

ICS 11.020
CCS C 50

WS

**INDUSTRY STANDARD OF THE
PEOPLE'S REPUBLIC OF CHINA**

WS/T 499-2017

**Performance guideline for bacterial culture of lower respiratory
tract infections
(English Translation)**

Issued on: January 15, 2017

Implemented on: July 1, 2017

**Issued by: National Health and Family Planning Commission of the
People's Republic of China**

Table of Contents

Foreword	
Introduction	
1 Scope	
2 Normative references	
3 Terms and definitions	
4 Before the analysis	
4.1 Specimen collection	
4.2 Specimen delivery	
4.3 Screening and rejection of specimens	
5 Analysis	
5.1 Sputum and tracheal aspirate specimen processing	
5.2 Tracheoscope specimens processing	
5.3 Continuous culture and observation of slow-growing bacteria	
5.4 Isolation and identification of important pathogens of lower respiratory tract (see Appendix C)	
5.5 Quality Control	
6 After the analysis report the results	
6.1 Gram staining report	
6.2 Report clinically significant microorganisms	
6.3 Report of non-pathogenic bacteria	
6.4 Plates without bacterial growth	
6.5 Results-related notes	
Appendix A (Normative) The main types of lower respiratory tract infection and the main pathogen	
Appendix B (Normative) Fiberoptic bronchoscopy specimens collected for diagnosis of pathogens and test items	
Appendix C (Normative) Common suspicious colony morphology and rapid identification methods	
References	

Foreword

This standard was drafted in accordance with the rules given in GB/T 1.1-2009.

This standard was drafted. National Health and Family Planning Commission Clinical Laboratory Center, Shaanxi Provincial People's Hospital, Anhui Provincial Hospital, Beijing Hospital, Peking University People's Hospital, Chinese Academy of Medical Sciences Beijing Union Medical College Hospital, Capital Medical University Affiliated Beijing Friendship Hospital, PLA General Hospital Hospital, Wenzhou Medical University Affiliated Second Hospital.

Introduction

Changes of colonization flora of oropharyngeal the human oropharynx colonies a large number of aerobic bacteria, facultative anaerobic bacteria and anaerobic bacteria and other microorganisms, the total number of oral flora up to 10^{10} CFU /mL to 10^{12} CFU/mL. Healthy people pharyngeal colonization bacteria at least, the pharyngeal aerobic normal flora mainly composed of gram-positive bacteria. Human body base Changes in the basic conditions will change the type and number of pharyngeal colonization flora. Long-term exposure to certain people carrying invasive colonization bacteria, such as day-care children of parents of *S. pneumoniae*, *Haemophilus influenzae* colonization will increase the number; in immunosuppression, chronic lung disease, broad-spectrum antibiotic treatment or hospitalization Patients and other groups, Gram-negative bacilli significantly increased the advantages.

0.2 Common mechanism of lung infection

The most common mechanism of pulmonary infection is the alveolar ingestion of oropharyngeal colonization of bacteria. Healthy host usually has no clinical symptoms after inhalation of colonization, Bacteria can be mucus, columnar cilia cleared; pharyngeal flora in patients with aspiration pneumonia tend to invasive bacteria or resistant bacteria, such as pneumonia chain Cocci or gram-negative bacilli and so on. Inhalation of colonization bacteria can cause lung infection depends on the pathogenicity and quantity of inhaled bacteria, the patient's immune system and respiratory defense and other factors.

Second, inhalation of microbial aerosol can also cause lower respiratory tract infections such as those caused by the use of unclean ventilators.

Dissemination of blood is the third leading cause of lower respiratory tract infection, which usually causes pneumoconiosis in the lower lung.

0.3 Sputum smear on the diagnosis of pathogenic bacteria in lower respiratory tract infection

In addition to the common causes of SARS in the community can not be routine culture, other common pathogen of lung infection can be used conventional culture methods Separation, but the sensitivity of culture methods is low, and can not determine the origin of the isolates.

Sputum smear can enhance the specificity and sensitivity of the etiological diagnosis of lower respiratory tract infection. Smear Gram staining can assess the quality of sputum specimens, it can reduce the influence of bacteria in the oropharynx and improve the diagnosis of pathogenic bacteria. Sputum smear can also be found to grow bacteria can not grow.

0.4 Fibrin bronchoscopy quantitative culture of clinical significance

Bronchoscopic bronchoalveolar lavage fluid and brush protection is suitable for bacterial quantitative culture, when possible pathogenic bacteria when the number of colonies is greater than the threshold, the specificity of diagnosis of lower respiratory tract infection can reach 82% -91%, and the diagnostic value is much higher than that of sputum specimens.

0.5 Limitations of bacterial culture of lower respiratory tract infection

Microbiology laboratory selection training methods do not support the growth of pathogens, antibacterial drugs, specimen delivery time, oral normal bacteria Fouling, etc. can lead to false negative results; and the impact of contaminated bacteria on the test results of specimens and over interpretation of bacteriological results can lead to False positive report.

Lower Respiratory Tract Bacteria Culture Guide

1 Scope

This standard specifies the routine bacterial culture of lower respiratory tract infection guidelines.

This standard applies to medical institutions microbial laboratory.

2 Normative references

The following documents for the application of this document is essential. For dated references, only the dated version applies to this article Pieces. For undated references, the latest edition (including all amendments) applies to this document.

WS/T 503 clinical microbiology laboratory blood culture practices

3 Terms and definitions

The following terms and definitions apply to this document.

Cushman Spiral Fiber Curschmann's spiral fibers Cushman spiral fiber was spiral, is a small bronchial mucus secretion of chronic inflammation, due to dyspnea, increased pulmonary carbon dioxide tension High and solidified, at the same time as a result of intermittent breathing wheezing rotating scroll made. After Gram stain, the caterpillar can be seen under the microscope Curly shape, the central axis of blue dye, the edge was pale red.

Charcot-Leyden Crystals can be found in the bronchial, rhomboid or acicular hexagonal colorless and transparent crystals, both ends of the long, ranging in size, strong refraction, from eosinophilic Cells after eosinophilic granulocytes fused together, available iodine staining. Eosinophilic hematopoiesis can be found in sputum placed slightly. The song on the smoke it is common in sputum in patients with allergic asthma or in patients with parasitic lung infections.

Ciliated columnar epithelial cells ciliated columnar epithelium cell Mainly distributed in the lower respiratory tract inner surface of the free surface of the columnar cells with a swinging cilia, is able to secrete mucus goblet cells, Secreted mucus can adhere and remove dust and bacteria and other foreign matter, with the ciliary rhythmic swing, the mucus with dust, bacteria are excluded to the throat.

Pulmonary macrophages Differentiated from the mononuclear cells, widely distributed in the lung interstitial, below the respiratory bronchioles in the pipe and alveolar septa are more, Swim into the alveolar cavity of the lung macrophages, called alveolar macrophages. Phagocytosis, immune and secretion of lung macrophages are very active, there Important defense function. Inhalation of dust particles in the air, bacteria and other foreign matter into the alveoli and lung interstitial, mostly swallowed by macrophages cleared, and some from the lung Bubble through the respiratory mucus flow and ciliary movement was cough.