Hemodialysis: Cardiac Arrest (Code Blue) Procedure in Community Dialysis Units

Site Applicability

Providence Health Care Community Dialysis Units.

Practice Level

Staff (RN, LPN, Renal Technician) who have completed the required education and provide care in a Providence Health Care Renal Program Community Dialysis Unit (CDU).

Requirements *[if required]*

1. Basic Life Support (BLS) certification (i.e. cardiopulmonary resuscitation or CPR) is required for all staff upon hiring.
2. As per Occupational Health and Safety, all clinical staff should have an up-to-date fit test for an N95 mask.
3. Staff members caring for a patient must be aware of the patient's code status. And the patient's own directives such as an advanced Care Plan, Advanced Directive, or Provincial "No CPR" form. Staff members should discuss with the most responsible provider if there is any lack of clarity concerning the patient's code status (e.g. Options for care order, or Medical Scope of Treatment also known as MOST).

Need to Know

- Staff are expected to maintain competency in performing BLS skills by attending education sessions of their choice at least once per year.
- Code Blue is initiated when the patient's condition deteriorates, leading to potential or actual cardiac or respiratory arrest. (The term patient can include visitors or staff).
- For medical emergencies such as hypoglycemia, allergic reaction, or anaphylaxis, the emergency medications required are located in each unit's medication cupboard or emergency cart.
- Identify patient's COVID -19 status appropriately to allow staff to conduct accurate risk assessment during a code blue event, including the appropriate PPE use before starting CPR.
- All patients should have a completed order for Options for Care and Resuscitation / DNAR.
- BC Ministry of Health No Cardiopulmonary Resuscitation Form: Patients who are DNR should be encouraged to complete this document and keep a copy at home, carry a copy with them when they are traveling, and provide their care facilities (e.g. CDU) with a copy. A physician must complete the bottom portion of the document.

- All patients dialyzing in a chair must have a sheet placed under them to aid transferring the patient out of the chair in the event of an emergency. CDU patients should be encouraged to bring a sheet to dialysis as the community unit does not supply sheets.
- To transfer the patient out of a dialysis chair for CPR:
  - Place the chair in Trendelenburg or lower the head of the chair to its lowest position.
  - First and second responder: gently lower the patient to the floor using the sheet under the patient while ensuring safety of the dialysis lines and access. This is best accomplished by sliding the patient out of the top of the chair while the third responder pulls the chair out from under the patient in the direction of the patient's feet. Do not disconnect the bloodlines from the patient's access.
- Staff should be familiar with the location of the emergency equipment in the unit. Each CDU is equipped with a board for CPR and a bag-valve-mask (Ambu bag) for cardio-respiratory arrest. Every shift must ensure the appropriate emergency equipment is stocked and is properly functioning (e.g. suction equipment, oxygen equipment). Nurses are to ensure that the contents of the emergency cart, if applicable, are correct and there are no expired equipment. Items used from the emergency cart must be replaced as soon as possible. Replenish the portable oxygen if necessary. To replenish the oxygen tanks in the metro CDUs call SOS Emergency Response Technologies at 604-277-5855. Replacement bag-valve-masks (Ambu bags) may be ordered from eProcurement (ePro).
- Automatic external defibrillators (AED) are only available in the metro CDUs. (The metro CDUs include the Vancouver, East Vancouver, Richmond and North Shore CDUs).
- For code blue events in the metro CDUs call 911. For code blue events in the Powell River, Sechelt, and Squamish CDUs, activate the hospital code blue system.
- If the patient is found on the floor (e.g. unwitnessed fall) treat as a suspected c-spine injury.
- Nurses in the CDUs are not able to pronounce death since patients in the CDU do not meet the criteria of expected death. Call MD and MD will call Coroner. A nurse working at PHC can pronounce death only when the following criteria has been met:
  - The death is expected (see below)
  - Do Not Attempt Resuscitation (DNAR) and options for care order are in place.
  - Collaboration with the physician has occurred and an agreement has been reached that includes the nurse to pronounce death and who will notify the family/ next of kin if not present at time of death. Ideally this discussion occurs prior to the death of the patient and includes the patient's family. (See Pronouncement of Expected Death).
- The nephrologist does not have to come to the unit to pronounce death. This may be done via telephone if the physician feels comfortable doing so.
- The Medical Certificate of Death form must be completed by the CDU nephrologist within 48 hours of death.
- The Coroners Act states that deaths must be reported in some circumstances (e.g. accident [e.g. fall], homicide, suicide, malpractice, suspicious). If a natural death occurs in the CDUs, the police do NOT need to be notified.
- Debriefing following a critical incident is available through these resources:
  - Employee & Family Assistance Program (EFAP) at 604-872-4929. For more information go to http://www.efap.ca/

- Pastoral Care at 604- 806-8163 (24-hour pastoral care pager) – Pastoral care is available for patients and staff.

Equipment and Supplies

Emergency cart, if applicable, with CPR board, bag-valve-mask (Ambu bag) and portable suction equipment
Emergency medications
Automatic External Defibrillator (AED) in the metro CDUs only
Oxygen and related equipment
PPE
Foot stool

Procedure

Steps

STEPS	RATIONALE
1. Shout for help from other staff members.	To mobilize additional help for the patient.
2. Begin returning the patient's blood and place the patient in a supine position.	To promptly rule out a hypotensive event.
3. Don appropriate PPE if not already donned.	Protect yourself first.
4. Assess Circulation-Airway-Breathing (C-A-B)	
5. **C - CIRCULATION**: If returning the patient's blood does not increase responsiveness and you have determined that the patient is having a life-threatening event requiring immediate intervention by the paramedics/code blue team AND the patient is a full code, have a delegate call 911 or activate the hospital code blue system. Assess for breathing and pulse/signs of life for no more than 10 seconds to check for pulse. If the patient is unconscious and not breathing or not breathing normally (e.g. only gasping), or has no pulse, begin chest compressions ONLY.	Metro CDUs: call 911. Sechelt, Powell River, and Squamish CDUs: activate hospital code blue system. If the patient has a signed no cardiopulmonary resuscitation order and is in cardiac or respiratory arrest, do not call a code blue or call 911; allow a natural death to occur. If a pulse is not definitely felt within 10 seconds, begin CPR and use the AED when available as early initiation of CPR is associated with better patient outcomes
6. If patient is unconscious and not breathing or not breathing normally, and has a definite pulse, continue to step 11.	Unnecessary compressions are less harmful than failing to provide compressions when the patient has inadequate circulation.

STEPS	RATIONALE
7. Agonal breathing is not normal breathing. When in doubt, start CPR.	
8. Ask a second responder to bring the emergency equipment to the location (e.g. Emergency cart and medications, CPR board, AED [metro CDUs only], portable oxygen, portable suction, etc.)	
9. When possible, place the patient on a cardiac arrest board or a suitable hard surface. When rolling the patient onto the arrest board, ensure the vascular access is protected.	
10. Compression rate: 100 to 120 per minute Compression depth: at least 2 inches (5 cm and no more than 6 cm) for adults	A hard surface allows for more effective chest compressions.
11. A - AIRWAY Airway opening maneuvers: • Suspected c-spine injury : DO NOT extend the neck. Open airway using jaw thrust without head tilt: Keep the head in-line with spine and prevent movement of the cervical spine. Place first 2 fingers of each hand behind the angle of the jaw, lift jaw upwards to create “jaw thrust”. • No suspected c-spine injury: Maneuver the head into the sniffing position using head tilt, chin lift, or jaw thrust. Check for any secretions/blood/emesis/ foreign objects. Turn head to side and remove using Yankauer (tonsil) suction/finger sweep as required. Note: Do NOT insert an oropharyngeal airway unless trained to size and insert	The tongue is the biggest obstruction of the airway which is attached to the lower jaw. In pulling the jaw forward this displacement will pull the tongue forward and out of the way of the airway to allow easier ventilations and passage of air to the lungs. Incorrect sized oropharyngeal airway can cause trauma and obstruction of the airway

STEPS	RATIONALE
12. B – BREATHING: • Cover patient's face with a simple O_2 mask & turn on O_2 at 10 L/minute. • Only use bag-valve-mask if you have been trained to do so. • Place face mask over face with pointed area at nose, and apply effective seal to prevent air leak around the mouth and nose. • Apply Artificial respirations: Just enough to see the chest rise. If the chest does not rise, reposition the airway and try again. 10 breaths per minute for respiratory arrest (1 breath every 6 seconds)	An effective seal between the patient's face and mask must be maintained for adequate ventilation. Excessive ventilations can cause: • gastric inflation (leads to vomiting and aspiration) • increased intra-thoracic pressure which affects venous return to the heart and cardiac output
13. Continue chest compressions until the AED arrives. Rotate task of compressions every 2 minutes.	Rotate the task of compressions to maintain high quality CPR.
14. Apply and initiate the AED as soon as possible as per Hemodialysis: Zoll Plus Automatic External Defibrillator (AED) in CDU (metro CDUs only).	Early defibrillation is critical to survival from sudden cardiac arrest.
15. Continue CPR until the paramedics/code blue team takes over and/or asks you to stop.	
Once the paramedics/code blue team arrives:	
Duties of the nursing staff are: • First nurse on scene (or primary nurse) provides report to paramedics/code blue team. Information required by the paramedics/code blue team include: ○ **S**igns and symptoms ○ **A**llergies ○ **M**edications ○ **P**ast medical history including diagnosis and isolation status ○ **L**ab results and blood glucose ○ **E**vents leading up to code (e.g. vital signs, procedures, and equipment [e.g. pacemaker]). How long it has been since the patient collapsed? How many shocks were delivered?	

STEPS	RATIONALE
Continued: • Have WOW at the bedside: Obtain medical and nursing notes, if appropriate • If family or other visitors present, assist them to another area (e.g. patient waiting area) • Notify responsible physician that a code blue is in progress • Assist team in arrest as required (e.g. getting supplies	In the event of a cardiac arrest the attending physician may be able to lend expertise/knowledge to the code team re: appropriate care of the patient.
After code blue event:	
• If the patient is to be transferred to the emergency department, remove access needles or cap CVC unless contraindicated (e.g. if required for IV access) and ensure documentation is complete. • If unsuccessful (i.e. natural death occurs), notify the nephrologist to pronounce death and then contact the coroner to arrange transportation of the body. • Ensure all used emergency equipment and other supplies have been returned to its appropriate location and/or restocked. • Safely dispose of sharps and used bag-valve-mask. • Obtain replacement bag-valve-mask. • Contact pharmacy for replacement of emergency medications. • Ensure family has been followed up with. • Participate in debriefing.	During regular hours: contact the CDU nephrologist to pronounce death. After hours: contact the on-call nephrologist to pronounce death. Coroner 24-hour pager service: 1-855-207-0637 (Metro and Coastal CDUs) This equipment must be available for future emergencies. The AED must NOT be used for a second event until the internal batteries have been replaced. If the AED did not deliver a shock, discuss the need for battery replacement with a St. Paul's Hospital (SPH) biomedical engineer. Bag-valve-mask must be disposed of into clinical waste.

Documentation

Document the event in Cerner PowerChart including:

- Date and time of respiratory/cardiac arrest
- Specific information regarding events leading up to arrest procedure
- Names of ward staff involved
- Actions/procedures performed by the nursing/ward staff, and any other pertinent data

Document the outcome of the incident and the name of the nephrologist who was notified of the event.

Related Documents

1. B-00-11-10111 – Death (policy)
2. B-00-13-10130 - Hemodialysis: Anaphylaxis Treatment
3. B-00-13-10147 Hemodialysis: Cardiac Arrest (Code Blue)- Staff Responsibilities in Community Dialysis Units
4. B-00-13-10094 - Hemodialysis: Zoll Plus Automatic External Defibrillator (AED) in CDU
5. BD-00-13-40096 - Hypoglycemia, Management in Adults
6. B-00-12-10006 - Pronouncement of Expected Death:
7. Elsevier Clinical Skills. Ventilation: Bag Mask

References

BC Renal Agency Hemodialysis Guideline (Feb 20, 2021): Nursing management of complications during hemodialysis, cardiac arrest (intradialytic) with resuscitation, p 6. Retrieved on June 1, 2023 from http://www.bcrenal.ca/resource-gallery/Documents/Provincial-Guideline_HD_Complications.pdf

Counts, C.S. (Eds.). (2008). Core curriculum for nephrology nursing (5th ed.). Pitman, NJ: Anthony J. Jannetti, Inc.

Elmer, J. (2023). Adult basic life support (BLS) for health care providers in UpToDate. Walls, R. Grayzel, J. (Eds), UpToDate, Waltham, MA, 2023. Retrieved May 30, 2023 from

Heart and Stroke Foundation of Canada. 2020 Highlights-Guidelines for CPR &ECC. Retrieved on June 1, 2023. https://cpr.heartandstroke.ca/s/article/2020-Guidelines?language=en_US

Molzahn, A. & Butera, E. (Eds.). (2006). Contemporary nephrology nursing: Principles and practice (2nd ed.). Pitman, NJ: Anthony J. Jannetti, Inc.

Groups/Persons Consulted:

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