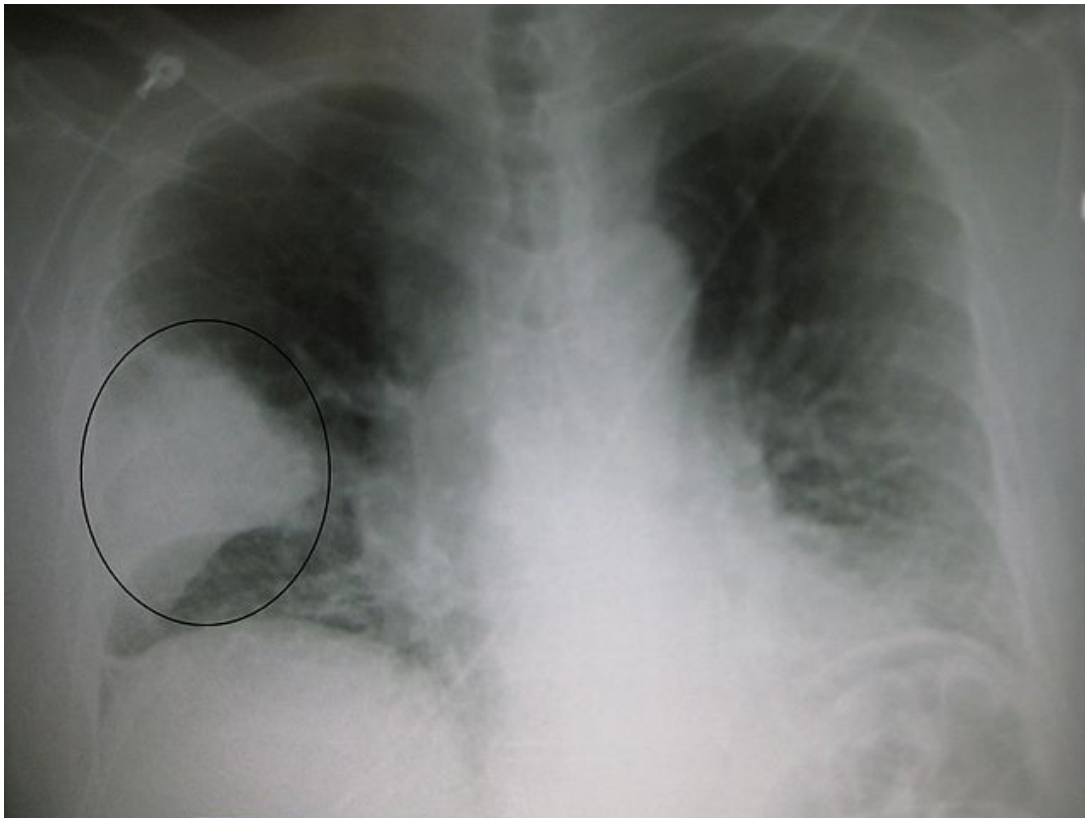


Mycoplasma Pneumonia in Children — Symptoms and Treatment

[See online here](#)

Mycoplasma pneumoniae is a common cause of lower respiratory tract infections in adults and children. Up to 40% of the cases of community-acquired pneumonia are caused by mycoplasma pneumoniae. The diagnosis of mycoplasma pneumoniae pneumonia is based on the clinical manifestations, radiographic findings, and serology testing. Because of the good response to macrolides and the favorable natural history of the infection, advanced polymerase chain reaction testing for the confirmation of the disease is rarely needed.



Overview of MP Pneumonia

Mycoplasma pneumoniae (MP) is an **extracellular prokaryotic pathogen that can cause pneumonia in humans**. MP pneumonia **might be asymptomatic, lobar pneumonia, or a fatal condition** if left untreated. MP pneumonia is more common in children compared to adults.

MP lacks a cell wall, is insensitive to beta-lactam antibiotics, and is known to have a small

and limited genome. Because of the limited and small genome, MP cannot replicate without the cytoadherence to the respiratory epithelium in the host for an exchange of certain nucleotides and sterols.

Pathogenesis of MP Pneumonia



“Mycoplasma Pneumonia” Image created by Lecturio

MP **attaches itself to the ciliated respiratory epithelial cells**, where it induces a **cytotoxic response** mediated by hydrogen peroxide. After adherence to the respiratory epithelium, MP starts replication and colonization of the lower respiratory tract occurs. The colonization of the lower [respiratory tract](#) is thought to trigger a **localized inflammatory response** that is responsible for the respiratory symptoms of the disease.

In response to the presence of MP and the associated inflammatory response, the innate and adaptive **immune systems of the host get activated**. Once activated, these two immune systems work together via a cascade of proteins known as mediators of inflammation to **attack and destroy MP**. In most patients, this immune response is sufficient to clear the infection without any intervention; hence, the disease is known to be self-limiting.

Myth	Reality
Infects kids over 5	Can infect all children in outbreaks
Causes “walking pneumonia”	Also causes asthma exacerbation or lobar pneumonia
Has a typical X-ray appearance	No typical X-ray appearance
Responds to azithromycin	Responds to anti-inflammatory?

Epidemiology of MP Pneumonia in Children

MP pneumonia is common in children and is responsible for up to 40% of the cases of community-acquired pneumonia at any time. However, **MP pneumonia epidemics are known to recur every 3-7 years**. The cyclic nature of MP epidemics might be different from one region in the world compared to another; for instance, MP epidemics occur every 3-4 years in Korea. MP epidemics typically last for one year to one year and a half. Most cases occur during winter.

Most cases of MP occur in school-aged children. Because MP pneumonia might be very mild and go unnoticed, the exact incidence of MP pneumonia in the general population is unknown. Selected studies have explored the question of what are the most common pathogens causing community-acquired pneumonia. Such studies showed that **MP is responsible for at least 10% and up to 40% of community-acquired pneumonia**. Patients who are 4 years of age or older had a 100% rate of seropositivity for MP.

During an epidemic, the estimated prevalence of MP pneumonia in the affected population can be as high as 50%. **Most of these patients, however, will be asymptomatic or have very mild disease and the diagnosis will never be confirmed.**

Clinical Presentation of MP Pneumonia in Children

Patients with symptomatic **MP infection most commonly have pneumonia**. Other MP-related infections include **otitis media, sinusitis, bronchitis, and bronchiolitis**. The previous contact with an infected patient is difficult to confirm because the incubation period is variable and can range from 1 week up to 3 weeks.

The typical symptoms of MP Pneumonia are:

- Acute onset fever
- Headache
- Malaise
- Sore throat

High-grade fever is quite common in patients with MP pneumonia. Typically, the clinical picture is not correlated with the radiographic findings.

The radiographic findings

The radiographic findings are typical of diffuse pneumonia that is expected to be seen in a severely ill patient. **Interstitial and bronchopneumonic patterns are the most common radiographic finding**. Lobar pneumonia can be also seen in patients with MP pneumonia. Pleural effusions are also a common finding.

An **acute exacerbation of chronic asthma** might be caused by MP pneumonia. Additionally, patients with a previously documented MP pneumonia incident were found to be more likely to develop asthma than the general population.

MP **might also be involved with central nervous system disorders**. MP encephalitis, meningoencephalitis, and MP-related Guillain-Barre syndrome have been reported before. Skin rash which might be immune-mediated is also a common finding in patients with MP pneumonia.

Diagnostic Workup for MP Pneumonia in Children

Radiography

The first step in the diagnostic workup of a child suspected to have pneumonia is to obtain a chest radiograph. The radiation dose of a single chest radiograph, despite being low, is still not trivial; therefore, **care must be taken to obtain a radiograph that shows the trachea, both lungs, and the upper parts of the diaphragm to prevent a repeat radiograph**.

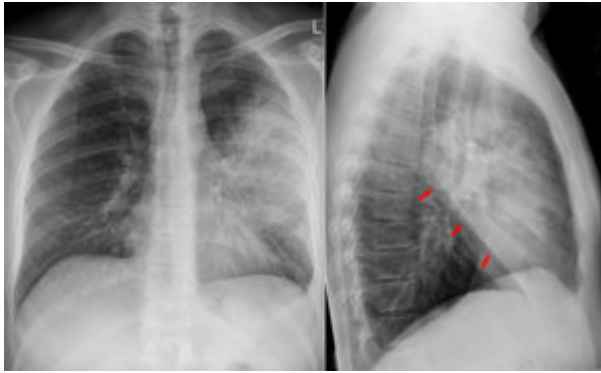


Image: "Lobaerpneumonie" by Hellerhoff. License: [CC BY-SA 3.0](https://creativecommons.org/licenses/by-sa/3.0/)

The radiographic features of MP pneumonia are usually suggestive of a more severe disease process compared to the clinical presentation of the patient.

Serologic tests

There are two main techniques to confirm the diagnosis of MP pneumonia in children. A **serologic assay** which can be based on complement fixation methods, microparticle agglutination assay, enzyme-linked immunosorbent assay, **or an enzyme-linked immunoassay**. These serologic tests require two samples and a confirmatory test of MP pneumonia should show either a 4-fold increase in antibody titer or seroconversion.

Polymerase chain reaction testing

Polymerase chain reaction (PCR) testing can also be used for the confirmation of the diagnosis. PCR testing has a **detection rate of 10-30%** for MP pneumonia which is **not acceptable in a clinical setting**; therefore, a negative PCR should be accompanied by a negative serology test to exclude MP pneumonia.

MP cultures take too long to provide a definitive diagnosis and are therefore considered not suitable in most cases of MP pneumonia where the disease is self-limited.

Management of MP Pneumonia in Children

MP pneumonia is usually a self-limited disease that does **not require any specific treatment**. Most patients never actually get a confirmation of their diagnosis and go unnoticed and do not receive any specific antibiotic therapy.

Children who seek medical care with their parents and who have a confirmatory test that is positive for MP pneumonia **might benefit from using a macrolide antibiotic** such as erythromycin, clarithromycin, or azithromycin.

Patients who do not respond to a macrolide antibiotic should receive **prednisolone 1 mg/kg** in addition to changing to another macrolide antibiotic or starting a non-macrolide antibiotic such as cefuroxime or amoxicillin/clavulanic acid.

Patients with **severe MP pneumonia** that has been proved to be macrolide-resistant might benefit from **inpatient treatment with intravenous methylprednisone**. Methylprednisone is typically administered at the dose of 10 mg/kg for 2-3 days followed by tapering within a week. This approach typically results in a clinical and radiographic improvement in most patients.

References

Youn Y-S, Lee K-Y. "[Mycoplasma pneumoniae pneumonia in children.](#)" Korean Journal of Pediatrics. 2012;55(2):42-47. doi:10.3345/kjp.2012.55.2.42. Available at: <https://www.ncbi.nlm.nih.gov/pubmed/22375148>

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