurka, Amanda	3010	\$4,473.16
Schoen, Faith	3010	\$4,511.62
Vilchis, Brenda (.75 FTE)	3020	\$1,616.16
	3025	<i>Included in above</i>
SS	3105	\$981.83 6.20%
MEDICARE	3106	\$229.63 1.45%
IMRF	3110	\$1,520.26 9.60%
INSURANCE	3146	<u>\$2,010.18</u>

Payroll Total

**\$20,577.96**

\$32.32 overall  
 variance from  
 Inc&Exp;  
 working to  
 correct

<u>VD</u>	<u>VENDOR</u>	<u>ACCT #</u>	<u>AMOUNT</u>
9851692012	VERIZON WIRELESS	409620	\$ 46.32
OSV000002080473	VERIZON CONNECT NWF INC	409600	\$ 18.95
2030075	SCRIPTCLAIM SYSTEMS LLC	508500	\$ 107.91
		<b>Total Expenses</b>	<u>\$173.18</u>
		<b>Grand Total</b>	<u><u>\$20,751.14</u></u>

MCHENRY COUNTY HEALTH DEPARTMENT  
 TB - DISBURSEMENTS as of 06/22/2020  
 May 2020 (FY20)

<u>Personal Service</u>	<u>ACCT #</u>	<u>PAYROLL</u>
Engelbrecht, Renee (59% on TB)	3010	\$3,931.93
Garcia, Sandra	3010	\$3,906.00
Kurka, Amanda	3010	\$6,709.74
Schoen, Faith	3010	\$6,767.43
Vilchis, Brenda (.75 FTE)	3020	\$2,424.24
	3025	<i>Included in above</i>
SS	3105	\$1,471.83 6.20%
MEDICARE	3106	\$344.23 1.45%
IMRF	3110	\$2,278.98 9.60%
INSURANCE	3146	<u>\$2,010.18</u>

\$32.32 overall  
 variance from  
 Inc&Exp; working  
 to correct

Payroll Total            \$29,844.56

<u>Invoice #</u>	<u>VENDOR</u>	<u>ACCT #</u>	<u>AMOUNT</u>
OSV000002107994	VERIZON CONNECT NWF INC	409600	\$ 16.45
9853752643	VERIZON WIRELESS	409620	\$ 46.32
2020-02	HAFIZ IRFAN MD SC	424800	\$ 500.00
2020-03	HAFIZ IRFAN MD SC	424800	\$ 500.00
9000100560420	MERCY HEALTH SYSTEMS CORP	424800	\$ 434.00
9000100560520	MERCY HEALTH SYSTEMS CORP	424800	\$ 62.00
T1322146	QUEST DIAGNOSTICS TB LLC	444140	\$ 423.20
9187285423	QUEST DIAGNOSTICS LLC	444140	\$ 2.79
00003W01R9528	UNITED PARCEL SERVICE	507000	\$ 3.50
00003W01R9070	UNITED PARCEL SERVICE	507000	\$ 35.62
00003W01R9110	UNITED PARCEL SERVICE	507000	\$ 2.14
20040080	SCRIPTCLAIM SYSTEMS LLC	508500	\$ 94.84
3436162170	STAPLES CONTRACT & COMMERCIAL INC	511400	\$ 88.59
			<hr/>
	Expense Total		\$2,209.45
			<hr/>
	Grand Total		<u>\$32,054.01</u>



**CONTRACTS  
AGREEMENTS  
AND/OR  
ADDENDUMS**

# **MONTHLY REPORTS**

## **MCDH Nurse Report**

### **January, February, March, April, & May, 2020**

#### **Skin Testing:**

In January, 20 clinics were held with 73 skin tests performed and 0 IGRAs collected.

In February, 17 clinics were held with 47 skin tests performed and 5 IGRAs collected.

In March, 22 clinics were held with 34 skin tests performed and 4 IGRAs collected.

In April, 12 clinics were held with 1 skin test performed and 2 IGRAs collected.

In May, 11 clinics were held with 7 skin tests performed and 0 IGRAs collected.

#### **Doctor Clinic:**

In January, 2020, Doctor's Clinic was postponed.

On February 10, 2020, Doctor's Clinic was held with 10 chest X-rays reviewed and 21 charts reviewed.

In March, 2020, Doctor's Clinic was cancelled due to Covid-19.

On April 20, 2020, Doctor's Clinic was held with 17 X-rays reviewed, 27 charts reviewed, and 3 Immigration patients seen by Dr. Hafiz.

On May 18, 2020, Doctor's Clinic was held with 1 X-ray reviewed and 1 chart reviewed.

#### **Patient Update:**

On February 10, 2020, our active TB patient transitioned to LTBI treatment to complete treatment plan due to CT scan.

3HP Completion: 7 patients have completed 3HP treatment between January and June 2nd of 2020.

3HP: Currently there are 0 patients on 3HP treatment due to the Rifapentine shortage.

Preferred regimens suggested by the CDC: SAT with either Rifampin x4 months or Isoniazid x6 mos.

INH: Currently there are 3 patients on Isoniazid treatment.

RIF: Currently there are 3 patients on Rifampin treatment.

#### **Activities:**

PADS testing 2/4/2020 and 2/6/2020; 6 total tests performed, 6 read.

PADS testing currently postponed due to Covid-19.

Annual TB testing for County employees 1/4/2020, 1/6/2020; 1/28/2020, and 1/30/2020.

**Webinars/Trainings:**

1/14/2020 Webinar: Navigating the Complexity of ICE Custody for Tuberculosis Care; National Prevention Information Network/CDC.

1/17/2020 Webinar: Challenges in TB Care for Migrants; Global Tuberculosis Institute Rutgers, The State University of New Jersey.

1/30/2020 Webinar: Let's Hash Out the Drug Rash Webinar, Part 2, Heartland National TB Center.

2/14/2020 Webinar: End the Stigma of TB.

All remaining scheduled Webinars throughout March, April, and May were cancelled due to Covid-19.

**Up Coming Events:**

Amanda and Renee were to attend the 9<sup>th</sup> Annual TB Summit at the Epic Campus in Verona, Wisconsin, on 4/9/2020; however, it was cancelled due to Covid-19.

**EDUCATION**

Presentations	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Total YTD	YTD Reference †
# of Presentations	0	0	0	0	0								0	0
# of Attendees	0	0	0	0	0								0	0

† Past 1-year year-to-date (YTD) used as reference

**TESTING**

TB Test Statistics	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Total YTD	YTD Reference †
<b>MCDH (Annex B)</b>														
# of Clinics	20	17	22	12	11								82	83
# of IGRAs (T Spot and Quantiferon)	0	5	4	2	0								11	9
# of Skin Tests	73	47	34	1	7								162	244
<b>PADS / Old Firehouse</b>														
# of Clinics	0	2	2	0	0								4	6
# of IGRAs (T Spot and Quantiferon)	0	0	0	0	0								0	0
# of Skin Tests	0	6	4	0	0								10	18
<b>Contact Investigation Testing</b>														
# of Clinics	2	0	0	0	0								2	0
# of IGRAs (T Spot and Quantiferon)	3	0	3	0	0								6	1
# of Skin Tests	3	0	0	0	0								3	7
<b>Other Outreach Sites</b>														
# of Clinics	0	0	0	0	0								0	0
# of IGRAs (T Spot and Quantiferon)	0	0	0	0	0								0	0
# of Skin Tests	0	0	0	0	0								0	1
<b>Totals</b>														
Total Skin Tests	73	47	34	1	7								162	244
Total IGRAs (T Spot and Quantiferon)	3	5	7	2	0								17	9
Total Positive Tests	0	0	0	0	0								0	1
County Positive Skin Test Rate*	0.0	0.0	0.0	0.0	0.0								0.0	-

† Past 1-year year-to-date (YTD) used as reference

\*Annual Rate YTD represents the annual rate per 100,000 population based on the US Census Bureau, 2014-2018 ACS 5-year Estimates for McHenry County (307,789 people)

Diagnostic Statistics	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Total YTD	YTD Reference †
X-Rays Ordered	4	6	8	1	0								19	15
Sputum Collected	3	6	0	0	0								9	15
Laboratory Tests Ordered (LFT and CBC)	2	1	5	1	6								15	10

† Past 1-year year-to-date (YTD) used as reference

**LTBI**

Preventive Statistics	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Total YTD	YTD Reference †
Positive clients transferred into county	0	0	0	1	0								1	0
Positive Interviews	4	7	8	1	1								21	27
Clients Starting LTBI	2	1	5	1	5								14	10

† Past 5-year year-to-date (YTD) median used for calculation of reference value

Clients Starting LTBI	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Total YTD	YTD Reference †
<b>Gender</b>														
Male	0	1	4	1	1								7	1
Female	2	0	1	0	4								7	7
<b>Age</b>														
Children (0-18 years)	1	0	0	0	0								1	0
Adult (19-64 years)	1	0	5	1	5								12	8
Senior Adult (65+ years)	0	1	0	0	0								1	0
<b>Foreign Born</b>														
Yes	1	1	5	1	2								10	2
No	1	0	0	0	3								4	6

† Past 1-year year-to-date (YTD) used as reference

Treatment Completion	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Total YTD	YTD Reference †
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Clients Completing LTBI	2	2	1	3	3											11	8
Failure to Complete	0	0	0	0	1											1	0
Moved	0	0	0	0	0											0	0
Lost to F/U	0	0	0	0	1											1	0
Declined- Personal	0	0	0	0	0											0	0
Declined-Medical	0	0	0	0	0											0	0
Deceased	0	0	0	0	0											0	0
Other	0	0	0	0	0											0	0

† Past 1-year year-to-date (YTD) used as reference

**ACTIVE TB**

Active TB Statistics	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Total YTD	YTD Reference †
# TB Cases Identified	0	0	0	0	0								0	1
# Incident TB Cases for McHenry County	0	0	0	0	0								0	0
County TB rate*		0	0	0	0								0.00	-
Active Cases Transferred OUT of County	0	0	0	0	0								0	1
Active Cases Transferred INTO County	0	0	0	0	0								0	0
Total Active TB Caseload**	0	0	0	0	0								0	8
# DOT Visits	18	6	0	0	0								24	135
# Video DOT Visits	0	0	0	0	0								0	0
# TB Contact Investigations Initiated	1	0	0	0	0								1	1
# Suspected Cases	0	0	0	0	0								0	2

† Past 1-year year-to-date (YTD) used as reference for all values except for "# TB Cases Identified" and "# Incident TB Cases for McHenry County" (past 5-year YTD median used as reference for these statistics)

\*Annual Rate YTD represents the annual rate per 100,000 population based on the US Census Bureau, 2014-2018 ACS 5-year Estimates for McHenry County (307,789 people)

\*\*Number does not accumulate, it reflects the number of people for whom the DOT visits and DOT time account

Treatment Completion	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Total YTD	YTD Reference †
Cases Completing Active TB Medication	0	1	0	0	0								1	1
Failure to Complete	0	0	0	0	0								0	0
Moved	0	0	0	0	0								0	0
Lost to F/U	0	0	0	0	0								0	0
Declined- Personal	0	0	0	0	0								0	0
Declined-Medical	0	0	0	0	0								0	0
Deceased	0	0	0	0	0								0	0
Other	0	0	0	0	0								0	0

† Past 1-year year-to-date (YTD) used as reference

Resistance Classifications	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Total YTD	YTD Reference †
#MDR Cases Identified	0	0	0	0	0								0	0
#XDR Cases Identified	0	0	0	0	0								0	0

† Past 1-year year-to-date (YTD) used as reference

Active TB Statistics	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Total YTD	YTD Reference †
<b>Location of Active TB Identified</b>														
Pulmonary	0	0	0	0	0								0	1
Extrapulmonary	0	0	0	0	0								0	0
<b>Gender</b>														
Male	0	0	0	0	0								0	0
Female	0	0	0	0	0								0	1
<b>Age</b>														
Children (0-18 years)	0	0	0	0	0								0	1
Adult (19-64 years)	0	0	0	0	0								0	0
Senior Adult (65+ years)	0	0	0	0	0								0	0
<b>Foreign Born</b>														
Yes	0	0	0	0	0								0	0
No	0	0	0	0	0								0	1

† Past 1-year year-to-date (YTD) used as reference

**I. Numbers of Cases**

There were 327 cases reported and confirmed 2019.

There were 319 cases reported and confirmed in 2018.

So far for 2020, we have 12 active cases reported. Compared to the same week last year, there were 17 cases reported.

	<u>2019 totals</u>	<u>2020 to date</u>
Boone County	2	0
DuPage County	46	0
Kane County	15	0
Kendall	1	0
Lake County	9	1
McHenry	1	0
Will County	19	0
Winnebago	6	0
Suburban Cook	72	6
Chicago	124	6

## **II. Drug Resistance**

Of the 327 cases reported in 2019, 217 were culture positive.

Of the culture positives, 196 (60%) have their susceptibilities reported.

13 (4%) cases are resistant to Isoniazid.

1 (0.3%) cases are Multi-Drug Resistant (resistant to both Isoniazid and Rifampin).

1 (0.3%) are XDR (extensively drug resistant)\*

\*Down state, they are treating a second XDR case, but the case is not countable, as the case was already counted in their home country.

Of the 12 cases reported thus far in 2020, 11 are culture positive. Of the culture positives, 5 (36%) have their susceptibilities reported. No resistant cases noted to date.

## **III. Dead at Diagnosis or Died on Therapy**

Of the 327 cases reported in 2019, 11 were dead at diagnosis and 27 died during therapy. 17 have documentation that cause of death was related to TB.

Of the 12 cases reported for 2020, none are reported as dead.

## **IV. US born vs Foreign Born**

Of the 327 cases reported in 2019, 87 cases were US born (27%)

239 cases were Foreign Born (73%)

1 not specified

Of the 12 cases reported in 2020 thus far, 3 cases are US born (25%)

9 Cases are Foreign Born (75%)

## **V. Education Opportunities**

There will be webinars on TB topics on Wednesdays March 4, 11 and 25. Please email [Michael.moore@illinois.gov](mailto:Michael.moore@illinois.gov) to learn more about topics and registration.

**I. Numbers of Cases**

There are 62 cases of active TB disease reported to date for 2020. Compared to the same week last year, there were 122 cases reported.

	<u>2020 to date</u>
Boone County	0
DuPage County	5
Kane County	3
Kendall	0
Lake County	3
McHenry	0
Will County	0
Winnebago	1
Suburban Cook	18
Chicago	23

## **II. Drug Resistance**

Of the 62 cases reported thus far in 2020, 49 were culture positive.  
Of the culture positives, 38 (78%) have their susceptibilities reported.

3 (4%) cases are resistant to Isoniazid.

0 cases are Multi-Drug Resistant (resistant to both Isoniazid and Rifampin).

0 are XDR (extensively drug resistant)\*

## **III. Dead at Diagnosis or Died on Therapy**

Of the 62 cases reported thus far in 2020, 2 were dead at diagnosis and 5 died during therapy. 2 have documentation that cause of death was related to TB.

## **IV. US born vs Foreign Born**

Of the 62 cases reported thus far in 2020,

13 cases were US born (21%)

49 cases were Foreign Born (79%)

# **PROGRAM HIGHLIGHTS**

# **OLD BUSINESS**

**NEW BUSINESS**

# **BOARD ISSUES**

# **INFORMATION AND COMMUNICATION**

Centers for Disease Control and Prevention

**MMWR**

Morbidity and Mortality Weekly Report

Recommendations and Reports / Vol. 69 / No. 1

February 14, 2020

# Guidelines for the Treatment of Latent Tuberculosis Infection: Recommendations from the National Tuberculosis Controllers Association and CDC, 2020



U.S. Department of Health and Human Services  
Centers for Disease Control and Prevention

## Recommendations and Reports

### CONTENTS

Introduction.....	1
Methods.....	2
Results.....	4
Discussion.....	7
Other Considerations.....	8
Conclusion.....	8
References.....	8

The *MMWR* series of publications is published by the Center for Surveillance, Epidemiology, and Laboratory Services, Centers for Disease Control and Prevention (CDC), U.S. Department of Health and Human Services, Atlanta, GA 30329-4027.

Suggested citation: [Author names; first three, then et al., if more than six.] [Title]. *MMWR Recomm Rep* 2020;69(Na. RR-#):[inclusive page numbers].

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# Guidelines for the Treatment of Latent Tuberculosis Infection: Recommendations from the National Tuberculosis Controllers Association and CDC, 2020

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## Summary

Comprehensive guidelines for treatment of latent tuberculosis infection (LTBI) among persons living in the United States were last published in 2000 (American Thoracic Society. CDC targeted tuberculin testing and treatment of latent tuberculosis infection. *Am J Respir Crit Care Med* 2000;161:S221–47). Since then, several new regimens have been evaluated in clinical trials. To update previous guidelines, the National Tuberculosis Controllers Association (NTCA) and CDC convened a committee to conduct a systematic literature review and make new recommendations for the most effective and least toxic regimens for treatment of LTBI among persons who live in the United States.

The systematic literature review included clinical trials of regimens to treat LTBI. Quality of evidence (high, moderate, low, or very low) from clinical trial comparisons was appraised using the Grading of Recommendations Assessment, Development, and Evaluation (GRADE) criteria. In addition, a network meta-analysis evaluated regimens that had not been compared directly in clinical trials. The effectiveness outcome was tuberculosis disease; the toxicity outcome was hepatotoxicity. Strong GRADE recommendations required at least moderate evidence of effectiveness and that the desirable consequences outweighed the undesirable consequences in the majority of patients. Conditional GRADE recommendations were made when determination of whether desirable consequences outweighed undesirable consequences was uncertain (e.g., with low-quality evidence).

These updated 2020 LTBI treatment guidelines include the NTCA- and CDC-recommended treatment regimens that comprise three preferred rifamycin-based regimens and two alternative monotherapy regimens with daily isoniazid. All recommended treatment regimens are intended for persons infected with *Mycobacterium tuberculosis* that is presumed to be susceptible to isoniazid or rifampin. These updated guidelines do not apply when evidence is available that the infecting *M. tuberculosis* strain is resistant to both isoniazid and rifampin; recommendations for treating contacts exposed to multidrug-resistant tuberculosis were published in 2019 (Nahid P, Mase SR, Migliori GB, et al. Treatment of drug-resistant tuberculosis. An official ATS/CDC/ERS/IDSA clinical practice guideline. *Am J Respir Crit Care Med* 2019;200:e93–e142). The three rifamycin-based preferred regimens are 3 months of once-weekly isoniazid plus rifapentine, 4 months of daily rifampin, or 3 months of daily isoniazid plus rifampin. Prescribing providers or pharmacists who are unfamiliar with rifampin and rifapentine might confuse the two drugs. They are not interchangeable, and caution should be taken to ensure that patients receive the correct medication for the intended regimen. Preference for these rifamycin-based regimens was made on the basis of effectiveness, safety, and high treatment completion rates. The two alternative treatment regimens are daily isoniazid for 6 or 9 months; isoniazid monotherapy is efficacious but has higher toxicity risk and lower treatment completion rates than shorter rifamycin-based regimens.

In summary, short-course (3- to 4-month) rifamycin-based treatment regimens are preferred over longer-course (6–9 month) isoniazid monotherapy for treatment of LTBI. These updated guidelines can be used by clinicians, public health officials, policymakers, health care organizations, and other state and local stakeholders who might need to adapt them to fit individual clinical circumstances.

## Introduction

One fourth of the global population (approximately 2 billion persons) is estimated to be infected with *Mycobacterium tuberculosis* (1), including approximately 13 million in the United States (2). Most infected persons are asymptomatic

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and classified as having latent tuberculosis infection (LTBI). If untreated, approximately 5%–10% of persons with LTBI progress to tuberculosis (TB) disease during their lifetime (3–5). Progression from untreated LTBI accounts for approximately 80% of U.S. TB disease cases (6). Treatment of LTBI is effective in preventing progression to TB disease (7). The most recent comprehensive guidelines for treatment of LTBI in the United States were published in 2000 (8). In 2003, CDC and the American Thoracic Society recommended against use of the 2-month regimen of rifampin plus pyrazinamide because of the risk for severe hepatotoxicity (9). Since then, several new regimens have been evaluated in clinical trials. To update the 2000 and 2003 treatment guidelines, the National Tuberculosis Controllers Association (NTCA) and CDC convened a committee to conduct a systematic literature review of clinical trials for the treatment of LTBI. Grading of Recommendations Assessment, Development, and Evaluation (GRADE) criteria were applied to the evidence of effectiveness, a network meta-analysis of selected evidence was performed, and the evidence was used to support 2020 LTBI treatment guidelines.

These updated 2020 LTBI treatment guidelines apply to persons with LTBI who live in the United States. In addition, these guidelines apply to persons infected with *M. tuberculosis* that is presumed to be susceptible to isoniazid or rifampin; they do not apply when evidence is available that the infecting *M. tuberculosis* strain is resistant to both isoniazid and rifampin. Local and state TB programs in the United States answer questions about diagnosing and treating persons with LTBI in their jurisdictions (<http://www.tbcontrollers.org>).

## Methods

These updated guidelines were developed by NTCA and CDC. The LTBI treatment guidelines committee members, who are the authors of this report, were nominated on the basis of their expertise in treatment of LTBI. The committee had expertise in epidemiology, domestic and international TB control, clinical trials, and treatment of LTBI in adults and children. A methodologist with expertise in the GRADE approach served as a consultant to the guideline development committee.

## Evidence Search

The committee determined that the following clinical question should be addressed in the updated guidelines: “Which regimens for treatment of latent tuberculosis infection have the greatest effectiveness and least toxicity?” The question was written in the population, intervention, comparator, outcomes (PICO) format, and then the outcomes were rated as critical, important, or not important. Comparison of

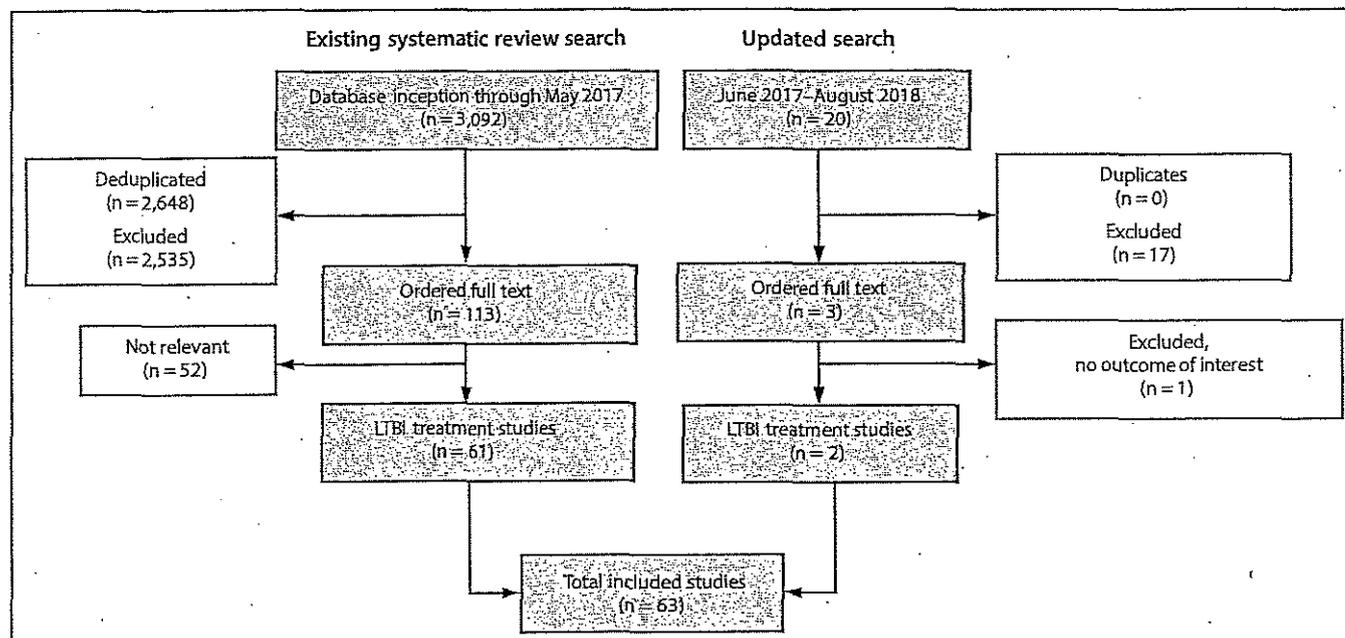
regimen toxicities was limited to hepatotoxicity because this was the only toxicity that could be consistently compared across studies.

A systematic literature review was initiated in December 2017. Electronic databases including MEDLINE, Embase, CINAHL, ClinicalTrials.gov, the Cochrane Central Register of Controlled Trials (CENTRAL), and gray literature were searched for studies evaluating the effectiveness of LTBI treatment regimens. Search terms included “latent tuberculosis,” “latent TB,” “LTBI,” “*Mycobacterium tuberculosis*,” “tuberculosis infection” AND “isoniazid,” “rifampin,” “rifapentine,” or “pyrazinamide.” Articles were included if the study design was a randomized controlled trial and outcomes included prevention of TB disease and drug-related hepatotoxicity. Studies that included persons with suspected or confirmed TB disease were excluded from the review.

The initial search located a high-quality systematic review and meta-analysis published in August 2017 that examined the effectiveness of LTBI treatment regimens (10). The study authors were contacted and asked for access to the extracted data. Study characteristics, types of participants, interventions, the outcomes measured, and results were extracted from each study. If the data were amenable to pooling, effects were estimated via meta-analysis. For the meta-analyses, a random effects model was used unless otherwise specified, and effect estimates were reported as odds ratios. All statistical analyses were conducted using the “metafor” package in R, versions 3.4.3 (11). The Cochrane risk-of-bias tool was used to conduct a bias assessment (12). Analyses conducted in 2018 included combined data from the studies in the previous review and articles identified during an updated search for studies published during June 2017–August 2018 (Figure) (13,14).

All treatment regimens were analyzed using a Bayesian network meta-analysis (NMA) approach, which allowed for indirect comparisons of treatment regimens when direct comparisons were not available. However, direct, pairwise meta-analysis was the preferred method; the results of the network analysis are presented in this report only if no direct comparisons were available. A full description of the network analysis method has been previously published (10,15). NMA allows for indirect comparisons of treatment regimens through inference from a network of evidence. For this analysis, WinBUGS software (version 1.4; Medical Research Council Biostatistics Unit of the University of Cambridge) was used to create the Bayesian network with posterior distributions on the basis of 20,000 samples after a burn-in period of 10,000 iterations (15). Convergence was assessed by inspecting parameter chains and the Gelman–Rubin diagnostic (16). Summary statistics and 95% credible intervals were obtained from posterior distributions. Network inconsistency, which

FIGURE. Systematic literature review search process\* for latent tuberculosis infection treatment regimens recommended by the National Tuberculosis Controllers Association and CDC, 2020



Abbreviation: LTBI = latent tuberculosis infection.

\* Existing systematic review search: the results from the 2017 analysis were published, citing all primary studies included in the analysis (Zenner D, Beer N, Harris RJ, Lipman MC, Stagg HR, van der Werf MJ. Treatment of latent tuberculosis infection: an updated network meta-analysis. *Ann Intern Med* 2017;167:248–5). Updated search: analyses included combined data from the studies included in the previous review and articles identified during an updated search for studies published during June 2017–August 2018.

can arise if indirect comparisons conflict with direct pairwise estimates, was assessed by comparison with standard meta-analysis and by using the omnibus test for consistency (17).

The overall quality of evidence was appraised using the GRADE approach, and GRADEpro software was used to develop evidence profiles that summarized the quality of evidence for each outcome (high, moderate, low, or very low) and the rationale for the quality of evidence appraisal (18). Head-to-head comparisons of regimens evaluated in clinical trials were evaluated according to the populations studied: adults, children, HIV positive, and HIV negative. References for all of the studies included in the analyses are available (Supplementary Tables; <https://stacks.cdc.gov/view/cdc/84235>).

## Development of Recommendations

The committee discussed evidence during face-to-face meetings and teleconferences. GRADE evidence tables were prioritized according to the regimens, comparisons, and study populations that were deemed most clinically relevant to the United States. If discrepancies between GRADE head-to-head comparisons and network meta-analysis results were found, the committee prioritized the GRADE comparisons. Recommendations were formulated on the basis of the

following considerations: the balance of desirable consequences of the intervention (benefits) and undesirable consequences (regimen complexity, adverse effects, and cost), the quality of evidence, patient values and preferences, and feasibility (19). The desirable and undesirable consequences considered by the committee included both those related to individuals and to overall public health.

A strong GRADE recommendation for a regimen was made if the panel concluded that the desirable consequences of the intervention outweighed the undesirable consequences, the majority of well-informed patients would choose the regimen, and the evidence was at least moderate quality (18,19). A conditional GRADE recommendation was made for a regimen when uncertainty existed regarding whether the desirable consequences outweighed the undesirable consequences (e.g., low-quality evidence for a critical outcome such that additional evidence could change key findings, hence the recommendation) (18,19). A conditional recommendation indicates that well-informed patients might make different choices regarding whether to choose the regimen (18,19).

The panel also prioritized recommended regimens as either preferred or alternative. Preferred regimens were defined as having excellent tolerability and efficacy, shorter treatment duration, and higher completion rates. Alternative regimens

were defined as having excellent efficacy but longer treatment duration and lower completion rates. The rationale for prioritizing the regimens was that treatment completion rates are higher with shorter regimens (20); if regimens have similar efficacy and safety, the shorter regimen is more effective because completion rates are higher.

Draft recommendations were publicly presented during the U.S. Advisory Council on the Elimination of Tuberculosis meeting on December 11, 2018, and at the NTCA meeting on April 23, 2019. The recommendations were positively received at both meetings, and no substantive changes were made to the recommendations thereafter.

## Results

The GRADE evidence tables are provided (Table 1) (Supplementary Tables; <https://stacks.cdc.gov/view/cdc/84235>). The Supplementary Tables contain all references; selected references are included in this report. In total, 55 clinical trials evaluated effectiveness (7,13,14,21–74), and 31 trials evaluated toxicity (13,14,27,35–38,43–46,49,51–53,55,61–66,68,71,72,75–82). Results of the 2018 updated network meta-analysis are provided (Table 2); 63 studies of 16 regimens were evaluated (7,13,14,21–82).

### Summary of Evidence and Recommendations

The recommended treatment regimens include three preferred and two alternative treatment regimens (Tables 3 and 4). Rifamycin-based regimens, including 3 months of once-weekly isoniazid plus rifapentine, 4 months of daily rifampin, and 3 months of daily isoniazid plus rifampin are the preferred recommended regimens because of their effectiveness, safety, and high treatment completion rates. Regimens of 6 or 9 months of daily isoniazid are alternative recommended regimens; although efficacious, they have higher toxicity risk and lower treatment completion rates, which decrease effectiveness. On the basis of the most recent comprehensive LTBI treatment guidelines in the United States, which were published in 2000 (8), 9 months of daily isoniazid was considered the standard comparator regimen to evaluate shorter-course regimens. Data on the effectiveness and toxicity of 9 months of daily isoniazid are provided, as are data on the other recommended regimens. A rifamycin-based regimen refers to treatment that includes either rifampin or rifapentine.

## Preferred Regimens

### Three Months of Weekly Isoniazid Plus Rifapentine

A regimen of 3 months of once-weekly isoniazid plus rifapentine is a preferred regimen that is strongly recommended for adults and children aged >2 years, including HIV-positive persons (as drug interactions allow). This regimen, administered through directly observed therapy, had equivalent effectiveness and was not more toxic than the standard regimen of 9 months of daily isoniazid in adults and children aged >2 years (53,68,83). Treatment completion rates were higher with the 3-month regimen. In HIV-negative persons in a noninferiority study, 3 months of isoniazid and rifapentine was equivalent to and was associated with less hepatotoxicity than 9 months of isoniazid, despite more discontinuation because of adverse effects (68). In HIV-positive persons, no significant difference was found in a comparison of isoniazid plus rifapentine for all outcomes with either 6 or 9 months of isoniazid (22,53). In a noninferiority study of 3 months of weekly isoniazid plus rifapentine, the completion rate by self-administered therapy was inferior to the rate with direct observation but noninferior in the prespecified subpopulation from the United States (84).

Potential disadvantages of this regimen include cost of medications that are greater than most alternatives, potential added costs if provided by directly observed therapy (with treatment completion being highest with directly observed therapy, although self-administered therapy is an approved option) (85), the need to take numerous pills simultaneously (10 pills once weekly compared with two or three pills daily for other regimens for most adults), and the association with a systemic drug reaction or influenza-like syndrome that can include syncope and hypotension. Severe events requiring hospitalization occurred in 0.1% of persons (68,86). The systemic drug reaction is self-limited and usually mild; no deaths have been reported. Potential drug interactions and acquired drug resistance if TB disease is not adequately excluded also are important considerations for all treatment regimens.

### Four Months of Daily Rifampin

A regimen of 4 months of daily rifampin is a preferred treatment that is strongly recommended for HIV-negative adults and children of all ages. (No evidence is available for effectiveness in HIV-positive persons.) The effectiveness of this regimen was clinically equivalent to, and less toxic than, the standard regimen of 9 months of daily isoniazid in adults and children (13,14,78,79). Four months of daily rifampin had noninferior effectiveness in preventing TB disease compared with 9 months of daily isoniazid, as well as a lower rate of treatment discontinuation because of

TABLE 1. Summary of GRADE evidence tables, by treatment regimen and study population\*

Regimen		Population	No. of trials	
Experimental regimen	Comparator regimen		Effectiveness	Toxicity
3 mos isoniazid plus rifapentine given once weekly	9 mos isoniazid	HIV-positive adults	1	1
3 mos isoniazid plus rifapentine given once weekly	9 mos isoniazid	HIV-negative adults and children	1	1
3 mos isoniazid plus rifapentine given once weekly	9 mos isoniazid	HIV-negative children	1	1
3 mos isoniazid plus rifapentine given once weekly	6 mos isoniazid	HIV-positive adults	1	1
3 mos isoniazid plus rifampin given daily	9 mos isoniazid	HIV-negative adults	1	1
3 mos isoniazid plus rifampin given daily	6 mos isoniazid	HIV negative adults and children	3	2
3 mos isoniazid plus rifampin given daily	6 mos isoniazid	HIV-positive adults	4	4
3 mos isoniazid plus rifampin given daily	Placebo or no treatment	HIV-positive adults	2	1
3 mos isoniazid plus rifampin given daily	Placebo or no treatment	HIV-negative adults and children	2	0
4 mos rifampin given daily	9 mos isoniazid	HIV-negative adults	1	2
4 mos rifampin given daily	9 mos isoniazid	HIV-negative children	1	1
4 mos rifampin given daily	6 mos isoniazid	HIV-negative children	1	0
6 mos isoniazid given daily	Placebo	HIV-negative adults and children	4	2
6 mos isoniazid given daily	Placebo or no treatment	HIV-positive adults	5	3
9 mos isoniazid given daily	No treatment	HIV-negative adults and children	2	0
12 mos isoniazid given daily	No treatment	HIV-positive adults	2	0
12 mos isoniazid given daily	Placebo	HIV-positive adults and children	5	3
12 mos isoniazid given daily	Placebo	HIV-positive children	3	1
12 mos isoniazid given daily	Placebo or no treatment	HIV-negative adults and children	15	5
3 mos isoniazid plus rifapentine given once weekly	Continuous isoniazid (up to 6 yrs)	HIV-positive adults	1	1
2 mos rifampin and pyrazinamide given daily or twice weekly	6 mos isoniazid, 12 mos isoniazid	HIV-positive adults and children	4	2

Abbreviation: GRADE = Grading of Recommendations Assessment, Development, and Evaluation.

\* Study details and information on evidence quality are available (Supplementary Tables; <https://stacks.cdc.gov/view/cdc/84235>).

TABLE 2. Network meta-analysis of regimens to treat latent tuberculosis infection

Risk and treatment	2017*	2018 update (unpublished)
	Odds ratio (95% credible interval)	Odds ratio (95% credible interval)
<b>Tuberculosis risk compared with no treatment</b>		
No treatment	1 (ref)	1 (ref)
3 mos isoniazid plus rifapentine given once weekly	0.36 (0.18–0.73)	0.36 (0.18–0.72)
3–4 mos rifampin given daily	0.25 (0.11–0.57)	0.25 (0.12–0.50)
3 mos isoniazid plus rifampin given daily	0.33 (0.20–0.54)	0.33 (0.20–0.53)
6 mos isoniazid given daily	0.40 (0.26–0.60)	0.40 (0.26–0.59)
9 mos isoniazid given daily	0.46 (0.22–0.95)	0.47 (0.24–0.90)
<b>Hepatotoxicity risk compared with no treatment</b>		
No treatment	1 (ref)	1 (ref)
3 mos isoniazid plus rifapentine given once weekly	0.52 (0.13–2.15)	0.53 (0.13–2.13)
3–4 mos rifampin given daily	0.14 (0.02–0.81)	0.13 (<0.02–0.72)
3 mos isoniazid plus rifampin given daily	0.72 (0.21–2.37)	0.73 (0.22–2.38)
6 mos isoniazid given daily	1.10 (0.40–3.17)	1.11 (0.41–3.15)
9 mos isoniazid given daily	1.70 (0.35–8.05)	1.77 (0.35–8.32)

Abbreviation: ref = referent.

\* The results from the 2017 analysis were published, citing all primary studies included in the analysis (Zenner D, Beer N, Harris RJ, Lipman MC, Stagg HR, van der Werf MJ. Treatment of latent tuberculosis infection: an updated network meta-analysis. *Ann Intern Med* 2017;167:248–55.); the 2018 update includes data subsequently published (Diallo T, Adjobimey M, Ruslami R, et al. Safety and side effects of rifampin versus isoniazid in children. *N Engl J Med* 2018;379:454–63; Menzies D, Adjobimey M, Ruslami R, et al. Four months of rifampin or nine months of isoniazid for latent tuberculosis in adults. *N Engl J Med* 2018;379:440–53).

adverse effects, a lower rate of hepatotoxicity, and a higher rate of treatment completion (13,14).

The potential disadvantages of the rifamycin-based regimens are the many drug interactions, including warfarin, oral contraceptives, azole antifungals, and HIV antiretroviral therapy (87). Rifabutin has fewer or less pronounced drug interactions and may be used in place of rifampin when rifampin is contraindicated due to drug-drug interactions and isoniazid cannot be used (87). Drug interactions with

weekly rifapentine are fewer than with rifampin and appear to be fewer than with rifabutin; therefore, weekly isoniazid and rifapentine could be considered when rifampin is contraindicated, although clinical data are limited (88). Drug-drug interactions between rifamycins and antiretroviral therapy are regularly updated by the U.S. Department of Health and Human Services (<https://aidsinfo.nih.gov/guidelines/html/4/adult-and-adolescent-opportunistic-infection/0>). In HIV-positive persons with low CD4+ lymphocyte counts, the risk

**TABLE 3. Recommendations for regimens to treat latent tuberculosis infection**

Priority rank*	Regimen	Recommendation (strong or conditional)	Evidence (high, moderate, low, or very low)
Preferred	3 mos isoniazid plus rifapentine given once weekly	Strong	Moderate
Preferred	4 mos rifampin given daily	Strong	Moderate (HIV negative) <sup>†</sup>
Preferred	3 mos isoniazid plus rifampin given daily	Conditional	Very low (HIV negative)
Alternative	6 mos isoniazid given daily	Conditional	Low (HIV positive)
		Strong <sup>§</sup>	Moderate (HIV negative)
Alternative	9 mos isoniazid given daily	Conditional	Moderate (HIV positive)
		Conditional	Moderate

Abbreviation: HIV = human immunodeficiency virus.

\* Preferred: excellent tolerability and efficacy, shorter treatment duration, higher completion rates than longer regimens and therefore higher effectiveness; alternative: excellent efficacy but concerns regarding longer treatment duration, lower completion rates, and therefore lower effectiveness.

<sup>†</sup> No evidence reported in HIV-positive persons.

<sup>§</sup> Strong recommendation for those persons unable to take a preferred regimen (e.g., due to drug intolerance or drug-drug interactions).

**TABLE 4. Dosages for recommended latent tuberculosis infection treatment regimens**

Drug	Duration	Dose and age group	Frequency	Total doses
Isoniazid* and rifapentine <sup>†</sup>	3 mos	Adults and children aged ≥12 yrs Isoniazid: 15 mg/kg rounded up to the nearest 50 or 100 mg; 900 mg maximum Rifapentine: 10–14.0 kg, 300 mg 14.1–25.0 kg, 450 mg 25.1–32.0 kg, 600 mg 32.1–49.9 kg, 750 mg ≥50.0 kg, 900 mg maximum Children aged 2–11 yrs Isoniazid*: 25 mg/kg; 900 mg maximum Rifapentine <sup>†</sup> : see above	Once weekly	12
Rifampin <sup>‡</sup>	4 mos	Adults: 10 mg/kg Children: 15–20 mg/kg** Maximum dose: 600 mg	Daily	120
Isoniazid* and rifampin <sup>‡</sup>	3 mos	Adults Isoniazid*: 5 mg/kg; 300 mg maximum Rifampin <sup>‡</sup> : 10 mg/kg; 600 mg maximum Children Isoniazid*: 10–20 mg/kg <sup>††</sup> ; 300 mg maximum Rifampin <sup>‡</sup> : 15–20 mg/kg; 600 mg maximum	Daily	90
Isoniazid*	6 mos	Adults: 5 mg/kg Children: 10–20 mg/kg <sup>††</sup> Maximum dose: 300 mg	Daily	180
		Adults: 15 mg/kg Children: 20–40 mg/kg <sup>††</sup> Maximum dose: 900 mg	Twice weekly <sup>§</sup>	52
	9 mos	Adults: 5 mg/kg Children: 10–20 mg/kg <sup>††</sup> Maximum dose: 300 mg	Daily	270
		Adults: 15 mg/kg Children: 20–40 mg/kg <sup>††</sup> Maximum dose: 900 mg	Twice weekly <sup>§</sup>	76

\* Isoniazid is formulated as 100-mg and 300-mg tablets.

<sup>†</sup> Rifapentine is formulated as 150-mg tablets in blister packs that should be kept sealed until use.

<sup>§</sup> Intermittent regimens must be provided via directly observed therapy (i.e., a health care worker observes the ingestion of medication).

<sup>‡</sup> Rifampin (rifampicin) is formulated as 150-mg and 300-mg capsules.

\*\* The American Academy of Pediatrics acknowledges that some experts use rifampin at 20–30 mg/kg for the daily regimen when prescribing for infants and toddlers (Source: American Academy of Pediatrics. Tuberculosis. In: Kimberlin DW, Brady MT, Jackson MA, Long SS, eds. Red Book: 2018 Report of the Committee on Infectious Diseases. 31st ed. Itasca, IL: American Academy of Pediatrics; 2018:829–53).

<sup>††</sup> The American Academy of Pediatrics recommends an isoniazid dosage of 10–15 mg/kg for the daily regimen and 20–30 mg/kg for the twice-weekly regimen.

for asymptomatic or subclinical TB disease increases, possibly facilitating rifampin resistance if TB disease is inadvertently treated with rifampin monotherapy (89).

### Three Months of Daily Isoniazid Plus Rifampin

A regimen of 3 months of daily isoniazid plus rifampin is a preferred treatment that is conditionally recommended for adults and children of all ages and for HIV-positive persons as

drug interactions allow. HIV-negative adults and children with a positive tuberculin skin test (TST) who received 3 months of daily isoniazid plus rifampin appeared to have a similar risk for TB disease, hepatotoxicity, and adverse effects requiring discontinuation of therapy as those who received  $\geq 6$  months of isoniazid (23,35,44,51,90). Among children aged  $< 15$  years specifically, a 3-month course of daily isoniazid plus rifampin appeared as effective as a 6-month or longer course of isoniazid, because direct comparisons found no difference in TB disease and no differences in adverse effects requiring discontinuation of therapy or hepatotoxicity (67). In HIV-positive persons, no difference was found in the incidence of TB disease among those who received 3 months of daily isoniazid plus rifampin compared with those who received  $\geq 6$  months of isoniazid monotherapy, regardless of whether they were TST positive, TST negative, or anergic (34,46,63,72). Hepatotoxicity was less frequent among those receiving the shorter course of therapy, although discontinuation of therapy because of adverse effects was more frequent (63).

Potential drug interactions with rifampin and acquired drug resistance if TB disease is not adequately excluded also are important considerations (see previous section on 4 months of daily rifampin). In addition, hepatotoxicity risk might be greater with the two drugs given together than with either drug given alone (91).

### Alternative Regimens: Six or Nine Months of Daily Isoniazid

Regimens of 6 or 9 months of daily isoniazid are alternative recommended regimens; 6 months daily is strongly recommended for HIV-negative adults and children of all ages and conditionally for HIV-positive adults and children of all ages and 9 months daily is conditionally recommended for adults and children of all ages, both HIV-negative and HIV-positive. Isoniazid reduces the risk for developing TB disease in persons with a positive TST, including HIV-negative adults and children (7,23,28,43,47,73), HIV-positive adults (27,38,42,46,60,72), and presumably also HIV-positive children. The drug can cause hepatotoxicity and be associated with discontinuation because of adverse effects, although these effects are more common in adults than children (23,43).

In HIV-positive persons who have a negative TST, anergy, or an unknown TST, the benefit of isoniazid is uncertain in settings with low TB incidence (38). For these HIV-positive persons, the potential exists for a reduction in the incidence of TB disease and an increase in adverse effects with isoniazid therapy; however, the likelihood of these effects remains uncertain because of wide confidence intervals resulting from too few events.

The evidence synthesis included multiple durations of isoniazid therapy in persons with a positive TST (3, 6, and 12 months in HIV-negative persons and 6 months in HIV-positive persons) (7,72). Among HIV-negative persons with inactive TB (defined as the presence of tuberculin positivity, stable fibrotic lung lesions, and negative sputum cultures in persons not previously treated), 6 and 12 months of therapy were more effective than 3 months of therapy, demonstrating the benefit of LTBI treatment with isoniazid in this high-risk subset of patients with LTBI (7). Studies of other regimens have persons with LTBI and fibrotic lesions but in much smaller numbers (14,68). According to the results of the systematic review process, among HIV-positive persons, 6 months of therapy was highly effective (72), and the effect of other durations was unknown. Also reviewed was an analysis that included different, fewer trials than included in this report and found that 9 months of daily isoniazid therapy was perhaps more effective than 6 months and similar to 12 months (25,92–94). However, no clinical trial data were available directly comparing 9 months of isoniazid to placebo, 6 months of isoniazid, or 12 months of isoniazid.

Among HIV-positive persons living in areas with a high TB incidence, isoniazid is complementary to antiretroviral therapy in preventing TB disease. Two randomized controlled trials have demonstrated that isoniazid plus antiretroviral therapy decreased the incidence of TB disease to a greater extent than either isoniazid alone or antiretroviral therapy alone (27,61). Potential disadvantages of the regimen include its long duration, hepatotoxicity, and low treatment completion rates (primarily due to the first two factors).

## Discussion

A systematic literature review was performed of clinical trial data pertaining to effectiveness and toxicity of treatment of LTBI, including studies published since the 2018 World Health Organization LTBI guidelines (95). Evidence quality was evaluated using the GRADE approach, and a network meta-analysis was performed, updated to include data from studies published since a previous network meta-analysis (10), to compare regimens not evaluated head-to-head in clinical trials.

Recommendations were formulated on the basis of the balance of desirable and undesirable consequences of the intervention, the quality of evidence, patient values and preferences, and feasibility. These factors also informed the priority rank of the regimens as preferred or alternative, with preference for shorter regimens, given their similar efficacy compared with 6–9 months of isoniazid but favorable tolerability and higher treatment completion rates. This combination of characteristics

should result in greater effectiveness of the shorter regimens in clinical settings. More effective treatment of LTBI will facilitate TB elimination (96). Prescribing providers or pharmacists who are unfamiliar with rifampin and rifapentine might confuse the two drugs. They are not interchangeable, and caution should be taken to ensure that patients receive the correct medication for the intended regimen.

Although 9 months of isoniazid was a preferred regimen in the guidelines published in 2000, both 6 and 9 months of isoniazid were recommended at that time (8). In these current guidelines, application of GRADE criteria resulted in a strong recommendation for 6 months of isoniazid as an alternative for those persons unable to take a shorter preferred regimen (e.g., due to drug intolerance or drug-drug interactions), particularly in HIV-negative persons. The longer duration of isoniazid could increase the risk for hepatotoxicity and although increased effectiveness is plausible, the two treatment durations have not been directly compared.

Two months of rifampin plus pyrazinamide are not recommended for treatment of LTBI because of the hepatotoxicity risk. However, in persons treated empirically for TB disease with isoniazid, rifampin, and pyrazinamide for 2 months, this regimen will effectively treat LTBI in persons subsequently determined to have LTBI rather than TB disease.

## Other Considerations

Following are several considerations for the use of these guidelines. First, the committee did not include cost-effectiveness in evaluating the evidence; recommendations were based on evaluating effectiveness and toxicity of the regimens. Second, the committee did not evaluate evidence regarding how to implement these regimens programmatically (e.g., who to test and treat and management of side effects). Third, these guidelines focus on treatment regimens for persons with LTBI living in countries with low TB disease incidence. These guidelines do not address other empiric TB prevention strategies (e.g., 1 month of isoniazid plus rifapentine among HIV-positive persons living in settings with a high TB incidence regardless of results from the TST or an interferon-gamma release assay) (97). Finally, shorter regimens should not be used for patients in whom rifamycins are contraindicated, including those taking medications with significant drug-drug interactions with rifamycins.

## Conclusion

For patients without drug intolerance or drug-drug interactions, short-course (3–4 months) rifamycin-based

treatment regimens are preferred over the longer-course (6–9 months) isoniazid monotherapy for treatment of LTBI. These guidelines can be used by clinicians, public health officials, policymakers, health care organizations, and other state and local stakeholders who might need to adapt these guidelines for individual clinical circumstances. Local and state TB programs in the United States answer questions about diagnosing and treating persons with LTBI in their jurisdictions (<http://www.tbcontrollers.org>).

## Acknowledgments

Carol Hamilton, Duke University; John Jereb, National Center for HIV/AIDS, Viral Hepatitis, STD, and TB Prevention, Division of Tuberculosis Elimination, CDC; Victoria Shelus, The University of North Carolina at Chapel Hill; Ross Harris, Public Health England; 2019–2020 National Tuberculosis Controllers Association board members.

## Conflicts of Interest

All authors, who are also the LTBI treatment guidelines committee members, have completed and submitted the International Committee of Medical Journal Editors form for disclosure of potential conflicts of interest. No potential conflicts of interest were disclosed.

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ISSN: 0149-2195 (Print)