ICU, Emergency Department (ED), General Internal Medicine (GIM) and COVID-19 Testing Assessment Centre COVID-19 Physician Assistant Support Team Medical Directive

Table of Contents

Hamilton Health Sciences

AUTHORIZING MECHANISM
Medical Directive and/or Delegation

Title: MAC – MD – No. 50009 ICU, Emergency Department (ED), General Internal Medicine (GIM) and COVID-19 Testing Assessment Centre Physician Assistant (PA) COVID-19 Support Team Medical Directive

Number: 50009

Activation Date: 2020 04 01 **Next review due by: 2022 04 01**

Approved by: MAC **Date: 2020 04 01**

Sponsoring/Contact Person(s) Dr. Michael Stacey, Executive Vice President, Academic and Chief Medical Executive, ext 42030

Order/Description of Procedure:

Authorized Controlled Act: yes X no ☐ Delegated Controlled Act: yes X no ☐ Other: yes ☐ no X

The Physician Assistants (PAs) working with supervising/authorizing physicians in Emergency Departments (ED), Adult Critical Care (ICUs), General Internal Medicine (GIM) and the COVID-19 Testing Assessment Centre at Hamilton Health Sciences will provide care to adult patients, including:

1. Perform and enable performance of Controlled Acts and Procedures (Appendix)
2. Start, Adjust, Hold and D/C medications, including blood and blood products (Appendix).
3. Requisition Investigations (Appendix)
4. Order Laboratory Tests
5. Order Diagnostic Tests (DI/NM)
6. Make Referrals (Appendix)
7. Sanction Patient Flow (Appendix)
8. Accept and document verbal orders from physicians, but may not give verbal orders

Physician Assistants (PAs) may only perform those medical services which they are competent to perform and which are consistent with the PA's education, training and experience. PAs shall consult with the supervising physician regarding any

task, procedure or diagnostic problem which the PA determines exceeds their level of competence, or shall refer such cases to a supervising physician or delegate.

The PA shall perform medical services only when there is an appropriate level of supervision by a physician who has agreed to this medical directive. The physician and the PA must ensure there is a communication path that will enable the PA to identify the physician responsible for the care of the patient in order to contact them immediately, if necessary.
******All patients must be registered to a supervising, attending physician who has agreed to this directive.

Authorized by:
Sponsoring Physician/Health Professional(s):

Dr. Michael Stacey, Executive Vice President, Academic and Chief Medical Executive

Approving Physician(s)/Health Professional(s) to Whom this Directive Applies:
On behalf of all physicians working in their departments:

Dr. Kuldeep Sidhu, Chief, Emergency Medicine
Dr. Khalid Azzam, Physician-In-Chief, General Internal Medicine
Dr. Corey Sawchuk, Chief, Critical Care Medicine
Note: Physician Redeployment Principles During Public Health Emergencies: COVID-19 (Draft March 25, 2020)

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Title: MAC - MD - No. 50009 ICU, Emergency Department (ED), General Internal Medicine (GIM) and COVID-19 Testing Assessment Centre COVID-19 Physician Assistant Support Team Medical Directive

Indications:

These medical directives may be implemented by the Physician Assistants (PAs) for inpatients/outpatients:

- in the ICUs, EDs, GIM and the COVID-19 Testing Assessment Centre at all Hamilton Health Sciences sites
- whose MRP is one of the supervising physicians for these medical directives,
- who meet the specific indications as outlined in the directive and its appendices, and
- who have provided consent, or their Substitute Decision Maker (SDM) has provided consent for the proposed intervention/treatment

Contraindications:

These medical directives may not be implemented if:

- any of the indications above are not met, or
- the PA assesses that they are not competent to perform the proposed intervention/treatment which exceeds their level of competence based on their current education, training and experience, or
- if there is a specific contraindication (as per Appendices) for a proposed intervention/treatment, or
- patient or SDM does not consent

Process for Implementing the Procedure:

In general, each action/procedure under each directive will be implemented in the context of a collaborative relationship with the supervising physician(s). Some actions/procedures will be implemented as the result of a discussion with the physician immediately prior to implementation (Type 2 Procedure). Other procedures will be implemented without specific prior discussion but as part of the plan of care as per the indications and contraindications for each of the directives (Type 1 Procedures).

In implementing the directives the PA will:

a) Ensure a physician supervisor(s) or a designate, including residents and fellows, is available for consultation.

b) Apply the clinical reasoning process to each patient to guide the appropriateness of implementing the medical directives. This will include an assessment, i.e. history (chief complaint, history of present illness, past medical history, medications, allergies, social history, family history, review of systems, physical examination (focused examination), application of clinical reasoning process to determine differential findings and evidence-based plan for addressing the findings.

c) Provide timely reporting of any developments and/or change in patient status that would affect the established medical plan of care to the supervising physician.

d) Implement the directives according to the specific conditions/ indications/ contraindications in the attached appendices and obtain patient consent for doing so.

e) The PA will implement part or all of the medical directives according to their current level of knowledge, skill and clinical judgment as per the Physician Assistant's Competency Checklist, the scope of practice of the supervising physician(s) and the CPSO regulations regarding authorizing mechanisms and PA practice in Ontario.
f) Obtain patient/SDM consent prior to implementing any part of the medical directive, unless in an emergency situation where prior consent cannot be obtained.

Management of Untoward Outcomes
The PA will immediately notify a supervising physician and/or the sponsoring physician, Dr. M. Stacey, of any untoward outcomes. If circumstances permit, a supervising physician or their delegate will be readily available to the PA during the time that the PA is working in their service.

Documentation/Communication Requirements for Medical Directives

1. On the patient care order sheet, document the procedure(s) that was/were implemented "as per Medical Directive #50009*."*
2. Document the patient's symptoms and the indications for performing the procedure, consent, the response to the procedure, and any other necessary information in the patient's health record.
3. Include the following information when completing requisitions for investigations:
    - the name of the patient's most responsible physician
    - the reason for the test/procedure being requested
    - the current history and pertinent results of other investigations (e.g. creatinine, e-GFR, patient age and weight for CT and MRI)
    - that the test/procedure is requisitioned under authority of Medical Directive #50009
    - the printed name, signature and designation of the PA implementing the directive
4. For Type 2 actions/procedures, the PA will document the occurrence and nature of the procedure and prior authorizing discussion with the Supervising Physician in the patient's health record.
5. In their medical management of the patient, the Supervising Physician(s) will take into account implementation of the directive as documented in the patient's health record by the PA.

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Quality Monitoring Processes:

The following processes will be used to maintain appropriate implementation of the directive and guide action if inappropriate, unanticipated and/or untoward outcomes result:

- The staff member who identifies any inappropriate, untoward or unanticipated outcomes resulting from implementation will immediately notify the PA and Supervising and/or Authorizing Physician who will immediately trigger an ad hoc review as per AMPDM - Authorizing Mechanisms Protocol
- This medical directive will be reviewed in six months after initial activation and then in one year, then biennially thereafter according to the Implementation Proposal for this directive and the processes identified in the AMPDM - Authorizing Mechanisms Protocol.
- This medical directive can be placed on hold if routine review processes are not completed, or if indicated for an ad hoc review. During the hold, the PA cannot perform the procedure under authority of the directive and must obtain direct, patient-specific orders for the procedure(s) until it is renewed. Program and Medical Directors or designates will notify staff of any hold on the directive.
- The supervising physician(s) will be responsible for critiquing the quality, accuracy and relevance of the PA's participation or decision-making skills in the clinical setting to determine the impact of the utilization of laboratory testing, diagnostic imaging or other clinical intervention on clinical outcomes. If there are any concerns or constructive feedback regarding their practice, they are informed in real time.
- Upon renewal of the directive, the PAs will be re-authorized to implement it.
- The PA will demonstrate participation in relevant educational updates offered by the Diagnostic Imaging, General Internal Medicine and Emergency Departments, and Critical Care.

Developed and Agreed to by:

Dr. Michael Stacey, Executive Vice President, Academic and Chief Medical Executive
Tanya Roglich, Interim Manager, Medical Affairs
Dr. Julian Owen, Emergency Physician, Intensivist, & Trauma Team Leader, HHS, Site Lead, ICU West, HGH
Olivia Ramsay, PA, ICU West

Resources/References:

List A

Andersen, Ilene B. Poisoning and Drug Overdose Pharmacokinetic Data table, McGraw-Hill through Access Medicine July 2011.

Arizona Center for Research and Education on Therapeutics. "QT Drug Lists by Risk Groups", www.qtdrugs.org

Bojar, Robert M. Perioperative Care in Adult Cardiac Surgery. 4th ed. Massachusetts: Blackwell Publishing Inc. 2009.

Butler, Ronald J. Neurologic Complications and Management. In Davy C.H. Cheng and Tirone E. David. Perioperative care in Cardiac Anesthesia and Surgery. Philadelphia: Walters Kluwer, Lippincott Williams and Wilkins, 2006:415-419.

Callum, JL et al. Bloody Easy 3: Blood Transfusions, Blood Alternatives and Transfusion Reactions: a Guide to Transfusion Medicine. 3rd edition, 2011.

Canadian Pharmacists Association. RxTx. Ottawa: Canadian Pharmacists Association. https://www-e-therapeutics-ca.libaccess.lib.mcmaster.ca. Accessed on March 16, 2017.

Cheng, Davy C. H. And Tirone E. David eds. Perioperative Care in Cardiac Anesthesia and Surgery. Philadelphia: Walters Kluwer, Lippincott Williams and Wilkins, 2006.
ePOCRATES medication reference on-line application

Gehlbach Brian, Kress John P, "Chapter 14. Pain Control, Sedation, and Use of Muscle Relaxants" (Chapter). Hall JB, Schmidt GA, Wood LDH: Principles of Critical Care, 3e: http://www.accessmedicine.com/content.aspx?aID=2283228.

Goodman & Gilman's The Pharmacological Basis of Therapeutics, 12e. Laurence L. Brunton, Bruce A. Chabner, Björn C. Knollmann. Editors of the online edition: Editor-in-Chief: Laurence L. Brunton, Associate Editors: Donald K. Blumenthal, Nelda Murri, and Randa Hilal-Dandan

Consulting Editor: Björn C. Knollmann, eds. http://www.accessmedicine.com
HHS . Cardiac NP 5S directives, 2011

Karski, Jacek M. and Ketvan Karkouti . Antifibrinolytics and Coagulation Management. In Davy C.H. Cheng and Tirone E. David, eds. Perioperative care in cardiac Anesthesia and Surgery. Philadelphia: Walters Kluwer, Lippincott Williams and Wilkins, 2006:165-171.

Katzung, Betram G., Susan B. Masters, and Anthony J. Trevor. Basic Clinical Pharmacology, 11e. Lange: New York , 2009.

Lamy A, Romeril E, Syed S, Fox-Robichaud A, & Roglich T. Dexmedetomidine Prophylaxis Powerpoint Presentation. Presented at: Dexmedetomidine Initiative Information Night; February 16, 2017; Hamilton General Hospital.

Lemmer, John H. And Gus J. Vlahakes. *Handbook of Patient Care in Cardiac Surgery, 7th ed.* Philadelphia: Wolters Kluwer Medical, Lippincott Williams and Wilkins, 2010.

Masharani Umesh, "Chapter 27. Diabetes Mellitus & Hypoglycemia" (Chapter). McPhee SJ, Papadakis MA: CURRENT Medical Diagnosis & Treatment 2011: http://www.accessmedicine.com/content.aspx?aID=15524.

Medscape Drug Reference. Medscape. http://reference.medscape.com/drugs. Accessed on March 16, 2017.

Michel Thomas, Hoffman Brian B, "Chapter 27. Treatment of Myocardial Ischemia and Hypertension" (Chapter). Brunton LL, Chabner BA, Knollmann BC: Goodman & Gilman's The Pharmacological Basis of Therapeutics, 12e: http://www.accessmedicine.com/content.aspx?aID=16667490.

Olson, James. Clinical Pharmacology Made Ridiculously Simple. Miami: Medmaster Inc., 2011.

Preston, John and James Johnson. Clinical Psychopharmacology Made Ridiculously Simple. 6th ed. Miami: Medmaster Inc., 2009.

Ryan KJ, Ray CG, "Chapter 23. Antibacterial Agents and Resistance" (Chapter). Ryan KJ, Ray CG: Sherris Medical Microbiology, 5e: http://www.accessmedicine.com/content.aspx?aID=6941990.
University of Toronto, Department of Anesthesia. "Replacement Therapy", http://www.anesthesia.utoronto.ca/edu/cme/courses/m08/m08p09.htm, accessed July 29, 2011.

Webert, Kathryn. "Indications for Transfusion Support", Presentation at 3rd McMaster University Review Course in Internal Medicine", March 30th – April 2, 2011.

Whitlock, Richard, Mark A. Crowther and Heng J. Ng. "Bleeding in Cardiac Surgery: Its Prevention and Treatment – an Evidence-based Review". Critical Care Clin. 21 (2005) 589-610.

List B

Hamilton General Hospital (2018): Acute Care Surgery Physician Assistant Medical Directive #60011

St. Joseph's Healthcare, Hamilton (2015): Physician Assistant Medical Directive: General Surgery Service

Sunnybrook Health Sciences Centre (2014): Medical Directive/Delegation of Controlled Acts: Physician Assistant in General Surgery

Hamilton Health Sciences (2016): Physician Assistant Medical Directive: Adult Neurosurgery Physician Assistant (PA) Medical Directives

American Association of Surgical Physician Assistants
http://www.aaspa.com/page.asp?tid=122&name=Neurosurgery&navid=32

CHEP Guidelines 2013.
https://www.hypertension.ca/accredited-cpd-modules/scroller/tabs/chep-2011-recommendations-slide-kits/chep-2013-recommendations-slide-kits/downloads
College of Physicians and Surgeons of Ontario (revised 2012) Delegation of controlled acts. (Policy #4-03)
https://www.cpso.on.ca/Physicians/Policies-Guidance/Policies/Delegation-of-Controlled-Acts
Bickley, L.S. & Szilagyi, P.G. (2009). Bates' Guide to Physical Examination & History Taking, Tenth Edition. Philadelphia: Wolters Kluwer Health / Lippincott Williams & Wilkins

Chen, Y.A. & Tran, C. (2011): Toronto Notes, Comprehensive Medical Reference & Review for MCCQE I & USMLE II, 27th Edition. Toronto: Toronto Notes for Medical Students Inc

Fischbach, F., & Barnett, M (2009). A Manual of Laboratory & Diagnostic Tests. Lippincott Williams & Wilkins.

Greenberg, M.S. (2010). Handbook of Neurosurgery. New York: Thieme Publishers

Hamilton Health Sciences (2019) Cardiovascular Critical Care Physician Assistant Medical Directive

Hamilton Health Sciences (2019): Adult Acute Medicine Physician Assistant Medical Directive

Hamilton Health Sciences (2019): Acute Care Surgery Physician Assistance Medical Directives Physician Assistant Medical Directive

Hamilton Health Sciences (2019): Physician Assistant Gynecological/Oncology Medical Directive

Hamilton Health Sciences (2019): Adult Neurosurgery Physician Assistant Medical Directive

Hamilton Health Sciences (2019): Adult Acute Spinal Cord Injury in Adults – Master Medical Directive (NP)

Hamilton Health Sciences (2020). *Drug Formulary.* https://hub.hhsc.ca/about-us/hhs-teams/pharmacy/Pages/Pharmacy-and-Therapeutics-Committee.aspx

Hayden-Cephart, M.C. (2014). Tarascon Neurosurgery Pocketbook. Burlington, MA: Jones & Bartlett Learning

Hooker, R.S., Cawley, J.F.,& Asprey, D.P. (2009).Physician Assistants: Policy and Practice. Philadelphia, PA: F.A. Davis Company

Hui, D. (2011). Approach to Internal Medicine; A Resource Book for Clinical Practice. Houston: Springer Science

Hui, D., Thompson, A., Hamilton, P. (2011). Drugs & Drugs, A practical Guide to the Safe Use of Common Drugs in Adults. Edmonton: Department of Medicine, University of Alberta

Liebenberg W.A. & Johnson, R.D. (2010). Neurosurgery for Basic Neurosurgical Trainees; Second Edition. Carnforth: Hippocrates Books

McCance, K.L, Huether, S.E., Brashers, V.L., & Rote, N.S. (2010): Pathophysiology; the Biological Basis for Disease in Adults and Children, 6th Edition. Maryland Heights, Missouri: Mosby Elsevier

MOH&LTC, OHA PA Hospital Demonstration Site Toolkit, 2007, Ontario

Oyama, K. & Criddle, L. (2004). *Vasospasm After Aneurysmal Subarachnoid Hemorrhage*. Critical Care Nurse; The Journal for High Acuity, Progressive, and Critical Care. American Association of Critical-Care Nurses

PA Toolkit, Canadian Association of Physician Assistants, 2012

Ramnarayan, R. Arulmurugan, B., Wilson, P.M., Nayar, R. (2008). Twist drill craniostomy with closed drainage for chronic subdural haematoma in the elderly: An effective method. *Clinical Neurology and Neurosurgery 774-778.* Elsevier

Roundy, N. (2012). Neurosurgery Survival Guide.

Sharma, S., Nathans, A., & Rutka, J. Acute Neurosurgical Consultation Guidelines. Criticall Ontario. https://www.criticall.org

Tortora, G.J. & Derrickson, B. (2012): Principles of Anatomy & Pathophysiology., 13th Edition. John Wiley & Sons Inc.

Winnipeg Regional Health Authority (2012): Physician Assistant Medical Directive: Neurosurgery Services and Surgery Program

HealthForce Ontario (2007) Defining the Physician Assistant Role in Ontario: Ontario Physician Assistant Scope of Practice Statement and Ontario Physician Assistant Competency Profile. http://www.healthforceontario.ca/upload/en/work/defining%20the%20role%20of%20physician%20assistant%20scope%20of%20practice%20and%20competencies%20document_%20may%209%202007.pdf

Narcotic Control Regulations made under the *Controlled Drugs and Substances Act*, S.C., , c. 19.

Narcotic Control Regulations made under the *Controlled Drugs and Substances Act,* S.C., c. 19.
Schedule G of the Regulations under the *Food and Drugs Act,* S.C., , c. F-27.
Benzodiazepines and Other Targeted Substances Regulations made under the Controlled Drugs and Substances Act, S.C.

Canadian Association of Radiologists
https://car.ca/patient-care/practice-guidelines/

American College of Radiology: ACR Appropriateness Criteria.

Royal Australian and New Zealand College of Radiologists
https://www.ranzcr.com/college/document-library/
https://www.ranzcr.com/

Related Policies and Procedures:
Physician Redeployment Principles During Public Health Emergencies: COVID-19 (Draft March 25, 2020)
AMPDM - Authorizing Mechanisms Protocol
DI - Irradiation of Pregnant Patients
MAC - Consent, Withdrawal or Refusal of Consent for Treatment Policy
VAT - Initiation of Peripheral Vascular Access Device (PVAD) and Blood Sampling Adult and Pediatric Patient Protocol
VAT - Intravenous Therapy (IV) Protocol - Adult and Pediatric IPC - Restraint Protocol

APPENDIX: CONTROLLED ACTS AND PROCEDURES

Type 1 Controlled Acts and Procedures (CAPs): CAPs the PA will implement as part of the medically established plan of care, without specific discussion with a supervising physician immediately prior to implementation.
Type 2 CAPs: CAPs the PA will implement only after discussion with a supervising physician to identify the procedure.
Note: The PA will collaborate with the attending physician when a patient's condition changes, or their condition is outside of the scope of practice of the PA.

Controlled Acts and Procedures				**Type**
Perform and Enable Performance	**Indications**	**Contraindications**	**Potential Complications of Procedure**	
Complete COVID Risk Status (CRS) Order Set at time of admission (P)	Inpatient admission			1
Activity level (P,E)	Activity level may be determined after assessment by the PA to enhance patient safety and satisfaction.	If patient's status is unstable and an activity level cannot be safely determined, bed rest will be ordered and the physician or designate will be consulted for further discussion.	Risk of falling if weak or syncopal episode.	1
Admission, history and focused physical, daily progress notes, transfer notes, orders – obtain, perform and document (P,E)	Focused physical exam on admission and transfer, as well as daily as part of clinical assessment. Admission and transfer orders per Appendix: Sanctioning Patient Flow. Per HHS policy: IPC - Documentation of Patient Care in the Health Record Policy	Patient refusal of physical examination. Anesthesiologist not present or patient hemodynamically unstable. Complex patient or procedure such that anesthesiologist feels it requires handover to attending physician		1

Controlled Acts and Procedures				Type
Perform and Enable Performance	**Indications**	**Contraindications**	**Potential Complications of Procedure**	
	Anesthesiologist transferring patient from O.R., or patient transferred from another unit or another hospital to ICU.			
Aerochamber (E)	The device is intended to be used by these patients to administer aerosolized medication from most pressurized Metered-Dose Inhalers. To improve medication delivery, decrease deposition of medication in the mouth and throat, and eliminate the need to coordinate activating the MDI with inhaling the medication.	The patient will require direction and teaching on how to use the aerochamber correctly.		2
Airway - use manual maneuvers to position and maintain patent airway (P,E)	Indications: as directed by physician during assist.	Traumatic c-spine injury.		1
Application of energy: cardioversion (P,E)	In accordance with ACLS guidelines: Tachycardia with serious signs and symptoms (for HR greater than 150) Monomorphic VT with pulse PSVT Afib A flutter For polymorphic VT/VF use VT/VF algorithm	May give trial of medication briefly; if hemodynamically compensated; if poison/drug-induced tachycardia.	Cardioversion-associated thromboembolism when used for atrial fibrillation or atrial flutter. Possible damage to myocardium from electrical cardioversion	2

Controlled Acts and Procedures				Type
Perform and Enable Performance	**Indications**	**Contraindications**	**Potential Complications of Procedure**	
	Manage situation until arrival of MD, then assist.			
Application of energy: defibrillator (P,E)	In accordance with ACLS guidelines: first intervention for VF or pulseless VT. Manage the situation until arrival of MD, then assist.	If temp below 30 degrees, do not defibrillate more than 3 times; raise temp before next attempt at defibrillating; place paddles and pads several inches away from internal pacemaker/defibrillator.	Possible damage to myocardium from electrical cardioversion.	1
Application of energy: initiation of transcutaneous pacing (P,E)	In accordance with ACLS guidelines: Unstable bradycardia. Manage situation until arrival of MD, then assist.	Pain if awake; if temporary transvenous or epicardial pacer available, use first line.	Discomfort and skin irritation	1
Arterial Line – insertion, discontinuation, removal (P,E)	Insertion: serial ABGs or frequent bloodwork; continuous blood pressure monitoring; titrating vasopressors or inotropic medications. Post-procedure: square-wave test; review necessity of line daily; inspect for distal perfusion daily. Discontinuation: Line no longer needed for hemodynamic monitoring or blood sampling; line infection.	Absolute contraindications: insertion into burn, infected site or traumatized artery; site with radial grafts; limb with poor perfusion or ischemia distal to cannulation. Relative contraindications to insertion of arterial line: bleeding diasthesis/coagulopathy; high-dose heparin; recent systemic thrombosis; Raynaud's disease. Contraindications of discontinuation: if baseline		2

Controlled Acts and Procedures				Type
Perform and Enable Performance	**Indications**	**Contraindications**	**Potential Complications of Procedure**	
	In accordance with procedure as outlined in HHS policies: CRIT CARE - Radial Arterial Line Insertion, Setup and Maintenance Protocol CRIT CARE - Arterial Line Removal Protocol	coagulation studies (CBC, INR, PTT, fibrinogen) are outside normal limits.		
Bag-Mask Valve Ventilation - perform 1 and 2 person (P,E)	As directed by physician		Air leak around the mask	1
Bladder Management (E) Catheterization • Indwelling • Intermittent Bladder Scanning	Catheterization to obtain urine samples; to empty the bladder intermittently in patients experiencing urinary retention; to accurately monitor urinary output when indicated (i.e. during diuresis or dehydration/rehydration); and for patients with skin breakdown, mobility impairments and urinary incontinence to promote wound healing. Bladder scanning to assess post residual volumes in the bladder and assess for urinary retention.	Indwelling catheters increase the risk of urinary tract infection and therefore will be used only if absolutely necessary and for as short a duration as possible. Contraindicated in patients with known urethral obstruction; Internist or designate consultation to be sought.		2

Controlled Acts and Procedures				Type
Perform and Enable Performance	**Indications**	**Contraindications**	**Potential Complications of Procedure**	
Central Venous Access Device – insertion, including: (P,E) **Internal jugular vein** **Subclavian vein** **Femoral vein** **Dialysis catheters**	When benefit from use is expected to exceed risk of complication. To monitor CVP in acutely ill patient. To administer long-term antibiotics or parenteral nutrition or pain medication. To administer drugs prone to causing phlebitis: calcium chloride, chemotherapy, hypertonic saline, amiodarone, vasopressors (e.g. epinephrine, dopamine). Dialysis (use separate dialysis catheter). Frequent blood draws or persistent requirement for IV access. IV therapy if peripheral IV access is impossible: blood, medication, rehydration. Note HHS policies: VAT - Intravenous Therapy (IV) Protocol - Adult and Pediatric; VAT - Central Vascular Access Devices Adult Protocol	Uncooperative patient or no consent. Distorted anatomy, infection or trauma at insertion site. Relative contraindications: coagulopathy, INR greater than 1.6, platelets less than 50 000 Avoid subclavian if coagulopathy due to difficulty compressing and if higher risk for pneumothorax or if pneumothorax would not be tolerated.	Pneumothorax Central line associated blood stream infection Thrombosis Hemorrhage and hematoma Arrhythmias Arterial puncture Malposition Nerve Injury: Increased risk with inexperienced clinician or emergent procedure or patient with difficult anatomy.	2
Central Venous Access Device – removal (P,E)	Evidence of hemodynamic stability, suspect brachial plexus injury and/or adequate intravenous access.	May be contraindicated in hemodynamically unstable patients	Removal: bleeding. Insertion: risk of infection, bleeding	2

Controlled Acts and Procedures				Type
Perform and Enable Performance	**Indications**	**Contraindications**	**Potential Complications of Procedure**	
May include but not limited to: **CVP catheters** **Dialysis Catheters (temporary)** **Femoral catheters**	Preventive action for suspected line sepsis: infected site with evidence of infection; evidence of infection without infected site, for organism other than coagulase-negative Staph. VAT - Removal of Central Vascular Access Devices - Percutaneous Non-Tunneled and Peripherally Inserted Protocol – Adult Patients	Special consideration for patients with limited intravenous access or limited access for blood sampling Coagulopathy If line grows coagulase negative Staph, but no signs of systemic or site infection, discontinuation may not be necessary		
Chest Tube - insertion (P,E)	Pneumothorax – persistent, recurrent, under tension, bilateral, or in patient on positive pressure ventilation; recurrent or symptomatic large pleural effusion; hemothorax; empyema; chylothorax NUR - Closed Chest Drainage System - Maintenance, Insertion and Removal (Assisting with) - Adult Protocol	Coagulopathy Diaphragmatic hernia Lack of patient cooperation and consent	Complications may include: hemorrhage; infection; re-expansion pulmonary edema. May also cause injury to liver, spleen, diaphragm, lung, heart or aorta, and cause anxiety, pain, seroma, hematoma, dyspnea and cough.	2
Chest Tube - removal (P,E)	Procedure outlined in HHS policy: NUR - Closed Chest Drainage System - Maintenance, Insertion and	Coagulopathy Pneumothorax Continued drainage from chest tube/bubbling	If bleeding, air or fluid production, clogging can cause tamponade, tension pneumothorax, empyema or infection.	2

Controlled Acts and Procedures				Type
Perform and Enable Performance	**Indications**	**Contraindications**	**Potential Complications of Procedure**	
	Removal (Assisting with) - Adult Protocol CRIT CARE - Removal of Chest Tube (Mediastinal and/or Pleural) - Procedure			
Code Status/Post Orders - assist physician in discussion of (P,E)	Code status may be discussed / documented on behalf of the patient/substitute decision-maker in (SDM) partner(s), in line with HHS policy. Physician to be complete final POST	Code status cannot be determined if the capacity of the patient and/or SDM is in question.	Patient or family misunderstanding information Potential to provide incorrect information Potential for clinical situation to change	2
Consent For a Procedure from Patient or SDM – obtain or witness (P)	In accordance with HHS policy: **MAC - Consent, Withdrawal or Refusal of Consent for Treatment Policy**	Patient not fully alert or awake; unclear determination of who is SDM	Patient or SDM may not understand information	1
CPAP – application of home device/hospital device (E)	Identified sleep apnea patients who have been using CPAP at home prior to admission for cardiac surgery.	History of recurrent or untreated pneumothorax Patient unable to protect airway (overly sedated) or at risk for aspiration		1

Controlled Acts and Procedures				Type
Perform and Enable Performance	**Indications**	**Contraindications**	**Potential Complications of Procedure**	
		Pathologically low blood pressure due to or associated with intravascular volume depletion Severe cardiac arrhythmias or coronary artery disease, stroke, seizures, bullous emphysema or asthma, epistaxis, facial trauma/burns, recent cranial or ENT surgery, basilar skull fracture		
Diagnosis - formulation and communication to patient (P,E)	Diagnoses will only be communicated to patient after discussion with physician			2
Diagnostic Imaging – order	Per Appendix: Investigations			
Diet And Nutrition Orders – initiate, adjust and discontinue, including: (P,E) • **Type** • **Modified textures** • **Fluid thickness** • **Diet supplements** • **Gastric-tube/enteral**	For establishing a diet and when a change in the patient's condition necessitates a change in the order. The PA will work in collaboration with the dietitian/SLP to determine nutritional plan of care.	Contraindications: GI ileus and pathology; patient who is NPO	Aspiration, perforation, diarrhea, nausea/vomiting	1

Controlled Acts and Procedures				Type
Perform and Enable Performance	**Indications**	**Contraindications**	**Potential Complications of Procedure**	
feeding and flushes • **Food and fluid records** • **Intake and output monitoring** • **TPN** **SLP assessments and recommendations**	Examples of diet orders - not limited to: Diet Type orders may include: NPO; DAT; No Added Salt; Low cholesterol, diabetic diet Diet Texture orders may include: Regular; Dental Soft; Chopped; Minced; Moist Minced; Pureed. Fluid Thickness Orders may include: Thin Fluids; No Thin Fluids. Diet Supplement orders may include: Ensure; High Protein Diets; High Energy Diets.			
Endotracheal Tube (ETT) - Extubation (P,E)	Per procedure outlined in HHS policy: RESP - Removal of Endotracheal Tube Extubation in Adult and Paediatric ICU	Ensure patient readiness, do not extubate patient too early, patient must be able to maintain airway on extubation	Stridor; patient unable to maintain airway	2
Endotracheal Tube (ETT) – Intubation, non-emergent cases (P,E)	Procedure outlined in HHS policy: RESP - Adult Oral Endotracheal Intubation Policy	Non-emergent cases only; defer to more experienced operator as required; conscious patient.	Trauma to larynx, vocal cords, upper airway, dentition, bleeding.	2
Glucose testing – point of care (E)	For patients who have a history of diabetes, or have signs/symptoms of hypoglycemia, hyperglycemia	Lack of consent		1

Controlled Acts and Procedures				Type
Perform and Enable Performance	**Indications**	**Contraindications**	**Potential Complications of Procedure**	
Intravenous Therapy – administer (P,E) **Initiate** **Discontinue** **Saline lock**	For patients who require IV medication or fluid replacement. The PA may adjust, bolus and discontinue IV solutions.	Hydration rates will be based on clinical judgment.		1
Laboratory Tests- order	Per Appendix: Investigations			2
Medication - advise patient on the proper/ appropriate use of (P,E)	Awake and alert patient with questions.	Patient who may not understand instructions or forget will require printed information, and to discuss medications prior to discharge.		1
Medication PO - administer (E)	Clinical decision based on most effective route(s) of administration of particular medication and clinical condition of patient.		Complications vary with medication as listed in Appendix – Medications.	1
Medication IM – administer (P,E)				
Medication IV - administer (P,E)				
Medication by inhalation – administer while demonstrating compliance with all departmental infection, prevention and control practices (E)				

Controlled Acts and Procedures				Type
Perform and Enable Performance	**Indications**	**Contraindications**	**Potential Complications of Procedure**	
Medication ocular - administer (E)				
Naso-Gastric Tube - insert (P,E)	Manage gastric/enteral secretions Prevent gastric distension Initiate enteral feed/medications for intubated patient	Traumatic injury to face/head/nasal passages; sinusitis	Nasal, esophageal irritation, trauma, minor bleeding; edema of nasal passages, causing decreased drainage and sinusitis; misplacement in lung causing trauma to lungs. Tube displacement, clogging; pulmonary aspiration; may increase oropharyngeal colonization, stagnation of oropharyngeal secretions, increased risk of reflux.	1
Negative Pressure Wound Therapy (NPWT) - initiate and discontinue (E)	For use in infected, open, draining wounds where wound healing is impaired	The PA will collaborate with the MRP and the skin wound and ostomy nurse to assess appropriateness of intervention.		2
Oro-Gastric Tube - insert (P,E)	Manage gastric/enteral secretions Prevent gastric distension		Irritation or traumatic injury to oropharynx, esophageal tissues; esophageal reflux, tube-induced incompetence	1

Controlled Acts and Procedures				Type
Perform and Enable Performance	**Indications**	**Contraindications**	**Potential Complications of Procedure**	
	Initiate enteral feed/medications for intubated patient		of the distal esophageal sphincter Injury to lungs	
Oropharyngeal Or Nasopharyngeal Airway – insert and demonstrate an understanding of the indications and contraindications of each (P,E)	To maintain airway	Nasotracheal contraindicated if patient has basilar skull fracture; anticoagulated patient.		1
Oxygen therapy – administer in compliance with the established departmental infection prevention and control practices (P,E)	To keep O2 sats 94-96%	May tolerate reduced O2 sat for COPD patient 88-92%		1
Paracentesis (E)	To relieve abdominal pressure from ascites; for diagnosis of spontaneous bacterial peritonitis, other infections or metastatic cancer.	Absolute contraindication is an acute abdomen requiring surgery. Relative contraindications are pregnancy, distended bladder, cellulitis, distended bowel, intra-abdominal adhesions		2
Peak Expiratory Flow Tests – perform (P,E)	Assessment of airflow obstruction	Severely dyspneic patients		1

Controlled Acts and Procedures				Type
Perform and Enable Performance	**Indications**	**Contraindications**	**Potential Complications of Procedure**	
Peripheral Intravenous - access and discontinue (P,E)	The PA may insert peripheral IV or may order the insertion or discontinuation for patients who require peripheral IV access Removal per procedure outlined in HHS policy: VAT - Removal of Central Vascular Access Devices - Percutaneous Non-Tunneled and Peripherally Inserted Protocol – Adult Patients includes Apheresis and Dialysis Catheters), *Except* for Pulmonary Artery Catheters, Tunneled Catheters, Implanted Ports and Long-term	Contraindications for Peripheral IV: Phlebitis Conditions which impede venous return such as paralysis or lymphedema Orthopedic or neurological impairments affecting the extremity Presence of dialysis grafts or fistulas		1
PICC Line Insertion – order for VAT Nurse (E)	When the benefit of use expected to exceed risk of complication. Patient with very difficult IV access Long term IV medication requirements (e.g. antibiotics for endocarditis)	Thrombosis Uncooperative patient No consent Active blood stream infection with positive cultures Disordered anatomy or trauma at insertion site	Hemorrhage and hematomas at site PICC line associated blood stream infections Accidental arterial puncture/injury Thrombosis	2

Controlled Acts and Procedures				Type
Perform and Enable Performance	**Indications**	**Contraindications**	**Potential Complications of Procedure**	
		Relative contraindications: Coagulopathy, INR greater than 1.6, platelets less than 50,000	Malposition	
Rectal Exam (P,E)	Rectal bleeding or pain; severe constipation For insertion of a Fecal Management System (FMS)	Patient refusal If patient has no rectal tone		1
Restraints (soft) - lap belt or geri-chair (E)	As per IPC - Restraint Protocol Situations where patient is at risk of injury or harming self or other, incapable patient at risk of leaving/withdrawing from care, to limit adverse behavior/combativeness.	Discontinue restraints as soon as possible.		1
Sample collection : (P,E) **Venous blood** **Arterial blood** **Minor surgical samples** **Sample collection: (E)**	As clinically indicated for culture, diagnosis and therapeutic decision-making. Per HHS policy: (continued) HRLMP - LCCP - 08-315-015 Specimen Collection Venous Blood by Venipuncture	Do not collect samples unless clinically-indicated. Arterial blood sample contraindicated if: negative Allen's test to hand (choose another site); infection or lesion at site or site distal to surgical shunt (e.g. dialysis catheter); peripheral vascular disease; coagulopathy (relative contraindication).	Complications of arterial blood sampling: Vascular insufficiency, bleeding, infection, arterial spasm, pulselessness, hematoma, air or clotted blood emboli, anaphylaxis from local anesthetic, trauma to vessel, arterial occlusion, vasovagal	1

Controlled Acts and Procedures				Type
Perform and Enable Performance	**Indications**	**Contraindications**	**Potential Complications of Procedure**	
Bodily secretions and fluids including sputum, urine, vaginal and wound drainage	HRLMP - LCCP - 08-315-012 Order of Draw for Venous Blood Collection Procedure	Do not collect blood samples if no action will be taken regardless of results, e.g. if Jehovah's Witness patient refusing blood products.	response, pain, needle-stick injury to HCP.	
Skin Care (E) • **Protectants** • **Pressure reducing surfaces**	For patients at risk for breakdown of skin integrity due to immobility, liquid stool, debilitation, poor nutritional/hydration status, and diabetes.	Protectants/pressure reducing surfaces to be ordered as listed in Medication Directive. PA will consult as necessary with the Skin Wound and Ostomy Nurse. Decision making to be assisted by the use of the Braden Scale.		1
Small Gauge Feeding Tube (including oro-gastric and naso-gastric tubes) – insert, adjust, discontinue (P,E)	In accordance with HHS policy: MAC - Small Gauge Feeding Tube Insertion and Placement Confirmation Protocol - Adult, utilize 2 step procedure for NG tube insertion per policy.	HHS Policy states: Relative Contraindications to oral/nasal tube placement include: Esophageal varices with recent banding or bleed. Recent ear, nose & throat or upper gastrointestinal surgery. Active upper GI Bleeding. Facial fractures.	Trauma to lung, perforation of GI tract on insertion; misplacement.	1

Controlled Acts and Procedures				Type
Perform and Enable Performance	**Indications**	**Contraindications**	**Potential Complications of Procedure**	
		Severe coagulopathies. Nasal insertion is contraindicated in patients with basal skull fracture, epistaxis or sinusitis. Note: Use the oral route if nasal route is contraindicated (e.g. basal skull fracture, sinusitis).		
Suctioning (P,E) • **Oral** • **Nasal** • **Tracheostomy**	For the removal of excessive upper respiratory secretions when patient's own clearance effort is inadequate. Per HHS policy: RESP - Suctioning Protocol	Physician or designate to be consulted immediately if evidence of acute respiratory distress.		1
Suture/Staple - removal (P,E)	For the removal of sutures/staples in patients with clean, dry incisions when the sutures/staples have been in situ for greater than or equal to 10 days.	If evidence of redness, pain, heat, swelling, purulent or sanguineous drainage, PA will collaborate with Physician or designate.		1
Telemetry - initiation and discontinuation (E)	Application: For patients admitted whose condition requires close cardiac monitoring. Reapplication in a post-operative patient for close monitoring of ECG rhythm. Discontinuation: When patient has been in a stable rhythm x 24 hours,	Precaution when initiating or increasing dosage of medications that may cause arrhythmias, bradycardia, or heart block.		1

Controlled Acts and Procedures				Type
Perform and Enable Performance	**Indications**	**Contraindications**	**Potential Complications of Procedure**	
	is hemodynamically stable, and no longer requires ongoing telemetry monitoring.			
Tensor Bandages (E)	To decrease edema in the affected limbs Compression bandage	Impaired skin integrity on affected limb or open wound infection may be a contraindication		1
Transfer of ICU patients to wards, other areas of HHS as required or external to HHS – documentation and orders (P,E)				2
Thoracentesis (P,E)	To diagnose cause for a pleural effusion or symptomatic relief of pleural effusion	Coagulation disorder, uncooperative patient or lack of consent.		2
Tracheostomy Care: (E) • **Cleansing solution** • **Types of dressings** • **Frequency of dressing changes**	Tracheostomy stoma requires dressing changes to maintain homeostasis, prevent infection and promote healing of stoma site. Per HHS Policy: RESP - Emergency Change/Reinsertion Of a Tracheostomy Tube (Adult, Pediatric and Neonatal) Protoc...	The PA will collaborate with the Physician and/or the wound care nurse for complex wounds as required.		1

Controlled Acts and Procedures				Type
Perform and Enable Performance	**Indications**	**Contraindications**	**Potential Complications of Procedure**	
	RESP - Tracheostomy Tube Change (Adult, Pediatric and Neonatal) Protocol; RESP - Tracheostomy Tube Weaning & Decannulation Protocol			
Tuberculin Skin Test (TB test), Two-Step TB Test (E)	Screening for Exposure or suspected TB; requirement for admission to extended care facility	Severe reaction in the past, extensive burns or eczema over testing site, documented TB treated in past, active TB, major viral infections.		1
Thromboprophylaxis (Mechanical) including: (E) **-Thromboembolic Stockings (TED)** **- Sequential Pneumatic Compression devices (IPC)**	In accordance with intention and procedure of HHS policy: NUR - Anti-embolism or Thromboembolic Stockings Protocol - Adult NUR - Sequential Pneumatic Compression Device (SCD) Protocol - Adult To promote venous return in patients experiencing impaired mobility and/or edema HHS policy states **Criteria for use of Anti-embolism Stockings:** Patients with one or more risk factors in Virchow's Triad	HHS policy states: Contraindications of use: Dermatitis, open skin lesion or previous reaction to T.E.D Elastic or I.P.C. Stockings may aggravate a skin condition or cause it to spread. Also the area may require dressings. Recent skin graft, which are delicate and should not be dislodged. Disproportionately large thighs or massive edema. T.E.D.s or I.P.C.s may not fit correctly, causing excessive pressure and constriction around thighs, and act as a		1

Controlled Acts and Procedures				Type
Perform and Enable Performance	**Indications**	**Contraindications**	**Potential Complications of Procedure**	
	Hyper-coagulability with a contraindication for the use of anticoagulants. As typically seen in: Patients admitted due to trauma Post-operative neurosurgical, orthopedic or oncology patients Hemorrhagic stroke patients Medical patients who are not mobilizing well Patients with previous venous thromboembolism	tourniquet, thereby reducing venous return as well as decreasing circulation. Impaired skin integrity and arterial insufficiency on lower extremities may be a contraindication. Ensure presence of pedal pulses		
Vital Signs - monitoring: (P,E) • **Temperature** • **Pulse** • **Blood pressure** • **Respirations** • **$Sp0_2$** • **Glasgow Coma Scale** • **May include overnight oxygen saturation monitoring**	When monitoring of vital signs is required based on a change in patient's status, or to determine the need for, or response to treatment.	Frequency of monitoring is determined by assessment of the patient's clinical status and clinical judgment of the PA The PA will collaborate with the physician as the clinical condition of the patient changes		1

Controlled Acts and Procedures				Type
Perform and Enable Performance	**Indications**	**Contraindications**	**Potential Complications of Procedure**	
Wound care management using aseptic technique and tissue adhesive (P,E)	Wound Management including but not limited to: • cleansing sites with normal saline and dressing wounds with sterile gauze dressings • hydrocolloid dressings • foam dressings • occlusive dressings • film dressing • antimicrobial dressing • removal of JP drains • Site Wound and Ostomy Nurse assessment and recommendations Open skin wounds, surgical sites, insertion sites or areas of breakdown in skin integrity Note HHS policy statement: PERI - Services Classification of Wound Guidelines			2
Wound care management utilizing both absorbable and non-absorbable interrupted sutures. This includes the cleansing and irrigation of wounds, and administration of 1 or 2 % lidocaine local anesthesia as required (P,E)				2

Appendix - Medications

Medication Name	Start	Adjust	Hold	D/C
Acetaminophen	1	1	1	1
Acetazolamide	2	1	1	2
Acetylcysteine	1	1	1	1
Acetylsalicylic acid/ASA/Aspirin	1	1	1	1
Adenosine	2	2	1	2
Allopurinol	2	1	1	1
Alteplase	2	2	2	2
Amiodarone	1	1	1	1
Amitriptyline	2	1	1	1
Amlodipine	2	1	1	2
Amoxicillin	2	1	1	2
Amoxicillin-clavulanate	2	1	1	2
Ampicillin	2	1	1	2
Anidulafungin	2	2	2	2
Atenolol	1	1	1	1
Atorvastatin	1	1	1	1
Atropine	1	1	1	1
Budesonide inhaled	1	1	1	1
Budesonide and Formoterol	1	1	1	1
BisACODYL	1	1	1	1
BisOPROLOL	1	1	1	1
Calcium carbonate	1	1	1	1
Calcium CHLORIDE	1	1	1	1

Medication Name	Start	Adjust	Hold	D/C
Calcium GLUCONATE	1	1	1	1
Candesartan	2	1	1	1
CarBAMazapine	2	2	2	2
Carvedilol	1	1	1	1
CeFAZolin	1	1	1	1
CefTRIAXone	2	1	1	2
Cefuroxime	2	1	1	2
Cephalexin	2	1	1	2
Chlorhexidine 2% for wound care	1	1	1	1
Chlorhexidine 0.12% mouthwash	1	1	1	1
Ciprofloxacin	2	1	1	2
Citalopram	2	1	1	1
CloNIDine	2	1	1	1
Clopidogrel	2	1	1	2
Clotrimazole cream, vaginal suppositories	1	1	1	1
Cloxacillin	2	1	1	2
Colchicine	2	1	1	1
Cosyntropin	2	2	2	2
Dalteparin	2	1	1	1
Dexamethasone	2	1	1	1
Dexmedetomidine	2	1	2	2
Dextrose 50%, 10%, 5%	1	1	1	1
Digoxin	2	1	1	2
DilTIAZem	2	1	1	2

Medication Name	Start	Adjust	Hold	D/C
DimenhyDRINATE	1	1	1	1
DiphenhydrAMINE HCl	1	1	1	1
DOBUTamine	2	1	1	1
DOPamine	2	1	1	1
Empagliflozin	2	2	2	2
Enalapril	2	1	1	1
EPINEPHrine	2	1	1	1
Esmolol	2	1	1	2
Escitalopram	2	1	1	1
Ethacrynic acid	2	1	1	2
Ferrous salts (as Fumarate, Gluconate, Sulphate)	1	1	1	1
Fluconazole	2	1	1	2
Flumazenil	2	1	1	1
FLUoxetine	2	1	1	1
Fluticasone	1	1	1	1
Fondaparinux	2	2	2	2
Furosemide	1	1	1	1
Gabapentin	2	1	1	1
Gentamicin	2	1	1	2
Gliclazide	1	1	1	1
GlyBURIDE	1	1	1	1
Glycerine	1	1	1	1
Haloperidol	1	1	1	1

Medication Name	Start	Adjust	Hold	D/C
Heparin	2	1	1	1
HydrALAZINE	1	1	1	2
Hydrochlorothiazide	1	1	1	1
Hydrocortisone	2	1	1	2
Ibuprofen	1	1	1	1
Insulin	1	1	1	1
Ipratropium inhaled	1	1	1	1
Isopropyl alcohol for dressing changes	1	1	1	1
Isosorbide dinitrate	2	1	1	1
Labetalol	2	1	1	1
Lacrilube	1	1	1	1
Lactulose	1	1	1	1
Lansoprazole fast tab	1	1	1	1
Levofloxacin	2	1	1	2
Levothyroxine – synthetic T4	2	2	1	2
Lidocaine (cardiac)	2	1	1	2
Lidocaine 1% with and without epinephrine	1	1	1	1
Lidocaine 2% with and without epinephrine	1	1	1	1
Lisinopril	2	1	1	1
Losartan	2	1	1	1
Magnesium glucoheptonate	1	1	1	1
Magnesium hydroxide	2	1	1	1
Magnesium oxide	1	1	1	1
Magnesium sulphate	1	1	1	1

Medication Name	Start	Adjust	Hold	D/C
Melatonin	1	1	1	1
MetFORMIN	1	1	1	1
MethylPREDNISolone	2	1	1	2
Metoclopramide	2	1	1	1
Metolazone	2	1	1	2
Metoprolol	1	1	1	1
MetroNIDAZOLE	2	1	1	2
Milrinone	2	1	1	1
Naloxone	2	1	1	1
Naproxen	1	1	1	1
Nicotine patch	1	1	1	1
NIFEdipine	1	1	1	1
NitroGLYCERIN	1	1	1	1
NitroGLYCERIN patch	1	1	1	1
NitroPRUSSIDE	2	1	1	1
NorEPINEPHrine	2	1	1	1
Normal saline	1	1	1	1
Nortriptyline	2	1	1	1
Nystatin	1	1	1	1
Ondansetron	1	1	1	1
Oxygen therapy	1	1	1	1
Pantoprazole	1	1	1	1
Paroxetine	2	1	1	1
Penicillin G	2	1	1	2

Medication Name	Start	Adjust	Hold	D/C
Phenyleprine	2	1	1	1
Phenytoin	2	2	2	2
Phosphate Novartis	1	1	1	1
Piperacillin/Tazobactam	2	1	1	2
Polyethylene glycol (PEG)	1	1	1	1
Polysporin	1	1	1	1
Potassium CHLORIDE	1	1	1	1
Potassium citrate	1	1	1	1
Potassium PHOSPHATE	1	1	1	1
Pravastatin	1	1	1	1
PredniSONE	2	1	1	2
Pregabalin	2	1	1	1
Procainamide	2	2	2	2
Propofol	2	1	1	1
Propranolol	2	1	1	1
Protamine	2	1	1	1
QUEtiapine	2	1	1	1
Ramipril	2	1	1	1
Ranitidine	1	1	1	1
Replavite (dialysis vitamin)	1	1	1	1
Rho (D) Immunoglobulin	1	1	1	1
Rosuvastatin	1	1	1	1
Salbutamol	1	1	1	1
Sennosides	1	1	1	1

Medication Name	Start	Adjust	Hold	D/C
Simvastatin	1	1	1	1
Sodium BICARBONATE 8.4%	1	1	1	1
Sodium PHOSPHATE IV	1	1	1	1
Spironolactone	2	1	1	2
Trimethoprim-sulfamethoxazole	2	1	1	2
Tamsulosin	1	1	1	1
Terazosin	2	1	1	1
Ticagrelor	2	1	1	2
Tranexamic acid	1	1	1	1
TraZODone	2	1	1	1
Valsartan	2	1	1	1
Vancomycin	1	1	1	1
Vasopressin	2	1	1	1
Vitamin supplements not limited to multivitamin with or without minerals, B12, cyanocobalamin, Vitamin C	1	1	1	1
Vitamin K (phytonadione)	2	1	1	1
Warfarin/Coumadin	2	1	1	2
Zopiclone	2	1	1	1
Blood products				
Albumin	1	1	1	1
Cryoprecipitate/Fibrinogen concentrate	2	2	2	2
Fresh frozen plasma	1	1	1	1
Immune globulin	2	2	2	2
Packed red blood cells	1	1	1	1

Medication Name	Start	Adjust	Hold	D/C
Platelets	1	1	1	1
Prothrombin	2	2	2	2
rFactor VIIa	2	2	2	2

Appendix: Medications

Note: contraindications/cautions not fully listed; as well, hypersensitivity to drug/class/component implied contraindication.

Medication	Dosage, route, Frequency	Indications	Comments, select contraindications and undesirable effects
Acetaminophen	325 mg or 650 mg PO/PR q 4-6 h to a maximum of 4000 mg/day; reduce dose to no more than 2000 mg/day if hepatic or renal impairment or history of alcoholism Note: 2009 FDA advisory panel recommended maximum daily adult dose of 2600 mg.	Analgesic and anti-pyretic. Fever; mild to moderate pain; use when anti-inflammatory effect is not needed. **Note**: Overdose of acetaminophen treated with activated charcoal (for absorption) and N-acetylcysteine (NAC) for GSH repletion/substitution, anti-inflammatory and antioxidant properties.	Caution with: hepatic impairment, alcoholism (CYP induction, caution with severe hypovolemia, PKU (phenylalanine containing forms), chronic malnutrition/fasting (GSH depletion) or chronic alcohol use; maximum 4 g/day.
Acetazolamide	250-500 mg PO q daily to q6h; maximum 1g daily Start 250-500 mg PO daily; give in morning Renal dosing – adjust frequency: CrCl 10 – 50 mL/min: give q 12h Avoid use if CrCl less than 10 mL/min	Metabolic alkalosis; edema.	Hypokalemia, hyponatremia, hyperchloremic or metabolic acidosis, adrenal insufficiency, cirrhosis, hepatic or renal disease; angle-closure glaucoma. Not for long-term use.

Medication	Dosage, route, Frequency	Indications	Comments, select contraindications and undesirable effects
Acetylcysteine	600 mg PO/IV BID x 4 doses Administer as 2 doses pre- and 2 doses post-contrast dye. If a diagnostic test is required more urgently, give 1 dose pre- and 3 doses post-contrast.	Acetaminophen overdose and liver failure	Watch for signs of anaphylaxis during infusion. Ensure hydration with 0.45% saline 6 h before and 12 h after contrast dye and monitor renal function.
Acetylsalicylic acid/ASA/Aspirin	80 mg, 81 mg, 325 mg 81 mg for primary prophylaxis of MI CABG: 325mg OG 6 hours post-op then 80 TO 325mg PO daily	Anti-platelet; primary prophylaxis of MI; secondary prevention of vascular events among those with previous vascular events.	Coagulopathy; GI bleed.
Adenosine	**Initial dose**: 6 mg rapid IV push, preferably in large central line **Repeat dose:** 12 mg rapid IV push (given if initial dose does not terminate SVT within 1 to 2 minutes)	As per ACLS protocol. Used to terminate re-entrant arrhythmias.	Can activate carotid baroreceptors, causing transient sympathetic activation. Rarely, a bolus of adenosine will cause bronchospasm or atrial fibrillation by heterogeneously shortening action potentials.

Medication	Dosage, route, Frequency	Indications	Comments, select contraindications and undesirable effects
Allopurinol	Usual dose range 100-600 mg PO daily; maximum 800 mg/ day	Gout: reinitiate gout treatment started in community. **Note**: liver, renal function and CBC should be monitored periodically. Reduce dose in renal impairment.	Do not use for acute attack of gout. Discontinue at first sign of rash.
Alteplase	2 mg IV to be retained in catheter port for up to 2 h, may repeat x 1 in same port.	Restoration of central venous catheter/PICC function.	
Amiodarone	**To convert Afib to Sinus:** Amiodarone infusion 900 mg IV over 24 hours. To convert to oral load, stop infusion and begin: 400 mg PO TID x 3-5 days (load for 5-7 days total up to 10g load), then decrease to 200 mg daily to BID (usual maintenance dose 200 mg daily) **OR** Start amiodarone 400 mg PO x 1 followed by 400 mg PO TID x 3-5 days, then 200 mg PO daily to BID **In ACLS VF/pulseless VT protocol:** 300 mg IV x 1	Pharmacologic conversion of atrial fibrillation to normal sinus rhythm. To maintain sinus rhythm in patient with Afib. For acute termination of VT or VF. For recurrent VF resistant to other drugs. Within ACLS protocol for cardiac arrest. As adjunct to ICD to suppress symptomatic ventricular tachyarrhythmias.	QT prolongation with a risk of Torsades. May cause hypotension during IV loading, vasodilation, severe sinus node dysfunction, 2nd or 3rd degree heart block or symptomatic bradycardia. Serious reactions include pulmonary fibrosis. Caution with use in hepatic impairment.

Medication	Dosage, route, Frequency	Indications	Comments, select contraindications and undesirable effects
	If pulse, then may give 150 mg IV x 1 over 10 mins to decrease risk of hypotension. If no pulse/no BP, give 150 mg IV x 1 as rapid IV push. **In ACLS wide complex tachycardia:** Start: 150 mg IV x 1 over 10 mins (infusion: 0.5 mg/min IV x 18 h)		
Amitriptyline	10-200 mg PO daily, may give in divided doses	For use in the treatment of depression. For use as an atypical analgesic in treating neuropathies, fibromyalgia, etc.	Allow washout of MAOIs for 2 weeks prior to administration. May cause orthostatic hypotension, changes in cardiac rhythm and conduction, decrease seizure threshold and have anticholingergic effects.
Amlodipine	**Hypertension:** 5-10 mg PO daily Start: 5 mg PO daily, 2.5 mg PO daily if elderly or secondary agent; increase after 1-2 weeks; maximum 10 mg/day	Hypertension. CAD.	Hepatic impairment: start 2.5 mg PO daily.

Medication	Dosage, route, Frequency	Indications	Comments, select contraindications and undesirable effects
Amoxicillin	500 mg PO q8h; extend dosing interval in renal impairment	Treatment of respiratory/UTI infections empirically or with known sensitivities.	
Amoxicillin-Clavulanate	500/125 mg PO q 8 h; extend dosing interval in renal impairment	Treatment of susceptible infections (including lower respiratory tract infections) empirically or targeted.	
Ampicillin	1 -2 g IV q 4-6 h 2 g IV within 30 mins of procedure	Uncomplicated UTI, GI tract or RT infection where organism is susceptible to ampicillin.	Adjust dose with renal impairment.
Anidulafungin	Typically 200mg IV bolus followed by 100mg IV once daily	For treatment of candidemia and other systemic fungal infections Usually only started under guidance of Infectious Disease Service/Physicians.	May cause diarrhea, hypokalemia and abnormal liver function testing.
Atenolol	25-100 mg PO daily with hold parameters	Hypertension, CAD, UA, Afib, SVT.	Do not use in AV block, heart failure, cardiogenic shock, bradycardia. Caution with use in renal impairment.
Atorvastatin	10-80 mg PO q HS	Hypercholesterolemia, mixed dyslipidemia, hypertriglyceridemia, dysbetalipoproteinemia, familial hypercholesterolemia (homozygous), cardiovascular event prevention.	Active hepatic disease, unexplained elevations in LFT's, myalgia/myopathy, rhabdomyolysis.

Medication	Dosage, route, Frequency	Indications	Comments, select contraindications and undesirable effects
Atropine	0.5-1 mg IV q 3-5 mins, up to a total dose of 3 mg or 0.04 mg/kg	Symptomatic bradycardia.	
Budesonide inhaled	**Asthma maintenance:** 200-400 mcg inhaled/actuation BID Maximum 1600 mcg/day Titrate to lowest effective dose, taper gradually after 1 week	Asthma; restart home medication that continues to be necessary. **Note**: Rinse mouth after dose.	Do not use in status asthmaticus or acute asthma attack. Caution if hypersensitive to milk protein, concurrent systemic steroid use, TB infection, ocular HSV, untreated infection, exposure to measles or varicella, extremes of age.
Budesonide and Formoterol	100mcg/6mcg or 200mcg/6mcg inhalers; 1-2 puffs inhaled BID; x 1-2 weeks, varies with severity of asthma **Asthma:** Start with 100/6 mcg, may increase in 1-2 weeks to 200/6 mcg/spray Maximum 800/24 mcg/day; taper to lowest effective dose and use shortest effective duration **COPD:** 200/6 mcg/spray Maximum 800/24 mcg/day	Asthma, COPD that is uncontrolled with use of corticosteroids, to restart a home medication that continues to be necessary. Not for use by ventilated patients.	Caution with severe hepatic impairment, acute asthma, hypertension, cardiovascular disease.

Medication	Dosage, route, Frequency	Indications	Comments, select contraindications and undesirable effects
BisACODYL	**Suppository**: 10 mg per rectum if needed **Oral:** 5 mg tablets, 1-2 tablets PO daily if needed	Constipation.	Acute abdomen, undiagnosed abdominal pain, undiagnosed nausea or vomiting, GI obstruction, ileus, perforation, toxic megacolon, gastroenteritis, rectal bleeding, appendicitis.
BisOPROLOL	**Hypertension:** 2.5-20 mg PO daily with standard hold parameters Decrease dose for creatinine clearance less than 40	Hypertension, CHF; patient on bisOPROLOL as outpatient, requiring beta-blocker on transfer to 5 South, metoprolol contraindicated.	Serious reactions include CHF, heart block, severe bradycardia, bronchospasm. Decrease dose for renal or hepatic failure.
Calcium carbonate	625-5000 mg PO daily, may divide dose TID to QID **Note**: 625mg tablet contains 250mg elemental calcium	Hypocalcemia, osteoporosis (restarting home med).	Hypercalcemia, hypophosphatemia, nephrolithiasis, hypercalciuria.
Calcium CHLORIDE	1 g IV q 5-10 mins **Life-threatening arrhythmias**: 1 g IV q 10 mins PRN **Note**: 1 g contains 270mg elemental calcium	For emergent hypocalcemia, cardiac arrest, hypercalemia and calcium channel blocker overdose.	Hypophosphatemia, VFib (IV), digitalis (IV), nephrolitiasis (PO), hypercalciuria.
Calcium GLUCONATE	**Emergent hypocalcemia:** 1-3 g IV over 5-10 min	Emergent hypocalcemia, life-threatening arrhythmias, transfusion-associated hypocalcemia.	Hypophosphatemia, Vfib (IV), digitalis (IV) nephrolithiasis (PO), hypercalciuria.

Medication	Dosage, route, Frequency	Indications	Comments, select contraindications and undesirable effects
	Life-threatening arrhythmias: 1g IV q 10 min PRN, to a maximum 3 g/episode, or a maximum 15 g/day **Calcium channel blocker overdose:** 1 g IV x 1, may repeat in 10 minutes if needed **Note**: 1 g contains 90mg elemental calcium	**Note**: 10% IV sol = 1 g calcium gluconate/10 mL = 90 mg (4.5 mEq) elemental Ca	
Candesartan	4-32 mg PO daily	Treatment of CHF or hypertension.	Use with caution in post-CABG patients. May cause N/V/D, edema, albuminuria and arthralgia. May cause increase in creatinine and potassium
CarBAMazepine	Usual dose 800-1200 mg PO daily divided BID to QID	Anticonvulsant; to restart a home medication.	Risk of TENS and SJS.
Carvedilol	3.125-25 mg PO BID with hold parameters	Hypertension, MI, angina, CHF.	Do not use in active heart failure, angioedema, asthma, AV block, bradcardia, cardiogenic shock, hepatic disease or sick sinus syndrome.

Medication	Dosage, route, Frequency	Indications	Comments, select contraindications and undesirable effects
CeFAZolin	**Post-op prophylaxis**: 2 g IV q 8 h x 2 or renally adjusted dose **Infection susceptible to cefazolin**: 1-2 g IV q 8 h, depending on severity of infection (maximum 12 g/day); extend dosing interval in renal impairment	Post-operative prophylaxis; respiratory tract, skin and skin structure, urinary tract, bone and joint infections and septicemia due to susceptible gram-positive cocci; some gram negative bacilli including E. Coli, Proteus and Klebsiella may be susceptible.	Caution if hypersensitive to penicillin, renal impairment, antibiotic-associated colitis history, seizure disorder, concurrent nephrotoxic agents.
CefTRIAXone	1-2 g IV q 12-24 h; maximum 4 g/24 h Dose and duration vary with infection type and severity	Bacterial infection with known sensitivity to ceftriaxone; empiric therapy for gram negatives prior to sensitivity studies. Probenecid will extend the duration of action by prolonging renal excretion.	Caution if hypersensitive to penicillin, renal impairment, antibiotic-associated colitis history, seizure disorder, concurrent nephrotoxins.
Cefuroxime	**Bacterial infection**: 0.75-1.5 g IV q 8 h x 5-10 days 250-500 mg PO q12h Duration varies with the type and severity of infection Extend dosing interval in renal impairment	Bacterial infection sensitive to cefuroxime; potential empiric therapy for otitis media, pharyngitis, sinus, skin and respiratory infections.	Sensitivity to penicillin, seizure disorder, previous antibiotic-associated colitis, renal impairment; not useful for Pseudomonas.

Medication	Dosage, route, Frequency	Indications	Comments, select contraindications and undesirable effects
Cephalexin	500mg PO q 6 h Extend dosing interval for renal insufficiency	Skin and soft tissue infections, URTIs.	Sensitivity to penicillin, seizure disorder, previous antibiotic-associated colitis, renal or hepatic impairment or malnutrition; not useful for Pseudomonas.
Chlorhexidine 2% for wound care	Topical as required	Wound care and surgical site preparation prior to bedside procedure.	
Chlorhexidine 0.12% mouthwash	Applied by nurse q 6 h as mouthwash for ventilated patient	Antiseptic; used in ventilated patients; oral hygiene, a component of VAP prophylaxis.	GI, tongue or oral irritation with prolonged use.
Ciprofloxacin	250-750 mg PO BID 200-400 mg IV q 12 h Extend interval in renal impairment	Bacterial infections with known sensitivity. Useful against susceptible strains of Pseudomonas aeruginosa. Aerobes and facultative anaerobes that are susceptible to ciprofloxacin.	Prolonged use may result in fungal or bacterial superinfection, including C. difficile associated diarrhea and pseudomembranous colitis. Interacts with calcium, iron, magnesium (divalent cations). Feeds are usually held one hour prior and two hours post-dosage.
Clonidine	**Hypertension:** 0.1-0.4 mg PO BID	Hypertension.	Caution of severe CAD, recent MI, cardiac conduction disturbances, hemodynamically instability,

Medication	Dosage, route, Frequency	Indications	Comments, select contraindications and undesirable effects
	Start 0.1 mg PO BID, may increase to maximum of 2.4 mg/day Consider lower starting dose in older adults		renal impairment, cerebrovascular disease, depression.
Clopidogrel	Loading dose ACS 300 mg x1 maintenance dose 75 mg/day	To reduce atherosclerotic events (MI, stroke, vascular death) in patients with atherosclerosis. ACS. Off-pump CABG. Stent that remains post-op and treat new drug-eluting stents for one year.	Thrombotic thrombocytopenic purpura may occur; leucopenia very rarely; discontinue clopidogrel 5-7 days prior to an elective procedure.
Clotrimazole cream	1 % cream to affected skin BID x 7 days 200 mg as vaginal suppositories daily	Cutaneous candidiasis. Vaginal candidiasis.	
Cloxacillin	1-2g IV q 4-6 h	For MSSA.	
Colchicine	Initial treatment: 1.2 mg PO x 1, then 0.6 mg one hour later x 1 if needed, Then 0.6 mg PO daily to BID	Acute gouty exacerbations.	
Cosyntropin	0.25 mg IV	For use in ACTH stimulation test.	Discuss with attending before use in patients taking steroids.

Medication	Dosage, route, Frequency	Indications	Comments, select contraindications and undesirable effects
Dalteparin	2500 or 5000 units subcut daily Weight based dose considerations if less than 40 kg (2500 units) or greater than 120 kg (3750/7500 units)	Post-op DVT prophylaxis.	Coagulopathy; bleeding; can be continued up to time of surgery/line placement; Heparin Induced Thrombocytopenia (HIT). LMWH reversed 80% by protamine. Stop LMWH 12 h prior to surgery.
Dexmedetomidine (Precedex®)	Load: 0.4 mcg/kg IV Maintenance: 0.1-0.7mcg/kg/hour IV Titrate by 0.1 mcg/kg/hour q 30 min.	Delirium- both prevention and management	Hypotension Hypertension Drowsiness Agitation Nausea Bradycardia Can potentiate heart block, atrial fibrillation and severe LV dysfunction. Decrease dose by 50% with hepatic dysfunction.
Dexamethasone	0.75-10 mgIV/IM/PO	To be used as an anti-inflammatory in central or spinal shock.	All steroids may cause changes in electrolytes and elevated blood sugars. Do not administer if systemic fungal infection is present.

Medication	Dosage, route, Frequency	Indications	Comments, select contraindications and undesirable effects
			May require adjustment with stress levels.
Dextrose 50%, 10%, 5%	10-25 g (0.5g/mL) IV single STAT dose IV infusions of 10% or 5% to maintain blood glucose	Insulin-induced hypoglycaemia; treatment of blood glucose/capillary blood glucose; as part of treatment of hyperkalemia.	Contraindicated in patients with hypersensitivity to corn or corn products; diabetic coma with hyperglycemia; hypertonic solutions in patients with intracranial or intraspinal hemorrhage; patients with delirium tremens and dehydration; patients with anuria, hepatic coma, or glucose-galactose malabsorption syndrome.
Digoxin	**For new onset Afib with venticular response greater than 120 bpm post-CABG:** *Loading dose:* 0.5 mg PO/IV followed by 0.25 mg q 6 h x 2 doses *Maintenance Dose:* 0.0625-0.25 mg PO/IV daily **Restart dose for patient previously taking digoxin and who requires continued therapy:**	To provide inotropy for heart failure and control the ventricular response in Afib. Use oral loading dose unless heart rate greater than 140 or patient symptomatic.	If creatinine is greater than 130 mmol/L or creatinine clearance less than 50 mL/min, decease the dose and monitor serum levels accordingly. Toxicity symptoms: Arrhythmias, nausea, disturbance of cognitive function, blurred or yellowed vision. Rate control is less effective if high sympathetic tone drives

Medication	Dosage, route, Frequency	Indications	Comments, select contraindications and undesirable effects
	Draw random serum level; if subtherapeutic may need partial or full loading dose: 0.5 mg followed by 0.25 mg q 6 h x 2 doses (full load) The next day start with AM dose 0.0625-0.25 mg IV/PO daily Monitor serum digoxin levels 3-5 days after initiation or after any change in dose; adjust maintenance dose as appropriate Decrease dose/extend dosing interval in renal impairment Decrease dose by 50% if using concurrently with amiodarone		rapid AV conduction (chronic lung disease, thyrotoxicosis). Thyrotoxicosis will cause faster metabolism of digoxin. Increased sympathetic activity and hypoxia can potentiate digitalis changes in automaticity and DADs, increasing digitalis toxicity. 75% bioavailable; lag between administration of digoxin and clinical effect; test digoxin levels regularly. ECG changes: prolonged PR, depressed ST (changes ventricular repolarization). Hypokalemia will potentiate digitalis-induced arrhythmias (watch hypokalemia with diuretics, amphotericin B and corticosteroids). Phenytoin and rifampin accelerate digoxin metabolism. Decrease dose of digoxin if on amiodarone.

Medication	Dosage, route, Frequency	Indications	Comments, select contraindications and undesirable effects
			Use Digibind to bind and speed elimination of digoxin in case of toxicity.
DilTIAZem	**Post-op Afib/flutter:** 0.25 mg/kg IV x 1 over 2 mins May repeat after 15 min, may follow with 5-15 mg/h IV, titrate to HR 70-120 bpm for less than 24 h **For PSVT conversion:** 0.25 mg/kg IV x 1, after 15 min may follow with 5-15 mg/h IV for less than 24 h **Radial artery graft**: 120 mg PO daily of CD formulation	Hypertension, Afib, Aflutter, paroxysmal SVT conversion, radial artery graft patency post-CABG. **For HTN:** extended release forms used.	Decrease BP especially as bolus. If VT is mistaken for AV nodal re-entrant tachycardia and diltiazem is used, can cause a decrease in BP; may slow ventricular response too much when used for Afib. Can increase digoxin concentration.
DimenhyDRINATE	25-50 mg PO/IV/IM/PR up to q 4 h PRN	Nausea and vomiting.	May cause drowsiness; caution prescribing for older adults, those with or at risk of dementia, confusion and delirium.
DiphenhydrAMINE HCL	25-50 mg PO/IV/IM up to q 6 h PRN	Relief of symptoms of histamine release/allergic reaction.	Reduce dose for older adults; CNS depression, sedation; glaucoma, pyloroduodenal

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			obstruction, urinary tract obstruction, prostatic hyperplasia, asthma, hyperthyroid, increased intraocular pressure, cardiovascular disease. May be associated with prolonged QT if other risk factors: congenital long QT, other QT prolonging drugs, bradycardia, electrolyte disturbances, concomitant drugs that inhibit metabolism.
DOBUTamine	1-20 mcg/kg/min IV infusion of 250 mg in 250 mL D5W	Inotrope, to increase cardiac output.	Not for use in IHSS.
DOPamine	2-20 mcg/kg/min IV infusion of 400 mg in 250 mL D5W	For treatment of hypotension, low cardiac output and shock. May increase urine output.	Proarrhythmogenic. For infusions, ensure a daily dopamine free interval to maintain receptor sensitivity.
Empagliflozin	10mg or 25mg PO once daily	For treatment of type 2 diabetes. Also indicated to reduce the risk of cardiovascular death in adults with type 2 diabetes mellitus and cardiovascular disease.	Contraindicated in patients with eGFR less than 45. Causes intravascular volume contraction and symptomatic hypotension. Increased incidence of bone fractures reported; avoid in patients with fracture risk factors. Increase risk of UTIs and urosepsis.

Medication	Dosage, route, Frequency	Indications	Comments, select contraindications and undesirable effects
			Necrotizing fasciitis of the perineum (Fournier gangrene) reported with SGLT2 inhibitors. Hypoglycemia risk increased with insulin and insulin secretagogues. Fatal cases of ketoacidosis associated with SGLT2 inhibitors reported; monitor for signs of ketoacidosis.
Enalapril	2.5-20 mg PO BID	For treatment of CHF or hypertension.	Use with caution in post-CABG patients. May cause N/V/D, edema, albuminuria, arthralgia.
EPINEPHrine	As per ACLS: **Asystole, PEA, bradycardia** – refer to algorithm **Cardiac output control:** 0.05-0.5 mcg/kg/min IV infusion; of 4 mg or 8 mg in 250 mL D5W; start 0.02 mcg/kg/min IV infusion, titrate to desired effect **Anaphylaxis** 0.3–0.5 mg IM q 15-20 min PRN Maximum: 3 doses *OR* 0.1 mg IV infused slowly over 5 mins	Asystole, PEA, bradycardia (2nd line); cardiac output support, anaphylaxis.	Hypersensitivity – sulphites.

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Escitalopram	10-20mg PO once daily	Treatment of pre-existing depression and generalized anxiety disorder (GAD)	Risk of QT prolongation. Risk of serotonin syndrome when used with other serotonergic agents. Use caution when treating patients with history of mania. Common side-effects include nausea, headache, and insomnia.
Esmolol	**For post-op arrhythmia:** IV: load with 500 mcg/kg IV, begin infusion at 50 mcg/kg/min; increase in 50 mcg/kg/min increments q 5 min to maximum of 300 mcg/kg/min; maintain HR 70-120 beats/min and sBP greater than 90 mmHg	Afib/Aflutter with rapid conduction, immediate short-acting response; HTN, tachycardia.	Patient with bradycardia, heart block, hypotension, severe peripheral vascular disease; caution with asthma or COPD; may reduce cardiac output, cause AV block.
Ethacrynic acid	50-200 mg PO daily in 1 to 2 divided doses 50-100 mg IV x 1 dose	Diuresis – alternative to furosemide for patient with hypersensitivity to furosemide/sulphonamides. To treat edema of nephrotic syndrome and chronic kidney disease; HTN, CHF.	Ototoxicity (may be reversible) most common with ethacrynic acid – higher risk of ototoxity if IV and rapid administration of high dose and/or concomitant use of other ototoxic drugs.

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Ferrous salts (as Fumarate, Gluconate, Sulphate)	**Iron deficiency:** 2-3 mg/kg elemental iron daily **Iron supplementation:** 15-30 mg elemental Fe PO daily **Post-op supplementation:** ferrous gluconate 300 mg PO BID to TID with meals	Iron supplementation, iron deficiency anemia.	Constipation, dyspepsia, nausea, vomiting, diarrhea, dark stools.
Fluconazole	**Candidiasis oropharyngeal or esophageal**: Start 200 mg PO/IV, then 100 mg PO/IV daily, continue for more than 2 weeks to prevent relapse **Vulvovaginal candidiasis**: 150 mg PO x 1 Decrease dose in renal impairment	Candidiasis.	May be associated with prolonged QT if other risk factors: congenital long QT, other QT prolonging drugs, bradycardia, electrolyte disturbances, concomitant drugs that inhibit metabolism. Contraindicate/caution if QT prolongation, proarrhythmic condition, electrolyte abnormalities, heart disease, renal or hepatic impairment.
Flumazenil	0.2 mg IV q 1-2 mins to a maximum of 5doses; may	For the reversal of benzodiazepine related sedation.	Do not use in status epilepticus, increased ICP or benzodiazepine hypersensitivity; use with

Medication	Dosage, route, Frequency	Indications	Comments, select contraindications and undesirable effects
	repeat in 20-30 mins if resedation occurs		caution as it lowers the seizure threshold.
FLUoxetine	10-80 mg PO daily	For treatment of depression, bulimia nervosa and OCD.	Do not use in patients previously on MAOIs until proper washout period (minimum 2 weeks). Fluoxetine has a long half-life (up to 9 days); wait 5 weeks before MAOI therapy initiation. May cause hypoglycemia.
Fluticasone	125-250 mcg, 1-2 puffs BID 2-4 puffs BID for ventilated patients.	Maintenance corticosteroid therapy for asthma.	Contraindicated for as sole treatment for status asthmaticus, acute asthma attack.
Fondaparinux	2.5 mg subcut daily	Treatment of ACS	Avoid use if CrCl less than 30 mL/min; caution if platelet count less than 100 000 unless being used as a treatment for HIT; caution with concomitant use of drugs affecting hemostasis (NSAIDs, platelet inhibitors, other anticoagulants); spinal procedures; monitor for signs and symptoms of neurologic impairment.
Furosemide	20-80 mg/dose PO daily to BID OR	To increase urine output post-cardiac surgery; edema, pulmonary edema, HTN.	Higher risk of ototoxicity if IV and rapid administration of high dose and if other ototoxic

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	10-80 mg/dose IV q 6-12 h Oral bioavailability varies, approximately 60%.		drugs are administered as well. Loop diuretics also may cause electrolyte imbalances resulting in arrhythmias (especially if taking cardiac glycosides); hypokalemia, hypocalcemia, hyponatremia, hypomagnesemia; hypochloremic alkalosis; hyperuricemia leading to gout; hyperglycemia leading to DM, hypotension, decreased GFR, circulatory collapse, thromboembolic episodes, hepatic encephalopathy if liver disease; multiple drug-drug interactions.
Gabapentin	**Partial seizures**: Usual dose 300- 1200 mg PO TID; start at 300 mg/day; maximum 3600 mg/day, taper dose over 7 days to discontinue **Neuropathic pain**: Start 300mg PO daily x 1 day, then 300mg PO BID x 1 day, then 300mg PO TID;	Partial seizures; also used for post-herpetic neuralgia; to restart home medication which continues to be required.	caution if renal impairment, depression or history of depression, CNS depressant use, alcohol use. Avoid abrupt discontinuation. Serious reactions may include: leucopenia, thrombocytopenia, status epilepticus, withdrawal due to abrupt discontinuation, dyskinesia, depression, suicidality, fractures, erythema multiforme.

Medication	Dosage, route, Frequency	Indications	Comments, select contraindications and undesirable effects
	Usual maintenance dose 300-600mg PO TID, maximum daily dose 3600 mg		
Gentamicin	5-6 mg/kg q 24 h IV (dosing based on ideal body weight and adjusted for CrCl)	For susceptible infections, empirically or after sensitivities.	Monitor trough level before 4th dose. Monitor auditory function, renal function and neurological function.
Gliclazide	*Immediate release tablets*: Start 80 mg/day, up to 320 mg daily; daily doses greater than 160 mg divided between breakfast and dinner *Extended release tablets (Diamicron MR)*: 30-120 mg PO once daily with breakfast	To restart home medication post-operatively.	Hypoglycaemia.
GlyBURIDE	1.25-20 mg PO daily; give as single or divided doses; give with breakfast or first meal; give divided doses with meals	Type 2 DM; to restart home medication post-operatively. Long acting and slightly enhances free water clearance.	Hypoglycaemia. Reduce dose for renal or hepatic impairment and in older adults – risk of hypoglycemia.
Glycerin	1 tab PR for constipation	Constipation.	Fecal impaction, undiagnosed abdominal pain.

Medication	Dosage, route, Frequency	Indications	Comments, select contraindications and undesirable effects
Haloperidol	0.5-2 mg q 4-6 h PO/IM PRN	Sedation of post-operative patients with severe delirium or agitation at risk of injury. Delirium: acute onset of mental status change or fluctuating mental status, AND evidence of inattention, with disorganized thinking, OR an altered level of consciousness. May use with lorazepam if agitation is a major component of delirium, ratio of haldol:lorazepam 2:1.	IV or at higher-than-recommended doses: increases risk of sudden death, QT prolongation and Torsades. Parkinson's disease, CNS depression, bone marrow depression, severe cardiac or hepatic disease, coma. May cause prolongation of QT interval/arrhythmias/Torsades. Not recommended for older adults, patients with dementia, or patients with electrolyte disturbances. Recommend to avoid IV administration if possible. May cause anticholinergic effects and extrapyramidal symptoms. Rarely, may cause hypotension.
Heparin	5000 units subcut BID for patients weighing less than 50 kg 5000 units subcut TID for patients weighing 50-95 kg 7500 units subcut q8h for patients weighing greater than 95 kg	Post-op DVT prophylaxis. Treatment of DVT or other clots.	Coagulopathy; bleeding; can be continued up to time of surgery/line placement; Heparin Induced Thrombocytopenia (HIT). LMWH reversed 80% by protamine.

Medication	Dosage, route, Frequency	Indications	Comments, select contraindications and undesirable effects
HydrALAZINE	10-50 mg PO QID PRN 5-20 mg IV q 4-6 h and/or PRN	Acute hypertension. Congestive heart failure.	Drug-induced lupus-like syndrome possible. Adjust dose in renal dysfunction; use with caution in cardiac disease (reflex tachycardia may increase O2 demand); use with caution in pulmonary hypertension (may cause hypotension).
Hydrochlorothiazide	12.5-50 mg PO daily	Hypertension.	Doses above 25 mg/day associated with increased cardiovascular mortality; if HTN is not controlled at 25 mg/day, add second agent rather than increasing the dose; contraindicated in anuria. Adverse effects: hyponatremia, hypokalemia, hypercalcemia and hyperuriciemia
Hydrocortisone	**Corticosteroid responsive conditions:** 20-240 mg/day divided BID-QID; with food or milk **Septic shock:** 50mg IV q 6 h	Corticosteroid-responsive conditions; management of septic shock when blood pressure is poorly responsive to fluid resuscitation and vasopressor therapy.	Contraindications/cautions: immunosuppression, active infection, HTN, CHF, DM, PUD.

Medication	Dosage, route, Frequency	Indications	Comments, select contraindications and undesirable effects
		May restart home medication if continues to be required.	
Insulins: ***Rapid:*** **Insulin lispro, Aspart** ***Short Acting:*** **HumuLIN R** ***Intermediate Acting:*** **HumuLIN N** ***Long-acting:*** **Insulin GlARGine, Detemir, GlARGine U-300, Degludec**	Preprinted order sets including but not limited to: Critical Care IV infusion set; Critical Care Maintenance Subcutaneous Insulin order set Usual total insulin requirement 0.5-1 units/kg/day given 30-60 mins before meal or per sliding scale	To improve glycemic control in types 1 and 2 diabetes mellitus and critically ill patients with hyperglycemia.	Contraindicated if hypoglycaemia; caution if infection, hypokalemia. Do not use long-acting insulin if patient is not being fed.
Ipratropium inhaled	**COPD maintenance or asthma exacerbation**: 20 mcg/spray MDI, 2-4 puffs inhaled QID 4-8 puffs QID for intubated patients	Bronchospasm associated with COPD or asthma.	Dry mouth, thickened secretions.
Isopropyl alcohol for dressing changes	Topical as required	To cleanse intact skin during dressing changes.	Pain.
Isosorbide dinitrate	10-120 mg PO daily in divided doses.	For angina pectoris.	Patients may develop tolerance; avoid in severe anemia and shock. May need to avoid in narrow angle glaucoma.

Medication	Dosage, route, Frequency	Indications	Comments, select contraindications and undesirable effects
Labetalol	100-400 mg PO BID-TID with hold parameters **Hypertensive Emergency:** 10-20 mg IV q 20-30 mins until target BP achieved to a maximum of 300 mg IV/day	Hypertension, hypertensive emergency.	Possible bronchospasm; caution with COPD and asthma. Do not use in bradycardia, heart block, heart failure, cardiogenic shock, hypertension, severe peripheral vascular disease, sick sinus syndrome without a pacemaker, WPW. Caution if bronchospastic disease, major surgery, or hepatic impairment.
Lacrilube	0.25-0.5 inch ribbon to each eye PRN	For treatment of dry eyes.	May cause blurred vision after use.
Lactulose	**Constipation**: 15-30mL PO daily to BID **Hepatic Encephalopathy**: 30mL PO daily to QID, titrate to 3-4 loose stools per day	Treatment of constipation or hepatic encephalopathy with elevated ammonia levels.	Caution in patients with obstruction, ileus, severe abdominal pain, nausea, fever, or vomiting. May cause bloating, cramps, diarrhea.
Lansoprazole fast tab	30 mg NG/OG daily to BID **Gastric ulcer:** 30 mg PO/NG daily to BID	Stress ulcer prophylaxis for patients with NG/OG. Gastric ulcers.	Caution if hepatic impairment, PKU (phenylalanine-containing forms). Avoid in patients with soy allergy (contains soy lecithin).

Medication	Dosage, route, Frequency	Indications	Comments, select contraindications and undesirable effects
			Adverse reactions: blood dyscrasias, hepatic impairment.
Levofloxacin	250, 500 or 750 mg PO/IV q 24 h x 7-10 days as indicated by site of infection Reduce dose/extend dosing interval for renal insufficiency	For bacterial infection with known sensitivity; for empiric treatment of pneumonia, sinusitis, skin infection, UTI which is expected to be sensitive to levofloxacin.	Contraindicated if: prolonged QT interval, hypokalemia, myasthenia gravis. Cautions: proarrhythmic condition, renal impairment, seizure disorder.
Levothyroxine Synthetic T4	Usual dose range 50-200 mcg PO daily; elderly may require less than 1 mcg/kg/day	Hypothyroidism – replacement or supplement of thyroid hormone.	Uncorrected adrenal insufficiency. Use with caution in cardiovascular disease/recent MI and with older adults. May cause tachycardia or arrhythmias.
Lidocaine (cardiac)	1-1.5 mg/kg slow IV push, may repeat 0.5-0.75 mg/kg q 10 mins to maximum of 3 mg/kg	For treatment of VT as per ACLS protocol.	May cause hypotension, methemoglobuminemia, seizures, malignant hyperthermia, anaphylactoid reactions.
Lidocaine 1% with and without epinephrine	0.5 – 2 ml injection for local analgesia for minor bedside procedures	Local anesthetic for minor procedures.	Monitor for cardiovascular and central nervous system effects.
Lidocaine 2% with and without epinephrine	0.5 – 2 ml injection for local analgesia for minor bedside procedures	Local anesthetic for minor procedures.	Monitor for cardiovascular and central nervous system effects.

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Losartan	25-100 mg PO daily	For treatment of CHF or hypertension.	Use with caution in post-CABG patients and in renal impairment: may cause hypoglycemia, fatigue, N/V/D, edema, albuminuria, arthralgia, dizziness. May increase Creatinine and Potassium
Lisinopril	5-40 mg PO daily	For treatment of CHF or hypertension.	Use with caution in post-CABG patients and in renal impairment: may need to hold diuretics before starting, may cause N/V/D, edema, albuminuria, arthralgia, dizziness. May increase Creatinine and Potassium
Magnesium glucoheptonate	*Magnesium Rougier* 15 mL increment; 15-30 mL daily to QID **Note**: 1mL contains 5.12 mg elemental magnesium	Prevention of cardiac arrhythmias; treatment of hypomagnesemia. Normal range serum magnesium is 0.66 – 1.07 mmol/L.	Contraindications: in patients with myocardial damage, heart block. Caution in: renal impairment, bradycardia. Serious adverse reactions may include: cardiovascular collapse, respiratory paralysis, decreased cardiac function. Common reaction include:

Medication	Dosage, route, Frequency	Indications	Comments, select contraindications and undesirable effects
			decreased reflexes, hypotension, hypocalcemia, hypophosphatemia, hyperkalemia. May have laxative effect.
Magnesium hydroxide	15-60 mL PO q HS for constipation 5-15 mL PO up to QID for dyspepsia	Constipation and heartburn.	Do not use in GI bleeds.
Magnesium oxide	420mg tablet; 1-2 tablets PO daily **Note**: 420mg equivalent to 252 mg elemental magnesium	Prevention of cardiac arrhythmias; treatment of hypomagnesemia. Normal range serum magnesium is 0.66 – 1.07 mmol/L.	Contraindications: in patients with myocardial damage, heart block. Caution in: renal impairment, bradycardia. Serious adverse reactions may include: cardiovascular collapse, respiratory paralysis, decreased cardiac function. Common reactions include: decreased reflexes, hypotension, hypocalcemia, hypophosphatemia, hyperkalemia. May have laxative effect.
Magnesium sulphate	2 g in 100 mL 0.9% NaCl or 5 g in 250 mL 0.9% NaCl IV; infuse at a rate of 1 g/hour infusion over 2-5 h	Prevention of cardiac arrhythmias; treatment of hypomagnesemia.	Contraindications: in patients with myocardial damage, heart block.

Medication	Dosage, route, Frequency	Indications	Comments, select contraindications and undesirable effects
	Note: 5g equivalent to 490mg elemental Mg		Caution in: renal impairment, bradycardia. Serious adverse reactions may include: cardiovascular collapse, respiratory paralysis, decreased cardiac function. Common reaction include: decreased reflexes, hypotension, hypocalcemia, hypophosphatemia, hyperkalemia.
Melatonin	For insomnia- 3-6 mg PO QHS 3-4 hours before sleep period.	Insomnia	Daytime fatigue Dizziness Drowsiness Dysphoria in depressed patients Possible euphoric effects at higher doses
MetFORMIN	500-2500 mg PO daily, divided BID or TID (higher doses divided TID)	Management of Type 2 diabetes mellitus.	Caution in renal impairment given the risk for lactic acidosis.
MethylPREDNISolone	Methylprednisolone: usual dosing range, 2-60 mg/day IV divided 6-24 hr	Corticosteroid-responsive conditions; management of septic shock when blood pressure is poorly responsive to fluid resuscitation and vasopressor therapy. May restart home medication if continues to be required.	Contraindications/cautions: immunosuppression, active infection, HTN, CHF, DM, PUD.

Medication	Dosage, route, Frequency	Indications	Comments, select contraindications and undesirable effects
Metoclopramide	5-10 mg PO daily to QID	Motility agent to increase gastric emptying, an anti-nausea agent, and to help with diabetic gastroparesis.	Do not use in GI bleed, bowel obstruction, perforation, seizures, seizure disorders, or in pheochromocytoma. Suggest reducing the dose in renal impairment May prolong QT interval
Metolazone	**Edema due to CHF, renal disease**: 2.5-20 mg PO daily	Edema of CHF or renal disease. **Note**: Administer 30 mins prior to furosemide if using both medications together.	Contraindicated if anuric or hepatic coma. Caution if severe renal or hepatic impairment, electrolyte abnormalities, arrhythmias, DM, or history of gout or pancreatitis. Adverse effects include hyponatremia, hypokalemia, thrombocytopenia, hepatitis.
Metoprolol	25-100 mg PO BID May start at 12.5 mg PO BID to a maximum of 400 mg/day. Hold parameters for HR less than 65, sBP less than 110mmHg.	Hypertension, angina pectoris, A fib, SVT.	Possible bronchospasm, caution with asthma and COPD. Do not use in bradycardia, heart block, heart failure, cardiogenic shock, hypotension, severe peripheral vascular disease, sick sinus syndrome without pacemaker, WPW; caution if bronchospastic disease, major surgery, or hepatic impairment.

Medication	Dosage, route, Frequency	Indications	Comments, select contraindications and undesirable effects
MetroNIDAZOLE	**Bacterial infection**: 500 mg PO/IV q 12 h x 7-14 days **C. difficile-associated diarrhea:** 500 mg PO/IV q 8 h x 14 days	Anaerobes, bacterial infections with known sensitivity to metronidazole and C. difficile-associated diarrhea.	Blood dyscrasia, severe hepatic impairment, CNS disorder. Serious reactions: seizures, leukopenia. Common reactions: metallic taste, rash, pruritus, headache, dizziness, ataxia, confusion, thrombophlebitis (IV use), fever, vertigo, paresthesias, dysarthria.
Milrinone	0.25-0.75 mcg/kg/min IV of 20 mg in 80 mL 0.9% NaCl solution. *Optional bolus*: 50 mcg/kg IV x 1 dose, titrate to desired effect at 6-8 hour intervals (rarely done outside the OR) Maximum total daily dose of 1.13 mg/kg; ideally, not indicated for use longer than 48 h .	Short term management of severe CHF or for maintenance of cardiac output.	Severe aortic or pulmonic valve disease; acute MI; caution if Afib, Aflutter, renal impairment. Adverse effects include: arrhythmias, hypotension, angina, hypokalemia.
Naloxone	0.4-2 mg subcut IV or IM q 2-3 min to obtain desired response (maximum cumulative dose is 10 mg)	To reverse CNS and respiratory depression in known or suspected opioid overdose.	Caution: if CV disease or if with cardiotoxic drugs, opioid addiction, in patients with seizure or CNS disease. Serious reactions include: Vfib, cardiac arrest, seizures.

Medication	Dosage, route, Frequency	Indications	Comments, select contraindications and undesirable effects
			May precipitate opioid withdrawal symptoms, pulmonary edema.
Naproxen	250-500 mg PO q 12 h PRN 500 mg PR q 12 h PRN	To treat post-operative cardiac surgical pain with inflammatory component; as adjunct when pain control is inadequate.	Caution: if fluid retention, congestive heart failure, hypertension. May cause renal toxicity if renal impairment, dehydration, liver failure, GI irritation/GI bleed.
Nicotine patch	Adjust dose to reflect number of cigarettes smoked/day pre-op See "Nicotine Replacement Therapy" order set	To aid smoking cessation; to prevent nicotine withdrawal.	Severe arrhythmia, acute MI (2 weeks), worsening angina Caution if: asthma, reactive airway disease, CV disease, PVD, hyperthyroid, pheochromocytoma, insulin-dependent DM, active peptic ulcer disease, hypertension. Common reactions may include: local erythema, local edema, rash, headache, palpitations, tachycardia, HTN, chest discomfort, insomnia, nightmares.
NIFEdipine	20-60 mg PO daily extended release tablets	Hypertension and post-CABG for radial arterial grafts.	Do not use in shock or with dihydropyridine hypersensitivity.

Medication	Dosage, route, Frequency	Indications	Comments, select contraindications and undesirable effects
	Hold parameters for sBP less than 90mmHg		
NitroGLYCERIN	Post-op infusion to control blood pressure: 50 mg in 250 mL D5W run at 0-250 mcg/min IV, titrate according to BP order	To control post-op HTN, angina, CHF.	Contraindications and precautions: pericardial tamponade, restrictive cardiomyopathy, constrictive pericarditis. Adverse effects include: increase in ICP, excessive hypotension, reflex tachycardia. Do not use with sildenafil (Viagra).
NitroGLYCERIN patch	LIMA patient post-op day 1 off NTG infusion: 0.4 mg transdermal patch x 12 h	To keep LIMA patent.	Caution if hypotensive. Adverse reactions include severe hypotension; headache, tachycardia, contact dermatitis.
NitroPRUSSIDE	Nitroprusside infusion post-op: 50 mg in 250mL D5W run at 0-2 mcg/kg/min IV, titrate to sBP order	To control blood pressure post-operatively.	Excessive hypotension, palpitations, metabolic or lactic acidosis. Monitor for cyanide toxicity if duration of therapy exceeds 2 days. Monitor for renal or hepatic impairment
NorEPINEPHrine	0.03-3 mcg/kg/min of 8 mg in 250 mL D5W solution,	For inotropic and vasopressor effects in acute hypotension or cardiac arrest.	Contraindications include severe hypovolemia, vascular thrombosis, profound hypoxia,

Medication	Dosage, route, Frequency	Indications	Comments, select contraindications and undesirable effects
	titrate to maintain blood pressure parameters		hypercarbia, hyperthyroidism; severe adverse reactions may include severe HTN, arrhythmias, bradycardia, ischemic injury, asthma exacerbation,
Normal Saline	0.9% NaCl Bolus: 250-500 mL IV as indicated for hypovolemia *Infusion*: post-op patients NPO to maintain euvolemia *Flush for central lines*: 10 mL IV flush *Saline lock*: flush with 3 mL daily and PRN	Hypovolemia; as infusion for euvolemia maintenance post-op or flushes for IV lines.	Caution if edematous or Na imbalance; see guidelines for correction of hyper- and hyponatremia.
Nortriptyline	10-150 mg PO daily May give in divided doses Usual dose 50-75 mg PO daily	For use in treatment of depression. For use as an atypical analgesic in treating neuropathies, fibromyalgia, etc.	Allow washout of MAOIs for 2 weeks prior to administration. May cause orthostatic hypotension, changes in cardiac rhythm and conduction, decreased seizure threshold, and anticholinergic effects. Not recommended for patients following MI or patients with CHF.

Medication	Dosage, route, Frequency	Indications	Comments, select contraindications and undesirable effects
OLANZapine	5-10 mg PO daily	For agitation or agitated delirium in patients at risk for harm.	May cause agranulocytosis; avoid abrupt cessation.
Ondansetron	4 mg IV q 6-8 h PRN	Nausea and vomiting post-op.	Hypersensitivity to drug class or component. Caution if hepatic impairment, abdominal surgery or PKU. Adverse effects include: headache, hypotension, QT prolongation.
Oxygen therapy	FiO_2 28-100 % with mask, nasal prong or tracheostomy	Hypoxemia; in consultation with respiratory therapist.	Reduce O_2 sat parameters to keep at least 88-90% in patient with COPD who are chronic CO_2 retainers.
Pantoprazole	**Stress ulcer prophylaxis:** 40 mg IV daily **Continuation of home PPI therapy:** 40mg PO daily to BID	Stress ulcer prophylaxis for ventilated patients requiring IV formulation. Formulary PPI for continuation of patient's home PPI treatment while in hospital.	Blood dyscrasias, hepatic impairment, pancreatitis, interstitial nephritis. Common reactions include headache, diarrhea, abdominal pain, arthralgia, elevated liver transaminases.
Paroxetine	IR formulation: 20-60 mg PO daily CR formulation: 12.5-62.5 mg PO daily	To restart home medication and for treatment of depression, OCD, panic disorder, social phobia, GAD and PTSD.	Do not use in patients previously on MAOIs until proper washout (minimum 2 weeks).
Penicillin G	1-24 million units/day IV divided q 4-6 h	For treatment of susceptible infections (with cultures).	Monitor for C. Difficile associated diarrhea.

Medication	Dosage, route, Frequency	Indications	Comments, select contraindications and undesirable effects
Phenylephrine	100-200 mcg bolus IV 0.05-2 mcg/kg/min infusion of 50 mg in 250 mL 0.9% NaCl solution	For hypotension and shock. For treatment of procedural hypotension.	Ensure reliable venous access (extravasation may cause necrosis). May cause acidosis.
Phenytoin	300-400 mg PO daily For status epilepticus, loading dose of 15-20 mg/kg IV (maximum 1500 mg).	To restart a home medication. May also be used for status epilepticus.	Cautions: hepatic impairment, DM, alcohol use, thyroid disease, depression or history of depression. Avoid abrupt withdrawal. Feeds must be held 1 hour before and 2 hours after each PO dose.
Phosphate Novartis	500mg effervescent tablet; 1-2 tabs PO daily to BID **Note**: 500mg tab contains 16 mmol phosphate, 20 mEq sodium, 3 mEq potassium	To maintain serum phosphate of 0.8-1.45 mmol/L	Caution in renal impairment, adrenal insufficiency, hypernatremia, severe hepatic dysfunction. May have laxative effect.
Piperacillin/Tazobactam	3.375-4.5 g IV infused over 4 hours q 6-8 h	For serious infections.	Adjust for renal dosing.
Polyethylene glycol (PEG)	17g/packet PO once to twice daily	Post-op constipation, bowel clean out	Avoid with toxic colitis, bowel perforation, toxic megacolon, bowel obstruction, C.diff infection, colonic mucosal aphthous ulcerations. Electrolyte imbalance

Medication	Dosage, route, Frequency	Indications	Comments, select contraindications and undesirable effects
			reported with prolonged use (avoid use greater than 1 week)
Polysporin	Apply topically to affected area 1 to 3 times daily	Wound care.	
Potassium C**HLORIDE**	*IV*: 10 mEq in 100 mL sterile water if peripheral line or 20 mEq in 100 mL sterile water for central line *PO*: 1-3 tabs of 8mEq MicroK to correct or prevent hypokalemia with diuretic use	To maintain serum potassium and to manage digoxin toxicity.	Caution in renal impairment.
Potassium citrate	25mEq PO effervescent tab; 1-2 tabs PO daily to BID	To maintain serum potassium 3.5-5.0 mmol/L.	Caution if renal or hepatic impairment and peptic ulcer disease. Monitor calcium and blood pH with regular use. May have a laxative effect.
Potassium PHOSPHATE	22 mEq/15 mmol in 100mL D5W or NS if central line, in 250mL D5W or NS if peripheral line	To maintain serum potassium 3.5-5.0 mmol/L and serum phosphate of 0.8-1.45 mmol/L.	Caution if renal impairment.
Pravastatin	10-80 mg PO daily	Hypercholesterolemia, mixed dyslipidemia, hypertriglyceridemia, dysbetalipoproteinemia, familial hypercholesterolemia (homozygous), cardiovascular event prevention.	Active hepatic disease, unexplained elevations in LFTs, myalgia/myopathy, rhabdomyolysis.

Medication	Dosage, route, Frequency	Indications	Comments, select contraindications and undesirable effects
PredniSONE	1-60 mg PO/day May be divided into 1 to 4 doses/day	To restart a home medication. Useful for a variety of conditions including adrenocortical insufficiency, hypercalcemia, rheumatic and collagen disorders, dermatologic disorders, ocular, respiratory, gastrointestinal, neoplastic, organ transplantation, allergic, autoimmune, and inflammatory diseases.	Contraindicated in serious infections, systemic fungal infections, varicella. Avoid an adrenal crisis by tapering to discontinue. Multiple systemic effects, including HTN, CHF, sodium and fluid retention, increased sweating, hypokalemia, increased intraocular pressure.
Pregabalin	From 25mg PO once daily, not to exceed 600 mg/day	Neuropathic pain, fibromyalgia, post-herpetic pain	Requires dose adjustment for renal patients. Pregabalin may cause dizziness, somnolence, weight gain, angioedema (rare – more commonly peripheral edema). Increased seizure frequency may occur in patients with seizure disorders and have rapid discontinued treatment; taper Pregabalin gradually over a minimum of 1 week rather than discontinuing the drug abruptly.
Procainamide	Initial Load 15-17 mg/kg (maximum dose 1000mg) at rate of 20 mg/min (not to exceed 50 mg/min), then infuse at 1-6 mg/min (usual concentration is 1000 mg in 250 ml Normal Saline	Pharmacologic conversion of atrial fibrillation to normal sinus rhythm and maintenance of sinus rhythm in patients with A. Fib	QT prolongation with a risk of Torsades Des Points May cause bradycardia, hypotension, and AV block Can cause anaphylaxis, urticarial, or angioedema,

Medication	Dosage, route, Frequency	Indications	Comments, select contraindications and undesirable effects
		For acute termination of VT or recurrent VT resistant to other drugs	Caution with the use in hepatic or renal impairment Contraindicated with systemic lupus erythematosus (SLE)
Propofol	**Sedation for mechanically ventilated patients**: *Bolus*: 10-40 mg IV PRN, maximum of 100 mg/hr for RASS greater than or equal to 2 and pain scale less than three OR for procedural sedation PRN *Infusion*: 0.3-3 mg/kg/h IV of 10 mg/mL solution; start at 0.3 mg/kg/h and titrate to patient response	Titratable sedation for short procedures; propofol drip for longer anesthesia.	Do not use unless airway managed;-risk of propofol-related infusion syndrome (PRIS): lactic metabolic acidosis, cardiovascular instability, rhabdomyolysis, hyperlipidemia, enlarged liver.
Propranolol	10-80 mg PO BID	Hypertension, angina pectoris, ventricular arrhythmias, SVT, to prevent migraines, essential tremor, hyperthyroidism/thyroid storm.	Avoid abrupt discontinuation. May worsen suppression of a failing heart. Enters CNS readily: sedation, depression, nightmares.
Protamine	For bleeding related to residual heparin post-op cardiac surgery: 50 mg IV x 1 over 15 min, may repeat x 1	Heparin reversal, post-op bleeding due to residual heparin. Protamine 1 mg neutralizes 90 – 115 units of Heparin.	Anaphylactoid reactions, hypersensitivity to protamine, fish allergy, hypotension, vasoconstriction. Large doses may cause anticoagulation.

Medication	Dosage, route, Frequency	Indications	Comments, select contraindications and undesirable effects
			Do not give more than 50 mg of protamine within 10 minute period. Side effects of protamine: hypotension, pulmonary edema, anaphylaxis.
QUEtiapine	12.5-25 mg PO daily to BID to start; increase by up to 25mg per day. Maximum dose 300 mg daily.	For agitation, psychoses or to restart a patient's home medication.	Avoid abrupt cessation.
Ramipril	1.25-20 mg PO daily	For treatment of CHF or hypertension.	Use with caution in post-CABG patients. Consider low-dose start for patients with decreased renal function. May cause N/V/D, edema, albuminuria, arthraglia, arthralgia and dizziness. May increase Creatinine and Potassium
Ranitidine	**GERD:** 150 mg PO BID OR 50 mg IV q 8 h **Duodenal ulcer**: *Active*:	To restart home medication for GERD, duodenal and gastric ulcers, erosive esophagitis, hypersecretory conditions, dyspepsia, H. pylori.	Caution if hepatic or renal impairment, elderly or debilitated, chronic pulmonary disease, DM, immunocompromised.

Medication	Dosage, route, Frequency	Indications	Comments, select contraindications and undesirable effects
	150 mg PO BID OR 300 mg PO q HS OR 50 mg IV/IM q 8 h *Maintenance*: 150 mg PO q HS **Gastric ulcer**: *Active:* 150 mg PO qhs OR 50 mg IV q 8h *Maintenance*: 150 mg PO q HS 50 mg IV q 8h **Hypersecretory conditions:** 150 mg PO BID		Serious reactions include thrombocytopenia, hepatotoxicity, pneumonia. Avoid concomitant prescriptions including oral cefuroxime, iron, ketoconazole.
Replavite (dialysis vitamin)	1 tablet PO daily	To replace vitains B, C, and folic acid removed during dialysis.	Nausea, headaches; may increase appetite.
Rho (D) Immunoglobulin	300 mcg IV/IM	For incompatible transfusions.	May cause intravascular hemolysis. Avoid live vaccines for 3 months.
Rosuvastatin	5 – 40 mg PO daily	Hypercholesterolemia, mixed dyslipidemia, hypertriglyceridemia, dysbetalipoproteinemia, familial hypercholesterolemia	Active hepatic disease, unexplained elevations in LFTs, myalgia/myopathy, rhabdomyolysis.

Medication	Dosage, route, Frequency	Indications	Comments, select contraindications and undesirable effects
		(homozygous), cardiovascular event prevention.	
Salbutamol	**Bronchospasm**: inhaled 100 mcg spray 2 puffs q 4-6 h; if ventilated, 4-8 puffs q 4-6 h	Prevent or relieve bronchospasm of asthma or COPD.	Caution if ischemic heart disease, HTN, arrhythmias, hypokalemia.
Sennosides	Start 2 tabs PO q HS, increase to 4 tabs PO BID	To relieve constipation by increasing peristalsis.	GI obstruction, undiagnosed abdominal pain. Reacts with sodium sulphate/potassium sulphate/magnesium sulphate – may increase risk of colonic ulcer or ischemic colitis.
Simvastatin	10-40 mg PO daily	Hypercholesterolemia, mixed dyslipidemia, hypertriglyceridemia, dysbetalipoproteinemia, familial hypercholesterolemia (homozygous), cardiovascular event prevention.	Active hepatic disease, unexplained elevations in LFTs, myalgia/myopathy, rhabdomyolysis.
Sodium BICARBONATE 8.4%	**Acute metabolic acidosis**: 2-5 mEq/kg IV infused over 4-8 hours x 1 Subsequent doses to be based on response and acid-base status	Acute or chronic metabolic acidosis.	Hypochloremia, alkalosis; avoid excessive calcium intake. Caution if: renal impairment, CHF, sodium restriction, hypervolemia, Bartter

Medication	Dosage, route, Frequency	Indications	Comments, select contraindications and undesirable effects
	Note: 1 mEq = approximately 84 mg bicarbonate 500 mg PO daily or BID		syndrome, hypocalcemia, hypokalemia, hypernatremia. Serious reactions may include: metabolic alkalosis, CHF exacerbation, seizures, tetany, extravasation cellulitis (IV use).
Sodium PHOSPHATE IV	20 mmol sodium/15 mmol phosphate in 100mL NS or D5W for central vein administration or in 250mL NS or D5W for peripheral administration, IV x 1-2 doses according to level of phosphate deficiency and to renal function	Hypophosphatemia.	
Spironolactone	**Edema**: 25-200 mg PO daily (divide dose BID if CHF, cirrhosis or nephritic syndrome) **Hypertension**: 25-50 mg PO daily, start 12.5 mg daily (may divide dose)	Edema, hypertension, CHF, hypokalemia, primary hyperaldosteronism and hypokalemia.	Significant or acute renal impairment, hyperkalemia, hyponatremia, DM, elderly.

Medication	Dosage, route, Frequency	Indications	Comments, select contraindications and undesirable effects
Ticagrelor	90mg PO BID maintenance. Loading dose (following ACS event): 180 mg PO	P2Y(12) platelet inhibitor indicated to reduce the rate of thrombotic cardiovascular events in patients with ACS and atherosclerosis. Treatment post-ACS (Unstable angina/STEMI/NSTEMI) x1 year, post stent insertion x1 year, as per cardiac surgeon discretion post CABG	Coagulopathy, GI bleeding, intra-cranial hemorrhage, any active pathological bleeding. Dyspnea reported. Avoid in severe hepatic impairment (likely to increase Ticagrelor serum levels). Avoid coadministration with potent CYP3A inducers (e.g. rifampin, dexamethasone, phenytoin, carbamazepine, phenobarbital)
TraZODone	**25-100 mg PO q day**	Insomnia	MAO inhibitors: do not administer trazodone within 14 days of administering a MAO inhibitor Blurred vision Dizziness Drowsiness Dry Mouth Fatigue Headache Starting trazodone in a patient who is being treated with linezolid or IV methylene blue is contraindicated because of an increased risk of serotonin syndrome

Medication	Dosage, route, Frequency	Indications	Comments, select contraindications and undesirable effects
Trimethoprim-sulfamethoxazole	**Bacterial infections**: 800 mg/160 mg TMP PO q 12 h Dose adjustment in renal impairment.	Bacterial infection with known sensitivity to TMP-SMX; UTI empiric therapy.	Significant renal/hepatic impairment, hypersensitivity to sulphonamides, megaloblastic anemia, folate or G6PD deficiency, chronic alcohol use, anticonvulsant use, bone marrow suppressants, malabsorption, malnutrition, severe allergies or bronchial asthma, hyperkalemia, elderly. Severe adverse reactions include: Stevens-Johnson Syndrome, toxic epidermal necrolysis, photosensitivity, fulminant hepatic necrosis, agranulocytosis, aplastic anemia, blood dyscrasias, anaphylactoid reactions, hepatitis, hepatotoxicity, interstitial nephritis.
Tamsulosin	0.4-0.8 mg PO daily	Symptomatic benign prostatic hyperplasia; blocks alpha-1 receptors, resulting in vasodilation.	First dose may cause significant orthostatic hypotension.
Terazosin	**Hypertension**: 1- 20 mg PO q HS; may divide BID	Use for treatment of hypertension and benign prostatic hypertrophy.	Caution if cataract surgery. Serious reactions may include: hypotension with first dose, syncope, SVT, Afib, priapism,

Medication	Dosage, route, Frequency	Indications	Comments, select contraindications and undesirable effects
	BPH: 1-10 mg PO qHS		thrombocytopenia, anaphylaxis, intraoperative floppy iris syndrome.
Tranexamic acid	1 g IV x 1	Anti-fibrinolytic; for post-operative bleeding where excessive fibrinolysis appears to be a significant contributor to post-operative bleeding.	Risk of increased thrombotic tendency due to inhibition of thrombolysis. Caution with high doses (greater than 10 g) given association with seizures.
Valsartan	40-320 mg PO daily	For treatment of hypertension.	Use with caution in post-CABG patients; may cause N/V/D, edema, albuminuria, arthralgia.
Vancomycin	1 g IV over 1 h q 12 h Obtain vancomycin trough level 30 minutes prior to 4th dose and adjust interval based on level Extend dosing interval in renal impairment	Sepsis or endocarditis caused by methicillin-resistant staphylococci. Post-op prophylaxis for patients with a penicillin-allergy.	Check vancomycin trough levels – recommended trough levels 10-20 mcg/mL (depending on indication). Histamine release causes "red-man syndrome" – slow down infusion over 1-2 h. Increased risk of oto- and nephrotoxicity if given with aminoglycoside.
Vasopressin	**Vasodilatory shock**: 2-2.4 units/hour IV infusion of 20 units in 50 mL D5W or 0.9% NS	Vasodilatory shock.	Possible anti-diuretic effects, hyponatremia, increased risk of SIADH, increased risk of seizure.

Medication	Dosage, route, Frequency	Indications	Comments, select contraindications and undesirable effects
Vitamin supplements not limited to multivitamin with or without minerals, B12 cyanocobalamin, vitamin C	Dose dependent on agent selected and indication for use ***Commonly used:*** **Thiamine (vitamin B1): Wernicke encephalopathy prophylaxis, alcohol withdrawal**: 300 mg IV daily x 3 days **Folic acid (Folate)** 1-5 mg IV/PO daily post-op cardiac surgery	Treatment and prevention of vitamin and mineral deficiencies related to nutritional deficient states and/or chronic alcohol abuse, tissue and wound healing. Prevention of Wernicke encephalopathy prior to/during alcohol withdrawal; patient with history of regular ETOH use pre-op. Post-operative anemia; megaloblastic and macrocytic anemias.	Use with caution in severe renal and hepatic dysfunction.
Vitamin K (phytonadione)	5 mg IV x 2 if reversal of coumadin is required for urgent surgery 1-5 mg PO/subcut/IV x 1	To provide vitamin K for vitamin K-dependent clotting factors and to normalize INR after warfarin therapy.	Allergic/hypersensitivity reactions more common with IV dose.
Warfarin/Coumadin	Dose adjusted to maintain INR in desired range, in consultation with thrombosis service as indicated by cardiac surgeon post-operatively for mechanical and tissue valves. Start coumadin 2-5 mg PO daily x 2 days starting on post-op day 1 or as indicated	Stroke prophylaxis with atrial fibrillation. Tissue and mechanical valves – start coumadin and Heparin post-operatively and discontinue Heparin when INR is in therapeutic range.	Discontinue coumadin 3-5 days prior to surgery. Risk of major/fatal bleeding, including intracranial bleed; risk higher if INR greater than 4, age greater than 65, variable INR, history of GI bleed, HTN, cerebrovascular disease, serious heart disease,

Medication	Dosage, route, Frequency	Indications	Comments, select contraindications and undesirable effects
	clinically and by INR; usual maintenance dose ranges from 2-10mg/day, adjusted based on INR. Overlap heparin and warfarin treatment until INR is therapeutic, then discontinue heparin.		anemia, malignancy, trauma, renal impairment, concomitant drugs and long duration of coumadin therapy. Caution if renal impairment and decrease dose if hepatic impairment. To stop synthesis of vitamin K-dependent clotting factors: II, VII, IX, X; protein C and S, caution: drug-drug interactions, for those that decrease or attenuate/ increase coumadin effect.
Zopiclone	3.75 mg to 7.5 mg PO QHS	Insomnia	Drowsiness Confusion Bitter taste in mouth Day time anxiety or restlessness Avoid with severe liver impairment
Blood Products: See HHS Order Sets			
Albumin	5% 250 mL 25% 100 mL	For volume expansion post-operatively, especially hypovolemia where extravascular fluid appears to be available/total body fluid overload. Hypotension, to increase preload: NS 250-500 mL alternating with albumin 250 mL 5%.	Pooled plasma product: Jehovah's Witness – may or may not allow. Transfusion reaction, risk of infection. Caution with hypertonic solution (25%) in dehydrated patient.

Medication	Dosage, route, Frequency	Indications	Comments, select contraindications and undesirable effects
Cryoprecipitate/Fibrinogen concentrate	Usual dose 0.1 unit/kg (70 kg person will get 7 units)	Documented hypofibrinogenemia, or urgent surgery post-thrombolytic therapy with depletion of fibrinogen. Deficiency of factor VIII, von Willebrand's factor, factor I (fibrinogen) and of XIII ONLY if specific factor concentrates. *Note*: Recommended but not essential to observe ABO compatibility.	Transfusion reaction; risk of infection.
Fresh Frozen Plasma	10-15 mL/kg *Calculation for 70 kg patient*: 70 kg x 15 mL = 1050 mL Approximately 4 units *Generally*: 3 units for small adult 4 units for large adult Should be ABO compatible	Post-op surgery: greater than 100 mL/hr serosanguineous drainage. No residual heparin, platelets 5-100 x 10^9; PTT prolonged, and fibrinogen greater than 1 g/L. To correct clotting factor deficiencies, where clotting factor concentrates are not available or when multiple deficiencies are present e.g. liver disease, DIC , INR greater than 1.8, AND bleeding, or urgent surgery/procedure required. To reverse vitamin K deficiency only if vitamin K is not sufficient and prothrombin complex	Transfusion reaction; risk of infection.

Medication	Dosage, route, Frequency	Indications	Comments, select contraindications and undesirable effects
		concentrate unavailable; inherited or acquired single factor deficiency where specific factor concentrate is not available.	
Immune globulin	Dose determined by condition being treated. Administered IV.	Refer to MONO – Blood – Intravenous Immune Globulin. May be indicated for the treatment of: Primary and secondary immune deficiencies Idiopathic thrombocytopenic purpura (ITP) Guillain-Barre syndrome Chronic inflammatory demyelinating polyneuropathy (CIDP)	Anaphylaxis or anaphylactoid reaction, fever/chills, headache, nausea/vomiting, chest tightness, dyspnea, malaise, thrombotic events such as MI, stroke, hemolysis.
Packed Red Blood Cells	1 unit PRBC (300 mL), will raise Hgb by approximately 10 g/L MED/IV - BLOOD and BLOOD PRODUCT Administration - Adult and Pediatric Protocol	Symptomatic anemia or Hgb less than 70. If Hgb is less than 60 and NOT transfusing, this would need to be justified (young patient without CV disease may be able to tolerate greater degrees of anemia). Consider transfusing at higher Hgb if cardiac disease, ie. clear signs of inadequate tissue oxygen delivery in a patient with low Hgb and an acute coronary syndrome,	Transfusion reaction: acute hemolytic reaction, delayed hemolytic reaction, febrile non-hemolytic reaction, anaphylactic reaction, other minor allergic reaction, transfusion related acute lung injury (TRALI), transfusion-associated circulatory overload (TACO); risk of infection (Hep B & C, HTLV I and II, HIV).

Medication	Dosage, route, Frequency	Indications	Comments, select contraindications and undesirable effects
		transfuse when Hgb less than 80, or less than 100 with symptoms. Only when benefits of transfusion outweigh the risks, no general benefit of transfusion.	
Platelets	Post-cardiac surgery with platelet dysfunction and marked bleeding, give 1 adult dose of platelets regardless of platelet count 1 adult dose of platelets = 300-350 mL 1 adult dose contains 350 x 10^9 platelets, should raise platelet count by 10-15 x 10^9/mL (depends on BSA)	Platelet count less than 10 x 10^9/L. Platelet count less than 50 x 10^9/L and patient having surgery or bleeding. Platelet dysfunction suspected and patient having surgery or bleeding.	Transfusion reaction; risk of infection - bacterial sepsis risk greatest with platelets.
Prothrombin Complex Concentrates (Octaplex)	Octaplex for patient of weight between 50-90 kg, and INR less than 3: 1000 IU IVF at rate of less than 2-3 mL/min Give with Vitamin K 2-10 mg IV to avoid rebound anticoagulation	To rapidly reverse vitamin K antagonist (e.g. warfarin) when emergency procedure or life threatening bleeding and INR is greater than 1.5; for vitamin K deficiency, with INR greater than 1.5, and life-threatening bleeding. Approval from the thrombosis service is required for use.	Do not use Octaplex when: • INR less than or equal to 1.5 • Coagulopathy not related to warfarin or vitamin K • Known HIT (contains heparin) • Patient will receive rFactor VIIa

Medication	Dosage, route, Frequency	Indications	Comments, select contraindications and undesirable effects
rFactor VIIa Niastase	Warfarin over-anticoagulation INR reversal in life-threatening bleeding: 15-90 mcg IV x 1	For massive recalcitrant hemorrhage, to initiate hemostasis.	For use only when unable to stop bleeding with other products/medications/ means; complications include arterial and venous thrombotic/thrombo-embolic events. Use requires approval from hematology service.

Appendix: Investigations

Type 1 Investigations: Investigations the PA will implement as part of the medically established plan of care, without specific discussion with a physician supervisor.
Type 2 Investigations: Investigations the PA will implement only after discussion with a physician supervisor to identify the specific investigation required.

Investigations	Type	Indications/ Contraindication/notes
LABORATORY TESTING		
Chemistry: • Albumin • Blood Gases (arterial & venous) • Bicarbonate • Calcium • Cardiac Enzymes (CK) • Troponin • Chloride • Cortisol • C-Reactive Protein • Specific drug levels as indicated (e.g. Digoxin, Dilantin, Gentamicin, & Vancomycin) • Ferritin • Glucose, Capillary Blood Glucose • Glucose, Fasting • Glucose, Random • HbA1C • Lactate • LDH • Lipase	 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	• Consideration will be given to the volume and frequency of blood testing. • Test will be ordered to assess for, follow up on, or rule out clinical conditions or diagnoses and will be patient specific (e.g. HbA1c will only be ordered when clinically necessary and not on a routine basis). • To confirm or rule out a suspected diagnosis (e.g. urea & creatinine levels to diagnose renal insufficiency) • To determine effective drug dosage and to prevent toxicity (e.g. Digoxin)

• Lipids:		
Cholesterol	2	
Triglycerides	2	
HDL	2	
LDL	2	
Chol/HDL ratio	2	
• Liver Function:		
ALT	1	
GGT	1	
Alkaline Phosphatase	1	
Total bilirubin	1	
Conjugated bilirubin	1	
Unconjugated bilirubin	1	
• Magnesium	1	
• Osmolality, serum	1	
• Parathyroid Hormone	1	
• Phosphate	2	
• Potassium	1	
• Renal function	1	
Creatinine/e-GFR		
Urea	1	
• Sodium	1	
• Total CO_2	1	
• Total iron binding capacity	1	
• Total protein	1	
• TSH	1	
• Free T3	1	
• Free T4	1	
• Urate	1	
• Vitamin B12	1	

Blood Bank • Crossmatch • Group & Screen	 1 1	• When patients require blood transfusions or may need blood transfusions in the near future (e.g. patients undergoing surgery) • To determine ABO and Rh-D type and the presence or absence of unexpected antibodies. • Primary purpose is to prevent a possible transfusion reaction. • Contraindicated when a patient's personal choice is not to receive blood products (e.g. religion).
Coagulations: • INR • PTT • Fibrinogen • Anti-Xa • DIC Screen • D-dimer	 1 1 1 1 1 1	• Suspected or actual bleeding • To monitor therapy (e.g. warfarin, heparin). • Consideration will be given to the volume and frequency of blood testing.
Hematology: • CBC & Differential • ESR • Reticulocytes • Smear Scan • HIT screen	 1 1 1 1 1	• Consideration will be given to the volume and frequency of blood testing. • Test will be ordered to assess for, follow-up on, or rule out a suspected clinical conditions or diagnoses and will be patient specific (e.g. Hgb level to confirm the diagnosis of anemia).
Microbiology: Blood : • C & S Respiratory: • Nasal Swabs (e.g. Influenza) • Sputum C & S • Throat C & S Stools • C & S/ Gram stain • O&P • C-difficile • Rectal Swabs (e.g. MRSA, VRE)	 1 1 1 1 1 1 1 1	• Test will be ordered to assess for, follow-up on, or rule out a suspected clinical conditions or diagnoses and will be patient specific (e.g. blood cultures to assess for bacteremia and to identify the microorganism(s)). • Used to guide treatment (e.g. tailor antibiotic choice to sensitivities of the infecting organism)

Urine C & S Wound C & S	1 1	
Nasopharyngeal swabs (NPS) and if required swab for COVID-19 testing for patients who meet the screening criteria. **Collect a NPS and, if required, a throat swab for COVID-19 as outlined in the Laboratory Specimen Collection Protocol.**	1	Screening Criteria are as follows: • Patients who present with fever greater than 38°C, and/or cough, and/or difficulty breathing AND • Patients who have travelled outside of Canada within the last 14 days OR • Patients who have had close contact with a confirmed or probable case of COVID-19 in the past 14 days OR • Patients who have had close contact with a person with acute respiratory illness who has travelled outside of Canada within 14 days prior to onset of illness.
Urinalysis/ Enterics • Osmolality, Urine • Specific urine electrolytes as required: Ca, Cl, K, Na • Urine, Routine UA & Microscopy	 1 1 1	• To assess fluid volume status. • To assess for urinary tract infection. • To asses for blood in stool.
Medical Diagnostics		
• ECG • Spirometry • Pulmonary Function Tests • Echocardiogram (Transthoracic and transesophageal)	1 1 1 1	• Patient has known or suspected heart disease or arrhythmias. • To evaluate respiratory airflow. • To detect abnormalities and evaluate extent of pulmonary function. • To evaluate ventricular/valve function, R/O suspected clinical condition e.g. pericardial effusion/thrombus.

Diagnostic Imaging		
CT Scan		
• Head • C-spine • Chest • Abdomen • Pelvis	1 2 2 2 2	• To assess for and rule out diagnoses e.g. intracranial haemorrhage • Avoid in pregnant patient • PA will clearly identify clinical indication, view, location and what is wished to be assessed /ruled out on the order form. • Caution in pregnancy
X-Rays		
• Abdominal • Chest • Extremity • Spine • Ribs	1 1 1	• To assess for and rule out diagnoses (e.g. pulmonary congestion). • Avoid in patients who are pregnant. • PA will clearly identify clinical indication, view, location and what is wished to be assessed /ruled out on the order form. • Caution in pregnancy
Ultrasounds		
• Abdominal • Chest • Venous Doppler Ultrasound (extremities) • Bedside Ultrasound – Chest, Abdomen, Vascular, other	1 1 1 1	• Used to assess for, follow-up on, or rule out a suspected clinical conditions or diagnoses (e.g. DVT). • PA will identify clinical indication, location and what is wished to be assessed/ruled out on the order form. • For the assessment of free fluid, to assess in the placement of venous access devices and other invasive procedures

Appendix: Referrals

Type 1 Referrals: Referrals the PA will implement as part of the medically established plan of care, without specific discussion with a physician partner.
Type 2 Referrals: Referrals the PA will implement only after discussion with a physician partner.

Referrals	Indications/Contraindications	Type
Diabetic Nurse Clinician	Patients who require additional education for new onset diabetes, or ongoing diabetic care.	1
Dietitian	• Patients requiring additional health teaching regarding diet and nutrition Patients who have active or potential nutritional issues related to diabetes, debilitated state, neurological conditions (e.g. stroke), infection, or need for dietary supplements	1
Infection Control	Patients who are considered for isolation because of potential or actual infection with drug resistant microbes or significant immunosuppression.	1
LHIN Home and Community Care	• Patients requiring assessment and possible treatment to assist in determining appropriate discharge destination • To maximize supports required in the home to maximize independence and support in the home or community • Nursing assessment and treatment e.g. wound care Allied health assessment and treatment e.g. social work, physiotherapy, or occupational therapy	2
Medical Consultations - other (Arrhythmia, Cardiology, Cardiac Surgery, Infectious Diseases , Geriatrics, GI, Psychiatry, Surgery, Ortho, Spine, Urology, etc.)	• Other Medical Consultants (Arrhythmia, Cardiology, Cardiac Surgery, Infectious Diseases , Geriatrics, GI, Psychiatry, Surgery, Ortho, Spine, Urology, etc.) **In consultation with physician**	2
Occupational Therapy	• Patients requiring assessment and possible treatment to assist in determining an appropriate discharge destination and need for home aids (i.e. devices/aids required to maximize independence with activities of daily living (ADL)) Initiate rehab component of care for people with disability or handicap	1

Referrals	Indications/Contraindications	Type
Palliative Care	To help relieve suffering and improve quality of life of patients with serious, complex illnesses and those requiring additional pain and symptoms management beyond what the primary team has to offer.	2
Pharmacist	• Patients who require ongoing and/or discharge medication education Patients with complex medication regimens to ensure all medications indicated, effective, safe and cost effective	1
Physiotherapy	• Patients requiring assessment and possible treatment to assist in determining appropriate discharge destination and need for home aids (i.e. devices/aids required to maximize independence with ADL) Initiate rehab component of care for people with disability or handicap	1
Psychiatry	• Patient demonstrating signs and symptoms of delirium, excessive anxiety, or for consultation if patient has a previous psychiatric history	2
Rehabilitation	• Patient requiring continuing in-hospital care but deemed medically stable and ready to progress from ICU care	2
Rehabilitation, cardiac	• Patients requiring ongoing support and education for modification of cardiac risk factors and support and guidance for	2
Respiratory Therapist	• Patients requiring assessment and possible treatment to assist in maximizing respiratory function • Participate in patient/family teaching for respiratory techniques to maintain pulmonary hygiene for patients with spinal cord injuries (i.e. breath stacking, inexsufflation), stroke, or chronic respiratory disease	1
Social Work	• Patients requiring assistance with housing, finances, or emotional needs • Patients requiring information and assistance in accessing legal help • Patients requiring information and assistance in contacting support community resources for people facing disability/handicap • Required to assist in determining an appropriate and thorough discharge plan	1
Speech Language Pathologist	• Patients requiring assessment and possible treatment to assist in determining appropriate discharge destination • Patients requiring assessment and treatment of swallowing, communication/cognition or speech disorders • Patients requiring additional health teaching (i.e. patients with tracheotomies)	1

Referrals	Indications/Contraindications	Type
Spiritual	Patients requiring spiritual guidance.	1
Thrombosis Service	• Patients who are at risk for developing deep vein thrombosis or pulmonary embolus related to their diagnosis, neurological disease, or immobility • Patients who have prosthetic valvular devices implanted and require short-term or long term anticoagulation • Patients with identified DVT, pulmonary embolus, or suspected DIC Patients who are receiving anticoagulants and are problematic (e.g. Those with a high bleeding risk or patients with erratic anticoagulant control)	1
Wound Care Nurse	• Patients who require the expertise of the wound care nurse, especially those with NPWT dressings, stomas, or deep wounds	2

Appendix: Sanctioning Patient Flow

Patient Flow Sanctioning: refers to implementing authorization for admissions, discharges and for inpatients to have 'off unit privileges' so that inpatients, in light of their clinical condition and needs, may safely leave a unit with proper notice and planning (e.g. to go to cafeteria without accompaniment by staff or with family member). This also includes decisions re: appropriate accompaniment for off-unit tests if necessary (i.e. if decisions are not already guided by HHS policy and procedure).

Type 1 Patient Flow Sanctions: Sanctions the PA will implement as part of the medically established plan of care, without specific discussion with a physician supervisor immediately beforehand.
Type 2 Patient Flow Sanctions: Sanctions the PA will implement only after discussion with a physician supervisor.

Patient Flow Sanctions	Type	Circumstances
Authorizing Off Unit Tests/Level of Staffing Accompaniment	2	The patient will be assessed to determine if staffing accompaniment is required, based on their condition.
Authorizing admissions	2	In consultation with the physician or designate
Authorizing discharges/transfers	2	In consultation with the physician or designate
Authorizing Alternate Level of Care (ALC) designation	2	The patient will be assessed by the PA to determine the appropriate level of care needed. ALC designation will be used when the patient no longer requires acute hospital care and is waiting for transfer
Authorizing day/weekend passes	2	In consultation with physicians or designate to facilitate discharge planning and patient/family centered care.
Authorizing off unit privileges	1	The patient may leave the ward if it is determined by the PA that their condition is stable.
Authorizing off unit tests/ level of staffing accompaniment	1	The patient will be assessed to determine if staffing accompaniment is required, based on their condition.
Cosigning of Allied Health Orders	1	The PA will be able to cosign orders by the allied health team (i.e. SLP, Dietician and Pharmacy) within the scope of these Medical Directives

Patient Flow Sanctions	Type	Circumstances
General Orders	1	The PA may provide routine orders regarding day to day patient care. (i.e. getting up in chair, assisting with meals, fluid restriction etc)
Verbal and Telephone orders	1	Verbal orders may be received and implemented from a physician if the PA has the appropriate knowledge, skill, and judgment to perform the delegated act The PA themselves may not give verbal or telephone orders.