

# Microbiology in your chosen profession

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of Lecturer] Biology Microbiology in Nursing Cardio-Vascular System The cardiovascular system is composed of the heart, blood, and blood vessels. Interestingly, the circulatory system is free of microbial organisms. The discovery and isolation of microbes such as bacteria and fungi from patients' blood often indicate serious and uncontrolled infections that could be fatal. In the United States, statistics indicate that the presence of bacteria, bacteremia and the presence of fungi, fungemia, is observed in the blood of more than 250, 000 people annually. These conditions also result in about 50, 000 deaths annually. It is only via the rapid and accurate isolation, identification, and antimicrobial susceptibility tests that lifesaving nursing measures may be initiated (Gross, p. 428). Among the most effective and important clinical microbiology laboratory procedures that cardio-thoracic nurses and other health care professionals should be aware of is the culturing of blood to detect microbemia. The pathogenesis of the infectious diseases of the cardiovascular and the thoracic systems has been an area of interest and attention in the health industry in current times. Especially interested in these pathogeneses are cardio-thoracic system nurses who have to take care of patients of many and increasingly complex and resistant microbial infectious diseases of the cardiovascular and thoracic systems. This paper explores the microbes and the infectious diseases of the cardiovascular and thoracic systems and the manner in which they may be prevented, controlled, diagnosed, treated and managed. First, it is important to explore the avenues by which microbes enter the cardio-thoracic system. Generally, the microbes that cause infectious diseases of the cardio-thoracic system enter the circulatory system via the lymphatics in the areas of

localized infections. The other points of entrance of microbes into the cardio-thoracic system are diseased skin and mucous membranes, which are occupied by members of the normal bacterial flora. The manifestation of microbes in the cardio-vascular system could be short-lived, continuous, sporadic, asymptomatic, and symptomatic (Durack, p. 1471). However, due to the relative small population of non-pathogenic microbes, their manifestation is often asymptomatic. Nonetheless, the more pathogenic of the microorganisms have systemic signs and symptoms, which include but are not limited to rigors, sweating, malaise, fever, chills, sleepiness, and fatigue (Washington, p. 59). An important aspect of microbiology of the thoracic and cardiovascular system that cardio-thoracic nurses should be conversant with is the diagnosis of microbes. Among the common techniques used in such a diagnosis are multiple blood cultures and cultures of localized sites of infection. On rare occasions, blood serology is used to diagnose microbes in the cardiovascular and thoracic systems. In the same breadth, knowledge and skills in the prevention and treatment of the microbes is essential for evidence-based practices in cardio-thoracic nursing and management of microbes (Washington, p. 59). Basic prevention techniques should entail hand-washing for all personnel who come in contact with patients. Second, cardio-thoracic nurses should avoid uncalled for urinary and intravenous catheterization. Third, health care personnel are required to start treatment with intravenous broad-spectrum antimicrobial agents after samples are taken for culturing. This treatment should be based on an estimation of the most likely microorganisms to be found in a culture and the usual antimicrobial susceptibility patterns of these microorganisms. It then

becomes imperative on the nurses to ensure these treatments are adhered to. Once pathogens and their susceptibility patterns have been determined, the experimental treatments may be modified if necessary, to suit patient needs. The role of blood cultures in detecting, controlling, and preventing microbes and infectious diseases from the cardio-thoracic system cannot be overemphasized (Wilson & Weinstein, p. 69). Despite the fact that the infectious diseases that affect blood, blood vessels, and the heart mostly remain in these areas, in other cases, they are spread to secondary organs such as the lymph, lymph nodes, lymph vessels, lymphoid organs, the spleen, tonsils, and thymus. The microbial infections of the blood are generally referred to as septicemia. A major cause of streptococcal septicemia is the Gram-positive streptococcus named *Streptococcus pyogenes*. Other common infectious diseases of the cardio-thoracic system are rheumatic fever, rheumatoid arthritis, preceded by a streptococcal sore throat, and Tularemia, caused by a Gram-negative rod known as *Francisella tularensis*. Plague, caused by the Gram-negative rod *Yersinia pestis*, Brucellosis (undulant fever) and Anthrax, caused by the Gram-positive, aerobic, and spore-forming rod *Bacillus anthracis* are the other infectious diseases of the cardiovascular and thoracic systems. Microbes also cause relapsing fever, which is characterized by recurrent periods of fever and caused by *Borrelia recurrentis* and Lyme disease, which is caused by *Borrelia burgdorferi*. References Durack, D. T. Antimicrobial Treatment of Infective Endocarditis Due To Viridians Streptococci, Enterococci, and Staphylococci. *Journal of American Medical Association*, 1999; 1471. Gross, P. A. Quality Standard for the Treatment of Bacteremia. *Clinical Infectious*

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