# 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.

## 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.

<table>
<thead>
<tr>
<th>Growth Rate</th>
<th>Growth after 7 days</th>
<th>Growth within 7 days</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rapid-Growing</td>
<td><em>M. abscessus complex</em>, <em>M. chelonae</em>, <em>M. fortuitum</em></td>
<td>Most common examples:</td>
</tr>
<tr>
<td>Slow-Growing</td>
<td><em>M. avium complex (MAC)</em>, <em>M. kansasii</em>, <em>M. abscessus</em></td>
<td><em>M. avium complex (MAC)</em> (includes <em>avium, intracellulare, chimaera</em>), <em>M. kansasii</em>, <em>M. xenopi</em></td>
</tr>
</tbody>
</table>

## 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.

---

*Image source: [Infographic: Understanding Nontuberculous Mycobacteria](https://example.com/infographic)*
**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**.

---

**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](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](https://erj.ersjournals.com/content/56/1/2000535)
4. Nontuberculous Mycobacteria (NTM), CDC, 2019, [https://www.cdc.gov/hai/organisms/ntm/clinicians.html](https://www.cdc.gov/hai/organisms/ntm/clinicians.html)