Do you suspect NTM?

If NTM is part of your differential diagnosis, use this ATS/IDSA Statement reference guide for assistance in diagnosing NTM and treating this serious disease.

Think NTM? Test for NTM.

A nontuberculous mycobacterial (NTM) lung infection is a chronic and debilitating condition that can get progressively worse.[1-3] Although the majority of healthy individuals exposed to NTM do not contract the infection, patients with structural lung disease, such as chronic obstructive pulmonary disease (COPD), asthma, cystic fibrosis (CF), and bronchiectasis, are at a significantly greater risk of being infected.[1,4-6]

Recognizing an NTM Infection

REMEMBER! RULE IT IN. OR RULE IT OUT.

Research has shown that for nearly 3 out of 4 patients with at least 1 positive culture, NTM does not clear on its own.[7] **If you think NTM, test for NTM.** For patients with 2 positive cultures, continue with the diagnosis steps outlined below:

Diagnostic Criteria*

Clinical, radiographic, AND microbiologic criteria are all required for diagnosing NTM pulmonary disease[3]

Is it a pulmonary NTM infection?

- Refer patients to an NTM expert if you suspect the NTM infection is either unusual or represents contamination

Clinical/radiographic criteria

- Bronchopulmonary symptoms, nodular or cavitary opacities on chest radiograph, or multifocal bronchiectasis with multiple small nodules on HRCT scan
  and
- Exclusion of other diagnoses

Microbiologic criteria

- Positive culture results from at least 2 separate expectorated sputum samples
  or
- Positive culture result from at least 1 bronchial wash or lavage
  or
- Transbronchial or other lung biopsy with mycobacterial histopathologic features,† and positive culture for NTM or biopsy showing mycobacterial histopathologic features and 1 or more sputum or bronchial washing that are culture positive of NTM

†Granulomatous inflammation or AFB.

Diagnosis: NTM infection

- A diagnosis does not, per se, necessitate the institution of therapy but rather a decision based on potential risks and benefits of therapy for individual patients

- Antimycobacterial treatment can be associated with substantial side effects, and with the recommended treatment duration of 18 months, demands a high level of acceptance on behalf of the patient. Therefore, it is recommended to prepare the patient accordingly ahead of treatment initiation

Therapy according to ATS/IDSA Statement

Treatment for an NTM Infection*

The current treatment strategies for the most common species of NTM lung infections, *Mycobacterium avium* complex (MAC), are broken down by severity and patient type.[3]

INITIAL THERAPY FOR NODULAR/BRONCHIECTATIC DISEASE‡	
Macrolide	Clarithromycin 1000 mg TIW or azithromycin 500–600 mg TIW
Ethambutol	25 mg/kg TIW
Rifamycin	Rifampin 600 mg TIW
IV Aminoglycoside	None

‡Not recommended for severe or previously treated disease.
IV=intravenous; TIW=three times weekly.

V

INITIAL THERAPY FOR CAVITARY DISEASE	
Macrolide	Clarithromycin§ 500‖–1000 mg/d or azithromycin 250–300 mg/d
Ethambutol	15 mg/kg/d
Rifamycin	Rifampin 450‖–600 mg/d
IV Aminoglycoside	Streptomycin or amikacin¶ TIW or none

§Clarithromycin may need to be dosed BID (eg, 250 mg BID or 500 mg BID) if gastrointestinal intolerance occurs.
‖Lower dose for weight <50 kg.
¶See ATS/IDSA Statement for the complete dosing recommendation.
IV=intravenous; TIW=three times weekly.

V

ADVANCED (SEVERE) OR PREVIOUSLY TREATED DISEASE	
Macrolide	Clarithromycin§ 500‖–1000 mg/d or azithromycin 250–300 mg/d
Ethambutol	15 mg/kg/d
Rifamycin	Rifabutin 150‖–300 mg/d or rifampin 450‖–600 mg/d
IV Aminoglycoside	Streptomycin or amikacin¶ TIW

§Clarithromycin may need to be dosed BID (eg, 250 mg BID or 500 mg BID) if gastrointestinal intolerance occurs.
‖Lower dose for weight <50 kg.
¶See ATS/IDSA Statement for the complete dosing recommendation.
IV=intravenous; TIW=three times weekly.

Defining Treatment Success*

TARGETING CULTURE CONVERSION

The primary microbiological goal for treating NTM is the conversion of positive sputum cultures to negative. Additional indications of success include symptomatic and radiographic improvement.[3]

WHAT DOES TREATMENT SUCCESS LOOK LIKE?

To assess the response to treatment, ATS/IDSA Statement recommends[3]:

- Obtaining monthly cultures of sputum
- Within 3 to 6 months, patients should show clinical improvement
- Within 12 months, patients should convert their culture to sputum-negative
- Twelve months of culture-negative sputum status is the recommended endpoint of treatment

This information sheet has diagnosis and treatment strategies for pulmonary infections caused by NTM that are summarized in the statement by the American Thoracic Society (ATS) and the Infectious Diseases Society of America (IDSA). For the official ATS/IDSA Statement, please visit https://www.thoracic.org/statements/resources/mtpi/nontuberculous-mycobacterial-diseases.pdf

The ATS/IDSA Statement was published in 2007 and is currently in revision. Certain aspects of this document may be out of date and caution should be used when applying these in clinical practice or other usages.

References: 1. Young JD, Balagopal A, Reddy NS, Schlesinger LS. Differentiating colonization from infection can be difficult. *J Respir Dis.* 2007;28(1):7-18. **2.** Winthrop KL, McNelley E, Kendall B, et al. Pulmonary nontuberculous mycobacterial disease prevalence and clinical features: an emerging public health disease. *Am J Respir Crit Care Med.* 2010;182(7):977-982. **3.** Griffith DE, Aksamit T, Brown-Elliott BA, et al; ATS Mycobacterial Diseases Subcommittee. An official ATS/IDSA statement: diagnosis, treatment, and prevention of nontuberculous mycobacterial diseases. *Am J Respir Crit Care Med.* 2007;175(4):367-416 **4.** Adjemian J, Olivier KN, Seitz AE, Holland SM, Prevots DR. Prevalence of nontuberculous mycobacterial lung disease in U.S. Medicare beneficiaries. *Am J Respir Crit Care Med.* 2012;185(8):881-886. **5.** Adjemian J, Olivier KN, Prevots DR. Nontuberculous mycobacteria among patients with cystic fibrosis in the United States: screening practices and environmental risk. *Am J Respir Crit Care Med.* 2014;190(5):581- 586. **6.** Fritscher LG, Marras TK, Bradi AC, Fritscher CC, Balter MS, Chapman KR. Nontuberculous mycobacterial infection as a cause of difficult-to-control asthma: a case-control study. *Chest.* 2011;139(1):23-27. **7.** Martiniano SL, Sontag MK, Daley CL, Nick JA, Sagel SD. Clinical significance of a first positive nontuberculous mycobacteria culture in cystic fibrosis. *Ann Am Thorac Soc.* 2014;11(1):36-44.

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