



Evaluation & Management of a Patient with Sepsis

Description of the Activity	<p>Sepsis is a common cause of shock in critically ill patients. All surgical intensivists should be able to care for patients with life-threatening infections, including rapid recognition, initiation of treatment, and tailoring of therapy. They must also identify the need for source control with appropriate consultation when necessary.</p>
Functions	<ul style="list-style-type: none">❖ Resuscitation<ul style="list-style-type: none">➤ Assess the clinical status of patients and triage them based on the sepsis spectrum, demonstrating understanding of pertinent validated scoring systems and diagnostic criteria.➤ Generate applicable differential diagnoses for potential sources of sepsis.➤ Direct the use of and interpret necessary laboratory and radiologic studies, with attention to resource use.➤ Demonstrate proficiency in the bedside procedures necessary for resuscitation and invasive monitoring, such as point-of-care ultrasound (POCUS), central venous line placement, and arterial line placement.➤ Initiate and direct evidence-based resuscitation, taking into account and adjusting for patient-specific physiologic factors (eg, preexisting cardiac disease).➤ Initiate an appropriate empiric antibiotic regimen, accounting for factors that may impact drug selection (eg, institutional antibiogram, history of multidrug-resistant organisms) and dosing (eg, renal or hepatic insufficiency).➤ Consider unique patient factors, such as immunocompromised status, extremes of age, history of chronic antibiotic use, history of colonization, presence of indwelling hardware/prosthetic material, and history of multidrug-resistant infection.➤ Consider and evaluate for the relevant risk factors for atypical infections (opportunistic, mycobacteria, fungal), such as recent surgical instrumentation, exposure history, prolonged institutionalization, and immunocompromised status.➤ Recognize the potential need for procedural intervention to achieve source control.➤ Demonstrate proficiency in bedside procedures to obtain culture samples and source control.➤ Implement and direct care in compliance with institutional best-practice guidelines while integrating current scientific recommendations.❖ Ongoing Management<ul style="list-style-type: none">➤ Consider the potential for multifactorial shock with a tailored treatment plan.➤ Evaluate and optimize volume status, with application of adjunctive devices and maneuvers in patients with physiologic limitations such as heart failure or end-stage renal disease.➤ Identify indications for and titration of vasoactive and inotropic agents.➤ Evaluate for drug interactions and toxicity.➤ Recognize adverse reactions to common antibiotics and therapeutics.



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	<ul style="list-style-type: none">➤ Consider patient-specific risk factors for antibiotic resistance, and recognize the need for escalation and multidisciplinary consultation.➤ Perform timely identification and implementation of supportive measures for end-organ dysfunction as a complication of sepsis.➤ Monitor and interpret patient response to therapy, with prompt recognition of treatment failure and the need for escalation of therapy. <p>❖ Transition of Care</p> <ul style="list-style-type: none">➤ Reassess patient response to therapy with timely de-escalation of antibiotic treatment based on culture results and clinical response.➤ Practice antibiotic stewardship by determining the shortest duration of antibiotic treatment necessary based on evidence, accounting for patient- and infection-specific risk factors.
Scope	<p>❖ In scope</p> <ul style="list-style-type: none">➤ Antibiotic stewardship➤ Diagnostic maneuvers➤ Differential diagnosis➤ Evaluation of source➤ Resuscitation➤ Resuscitative procedures➤ Sepsis➤ Septic shock➤ Source control (bedside procedures) <p>❖ Special populations</p> <ul style="list-style-type: none">➤ Chronic infection versus colonization➤ Extremes of age➤ History of multidrug resistance➤ Immunocompromised



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<p>1</p> <p>Limited Participation Demonstrates limited critical care knowledge and skills</p> <p>Framework: What a learner directly out of residency should know</p> <p>Performs ICU procedures on straightforward patients but requires supervision/direction for more complex patients/procedures</p> <p>Requires continuous direct supervision by the attending for patient management</p>	<ul style="list-style-type: none">Identifies the presence of shock, including sepsis as a possible etiology; orders basic diagnostic studies to begin evaluation of shock but the differential may be limitedInitiates volume resuscitation without recognizing the need for an individualized resuscitation planRecognizes the need for procedures for source control of infection but requires prompting to initiate a consultation discussionNeeds direction to select empiric antimicrobials for common sources of sepsisInitiates vasoactive agents with ongoing assistance for indications and selectionDescribes the acuity and severity of illness with guidance; demonstrates familiarity with some validated and pertinent criteria and scoring systems (eg, SIRS/sepsis, SOFA, APACHE II)Identifies the need for physiologic monitoring but requires prompting for comprehensive implementationElicits and documents pertinent H&P details to diagnose a specific etiology of shock but demonstrates limited ability to formulate a diagnostic and therapeutic rationale	<ul style="list-style-type: none">Requires active assistance to assess endpoints of resuscitationDemonstrates limited recognition for the need to tailor volume administration and vasoactive agents based on interpretation of endpoints of resuscitationSelects antimicrobials without consideration for end-organ dysfunctionMonitors the effects of sepsis and treatment on volume and renal function with promptingIdentifies indications for RRT in a patient with sepsisDescribes the physiology of septic shock and a clinical rationale for volume resuscitation and use of vasoactive agents but without individualizing them to a specific patientWith guidance, applies evidence-based guidelines to manage vasoactive agents and antimicrobialsIdentifies mixed types of shock with active, ongoing guidanceNeeds direct guidance to interpret lab and radiologic data for the diagnosis of an infectious source	<ul style="list-style-type: none">Interprets patient response to therapy but requires active assistance to escalate/de-escalate vasopressors and monitoringRecognizes the need for ongoing monitoring of systemic complications but is needs assistance to create a specific or tailored planContinues an antimicrobial treatment plan without a clearly defined treatment duration and clinical rationaleNeeds supervision to adjust and wean vasopressor supportDemonstrates limited understanding of the indications for discontinuation of invasive monitoring



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	<ul style="list-style-type: none">Initiates the sepsis bundle with prompting	<ul style="list-style-type: none">Describes and monitors for common systemic complications of septic shock with assistance	
<p>2</p> <p><u>Direct Supervision</u></p> <p>Initiates straightforward management for many critical illnesses but requires active direction for further management and complex critical illnesses</p> <p><u>Framework:</u></p> <p>Demonstrates a sufficient fund of knowledge for basic critical care and some knowledge of complex critical illness</p> <p>Performs ICU procedures on straightforward patients but may require supervision/direction for more complex patients/procedures</p> <p>The attending gives active help throughout to direct the clinical course.</p>	<ul style="list-style-type: none">Initiates a diagnostic workup (including labs and imaging) for sepsis/septic shock; identifies a broad differential with some guidanceInitiates volume resuscitation with recognition of patient-specific factorsWith intermittent guidance, interprets lab and radiologic data to diagnose common infectious sourcesInitiates a consultation for procedural infectious source control, requiring guidance for a complex patientSelects empiric antimicrobials for common sources of sepsisSelects a vasoactive agent based on complementary mechanisms of actionDescribes the acuity and severity of illness, incorporating validated and pertinent criteria and scoring systems (eg, SIRS/sepsis, SOFA, APACHE II)Demonstrates understanding of physiologic monitoring and implements it with intermittent guidanceDocuments sepsis bundle compliance and reasons for deviation	<ul style="list-style-type: none">Assesses endpoints of resuscitation in a straightforward patient but needs assistance for a more complex patientTailors volume administration and vasoactive agents based on interpretation of endpoints of resuscitation with some guidanceIdentifies the need for but requires assistance in selection and dose adjustments of antimicrobials to account for end-organ dysfunctionMonitors the effects of sepsis and treatment on volume and renal functionMonitors the effects of RRT on a patient with sepsis with some guidance; works with consultants to make adjustmentsRecognizes the physiology of septic shock and a clinical rationale for volume resuscitation and use of vasoactive agents, individualizing treatment to a specific patientWith some guidance, uses evidence-based guidelines to select vasoactive agents and antimicrobials based on complementary mechanisms of action without coverage redundancy or gaps	<ul style="list-style-type: none">Creates escalation/de-escalation antimicrobial and vasopressor plans based on patient response to therapy with some assistanceCreates a tailored plan for monitoring of likely systemic complications of sepsisContinues an antimicrobial treatment plan with a clearly defined treatment duration and clinical rationaleAdjusts and weans vasopressor support tailored to patient status with guidanceWith guidance, discontinues invasive monitoring when a patient's condition indicates



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	<ul style="list-style-type: none">Independently initiates the sepsis bundle	<ul style="list-style-type: none">Identifies mixed types of shock with guidanceDescribes and monitors for common systemic complications of septic shock	
<p>3</p> <p><u>Indirect Supervision</u> Manages most critical illnesses but may require guidance for more complex patients or atypical presentations</p> <p><u>Framework:</u> Demonstrates a sufficient fund of knowledge for basic and most complex critical care</p> <p>Independently performs most ICU procedures and supervises procedures on straightforward patients</p> <p>The learner can manage a critically ill patient in straightforward circumstances but may require input to manage the most complicated ICU patients.</p>	<ul style="list-style-type: none">Initiates a diagnostic workup (including labs and imaging) to begin evaluation of sepsis/septic shock and identifies a broad differentialInitiates volume resuscitation, incorporating monitoring when indicated by patient-specific factorsIndependently and promptly consults an interventionalist for procedural infectious source controlSelects empiric antimicrobials based on an institutional/local antibiogram but requires assistance to incorporate uncommon patient-specific factorsUses evidence-based guidelines to create a cohesive vasoactive strategyDescribes the acuity and severity of illness, independently incorporating validated and pertinent criteria and scoring systems (eg, SIRS/sepsis, SOFA, APACHE II)Independently implements physiologic monitoringConcisely documents a diagnostic and therapeutic rationale in a complex patient	<ul style="list-style-type: none">Assesses endpoints of resuscitation in a straightforward and complex patientMonitors and adjusts fluid resuscitation and vasopressor therapies using evidence-based management strategies, as indicated by patient status and monitoring, in a patient without major comorbiditiesAdjusts antimicrobial dosing, taking into consideration the presence of end-organ dysfunctionAnticipates the potential for renal dysfunction in a septic patient and monitors and adjusts therapy accordinglyMonitors the effects of RRT in a patient with sepsis and collaborates with consultants to make adjustmentsUses evidence-based guidelines to tailor vasoactive agents and antimicrobials based on complementary mechanisms of actionCreates a cohesive therapeutic strategy, accounting for and prioritizing concurrent diagnoses; recognizes the potential for sepsis-related multisystem organ impairment	<ul style="list-style-type: none">Creates a timely escalation/de-escalation plan for antimicrobials, vasopressors, and invasive monitoring techniquesCreates a tailored plan for monitoring and managing common and uncommon systemic complications of sepsis with some inputDemonstrates understanding of the principles of antibiotic stewardshipAdjusts and weans vasopressor support tailored to patient statusDiscontinues invasive monitoring when a patient's condition indicates



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		<ul style="list-style-type: none">Interprets lab findings in atypical infections and tailors antimicrobial therapy accordingly	
<p>4</p> <p>Practice Ready Independently manages complex critical illnesses and leads the critical care team</p> <p>Framework: Demonstrates an attending-level fund of knowledge</p> <p>Independently performs and supervises procedures</p> <p>The attending is available at the request of the learner but is not routinely needed for common or complex critical illness.</p>	<ul style="list-style-type: none">Guides resuscitation in an evidence-based manner and employs disease and patient-specific monitoring techniquesGuides consultation for and coordinates optimal timing of procedural infectious source controlSelects empiric antimicrobials based on an institutional/local antibiogram, patient immune status, and risk factors for drug resistance and atypical infectionsDescribes the acuity and severity of illness, broadly incorporating validated and pertinent criteria and scoring systems (eg, SIRS/sepsis, SOFA, APACHE II)Concisely documents diagnostic and therapeutic reasoning while satisfying institutional and regulatory requirements	<ul style="list-style-type: none">Reevaluates for ongoing multifactorial shock in a patient with refractory shockDirects strategies to mitigate the risk of systemic complications without compromising treatment of the primary infectionLeads comprehensive management of a septic patient with renal dysfunction; collaborates with consultants on the initiation and ongoing use of RRTUsing evidence-based principles and advanced monitoring data, monitors and adjusts therapeutic agents in a complex patient, including fluids and vasopressorsApplies knowledge of disease processes, pathophysiology, and therapeutics to guide treatment for a patient with sepsis-related multiorgan dysfunctionPerforms a detailed evaluation for uncommon resistance patterns when initial studies do not explain the clinical scenario	<ul style="list-style-type: none">Guides timely tailoring and discontinuation of antimicrobial treatment based on culture results and clinical responseCreates a tailored plan to monitor for all anticipated systemic complications of sepsis with necessary therapeutic adjustmentsModels and advocates for principles of antibiotic stewardship