CORHA Workgroup Proposed Investigation / Reporting Thresholds and Outbreak Definition (Extrapulmonary *Nontuberculous mycobacteria,* NTM)

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The thresholds and definitions below are intended as general guidance and were based on available resources and expert opinion. States and local jurisdictions may have their own outbreak definitions and requirements for reporting. Thresholds and definitions should be applied regardless of location of onset (healthcare facility-onset or community-onset).

Nontuberculous mycobacteria (NTM) are opportunistic pathogens that can be difficult to diagnose and treat. Pulmonary disease, the most common clinical manifestation of NTM infection, often affects individuals with underlying lung disease. Extrapulmonary NTM infections are less common than pulmonary infections but are often associated with severe disease and poor outcomes, even among immunocompetent individuals.[1] Outbreaks of extrapulmonary NTM infections in the United States have been increasingly linked with healthcare exposure and healthcare-associated outbreaks have been associated with medical devices, cosmetic procedures,[2] dental procedures,[3] and contaminated parenteral medications, among others. Non-healthcare settings associated with extrapulmonary NTM outbreaks include tattoo parlors, nail salons, and spas. Given the nonspecific symptomatology and prolonged time between exposure and symptom onset, outbreaks of extrapulmonary NTM infections can be difficult to detect. Utilizing thresholds for investigation and reporting and establishing outbreak definitions for extrapulmonary NTM can assist in early outbreak detection and implementation of interventions to prevent additional infections.[4,5]

NTM are mycobacterial species other than *M. tuberculosis* complex species and *M. leprae*. An extrapulmonary NTM infection is a positive culture or molecular evidence, such as polymerase chain reaction (PCR) or 16S ribosomal RNA gene sequencing (16S), of NTM from at least one of the following extrapulmonary sites:

- Skin or soft tissue
- Lymph node
- Urine
- A normally sterile body site such as blood, spinal fluid, bone marrow, abdominal fluid, pleural fluid, or bone.

and excludes:

- Cultures or molecular evidence positive for *M. tuberculosis* complex or *M. leprae*
- Cultures or molecular evidence from lower respiratory samples, including sputum, bronchial alveolar lavage, tracheal aspirate culture, or lung tissues
- Stool specimens

	Acute Care Hospitals	Critical Access Hospitals	Long-Term Acute Care Hospitals and Long-Term Care Facilities with Vented Patients	Long-Term Care Facilities	Dialysis Facilities	Outpatient and Emergency Department
Threshold for additional investigation by facility	1 case of extrapulmonary NTM					
Threshold for reporting to public health	1 case of extrapulmonary NTM*					
Outbreak definition	≥2 cases of extrapulmonary NTM* within a one-year period of time that are epidemiologically-linked[#] Multiple species of *Mycobacteria* may be involved in the same outbreak					

*Exclude advanced HIV with disseminated MAC.

[#]Epidemiologically-linked = Including but not limited to the following examples: shared water sources, similar surgical procedures, common medical devices or equipment, similar medications, etc.

Points for consideration:

- When a case is identified related to a facility exposure, the facility should prepare a line list of exposures.
- Medical tourism should be considered as a possible source of extrapulmonary NTM and will require additional investigation and collaboration with state and/or local partners.[6]
- Extrapulmonary NTM infections are a cause of both sporadic and healthcare-associated infections in the United States. Outbreaks have been associated with medical devices, cosmetic procedures, contaminated parenteral medications, and medical tourism, as well as with community exposures such as tattoo parlors, nail salons, and spas
- Although the Council of State and Territorial Epidemiologists standardized case definition for extrapulmonary NTM includes clinical evidence of infection, the thresholds and definitions used in this document do not necessarily include clinical evidence to allow detection of potential pseudo-outbreaks.[4] Initial thresholds for identifying extrapulmonary NTM includes lab identification only, since clinical evidence may not be known until additional facility investigation is initiated.
- Pediatric lymph node infections with NTM are common and typically do not require further investigation unless related to a dental surgery or invasive procedure.[3]
- *M. gordonae* is known to be a contaminant in pulmonary specimens. However, less is known about whether *M. gordonae* is more often a pathogen versus a contaminant in extrapulmonary specimens. Rare case reports of *M. gordonae* causing extrapulmonary disease exist. Health jurisdictions may consider including *M. gordonae* isolates from extrapulmonary sites as clinical cases in order to better understand

the clinical significance and epidemiology of these isolates. However, the benefit of *M. gordonae* reporting in identifying outbreaks compared to the resources required to investigate these cases is unclear.[4]

References:

1. Piersimon C, Scarparo C. Extrapulmonary Infections Associated with Nontuberculous Mycobacteria in Immunocompetent Persons. *Emerg Infect Dis* 2009; 15:1351-8.
2. Ruegg E, Cheretakis A, Modarress A, Harbarth S, Pittet-Cuenod B. Multistate infection with *Mycobacterium abscessus* after replacement of breast implants and gluteal lipofilling. *Case Rep Infect Dis* 2015; 361: Epub 2015 Mar 29.
3. Peralta G, Tobin-D'Angelo M, Parham A, et al. Notes from the Field: *Mycobacterium abscessus* infections among patients of a pediatric dentistry practice – Georgia, 2015. *Morb Mortal Wkly Rep* 2016; 65:355-6.
4. Bancroft J, Shih DS, Cassidy MP, Cieslak P, Beldavs Z, Zane S, et al. Council of State and Territorial Epidemiologists Position statement 17-ID-07: Standardized case definition of extrapulmonary nontuberculous mycobacteria infections. Atlanta, GA: Council of State and Territorial Epidemiologists; 2017.
5. Shih DC, Cassidy PM, Perkins KM, Crist MB, Cieslak PR, Leman RL. Extrapulmonary nontuberculous mycobacterial disease surveillance – Oregon, 2014-2016. *Morb Mortal Wkly Rep* 2018; 67:854-7.
6. Gaines J, Poy J, Musser KA, et al. Notes from the Field: Nontuberculous mycobacteria infections in U.S. medical tourists associated with plastic surgery – Dominican Republic, 2017. *Morb Mortal Wkly Rep* 2018; 67:369-70.

Other Resources:

Oregon Health Authority. Extrapulmonary nontuberculous mycobacterium (NTM) Investigative Guidelines. December 2017. https://www.oregon.gov/oha/PH/DISEASESCONDITIONS/COMMUNICABLEDISEASE/REPORTINGCOMMUNICABLEDISEASE/REPORTINGGUIDELINES/Documents/ntm.pdf.