Sepsis, Related Terms Cause Confusion for Coders: Set the Record Straight About Sepsis, SIRS, Septic Shock

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Sepsis, severe sepsis, SIRS, and septic shock have long been a source of confusion for coders. New ICD-9-CM codes established recently for Systemic Inflammatory Response Syndrome (SIRS), and additional proposed code revisions have added to the confusion regarding the differentiation among these illnesses. Even if the latest classification proposals for these conditions are not implemented, it is worthwhile to review these medical terms and their relationships to avoid further confusion.

The terms “septic shock,” “sepsis,” “severe sepsis,” and “septicemia” are often used interchangeably by clinicians, which exacerbates the confusion surrounding the meanings of these terms, the clinical conditions they describe, and the proper coding of these conditions. The clinical information in this article is intended only to aid coding professionals’ understanding of sepsis and related conditions, not to serve as the basis for code assignment. Code assignment should always be based on physician documentation. If a diagnosis is not clearly documented by the physician or the physician’s intended meaning of a medical term is not clear, he or she should be queried for clarification.

Sepsis

Sepsis is an infection accompanied by SIRS. The infection can originate anywhere in the body. Sepsis can be triggered by a bacterial, viral, parasitic, or fungal infection and is often the result of events such as trauma, surgery, and burns, or illnesses such as cancer and pneumonia. It is not known why some patients progress to sepsis and others do not. The most frequent sites of infection leading to sepsis are the lung, urinary tract, abdomen, and pelvis. However, in up to 30 percent of patients, a definite source of infection cannot be identified.

Visible symptoms of sepsis include reduced mental alertness, confusion, shaking, chills, fever, nausea, vomiting, and diarrhea in the presence of an infection. Other signs and symptoms include tachycardia, decreased urine output, a low or high white blood cell count, low platelet count, hyperventilation, positive blood culture, and acidosis.

Sepsis can be thought of as a disease continuum, with patient outcomes varying according to the severity of illness. An infection can progress to sepsis, then severe sepsis, and then septic shock. While the event that causes an infection to develop into sepsis is unknown, increasing evidence suggests that sepsis is associated with widespread inflammation, coagulation, and suppression of fibrinolysis, which is thought to occur when chemical signals in the immune system go awry. Inflammation is the body’s normal response to infection.

In sepsis, regulation of the early response to infection is lost and a massive systemic reaction occurs. An excess of inflammatory mediators are released, triggering an overwhelming physiologic response that causes tissue injury and results in the development of diffuse capillary injury. Finally, excessive inflammatory reactions interfere with normal tissue function, leading to tissue damage and organ dysfunction.

The course of the disease is unpredictable. Some patients deteriorate rapidly, whereas others experience varying degrees of organ dysfunction or begin to recover. The mortality rate is 20 percent for sepsis, 40 percent for severe sepsis, and 60 percent for septic shock. According to the Society of Critical Care Medicine, sepsis is the leading cause of death in non-coronary intensive care units and the 11th cause of death overall in the US population.

Diagnosing sepsis is not always easy. Some of its symptoms are very general and can be indicative of many other conditions. The first line of treatment for sepsis is to identify and eliminate the underlying infection. However, some experts believe that certain antibiotics may actually worsen sepsis by increasing the breakdown of bacteria and the release of toxins into the

bloodstream. Depending on the patient's clinical status, other supportive care measures are used, such as mechanical ventilation and renal dialysis.

SIRS

SIRS is a clinical response to an insult (injury, attack, or trauma). It is the systemic inflammatory response to a variety of insults. To be considered SIRS, two of the following criteria must be met:

- fever or low body temperature (temperature >38C or <36C)
- heart rate >90 beats per minute
- increased respiratory rate (>20 breaths per minute or PaCO2 <32 mm Hg)
- high or low white blood cell count (>20,000/cu mm, <4000/cu mm, >10 percent immature [band] forms)

Septicemia

Septicemia represents a subset of patients with sepsis. It is the presence or persistence of pathogenic microorganisms or their toxins in the blood causing illness. Septicemia is basically a form of sepsis that begins with a blood-borne infection. Symptoms include a lowered blood pressure, elevated heart rate, decreased or elevated temperature, confusion, oliguria, tachypnea, metabolic acidosis, gastrointestinal symptoms such as abdominal pain, nausea, vomiting, and diarrhea, and altered mental status.

Septicemia in the Medicare population often occurs as a result of a urinary tract infection that has extended into the bloodstream (urosepsis). Physicians often use the term urosepsis to mean the presence of bacteria in the urine, rather than an extension of a urinary tract infection into the bloodstream.

A patient can still be diagnosed with septicemia even if blood cultures are negative. Blood cultures can be affected by prior antibiotic treatment and growth inhibitory factors in the blood and are not reliable for confirming or excluding the diagnosis of septicemia. Also, some organisms are difficult to culture from the blood. Septicemia is the tenth leading cause of death in the US, according to CDC data from 2000.

Bacteremia refers to the presence of bacteria in the circulating blood after a trauma or mild infection. Bacteremia represents a laboratory finding, whereas septicemia represents an acute illness. This condition is usually transient and often clears promptly through the action of the body's own immune system. Bacteremia is frequently asymptomatic but can progress to septicemia.

Severe Sepsis

Severe sepsis is sepsis associated with acute dysfunction in one or more organs. Organ dysfunction may be cardiovascular, renal, respiratory, hepatic, hematological, central nervous system, or unexplained metabolic acidosis.

The current standard of care for severe sepsis includes antibiotics, intravenous fluids, nutrition, mechanical ventilation for respiratory failure, and surgery to eradicate the source of infection. Drotrecogin alfa (activated) is a new biological agent to treat severe sepsis. This drug (the trade name is Xigris) is a biotechnology product that is a recombinant version of naturally occurring Activated Protein C (APC). APC is needed to ensure the control of inflammation and clotting in the blood vessels. In patients with severe sepsis, Protein C cannot be converted in sufficient quantities to the activated form. It appears that drotrecogin alfa (activated) has the ability to bring blood clotting and inflammation back into balance and restore blood flow to the organs.

Septic Shock

As sepsis progresses, coagulopathy becomes increasingly more severe. At its most extreme, the imbalance between inflammation, coagulation, and fibrinolysis results in widespread coagulopathy and microvascular thrombosis. In patients who develop septic shock, the coagulopathy accelerates markedly and includes laboratory changes consistent with profound Protein C deficiency, prolonged activated partial thromboplastin time (aPTT) and partial thromboplastin time (PTT), elevated fibrin monomers, reduced fibrinogen, and elevated D-dimer levels.

Septic shock is the end point of the continuum from sepsis to severe sepsis to septic shock. Septic shock occurs when the cardiovascular system begins to fail, blood pressure drops, and vital organs are deprived of adequate blood supply. It has also been defined as sepsis with hypotension refractory to fluid resuscitation and/or refractory hypotension. Advanced symptoms of septic shock can include decreased cardiac output or heart failure, peripheral cyanosis, mottling of the skin, semi-conscious state or coma, multi-organ failure, and disseminated intravascular coagulation.

Treatment of septic shock includes administration of oxygen, treatment of any respiratory distress, administration of intravenous fluids to restore blood volume, and administration of vasoactive drugs to treat low blood pressure. The underlying infection is treated with antibiotics and support is provided for any poorly functioning organs.

ICD-9-CM Code Revisions

Effective October 1, 2002, a new ICD-9-CM subcategory, 995.9, was created for SIRS. New codes within this subcategory identify SIRS due to infectious process without organ dysfunction (995.91), SIRS due to infectious process with organ dysfunction (995.92), SIRS due to non-infectious process without organ dysfunction (995.93), and SIRS due to non-infectious process with organ dysfunction (995.94). For codes 995.92 and 995.94, additional codes should be assigned to specify the organ dysfunction. A diagnosis of severe sepsis is classified to code 995.92. Also effective October 1, 2002, a new ICD-9-CM procedure code (00.11) has been created for the infusion of drotrecogin alfa (activated).

If the patient is admitted due to the underlying condition and SIRS or severe sepsis develops after admission, the principal diagnosis should be the underlying condition (such as an infection). The American College of Chest Physicians and the Society of Critical Care Medicine suggested that the term “septicemia” be removed from the ICD-9-CM classification and that the term “sepsis” be indexed to code 995.91, Systemic inflammatory response syndrome due to infectious process without organ dysfunction instead of code 038.9, Unspecified septicemia. It is not yet known whether either one of these proposals will be implemented.

It is unlikely that practicing physicians will stop using the term “septicemia” or stop using the terms “sepsis” and “septicemia” interchangeably. To ensure consistency of coding and accurate collection of data, coding professionals will need to educate physicians on the classification of the terms “sepsis,” “severe sepsis,” “septic shock,” “septicemia,” and “bacteremia” in ICD-9-CM and clarify the physicians’ intended diagnosis when these terms are used in physician documentation.

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