



Anesthesia Care of the Ebola Patient

Practice Considerations

In light of the recent care of Ebola patients and transmission of Ebola within the U.S., the American Association of Nurse Anesthetists (AANA) continues to monitor the ongoing situation in the U.S. and abroad. Ebola virus disease (EVD) is characterized by a high viral load, high rate of morbidity and mortality when infected, and risk of human-to-human transmission. At the time of this writing, there is no FDA-approved vaccine and treatment for Ebola.^{1,2}

Excellence in care, safety and continuous improvement of care are the hallmarks of the anesthesia profession. Nurse anesthetists may be called upon to care for patients infected with the Ebola virus. The AANA is committed to support Certified Registered Nurse Anesthetists (CRNAs) and the healthcare team to safely deliver patient care, to maintain the health of the nurse anesthetist, and to maintain the safety of families and the community.

Information and guidelines are being frequently updated. Please refer to the [CDC Ebola Outbreak](#) webpage and www.aana.com/ebola for current information. Please contact the AANA at practice@aana.com or call 847-655-8870 with questions, concerns or new learning that we may share.

Key Points

- Reference information from the Centers for Disease Control and Prevention (CDC) and other reputable sources for knowledge that allays fears.
- Utilize appropriate personal protection in every aspect of daily living (e.g., hand hygiene).
- Participate in general planning and training with your facility and department.
- Participate in intensive training if you volunteer to care for possible Ebola patients in your facility.
- In addition to droplet and contact precautions, when providing direct patient care to a known or suspected Ebola patient, use standard precautions with CDC recommended full body personal protective equipment (PPE).
- Identify and avoid procedures that may be aerosol producing.
- Use disposable supplies and equipment, when possible.
- Use point of care testing, when possible.
- Immediately report exposure to sharps and body fluids according to your facility policy.

AANA Practice Guidelines

The following documents may be accessed on AANA's website at www.aana.com/PracticeManual.

- [Safe Injection Guidelines for Needle and Syringe Use](#)
- [Infection Control Guide for Certified Registered Nurse Anesthetists](#)
- [Mass Casualty Incident Preparedness and Response](#)

Ebola Virus Disease Anesthesia Practice Considerations	
Transmission^{1,2}	Ebola spreads through human-to-human transmission via direct contact (through broken skin or mucous membranes) with the blood, secretions, aerosolized body secretions, organs or other bodily fluids of infected people, and with surfaces and materials (e.g. needles and other medical devices, bedding, clothing) contaminated with these fluids.
Exposure Risk³	High Risk Exposure <ul style="list-style-type: none"> • Direct skin contact with or exposure to blood or body fluids of an EVD patient without appropriate PPE. • Percutaneous (e.g., needle stick) or mucous membrane exposure to blood or body fluids of EVD patient.
	Low Risk Exposure <ul style="list-style-type: none"> • Close contact with EVD patients in healthcare facilities or community settings. • Being within approximately 3 feet (1 meter) of an EVD patient or within the patient's room or care area for a prolonged period of time (e.g., healthcare personnel, household members) while not wearing PPE. • Direct brief contact (e.g., shaking hands) with an EVD patient while not wearing recommended personal protective equipment.
	No Known Exposure <ul style="list-style-type: none"> • Having been in a country where an EVD outbreak occurred in the last 21 days and having no high or low risk exposures.
Facility Planning⁴	Policy & Procedure <ul style="list-style-type: none"> • In preparation of a potential EVD case, create an interprofessional team with representatives from every department in the facility to review your existing safety and infection control policies and all related elements of patient and community care (e.g., communication plan, staff and community education, staffing, laboratory, housekeeping, waste management).
	Healthcare Team <ul style="list-style-type: none"> • Identify staff who volunteer to care for patients. • Activities of team members involved in patient care must be monitored by other team members and these increased personnel demands should be anticipated. • Team training, communication and ongoing learning as care processes improve. • The team practices donning and doffing PPE while monitored by qualified trainers. • Use checklists where appropriate to minimize variability of care and optimize outcomes. • Daily team meeting to review plans, protocols, discuss observations, and new information. • Log all staff that enters the isolation area. • Log of staff that cared for patient with EVD to include twice daily temperature and symptom review for 21 days after last day working in the unit.
Personal & Patient Protection⁴⁻⁶	Standard Precautions <ul style="list-style-type: none"> • Meticulous, frequent hand hygiene. • CDC recommended full body PPE.

<p>Personal protective equipment (PPE)^{4,5}</p>	<p>CDC PPE Guidelines⁴</p> <ul style="list-style-type: none"> • See the October 20, 2014 CDC Guidance on Personal Protective Equipment To Be Used by Healthcare Workers During Management of Patients with Ebola Virus Disease in U.S. Hospitals, Including Procedures for Putting On (Donning) and Removing (Doffing) for extensive instructions.⁵ http://www.cdc.gov/vhf/ebola/hcp/procedures-for-ppe.html • Prior to working with Ebola patients, all healthcare workers involved in the care of Ebola patients must have received repeated, extensive training and have demonstrated competency in performing all Ebola-related infection control practices and procedures, and specifically in donning/doffing proper PPE. • While working in PPE, healthcare workers caring for Ebola patients should have no skin exposed. • The overall safe care of Ebola patients in a facility must be overseen by an onsite manager at all times, and each step of every PPE donning/doffing procedure must be supervised by a trained observer to ensure proper completion of established PPE protocols.
<p>Preanesthesia Health History & Evaluation⁷</p>	<p>Clinical Characteristics</p> <ul style="list-style-type: none"> • Acute infection begins as a non-specific febrile illness (fever, myalgia, malaise, progresses to include GI symptoms). • Increased small vessel permeability. • Multisystem compromise. • Hemorrhage may occur in the second week. • Poor prognosis associated with shock, encephalopathy, hemorrhage, high viral load. • Hypovolemia, with volume loss 5-10 liters/day, even though body weight increases. • Marked electrolyte abnormalities and nutritional deficiency. • Viral RNA found on skin, in blood, urine, semen, endotracheal suctioning, vomitus, and stool. <p>Ebola signs and symptoms to be included in health history</p> <ul style="list-style-type: none"> • Fever • Severe headache • Muscle pain • Weakness • Diarrhea • Vomiting • Abdominal (stomach) pain • Unexplained hemorrhage (bleeding or bruising) • Symptoms may appear from 2-21 days post exposure to Ebola, average is 8-10 days.
<p>Patient Equipment⁸</p>	<ul style="list-style-type: none"> • Use disposable supplies and equipment, when available. • Non-disposable medical supplies and equipment should be cleaned and disinfected according to manufacturer's instructions and facility policies.
<p>Needle & Sharps Safety^{4,6}</p>	<p>Needle, sharps safety</p> <ul style="list-style-type: none"> • Use needleless drug administration and IV access. • Do not re-sheath the needle.

	<p>Drug safety</p> <ul style="list-style-type: none"> • One vial, one needle, one syringe, one patient. • Any injection supplies or medications that enter the patient care area should be dedicated to the patient and discarded at the point of use. <p>Post Sharps Exposure</p> <ul style="list-style-type: none"> • Follow facility policy after personal sharps injury or exposure to blood, body fluids, or secretions. <ul style="list-style-type: none"> ○ Stop working and immediately wash the area with soap and water. ○ Irrigate eyes or mucous membranes with copious amounts of eye wash solution and water. ○ Report and immediately contact an Infectious Disease consultant for evaluation and care.
Airway Management⁴	<p>Aerosol Generating Procedures</p> <ul style="list-style-type: none"> • Airway management procedures include intubation and extubation, bronchoscopy, sputum induction, bilevel positive airway pressure (BiPAP), and open suctioning of airway. • When involved in these procedures, wear CDC Ebola PPE. • Disposable equipment should be used whenever possible.
Sterile Technique⁸	<ul style="list-style-type: none"> • The challenges of maintaining sterile technique must be anticipated while PPE is donned.
Anesthesia⁸	<ul style="list-style-type: none"> • When possible, provide total intravenous anesthesia with an ICU ventilator in the patient's room. • Use point of care testing systems to limit handling of blood samples.
Anesthesia Equipment⁸	<ul style="list-style-type: none"> • Use a disposable circuit with ISO-approved breathing circuit filter on the inspiratory and expiratory limbs of the circuit or placed between the Y piece of the breathing circuit and the breathing device. • Do not open the patient circuit during active ventilation. • If a conventional anesthesia machine is used, the machine must be decontaminated as per the manufacturer's directions and facility policy.

Comprehensive Resources

- CDC Ebola Outbreak webpage at <http://www.cdc.gov/vhf/ebola/>.
- AANA Ebola Virus Disease Resources at www.aana.com/ebola.

References

1. Centers for Disease Control and Prevention. About Ebola Virus Disease. <http://www.cdc.gov/vhf/ebola/about.html>. Accessed on October 21, 2014.
2. World Health Organization. Ebola Virus Disease. <http://www.who.int/mediacentre/factsheets/fs103/en/>. Accessed on October 16, 2014.
3. Centers for Disease Control and Prevention. Case Definition for Ebola Virus Disease (EVD). <http://www.cdc.gov/vhf/ebola/hcp/case-definition.html>. Accessed October 16, 2014.
4. Centers for Disease Control and Prevention. CDC Key Components of Standard, Contact, and Droplet Precautions Recommended for Prevention of Ebola Virus Disease Transmission in U.S. Hospitals. <http://www.cdc.gov/vhf/ebola/hcp/infection-prevention-and-control-recommendations.html>. Accessed October 16, 2014.
5. Centers for Disease Control and Prevention. Guidance on Personal Protective Equipment To Be Used by Healthcare Workers During Management of Patients with Ebola Virus Disease in U.S. Hospitals, Including Procedures for Putting On (Donning) and Removing (Doffing). October 20, 2014. <http://www.cdc.gov/vhf/ebola/hcp/procedures-for-ppe.html>. October 21, 2014.
6. Centers for Disease Control and Prevention. Infection Prevention and Control Recommendations for Hospitalized Patients with Known or Suspected Ebola Virus Disease in U.S. Hospitals. <http://www.cdc.gov/vhf/ebola/hcp/infection-prevention-and-control-recommendations.html>. Accessed October 18, 2014.
7. Centers for Disease Control and Prevention. Signs and Symptoms. <http://www.cdc.gov/vhf/ebola/symptoms/index.html>. Accessed October 16, 2014.
8. Ribner, B. Treating Patients with Ebola Virus Infection in the U.S.: Lessons Learned. Emory Serious Communicable Diseases Unit Team. ID Week: Special Plenary Session, October 8, 2014. http://www.idweek.org/ebola_idweek_2014/. Accessed October 16, 2014.