Hemodialysis: Patient Assessment Pre, Intra, and Post Dialysis

Site Applicability

All PHC Renal Program Hemodialysis (HD) units (In-centre and Community Dialysis Units)

Practice Level

Specialized

RNs and LPNs who have completed the required education from an accredited hemodialysis program and provide nursing care in a PHC Renal Program HD unit

Need to Know:

1. Hemodialysis nurses conduct patient assessments by:
   - reviewing the patient chart(s)
   - obtaining a patient history
   - performing a physical exam
2. Nursing assessments of patients receiving hemodialysis include, but are not limited to the following pre, intra and post dialytic assessments. The assessments in italics are additional assessment criteria for acute patients and inpatients.
3. All assessment data should be compared to previous data and be interpreted.
4. At every dialysis treatment, the nurse will ask the patient the following questions and document the patient's responses on the treatment log or in Cerner:
   - Have you seen a healthcare provider since last dialysis?
   - If yes, what changes have been made (e.g. medications, follow-up appointments)?
   - Have you had any falls since the last dialysis?
5. At the start of every dialysis session the nurse will ensure that the patient has a call bell and emergency take-off package available.

Assessment

Pre Dialysis Assessment

1. *For inpatients, review in Cerner: Action and Situational Awareness, the transport ticket, and obtain report from the ward nurse responsible for the patient's care.*
   For in-centre outpatients and CDUs on Cerner, review: Action and Situational Awareness. For CDUs not on Cerner: review report card and/or diary.

2. Review prescriber's orders and patient history including interdisciplinary progress notes/documentation, code status, caution sheet/allergies, medications, and laboratory/test results.
3. Review previous dialysis treatment records, with attention to pre/post treatment blood pressures, any interventions for hypotension, anticoagulation regimen and its effectiveness, status of dialysis access, and other intradialytic/post dialysis issues.
4. Assess patient adherence with care plan in consultation with the multidisciplinary team and/or family as indicated.

Predialysis nursing assessment includes:

1. General Condition

- General sense of well-being
- Voiced concerns or interdialytic history of headache, dizziness, hypotension, blurred vision, nausea, vomiting, diarrhea, muscle cramps, shortness or breath, dyspnea, cough, chest pain or palpitations, weakness, fatigue, insomnia, pain, fever, chills, bleeding, bruising, urgency or frequency of urination, injury, infection, medication changes, medical/surgical treatments or procedures, and/or other problems.
- Complications or adverse events from previous run (e.g. bleeding, bruising and cramping)
- Patient concerns

2. Systems Review

CENTRAL NERVOUS SYSTEM (CNS)

- Mental/cognitive status (e.g. level of consciousness, orientation to person, place and time, confusion, restlessness, mood, speech and thought processes)
- Pain (using scale of 0 to 10, where 0 is no pain and 10 is the worst pain ever)
- Headache and dizziness
- Numbness or tingling of extremities

CARDIOVASCULAR SYSTEM (CVS)

- Temperature
- Blood pressure: lying/sitting and standing, as patient's condition permits
    - *When dialyzing a patient in critical care areas, obtain a noninvasive blood pressure (NIBP) reading for comparison to the arterial blood pressure (ABP) for accuracy.*
    - *mean arterial pressure (MAP)*, if patient monitored
- Pulse: rate, rhythm and quality
    - heart sounds, as indicated
- Volume status
    - blood pressures, as above

  - pre dialysis weight, if possible
  - presence of edema (facial, periorbital, sacral, and peripheral)
  - neck vein distention
  - skin turgor
  - mucous membranes
  - shortness of breath and breath sounds as indicated
  - intake and output including fluid losses related to draining wounds, nasogastric tube, ostomy, etc.
  - sodium intake
- Vascular access
  - patency: presence and quality of bruit and thrill
  - tenderness or pain
  - extremity: numbness, tingling, decrease in sensation, change in colour or temperature, decreased range of motion (ROM) or strength, decreased capillary refill, in comparison to contralateral extremity
  - signs of infection (e.g. redness, warmth, swelling, drainage, pain, fever, and chills)
  - general condition (e.g. maturation of arteriovenous fistula, bleeding, bruising, skin irritation, collateral vessels, aneurysms or pseudoaneurysms, and impaired healing of the incision site)
  - central venous catheter (e.g. patency, redness, discharge, swelling, bruising, bleeding, tenderness, line integrity, neck and facial swelling, collateral vessels, dressing integrity, evidence of catheter migration, respiratory distress, and cardiac arrhythmia)
- History of bruising or bleeding
- Colour, warmth, movement, and sensation (CWMS) of extremities, as indicated
- Peripheral pulses, as indicated

RESPIRATORY

- Respirations: rate and quality (e.g. laboured, shallow, wheezy)
- Breath sounds, as indicated (e.g. presence of wheezes, crackles, diminished breath sounds)
- Oxygen saturation, as indicated

GASTROINTESTINAL (GI)

- Diet
- Change in appetite
- Anorexia
- Abdominal pain

- Nausea and vomiting
- Diarrhea or constipation
- Blood in stools
- Abdominal distention
- Bowel sounds

GENITOURINARY SYSTEM (GU)

- Signs and symptoms of urinary tract infection (e.g. frequency, urgency, hematuria, cloudy urine, and dysuria)
- Continence or incontinence
- Foley catheter
- Residual kidney function (urine output)
- Primary etiology of acute kidney injury or chronic kidney disease

ENDOCRINE

- Thirst
- Cold/heat intolerance
- Presence of diabetes and stability of serum glucose
- Frequency of blood sugar monitoring

SKIN

- Rashes or lesions
- Dryness
- Itchiness
- Excessive bruising
- Wounds
- Foot ulcers or lesions (critical for patients with diabetes)

MUSCULOSKELETAL

- Pain, cramping and stiffness
- Weakness and limited ROM
- Swelling, heat and redness
- Deformity
- Trauma

- Activities of daily living (ADLs)
- Exercise
- Level of mobility

PSYCHOSOCIAL

- Patient's overall sense of well-being
- Mood and coping status (e.g. adjustment to hemodialysis, sleep, stress, activities of daily living, meal preparation, transportation, level of functioning, home support, and body image)
- Learning needs (e.g. kidney disease, hemodialysis options, hemodialysis principles, hemodialysis procedure, complications of hemodialysis and its signs and symptoms, emergency procedures while on hemodialysis, care of access, fluid management, hemodialysis adequacy, diet, medications, anticoagulation, anemia, bone and mineral metabolism, laboratory tests, infection control procedures including hand washing, immunizations, treatment schedule, and emergency care), readiness to learn and preferred method of learning
- Family support and coping status

3. Laboratory, X-ray and other reports, as appropriate

4. Medications and allergies

- Prescribed
- Over-the-counter
- Herbal
- Recreational drugs
- Immunizations

5. Parenteral Fluids

- Type and patency of line
- Type of solution
- Intravenous (IV) site(s) (e.g. redness, warmth, swelling, tenderness and pain)

6. Indwelling Line

- Patency (IVs, foley, chest tubes, drains, etc.)
- Properly secured

7. Dialysis prescription, confirm:

- Dialyzer

- Electrolyte/molecular composition of dialysate
- Frequency and length of treatment
- Blood flow and dialysate flow rate
- Anticoagulation
- Dialysate temperature and/or profiling
- Ultrafiltration rate and/or profiling
- Sodium profiling
- Target weight

Interventions

1. Based on assessment data, implement appropriate nursing interventions and adjust treatment plan to minimize and/or prevent complications, within prescribed parameters (e.g. goal weight, volume removal, anticoagulation, needle size, single needle vs. double needle, medication, and dialysate potassium composition).

   RNs and LPNs in collaboration with a RN, can increase or decrease a goal weight by 0.5 kg based on clinical assessment. A nephrologist or nurse practitioner will then review the goal weight adjustment and write an order as (s)he deems fit.

   RNs and LPNs in collaboration with an RN, can increase or decrease the prescribed dialysate temperature by 0.5 degree Celsius based on clinical assessment. A nephrologist or nurse practitioner will then review the patient's status and write an order as (s)he deems fit. Dialysate temperature can only be increased to the maximum of 37 degrees Celsius.
2. There is a conditional order in Cerner to notify the provider and initiate heparin free dialysis if and when there is acute blood loss from any source (e.g. nose bleed or GI bleed) See Appendix A for more information on heparin and refer to SHOP Hemodialysis: Heparin Protocol
3. Notify the physician and/or nurse practitioner of any significant findings or changes in the patient's condition that might require modification of the hemodialysis prescription and/or treatment plan. Utilize the SBAR Communication Tool, if needed.
4. Encourage patient compliance with the care plan and provide ongoing education and support as needed.
5. Consult with other members of the multidisciplinary team as indicated.
6. If patient has nasogastric (NG) feeding, stop infusion at least 30 minutes prior to hemodialysis treatment (BD-00-12-40031 Hemodialysis-Preparation of an Inpatient or Resident) and flush NG tube as per protocol. B-00-13-10045 for small bore enteral feeding tube.

INTRADIALYSIS ASSESSMENT

Monitor vital signs, machine parameters, and patient's response to treatment at least hourly. Increase frequency to at least every 30 minutes if the patient is acute, unstable, or if it is the patient's first hemodialysis treatment.

Intradialytic nursing assessment includes:

PATIENT

1. Vital signs
   - Pulse: rate, rhythm, and quality
     - *Cardiac rate*, if patient monitored
     - Heart sounds, as indicated
   - Blood pressure: sitting or lying
     - *MAP*, if patient monitored
   - Respirations: rate and quality
     - Breath sounds, as indicated
     - Oxygen saturation, as indicated
   - Temperature, as indicated
2. Patient condition and response to treatment (e.g. change in mental status, headache, dizziness, hypotension, blurred vision, nausea, vomiting, fever, chills, chest pain or palpitations, shortness of breath, dyspnea, tachycardia, cramping, disequilibrium syndrome, air embolism, hemolysis, bleeding, blood leak, clotting of circuit, dialyzer reaction, pyrogenic reaction, and infection)
3. Volume status, as above plus:
   - Blood volume monitoring
   - UF rate
   - UF volume removed
   - UF target
4. Vascular access:
   - Patency of access
   - Connections: visible and secure
   - Cannulation difficulties and effectiveness of preventative measures
   - Pain and bleeding
   - Signs and symptoms of infiltration (e.g. redness, swelling, hematoma, and increased pressures)
   - Signs and symptoms of recirculation (e.g. sharp increase in Kt/V, decreased clearance readings, and high initial recirculation readings)
   - Venous and arterial pressures:
     - Baseline reading at initiation of dialysis at 200 ml/min blood pump speed
     - Then, at least hourly venous and arterial pressure reading at maximal achievable blood pump speed
   - Clearance reading (ml/min), if available
   - Transmembrane pressure (TMP), if available
   - Access flow as per unit guidelines

- Anticoagulation effectiveness
- Delivery of dialysis prescription

DELIVERY SYSTEM

1. Machine settings
2. Integrity of extracorporeal circuit (e.g. connections secure and signs of circuit clotting [e.g. residual blood in circuit, increased venous pressures, transmembrane pressure (TMP), and hematocrit])
3. Blood flow rate
4. Pressure monitor readings
5. Alarm limits and/or conditions
6. Anticoagulant delivery

Interventions

1. Notify the physician and/or nurse practitioner of any significant findings or changes in the patient's condition that require attention and/or alteration in the hemodialysis treatment plan. Utilize the SBAR Communication Tool, if needed.
2. Based on patient assessment and response to treatment, modify the treatment plan and implement appropriate nursing interventions as necessary to minimize or prevent complications, as prescribed (e.g. ultrafiltration profiling, minimum ultrafiltration, blood volume monitoring, or dialysate temperature adjustment).
3. Consult with other members of the multidisciplinary team as indicated.

POSTDIALYSIS ASSESSMENT

Assessment

Review subjective and objective data to assess the patient's response to treatment, which includes but not limited to:

- total volume replacement/removal during treatment and patient's response
- delivered treatment time
- final Kt/V
- final plasma sodium
- litres of blood volume processed
- final change in blood volume

PATIENT

1. Vital Signs

   For patient safety, all vital signs must be stable prior to patient weighing and discharge.

- Blood pressure: lying/sitting and standing, as patient condition permits
    - *MAP*, if patient monitored
- Pulse: rate, rhythm and quality
    - *cardiac rate*, if patient monitored
    - heart sounds, as indicated
- Temperature
- Respirations: rate and quality
    - Breath sounds, as indicated
    - Oxygen saturation, as indicated

2. General condition
    - General sense of well-being
    - Current symptoms (e.g. headache, dizziness, hypotension, blurred vision, nausea, vomiting, muscle cramps, shortness of breath, dyspnea, chest pain or palpitations, pain, fever and chills)
    - Patient concerns
3. Weight, if possible
    - Patients requiring assistance will be escorted to the scale
4. Volume status
    - Blood pressures, as above
    - Postdialysis weight
    - Presence of edema
    - Breath sounds, as indicated
5. Vascular access condition (as above) and any difficulty achieving hemostasis after needle removal (e.g. bruit, thrill, length of time bleeding, estimated blood loss, type of dressing applied, and patency of access).
6. Hemodialysis adequacy (e.g. final Kt/V) – If hemodialysis adequacy is suboptimal assess possible causes including:
    - Excessive dialyzer clotting
    - Incorrect needle placement and needle size
    - Reversal of blood lines
    - Inadequate dialyzer priming
    - Inappropriate dialyzer size or clearance
    - Error in sampling procedure (e.g. sampling methods, timing of samples and laboratory error)
    - Arteriovenous fistula/graft stenosis (e.g. poor access flows, positive recirculation studies, increased arterial or venous pressures, appearance of collateral veins, edema, prolonged bleeding post hemodialysis, difficulty with cannulation, pain, and altered characteristics of thrill or bruit)

  - Inadequate access (e.g. central venous catheter)
  - Lost dialysis time (e.g. patient request or demand, delay in initiation of dialysis, missed dialysis treatments, and dialysis unit issues [e.g. staff availability and HandyDART])
  - Recirculation
  - Inadequate dialysis flow
  - Low pump speeds
  - Uncompensated interruptions in actual treatment time due to intradialytic complications (e.g. hypotension, cramps, frequent alarms, manipulation of needles, and dialysate bypass situations [e.g. temperature or conductivity alarms])
- Signs or symptoms of inadequate dialysis including:
  - Fatigue
  - Loss of appetite
  - Uremic fetor (breath)
  - Nausea
  - Vomiting
  - Pruritus
  - Weight loss
  - Anemia
  - Secondary hyperparathyroidism
  - Neuropathy
  - Restless legs
  - Abnormal electrolytes
  - Pericarditis
  - Difficulty concentrating
  - Changes in cognitive function
  - Abnormal sleep patterns and insomnia
  - Abnormal electrolytes
  - Hypervolemia
  - Patient/family concerns of poor quality of life

DELIVERY SYSTEM

- Assess the dialyzer and extracorporeal circuit for residual blood.

Interventions

1. Compare post dialysis assessment data to pre-dialysis assessment data and implement appropriate nursing interventions based on assessment data.
2. Compare patient's response to current and previous treatments and modify nursing plan for future treatments.
3. Notify the physician and/or nurse practitioner of any significant findings or changes in the patient's condition that might require modification of the hemodialysis prescription and/or treatment plan. Utilize the SBAR Communication Tool, if needed.
4. Notify the physician/or nurse practitioner if the patient is unstable.
5. Encourage patient compliance with care plan and provide ongoing education and support as needed.

6. Consult with other members of the multidisciplinary team as indicated.
7. Ensure hemostasis has been achieved if the arteriovenous fistula/graft was used for dialysis.
8. Notify the physician/or nurse practitioner if the extracorporeal circuit clots or is close to clotting so that the prescriber can adjust the heparin dosing and/or order bloodwork if applicable.
9. *For inpatients, print off a transport ticket and give a verbal report to the ward nurse responsible for the patient's care.*
10. Patients must meet discharge criteria prior to discharge. See Appendix B.
11. If the patient is being admitted or going to the Emergency department, give a verbal report to the nurse most responsible for the patient's care and complete appropriate transfer documents. In the CDUs, complete PHCRU218 Inter HD Transfer Form.
12. If the patient leaves against the advice of the team, the nurse will: remind the patient of the risks, advise the patient on what to do if their condition worsens, notify the nephrologist/NP, and document the discussion and actions

Documentation

In Cerner:

1. In the "Dialysis Management" band:
   - Chart in the "Pre-Hemodialysis", "Intra-Hemodialysis", and "Post-Hemodialysis" sections for patient assessments and machine parameters.
   - Chart patient access assessment in "Arteriovenous Fistula/Graft" and/or "Central Line"
   - Chart transonic access flows and recirculation readings in "Hemodialysis Flow Monitoring"
2. In "Documentation":
   - Document unusual findings from pre, intra, post dialysis assessment.
3. In the care guide (in the chartlet):
   - Updates to the patient's vascular access
4. In "Team Communication"/ "Actions and Situational Awareness & Planning":
   - Document recommendations for next treatment, if applicable
   - Written report communicated for next run, if applicable (not a permanent record)
5. *Complete a transport ticket for the inpatient*: Go to "AdHoc"→"Additional Assessment"→"Transport Ticket"

Paper Chart:

1. Hemodialysis log:
   - Pre, intra and post dialysis: document nursing assessment and machine parameters on hemodialysis log and as indicated in the progress notes.
   - Post dialysis: document patient disposition and machine parameters post hemodialysis.
2. Interdisciplinary notes:

- Document unusual findings from pre, intra, and postdialysis assessment.

3. Hemodialysis Care Guide/Plan:
   - Update as indicated
   - In the CDUs, report treatment handover information in the diary and/or report card as indicated

Patient and Family Education

Provide patient education based on patient's learning needs and readiness to learn:

BCRenal: Readiness to Leave the Hemodialysis Unit, Post Treatment

BCRenal: Welcome to the Hemodialysis Unit

Patient education might include:

- Checking heart rate, temperature, and blood pressure (both standing and sitting) before leaving
- Sitting down right away and telling someone that they do not feel well if the blood pressure is low after the treatment, if feeling faint, dizzy, or lightheaded after dialysis
- To not leave the unit until they feel better
- To check that the fistula/graft is still working
- To carry packets of gauze in case the needle sites start to bleed after leaving the unit
- To weigh before leaving
- To wash hands pre and post dialysis to help stop the spread of any germs

Related Documents

1. BD-00-12-40031: Hemodialysis-Preparation of an Inpatient or Resident
2. B-00-12-10101: Hemodialysis: Attaching or Changing TEGO Connectors on Central Venous Catheter
3. B-00-12-10043: Hemodialysis: Central Venous Access Dressing
4. B-00-12-10152: Hemodialysis: Accessing a Central Venous Catheter (CVC) with and without Tego Connectors
5. B-00-12-10144: Hemodialysis: Flushing and Capping Central Venous Catheters
6. B-00-12-10063: Hemodialysis: Cannulation of an Arteriovenous (AV) Fistula or Graft
7. B-00-12-10069: Hemodialysis: Cannulation of AV Fistula or Graft Using Angiocaths
8. B-00-12-10029: Hemodialysis: Post-Dialysis Hemostasis for Arteriovenous Fistulas and Arteriovenous Grafts
9. B-00-13-10111: Intradialytic Hypotension
10. B-00-13-10055: Hemodialysis: Heparin Protocol
11. PHC-PH343 Conventional Hemodialysis Unit Admission Orders
12. PHCRU218 Inter HD Transfer Form.

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Definitions

SBAR: Acronym for Situation-Background-Assessment-Recommendation. Provides a framework for communication about a patient's condition between health care workers

Appendix A: Prescribed Heparin for Hemodialysis

1. Heparin is the most common anticoagulant used during HD for the prevention of clotting of the HD circuit.
2. The half-life of heparin is approximately 90 minutes. Therefore, approximately half the administered heparin will be metabolized by that time. The full dose of IV heparin will be completely gone after approximately 4 hours.
3. If heparin is stopped 1 hour prior to end of a HD treatment, a significant amount of the heparin will be gone, but there will be some anticoagulation present to prevent clotting.
4. Most patients receive a standard loading dose of 1000 units and a standard running dose of 500 units/hour until the last hour of HD.
5. The concentration of heparin used is 1000 units/mL.
6. Situations in which administering heparin or the dose of heparin should be held and reassessed by the MD include:
    a. Platelet count below 50: dose may need to be reduced.
    b. Surgery within the last 2 days: Should use no heparin for the subsequent 2 treatments after the surgery. Restart date to be determined by MD based on type and extent of surgery.
    c. Known to have active bleeding from the retina (i.e. due to diabetes) or has had eye surgery within the last 10 days. Heparin should be held for 3 runs post eye surgery due to risk of retinal bleeding.
    d. Menstruating women
    e. Active bleeding (e.g. GI, hemoptysis) or bruising
    f. History of recurrent falls
7. Patients with a high risk for bleeding should dialyze “heparin free.” This consists of intermittent flushes every 30 to 60 minutes using 100 to 200 mL of NS/substituate to visualize the circuit and, as necessary, a change of the circuit when there are clotting difficulties if greater than 1 hour of HD is remaining.
8. When a patient is having a HD treatment after a fistulogram/fistuloplasty, heparin is not being held unless there are complications during the procedure.
9. Heparin should be discontinued 1 hour prior to end of a HD treatment if the patient is going for fistulogram/fistuloplasty after the HD treatment.

Appendix B

POST HEMODIALYSIS ASSESSMENT AND DISCHARGE CRITERIA	
ASSESSMENT	**DISCHARGE CRITERIA**
PATIENT 1. **Vital signs** For patient safety, all vital signs must be stable prior to the patient weighing. • Blood Pressure (BP): lying/sitting and standing, as patient condition permits. Consider a sitting and standing BP prior to removing needles so that additional fluid may be given if the patient is hypotensive. ○ *MAP*, if patient monitored • Pulse: rate, rhythm and quality ○ *Cardiac rate*, if monitored ○ Heart sounds, as indicated • Temperature: compare to pre dialysis temperature. • Respirations: rate and quality ○ Oxygen saturation, as indicated ○ Breath sounds, as indicated	The patient should remain in the unit until the physician/NP is notified when: 1. BP is: • 180/110 or more, or RN/LPN has cause for concern • Less than 90/60 and patient is symptomatic or RN/LPN has cause for concern 2. Heart rate is 120 beats/min or more. 3. Heart rate less than 50 beats/min and unusual for patient 4. Temperature is 38°C or more 5. If the above conditions exist, a STAT CBC, two sets of blood cultures, and a C&S swab(s) of suspected site(s) should be collected. 6. Respiratory rate is: • 30 or more, or • Less than 10, or • Signs or symptoms of respiratory distress (e.g. shortness of breath, dyspnea, pallor, cyanosis, tachycardia, and chest pain) If the above conditions exist, the nurse should obtain oxygen saturation on room air.
2. **Volume status** • Blood pressures & respirations, as above • Post dialysis weight compared to pre dialysis weight and goal weight • Observe for edema • Breath sounds, as indicated • Patient's response to volume replacement and /or removal during treatment	Compare the post dialysis weight with the goal weight. • If 0.5 kg above goal weight, caution patient to restrict fluids until next dialysis treatment. • If 1 kg above goal weight, assess the patient's BP, pulse, respirations, breath sounds, respiratory effort, and oxygen saturation. • If O_2 sat less than 92%, contact physician/NP • If O_2 sat more than 92% and patient is stable, advise patient to restrict fluids &/or salt intake. Causes of the large discrepancy in weight may include fluid removal calculation error, fluid intake

	error, true increase in patient's body weight, and/or UFR machine error. • If 0.5 kg below goal weight with a low B/P and the patient is symptomatic, give oral fluids and reassess. • If 1 kg or more below goal weight with a low BP and the patient is symptomatic, give up to 500 mL normal saline IV per protocol. If the patient's BP stabilizes within 10 to 15 minutes, then the patient may be discharged. If not, the patient should remain on the unit until the physician/NP is notified.
3. **Vascular access condition** • Patency • Tenderness or pain • Signs or symptoms of infection (e.g. redness, warmth, swelling, drainage, pain, fever, and chills) • Bruising, swelling, and bleeding • Clotting time • Evidence of catheter migration	If any of the following conditions are found, the patient should remain in the unit until the physician/NP is notified. • Lack of bruit/thrill or patency • Signs or symptoms of infection (e.g. redness, warmth, swelling, discharge, pain, fever, and chills) • Evidence of catheter migration • Uncontrolled bleeding
4. **General well-being**	The patient should remain in the unit until the physician/NP is notified when the patient: • feels unwell • is too weak to ambulate • there is a change from the pre dialysis level of orientation to person, place, and time
5. **Mental/cognitive status**	• If there is a change in the patient's mental/cognitive status from the pre-HD status (e.g. confusion, new disorientation, restlessness, and loss of consciousness), the patient should remain in the unit until the physician/NP is notified.
6. **Other conditions/complications**	If the patient experiences complications post dialysis such as those listed below, the patient should remain in the unit until the physician/NP is notified: • Symptomatic hypotension (e.g. headache, pallor, perspiration, cold, clammy skin, visual disturbances, dizziness, hypotension, nausea, vomiting, tachycardia, decreased mental status)

	• Angina/chest pain(e.g. pain or tightness in the chest, back, arm, or jaw; diaphoresis; tachycardia; shortness of breath; dyspnea; nausea; vomiting; etc.) • Dialysis disequilibrium syndrome (DDS): mild symptoms include nausea/vomiting, blurred vision, restlessness, headache, hypertension, muscle cramps, dizziness not related to BP, and asterixis. Severe disequilibrium symptoms include confusion, disorientation, muscle twitching/tremors, seizures, arrhythmias, coma, etc.
DELIVERY SYSTEM: Assess the dialyzer and extracorporeal circuit for residual blood and abnormal conditions.	The patient should remain in the unit until the physician/NP is notified if the following situations occur: • Hemolysis: signs or symptoms include chest, back and/or abdominal pain, dyspnea, hypotension, translucent deep burgundy blood in bloodlines, localized burning and pain in the vascular access return site, dysrhythmias, hypoxemia, etc. • Air embolism: signs and symptoms include feeling of air rushing into circulation, chest pain, coughing, cyanosis, dyspnea, visual disturbances, confusion, coma, hemiparesis, etc.

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