

Review of Acute Care Rehabilitation Considerations for Pandemic Team-based Care

Additional Resource: Lines, Tubes, Drains, and Catheters

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BRIGHTER WORLD



Hover your mouse over each description to highlight the corresponding tube.

INTRACRANIAL PRESSURE CATHETER AND/OR VENTRICULOSTOMY ①

A small tube or catheter inserted into the brain to monitor the brain swelling. This may also be used to drain excess fluid.

CENTRAL LINE/PA CATHETER ②

A catheter in the neck, chest, or groin that helps in monitoring and treating the flow of blood. Some of these catheters may be used for giving nutrition and other medications.

TRACHEOSTOMY TUBE ③

A breathing tube inserted in the neck usually when ventilator (assisted) breathing is needed for a long period of time.

ARTERIAL LINE ④

A small tube or catheter that is inserted into the artery to continuously monitor the blood pressure.

PULSE OXIMETER ⑤

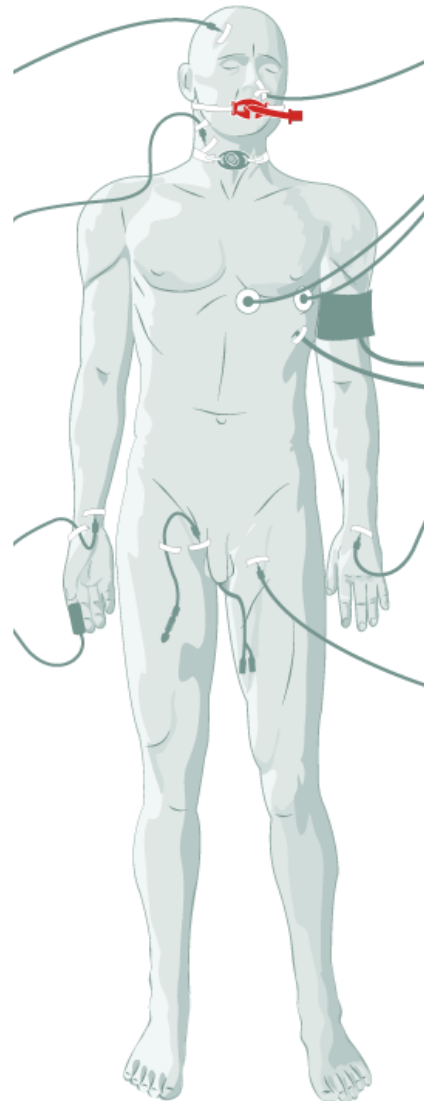
A small probe attached to the finger, nose, or ear that helps monitor the oxygen in the blood and the patient's pulse.

DIALYSIS CATHETER ⑥

A tube-like catheter inserted in the groin or neck. The catheter is hooked up to external tubing and a dialysis machine, which cleans the blood and assists the kidneys.

FOLEY CATHETER ⑦

A catheter inserted to the bladder to drain the urine into a bag.



NASOGASTRIC TUBE ⑧

A tube inserted into the stomach or intestines to provide nutrition and remove gastric acid or secretions.

ENDOTRACHEAL TUBE (ETT) ⑨

A breathing tube inserted through the mouth or nose that is connected to an assisted breathing machine (ventilator).

HEART MONITOR LEADS ⑩

Sticky pads are placed on the chest of almost every ICU patient in order to monitor the electrical activity of the heart.

BLOOD PRESSURE CUFF ⑪

A large cuff placed on the arm or the leg, which may be automatically or manually inflated so that the amount of pressure in the arteries can be evaluated.

CHEST TUBE ⑫

A larger tube inserted between the skin on the chest and the lungs. This tube removes free air or blood that may make it difficult for the patient to breathe.

PERIPHERAL IV ⑬

A small plastic tube placed into the vein, which is used to give fluid or medications.

INTRA-AORTIC BALLOON PUMP (IABP) ⑭

A catheter inserted into the groin, which assists the heart with pumping blood.

Sources: MyICUCare.org

<http://www.theglobeandmail.com/life/health/end-of-life/the-links-to-life-for-a-patient-in-critical-care/article2246280/#>

Summary of Selected Airways, Catheters, Tubes, and Monitoring Equipment

	Name	Components	Entry Site/ Terminus	Normal Values (if applicable)	Purpose	PT Considerations
Common medical monitoring devices, catheters, and tubes						
1	Electrocardiogram (ECG or EKG)	<ul style="list-style-type: none"> Electrodes Leads (connect to electrodes) Cables (connect to leads) Cables to monitor 	E: Electrodes on patient's chest wall (3-12 total) T: Electrodes connect to leads and leads to cables and cables to monitor	Adults (resting) 60-100 Adult athletes 50 10 yr 70-110 Preschool 80-120 1 yr 80-160 Newborn 90-170 ¹	Monitor heart rhythm	Monitor patient's HR and correlate any symptoms reported by pt w/ monitor output Ensure sufficient slack so cables don't get caught on bed
2	Pulse Oximeter (SpO ₂)	<ul style="list-style-type: none"> Peripheral probe / Sensor Cable (connected to sensor) Cable to monitor 	E: Most common for PT – fingers, earlobe, toes, could use forehead or cheek if poor peripheral perfusion ² T: Monitor	>94% ³	Monitor oxygen saturation	Monitor patient's SpO ₂ and correlate any symptoms reported by pt w/ monitor output Impaired accuracy with SpO ₂ <80% ²
3	Peripheral venous catheter (Peripheral IV or "PIV" or "IV")	<ul style="list-style-type: none"> Hollow catheter advanced over a needle and inserted into a vein⁴ IV bag and solution set⁵ 	E: Peripheral vein T: Peripheral vein	N/A	Deliver drugs, IV fluid, blood, contrast media ⁴	Caution with pedal IVs
4	Urinary Catheter ("Foley")	<ul style="list-style-type: none"> Urinary catheter Tubing and collection bag⁶ 	E: Vagina or penis T: Bladder	N/A	Obtain urine specimens, monitor volume status and renal perfusion ⁶	Keep drainage bag below level of bladder ⁷
5	Nasogastric Tube (NG)	<ul style="list-style-type: none"> Nasogastric tube or orogastric tube Suction tubing or drainage bag⁸ 	E: Nose (NG) or mouth (OG) T: Stomach	N/A	Feeding, drainage of gastric contents, drainage or lavage after poisoning (if indicated), stomach decompression ⁸	

	Name	Components	Entry Site/ Terminus	Normal Values (if applicable)	Purpose	PT Considerations
Artificial airways						
1	Endotracheal tube (ETT)	<ul style="list-style-type: none"> Endotracheal tube Ventilator circuit 	E: Mouth or nose T: Mid-trachea, below the vocal cords, 3-7 cm above the carina ⁹	Respiratory rate: 12-20 breaths per minute ¹	Airway control or protection (for general anesthesia, obstruction, aspiration, respiratory failure); facilitate mechanical ventilation ⁹	Cuffed tubes – prevents air leaks to allow ventilation; prevent aspiration of gastric contents Pediatric tubes may NOT be cuffed Ensure tube is firmly secured before initiating any mobility
2	Tracheostomy (“Trach”)	<ul style="list-style-type: none"> Outer cannula Inner cannula Obturator¹⁰ 	E: Inferior border of cricoid cartilage ¹¹ ; sutured in place T: Trachea	Respiratory rate: 12-20 breaths per minute ¹	Bypass upper airway Clean and remove secretions from an airway Deliver oxygen to the lungs ¹²	Watch for cuffed and cuffless trachs Video: http://www.hopkinsmedicine.org/tracheostomy/index.html
Arterial and venous catheters						
1	Arterial Catheter (“Art line”)	<ul style="list-style-type: none"> Catheter Transducer IV tubing Pressure bag Cable to monitor 	E: radial (most common), femoral, pedal, or brachial artery; sutured in place T: radial (most common), femoral, pedal, or brachial artery	Systolic: 85-140 mmHg ¹ Diastolic: 40-90 mmHg ¹ MAP: 70-110 mmHg ¹	Monitor arterial blood pressure; arterial blood gas draws	Look for good waveform
2	Central Venous Catheter (“Central line”); Central venous pressure (CVP)	<ul style="list-style-type: none"> Catheter (single to quadruple lumens)¹³ Transducer IV tubing Pressure bag (if CVP) Cable to monitor 	E: Internal Jugular, Subclavian, or Femoral vein; sutured in place T: Superior vena cava (IJ or subclavian) ¹⁴ ; Inferior vena cava (Femoral)	CVP: 2 to 6 mmHg ¹⁴	Central venous catheter – administer meds, fluid, TPN, dialysis ¹³ , bloodwork CVP = R atrial pressure; indirectly R ventricular end-diastolic pressure	Note Ciesla article incorrect re: line placement (NOT R atrium; if R atrium, risk of arrhythmias)
3	Peripherally Inserted Central Catheter (PICC)	<ul style="list-style-type: none"> Catheter IV tubing 	E: Brachial or cephalic vein (most common) ¹⁵ T: Superior vena cava ¹⁵	N/A	Medium to long-term IV therapy, total parenteral nutrition, pts with poor venous access ¹⁵	Do not take blood pressure measurements in the arm with PICC line

	Name	Components	Entry Site/ Terminus	Normal Values (if applicable)	Purpose	PT Considerations
4	Dialysis catheter (temporary)	<ul style="list-style-type: none"> Catheter Dialysis tubing 	E: Internal Jugular, or Femoral vein (subclavian not as common) ¹⁶ ; sutured in place T: Superior vena cava (IJ, subclavian); Inferior vena cava (Femoral) ¹⁶	N/A	Dialysis (intermittent or continuous)	Communicate w/ team re: timing of PT during dialysis; is feasible to do PT during dialysis in outpatient setting
5	Swan-Ganz or Pulmonary Artery Catheter	<ul style="list-style-type: none"> Via central venous catheter with special pulmonary artery lumens¹⁷ Transducer IV tubing Pressure bag Cable to monitor 	E: Internal Jugular, subclavian, or femoral vein ¹⁷ ; sutured in place T: Pulmonary artery ¹⁷		Hemodynamic monitoring tool: Central venous oxygenation; cardiac output; Wedge pressure - left ventricular end diastolic pressure (indirect) ¹⁷	Communicate w/ team re: patient severity of illness; Avoid therapy when balloon tip is inflated
Neurologic						
1	Intracranial pressure monitor (ICP)	<ul style="list-style-type: none"> Ventricular catheter¹⁸ Transducer Cable to monitor 	E: via burr hole or tunneled catheter or bolted catheter or intraventricular approach in cranium ¹⁸ T: Subdural, parenchymal, or ventricular space (dependent on patient) ¹⁸	0-10mm Hg ¹⁸	Monitor cerebral perfusion	Communicate w/ team re: patient severity of illness
2	Extraventricular drain (EVD)	<ul style="list-style-type: none"> Ventricular catheter¹⁸ Transducer Cable to monitor 	E: via burr hole or tunneled catheter or bolted catheter or intraventricular approach in cranium T: Subdural, parenchymal, or ventricular space (dependent on patient)	N/A	Cerebral spinal fluid drainage	Communicate w/ team re: patient severity of illness Retrospective case series considered pts with ICP <15mm for mobilization; presence of EVD did not preclude mobilization ¹⁹

	Name	Components	Entry Site/ Terminus	Normal Values (if applicable)	Purpose	PT Considerations
Other						
1	Chest Tube	<ul style="list-style-type: none"> Chest tube Pleural drainage system²⁰ Petroleum gauze May be connected to wall suction 	E: Between 4 th and 5 th intercostal space ²⁰ (or as indicated); sutured in place T: Between pleura and lung ²⁰	N/A	Pneumothorax, hemothorax, chylothorax, pleural effusion, post-operative ²⁰	Pneumothorax – will d/c chest tube after pleural drainage system stops bubbling ²⁰ Pleural effusion - will d/c chest tube if drainage <200 mL in 24 h period ²⁰
2	Epidural Catheter	<ul style="list-style-type: none"> Epidural catheter Epidural tubing 	E: Thoracic spine T: Approximately 3-5" from insertion into epidural space ²¹	N/A	Pain relief	Watch hypotension with low pain levels ²² Screen motor function before mobility ²³
3	Ventricular assist device (VAD)	<ul style="list-style-type: none"> Pump Cannula Driveline Controller Power source²⁴ 	E: Inflow: If L ventricle: apex of L ventricle or descending aorta; if R ventricle: R atria T: Outflow (L Ventricle)= ascending aorta; (R Atria) pulmonary trunk	N/A	Circulatory assist	Most devices implanted via median sternotomy – risk of wound dehiscence; consider institutional sternal precautions ²⁴

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