

Nontuberculous Mycobacteria

With over **190 species and subspecies**, nontuberculous mycobacteria (NTM) are on the rise. It is more important than ever to learn about these organisms and how to handle them.

What are they?

NTM are **environmental opportunistic pathogens**.

NTM are organisms that generally live in water, soil, and air. They can cause human infection, particularly of the lung, but can also be laboratory contaminants. *M. gordonae* is usually a contaminant.



Water



Air



Soil

Clinical Manifestations



Most common: NTM pulmonary disease

Chronic/recurring cough, sputum production, fatigue, malaise, dyspnea, fever, chest pain, weight loss



Lymphatic

Involved nodes enlarge rapidly, may rupture, not tender



Skin/soft tissue and bone

Localized drainage/abscess at puncture site;
Nosocomial infections - long term catheters, surgical wound infections



Disseminated disease

Seen in immunocompromised hosts;
Fever, night sweats, weight loss, abdominal pain, diarrhea

NTM are grouped by their growth rate in subculture.

Rapid-Growing

< vs. >

Slow-Growing

Growth within 7 days

Most common examples:
M. abscessus complex,
M. chelonae, *M. fortuitum*

Growth after 7 days

Most common examples:
M. avium complex (includes
avium, *intracellulare*,
chimaera), *M. kansasii*,
M. xenopi

NTM with Highest Clinical Significance

1 *M. avium* complex (MAC)

Most common NTM; lung disease is the most common presentation, particularly in elderly females with lung nodules and bronchiectasis

2 *M. kansasii*

Closely resembles tuberculosis

3 *M. abscessus*

Causes lung disease and other infections, extremely resistant to antibiotics, common in those with cystic fibrosis or non-cystic fibrosis bronchiectasis, including those without smoking history

Higher rates of NTM are found in the south and southeastern United States than in other regions

NTM Diagnosis



Need at least **two** positive cultures to diagnose NTM-related lung disease



Exception: *M. kansasii*

A diagnosis could be made with only **one** positive culture

Action Required



Report of **positive AFB without organism identification**: work up as a **presumptive TB case** until more information available (history of NTM, conversation with monitoring provider, organism identification). Report as a **presumptive case** to VDH.



Final NTM report on a **ruled out TB case: file away** at local health department - this may be useful to refer to in the **future** if you get a positive AFB report **without identification** to determine if it is a presumptive case of TB.



Refer client to pulmonologist or infectious disease specialist if **two** positive cultures of same NTM.



Minimize potential for contamination during [specimen collection](#).

Treatment



Similar to TB

Typically requires **multidrug therapy** which may include medications commonly used to treat *M. tuberculosis* complex



It Takes Time

Often requires lengthy treatment until patient is **culture negative for one year**



Further Action

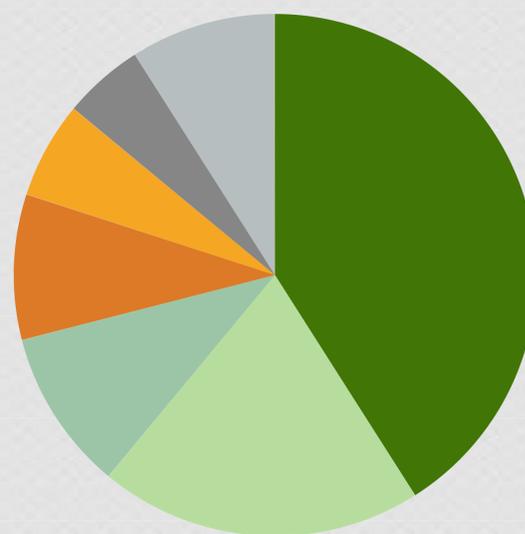
Surgery may be required to properly treat



What to Expect

Relapse and reinfection are **common**

NTM isolated by DCLS* from 2019 VDH TB Program presumptive and confirmed TB cases



- M. avium complex (41%)
- M. fortuitum group (20%)
- M. gordonae (10%)
- M. abscessus/chelonae group (9%)
- M. mucogenicum group (6%)
- M. kansasii (5%)
- Other (9%)

*Division of Consolidated Laboratory Services

Want to Learn More?

- [Treatment of Nontuberculous Mycobacterial Pulmonary Disease](#)
- [Patient handout on NTM Disease](#)
- [Practice guidelines for clinical microbiology laboratories: Mycobacteria](#)

References

1. Practical Guidance for Clinical Microbiology Laboratories: Mycobacteria, American Society for Microbiology, 2018, <https://cmr.asm.org/content/31/2/e00038-17>
2. ATS/ERS/ESCMID/IDSA clinical practice guideline, 2020, <https://erj.ersjournals.com/content/56/1/2000535>
3. ATS/IDSA Diagnosis, Treatment, and Prevention, 2007, <https://www.atsjournals.org/doi/pdf/10.1164/rccm.200604-571ST>
4. Nontuberculous Mycobacteria (NTM), CDC, 2019, <https://www.cdc.gov/hai/organisms/ntm/clinicians.html>