2.8 VASCULAR ACCESS

Vascular access involves inserting a catheter into an appropriate blood vessel to measure useful diagnostic parameters, draw blood for diagnostic testing, and/or provide specific therapeutic interventions. Many hospitalized patients require vascular access, and hospitalists differentiate patients who simply need peripheral venous access from those who require more invasive types of arterial or central venous access. Approximately 8% of hospitalized patients require central venous access, and more than 5 million central venous catheters are inserted annually in the United States.[1,2] Complications of vascular catheters such as infection, venous thrombosis, arrhythmia, and vascular injury can prolong hospital stays and increase morbidity and mortality. Of the 50,000 to 100,000 catheter-related bloodstream infections that occur annually in United States, approximately 90% are due to central venous catheters.[3-5] Hospitalists advocate for patients to determine the most appropriate type of vascular access on the basis of the patient's diagnostic and therapeutic requirements and overall clinical condition.

KNOWLEDGE

Hospitalists should be able to:

- Name the various locations for peripheral venous access and describe the normal vasculature and surrounding anatomy of the site chosen for access.
- Name the various locations for arterial or central venous access and describe the normal vasculature and surrounding anatomy of the site chosen for vascular access.
- Identify absolute and relative contraindications to placement of arterial or central venous access at specific sites.
- Describe the clinical findings or disease processes that require arterial or central venous access.
- Explain the indications for additional modalities such as ultrasonography in vascular access placement.
- Explain indications and contraindications of the various arterial or central venous access procedures.
- Describe and differentiate the potential risks and complications of individual vascular access procedures on the basis of the site chosen and other risk factors.
- Recognize the indications for specialty consultation, which may include interventional radiology, surgery, or critical care medicine.

SKILLS

Hospitalists should be able to:

- Elicit a thorough and relevant medical history to identify comorbid conditions and risk factors for complications related to arterial or central venous access placement.
- Assess patients for increased risk of complications and use appropriate preventive measures.
- Perform a directed physical examination of the site(s) intended for vascular access.
- Perform specific maneuvers to evaluate for collateral flow for arterial access procedures.
- Select the necessary equipment to perform the indicated vascular access procedure at the bedside.
- Properly position the patient and identify anatomic landmarks to obtain vascular access.
- Perform a time-out before the procedure.
- Use appropriate sterile technique and necessary precautions throughout the procedure to minimize the risk of complications for patients and providers.
- Anticipate and manage the complications of vascular access procedures, which may include infection, thrombotic complications, and mechanical complications.
- Promote the use of peripheral venous access over central venous access whenever possible.
- Evaluate the need for all central venous catheters and arterial catheters on a regular basis and limit their use accordingly.
- Communicate with patients and families to explain the indications and alternatives to vascular access.
- Obtain informed consent and effectively communicate with patients and families to explain the procedure, its expected diagnostic or therapeutic benefits, and potential complications.
- Educate patients and their families regarding the care of long-term vascular access.
- Arrange appropriate care for patients being discharged with long-term vascular access.

ATTITUDES

Hospitalists should be able to:

- Demonstrate awareness of and ability to address periprocedural emotional and physical discomfort.

SYSTEM ORGANIZATION AND IMPROVEMENT

To improve efficiency and quality within their organizations, hospitalists should:

- Lead, coordinate, or and/or participate in multidisciplinary initiatives to optimize resource use.
- Lead, coordinate, and/or participate in efforts to develop strategies to minimize institutional complication rates of vascular access.
- Lead, coordinate, and/or participate in patient safety and quality improvement programs to monitor hospitalists' performance and/or supervision of procedural competence.
- Lead, coordinate, or and/or participate in implementation of standardized protocols for catheter placement and maintenance care.

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