

Now that we have identified, assessed, and discussed critical thinking and CCT skills, we are ready to nurse them!
 Ready ... set ... nurse!

Let's discuss the guiding principle in CC nursing: Kirby's Rule of 20. This list of 20 parameters to observe and document in the critical patient has been a guiding principle in critical care for many years. Developed by Rebecca Kirby, DVM, DACVECC, DACVIM, this list allows a CCT to think globally about the critical care patient: It is available online at several different websites (for example, see the *Merck Veterinary Manual*, "The Rule of 20," http://www.merckmanuals.com/vet/emergency_medicine_and_critical_care/monitoring_the_critically_ill_animal/the_rule_of_20.html).

1- Fluid Balance**	2- Oncotic pull**	3- Glucose**
4- Electrolytes**	5- Oxygenation and ventilation**	6- Mentation**
7- Blood pressure**	8- HR, rhythm, contractility**	9- Albumin**
10- Coagulation**	11- RBC/Hgb concentration**	12- Renal function**
13- Immune status, Abx dosage, WBC count	14- GI motility/mucosal integrity**	15- Drug dosages/metabolism
16- Nutrition**	17- Pain control**	18- Nursing care/patient mobilization**
19- Wound care/bandage care**	20- Tender loving care**	

**The items with asterisks can be assessed or performed directly by technicians and reported to the veterinarian.

Nursing Observations and Interventions

	<i>Nursing Observations</i>	<i>Nursing Interventions (with DVM order as needed)</i>
1-Fluid balance**	Mucous membrane color, feel (tacky, etc.), CRT, skin tent, sunken eyes, HR/pulse quality, BP	Administer fluids, increase rate, decrease rate, change fluid therapy plan as needed
2-Oncotic pull**	Skin texture ("goosey?"), edema, chemosis, Alb/TP levels	Nutrition, colloid support, massage if edema present
3-Glucose**	Weakness, lethargy, hypo/hyperglycemia	Administer insulin, dextrose support, monitor blood glucose levels
4-Electrolytes**	Collapse, weakness, hypoventilation, ECG changes, hypo/hyper Na, K, Cl, Mg, PO4, Ca	Administer antidotes or supplement as needed, monitor patient reaction, ECG
5-Oxygenation and ventilation**	Ventilation, RR, character, orthopnea, cyanosis	Administer oxygen, supplement ventilation
6-Mentation**	BAR, QAR, depressed, obtunded, stuporous, responds to verbal/painful stimuli, coma	Treat underlying disease process, administer diuretics if increased ICP suspected

7-Blood pressure**	Hypo, hypertension, tachycardia (prompt to perform a BP)	Fluids, vasopressors, recheck BP at regular intervals
8-HR, rhythm, contractility**	HR, pulse quality, MM, CRT, mentation, temperature	Various medicaments, recheck BP, perfusion parameters
9-Albumin**	Hypo/hyperalbuminemia	Potentially administer colloids, nutrition support for hypoalbuminemia
10-Coagulation**	Tendency to bleed, primary/secondary coagulation deficit—bleeding from catheter sites, ecchymoses/petechiae, gingival bleeding, harsh lung sounds, joint pain	Use smaller-gauge catheters, avoid large vessels, only “good sticks”—be ready to run coagulation tests, administer plasma transfusion
11-RBC/Hgb concentration**	MM, CRT, HR, RR, pulse quality	Monitor transfusions and patient reaction
12-Renal function**	UOP, BUN, Crea, USG, signs of fluid overload	Monitor renal values, UOP measurements regularly
13-Immune status, Abx dosage, WBC count	Antibiotic selection, dosage, frequency—can be reported to DVM, WBC counts checked over course of treatment, history of immunosuppression? On chemotherapy? Other immunosuppressives (prednisone, azathioprine, cyclosporine)	Careful maintenance of invasive devices, nosocomial infection prevention (gloves, washing hands, properly administering medications), institute effective protocols to minimize colonization, protecting rectal thermometers, swabbing ports before injection, using as many one-time-use items as possible
14-GI motility/mucosal integrity**	Vomiting, diarrhea, anorexia, hematemesis, melena, hematochezia, tenesmus	Administer medicaments as prescribed, observe for aspiration, keep patient clean/dry, administer nutrition, watch for potential complications (bacterial translocation)
15-Drug dosages/metabolism	Pediatric, geriatric pets, patients with liver/kidney dysfunction, various medications change metabolism (CYP450 inhibitors)	Use drug charts to assess compatibility
16-Nutrition**	Poor BCS, muscle wasting, history of anorexia, GI signs (V or D)	Administering parenteral/enteral nutrition, tempting to eat, patience, not force-feeding, creating food aversion

17-Pain control**	Patients crying out, shivering, hiding, tachycardic, febrile, hypertensive, tachypneic, aggressive, submissive, attention-seeking	Assessing pain using scoring systems, objective/subjective criteria, PRN orders, reassessing after analgesic medications given
18-Nursing care/patient mobilization**	Recumbent patient, neurologic, orthopedic patient	Walks, PROM, recumbent care, eye/ear care,
19-Wound care/bandage care**	Patient with bandage present	Bandage changes/checks
20-Tender loving care**	Patient is attention seeking, patient is painful, patient isn't healing as fast as expected	Talking, petting, sitting with patients, providing owner visits, familiar toys, other items

Critical Care Essentials

- 1- Check all invasive tube sites q 12 to 24 hours for inflammation:
 - a. Catheters: peripheral, central, urinary
 - b. Feeding tubes: gastrostomy, jejunostomy
 - c. Chest tubes
 - d. Abdominal drains
- 2- Use latex gloves when dealing with immunosuppressed patients or invasive devices.
- 3- Wash hands between each patient.
- 4- Use appropriate disinfectants for appropriate contact time.
- 5- Perform regular physical exams on patients (TPR plus!).
 - a. Temperature
 - b. Pulse, HR, evaluation of pulse quality, palpation of distal/femoral pulses
 - c. Respiration rate, character, auscultation
 - d. Auscultation of heart
 - e. Abdominal palpation
 - f. Palpation for edema, chemosis
 - g. Evaluation of mentation, eyes, ears, nose
 - h. Evaluation of integument for bruising, scald, redness/swelling
- 6- Check data from prior exams (will catch temperature changes, HR increases, etc.).

Sample Protocol

- 1- Rounds
 - a. How was patient during prior shift?
 - b. Changes in labwork, physical exam? Pertinent diagnostics performed on shift.
 - c. Trends to monitor? (Increasing temperature, etc.)
- 2- Catheters
 - a. Check/change IV catheter bandages q 12–24 hours.
 - b. Urinary catheter care q 4–6 hours.**
 - c. Inspect chest tube/feeding tube site q 12–24 hours.
- 3- Housing
 - a. Bedding/padding.
 - i. Adequate?
 - ii. Patient clean/dry
 - iii. Any signs of scald? Decubital ulcer?
 - b. Recumbent care?
- 4- Medications
- 5- Physical exam

- a. Temp (What was it last hour? Previous few hours?)
 - b. HR, rhythm, pulse quality, distal pulses, auscultation
 - c. RR, rhythm, effort, auscultation
 - d. Hydration: skin turgor, MM/CRT, eye position, PCV/TS, weight
 - e. Perfusion: BP, HR, lactate
- 6- UOP
- a. Patient weight
 - b. IVF rate
 - c. Ins/outs matching?
- 7- Pain assessment
- a. Objective criteria:
 - i. HR, RR, temp, BP
 - b. Subjective
 - i. Incision palpation
 - ii. Behavior assessment
- 8- Nutrition
- a. RER
 - b. Patient receiving adequate nutrition?

Critical Care Protocols:

<i>Monitor/Invasive Device</i>	<i>Time Frame</i>	<i>Treatments</i>
Peripheral IV catheters	Every 12–24 hours	1-Observe below and above site for redness 2- Don nonsterile gloves, remove tape, observe site for redness, swelling 3- Infuse small amount of flush to check for pain 4- Palpate vein for thrombophlebitis: “Ropey” 5- Replace bandage
Central venous catheters	Every 12–24 hours	1- Don nonsterile gloves, remove all bandaging 2- Observe site for swelling, redness, irritation 3- Aspirate for blood return 4- Remove catheter if any above signs present 5- Replace bandaging
Urinary catheters	Every 4–6 hours	1- Quantify urine, ensure catheter patency 2- Evaluate patient comfort 3- Don nonsterile gloves, wipe catheter from tip of vulva/penis to end of urinary catheter extension line 4- Keep urinary bag off of ground and clean 5- Sample urine from injection port or special valve, avoid breaking tubing connections
Chest tubes	Every 12–24 hours	1- Don nonsterile gloves 2- Remove bandage 3- Inspect site for inflammation 4- Replace bandage **CCT’s should know to immediately try to aspirate for air in cases of acute respiratory compromise!** Use nonsterile gloves Aspirate q 2–4 hours for air, fluid
Abdominal drains (Jackson-Pratt “grenade” drains)	Every 4 hours	1- Don nonsterile gloves 2- Aspirate fluid from abdominal drain 3- Quantify fluid 4- When removing abdominal bandage, inspect drain site
Continuous ECG monitoring	Every hour	1- Every hour HR is documented from ECG machine 2- Manual pulse rate also taken 3- ECG observed for rhythm: ventricular, bradycardia, tachycardia, sinus

Nasal oxygen cannulas	Every hour	<ol style="list-style-type: none"> 1- Patient observed for comfort (high levels of O2 flow can cause problems) 2- Oxygen rate documented on flow sheet (L/min) 3- Noninvasive means of assessing oxygen levels: RR, HR, Spo2, can be performed every 2–4 hours
Oxygen cage	Every hour	<ol style="list-style-type: none"> 1- Temperature of cage measured hourly 2- Oxygen percentage of cage checked hourly 3- Every 6–8 hours Baralyme granules checked for saturation (if applicable) 4- Respiration rate hourly 5- Noninvasive means of oxygen monitoring instituted if patient will tolerate
Recumbent care	Every 2–4 hours	<ol style="list-style-type: none"> 1- Keep patient as sternal as possible to prevent atelectasis 2- Keep on adequate bedding/padding 3- Check for urine/fecal soiling every 2–4 hours 4- Rotate hips/sides frequently (4 hours) 5- Observe for decubital ulcers 6- Observe for corneal ulcers, potentially lubricate eyes q 4 hours 7- Physical therapy: walks, passive range of motion of joints, standing exercises
Airway care (intubated patient)	Every 2–4 hours	<ol style="list-style-type: none"> 1- Deflate ET tube cuff, move ET tube in/out of mouth 1 inch 2- Suction/humidify airways—nebulize with sterile saline, sterile suction catheter, briefly after 100% O2 administration, or instill small amount of sterile saline into airway 3- Change ET tube q 24 hours 4- Oral/mouth care—wipe tongue, gums, oropharynx with dilute chlorhexidine solution 5- Suction oropharynx and mouth to remove gastric/esophageal secretions
Tracheostomy tube care	Every 4 hours	<ol style="list-style-type: none"> 1- Pre-oxygenate patient 2- Humidify with sterile saline for 2–5 minutes 3- Suction secretions using sterile suction catheter 4- Change inner tube with aseptic technique 5- Clean stoma site with Q-tips and dilute chlorhexidine solution

References available upon request.