Housestaff Quick Reference: Rapids & Codes

July 2024 – June 2025

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Updates

(e-mail ethan.krauspe@hsc.utah.edu if there is additional information you think would be useful in this guide or if you identify any errata)

- *05/14/2025: Released to Residents*

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Logistics – The U

Call 1-2222 if:

- Patient is pulseless or in respiratory arrest (**C-Arrest Team** activation)
- Admitted patient with sudden change in mental status, vital signs or experiences acute distress (**Inpatient RRT** activation)
- Any visitor, clinic patient or employee is injured or requiring urgent/emergent medical attention (**Outpatient RRT** activation)
- Anyone displays stroke symptoms (**Brain Attack** activation)

Who Shows Up

OUTPATIENT RRT
2 EMT/Paramedics, stretcher, monitor

INPATIENT RRT
House Sup, IM Resident, SICU RN, Pharmacy

C-ARREST TEAM
Anesthesia, IM Resident, SICU RN, EMT, MICU Resident, House Sup, RT, Pharmacy

BRAIN ATTACK
Neuro Attending, Stroke Fellow, Neuro Res, NCC RN to acute care areas, Pharmacy, Phlebotomy, 12 lead, CT scanner held

STEMI
For a patient with ST elevation or a new left bundle branch block, call x12222 to activate the Cath Lab

New in 2025: PCCM Fellow will show up to all codes at the U of U if activated between 7AM – 7PM

Brain Attack (Acute Neurologic Change)

Is Your Patient Experiencing an Acute Neuro Change?

	INPATIENT BRAIN ATTACK IV Thrombolytic +/- IR Intervention	NEUROLOGY CONSULT	RAPID RESPONSE OR CODE BLUE
Symptoms	**Disabling** stroke-like symptoms less than 24 hours old: • Visual field cut • Abnormal eye movement • Inability to speak • Loss of coordination • Focal (one-sided) weakness • Brainstem Syndrome symptoms (issues with breathing, hearing, vision, swallowing, speech, etc.)	**Place a neurology consult order if:** Stroke symptoms are **greater than 24 hours old** OR for **ANY** non-stroke-like symptom including: • Seizure or status epilepticus • Altered mental status with no other focal deficit • Fatigue or generalized weakness • Tremors **If the change is acute, note "URGENT" in page.**	**RRT:** • HR <45 or >125 • SBP <90 or acute BP change • RR <10 or >30 • SpO2 <90% or increased O2 demand • Acute change in level of consciousness or mental status **CODE:** • Cardiopulmonary arrest (no pulse or breathing within 10 seconds)
Imaging	Non-Contrast CT Head **AND** CTA Head/Neck (will be placed by CT tech)	Per Neurology Consult	N/A
Who determines the page?	Any staff member who discovers the symptomatic patient – **Call 12222 for Brain Attack activation**	Patient's primary service team	Any staff member – **Call 12222 for activation**
Who receives the page?	Neurology Resident, NCC RN, CT tech, Radiology Resident, Pharmacy, Scribe, Social work, EKG, CXR	Inpatient Consult - Neurology Resident	RR team or CODE team as appropriate

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STEMI or new LBBB Protocol

Page Cardiology Fellow on-call first for guidance

- There is a Cardiology Fellow in-house 24/7. If your clinical suspicion is high and you are unable to reach a cardiology fellow, consider activating the cath lab as below (x1-2222) and initiate work-up.
- Consult with Cardiology fellow and/or pharmacist prior to initiating Heparin or a P2Y12 inhibitor

Pre-Cardiac Cath Lab Arrival
□ Activate Cardiac Catheterization Lab: **1-2222**. □ Place 2 large bore IVs, preferably on the left side with extension tubing. □ Infuse NS at 30 mL/hr. □ Administer oxygen to keep SaO_2 > 90%. □ Draw blood for CBC, BMP, high-sensitivity troponin, aPTT, and PT/INR. □ Administer appropriate medications: ○ Aspirin 324 mg by mouth (81 mg x 4 chewable tablets) or 300 mg PR. ○ Heparin ACS/MI Protocol: ▪ Heparin 60 units/kg IV bolus (maximum 4,000 units). ▪ Heparin continuous IV infusion at 12 units/kg/hr (maximum weight of 125 kg). ○ Ticagrelor 180 mg (90 mg x 2 tablets) or prasugrel 60 mg (10 mg x 6 tablets) if no history of stroke (and avoid use in patient s< 60 kg or > 75 years old). ○ Atorvastatin 80 mg.

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Cardiogenic Shock Team

Cardiogenic Shock-Sequence of Major Diagnostic and Therapeutic Interventions

CARDIOGENIC SHOCK?
Low Threshold to Activate

↓

PAGE SHOCK TEAM*
Call 1-2222 or online smartweb

↓

STEMI?

Yes ↓

CARDIOGENIC SHOCK WITH STEMI

In chronological order:

1. Establish central arterial access: LVEDP measurement first followed by angiogram
2. If criteria** met consider MCS if possible simultaneously with Angiogram-PCI
3. RHC (CCO Swan)

No ↓

ALL OTHER CARDIOGENIC SHOCK CASES

In chronological order:

1. RHC (CCO Swan)
2. If criteria** met consider MCS
3. Possible LHC depending on the clinical scenario

*__SHOCK TEAM__:

a. **Advanced HF Cardiology**
b. **CT Surgery**
c. **Interventional Cardiology**
d. **Cardiovascular ICU (including nursing)**

****Consider short-term MCS (e.g. Impella, VA-ECMO, IABP, etc.) in case of:**

a. Low Systemic Blood Pressure: SBP < 90 mmHg or MAP < 50 mmHg for > 30 minutes **or** need IV inotropes/vasopressors to maintain SBP > 90 mmHg or MAP > 50 mmHg.

b. Plus ONE of the following:

- PCWP or LVEDP > 15 mmHg **and** CI < 2.2 L/min/m², **or**
- Clinical or radiological signs of pulmonary edema, **or**
- Impaired end-organ perfusion defined as: altered mental status; cold, clammy skin and extremities; oliguria with urine output less than 30ml/hour.

NOTE: If mechanical ventilation is required in the cath lab the **Anesthesiology Service** should be involved. Per request of the Anesthesia Department if possible notify the on call anesthesiology team as early as possible.

CCO Swan: continuous cardiac output thermodilution flow-directed pulmonary artery catheter; IV: intravenous; LHC: left heart catheterization; LVEDP: left ventricular end-diastolic pressure; MAP: mean arterial pressure; MCS: mechanical circulatory support; PCI: percutaneous coronary intervention; RHC: right heart catheterization; SBP: systolic blood pressure; STEMI: ST elevation myocardial infarction.

Updated Sept 18, 2023

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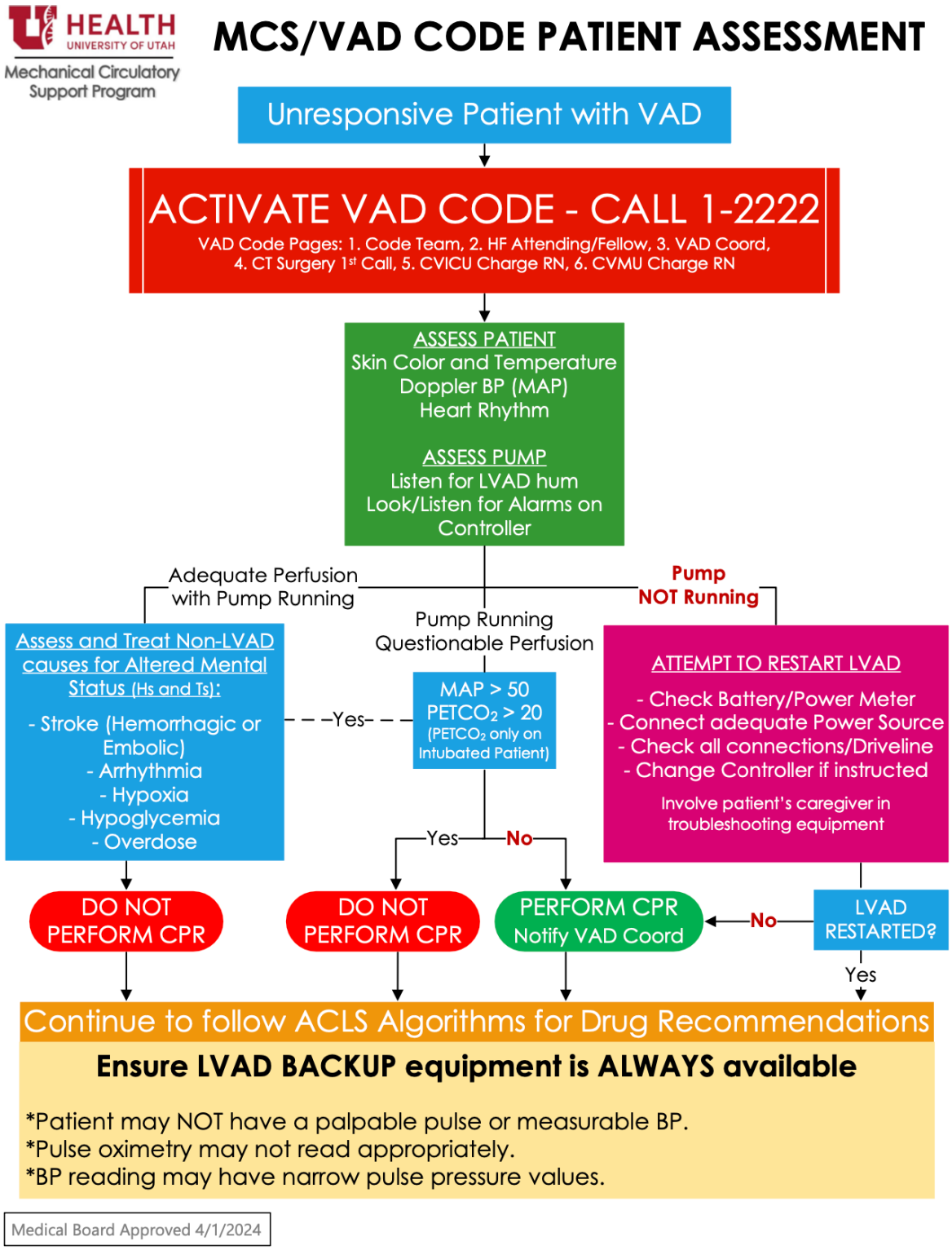
MCS/LVAD Codes



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Massive Transfusion Protocol

Consider if massive uncontrolled hemorrhage, or massive hemorrhage is highly anticipated (> 6 units RBCs in 2 hours)

- MTP can be activated by calling Blood Bank and requesting MTP activation
- The following information is required for activation:
    - Patient full name & MRN
    - Authorizing Physician's full name
    - Caller's full name &Title
- Blood Bank will prepare:
    - 6 RBC + 6 FFP + 1 platelet and release these from the Blood Bank each time someone presents to retrieve blood products.
- Blood Bank does not deliver, someone needs to physically present to the Blood Bank each time additional product is required. They must have patient name and MRN with them in order to confirm proper patient identification.
- MTP will remain active for **12 hours** or until a physician cancels, which ever occurs first.

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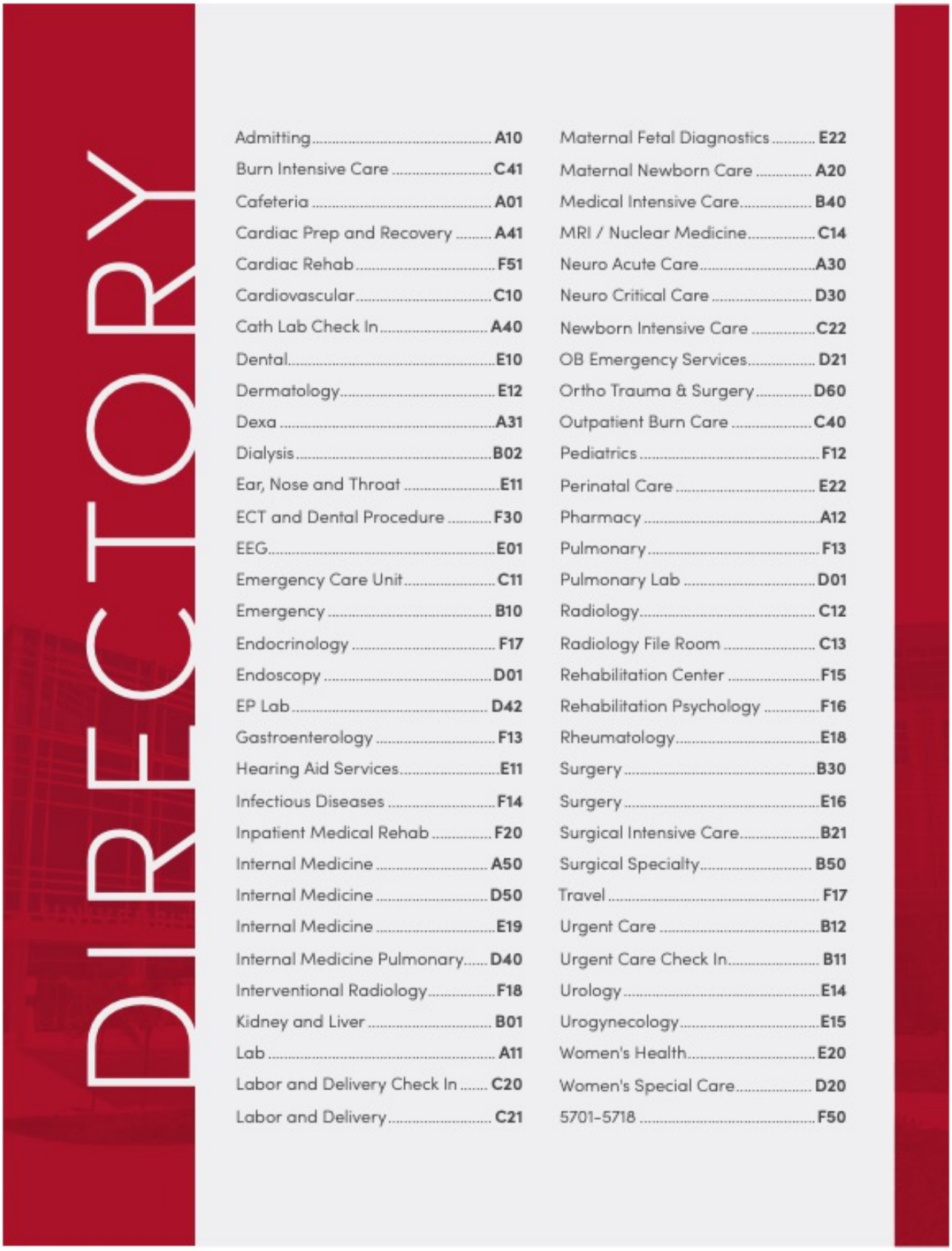
Hospital Directory & Map



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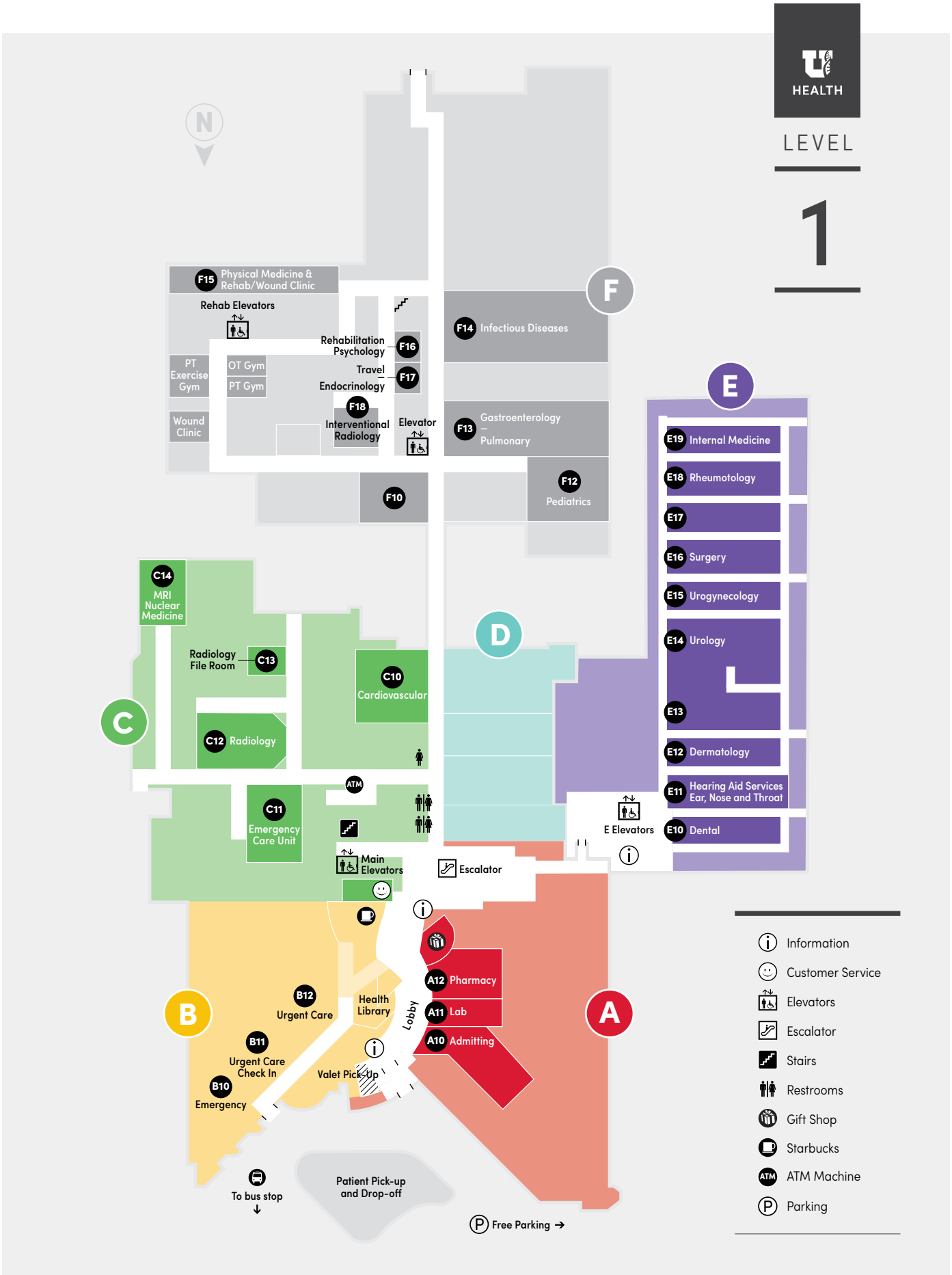
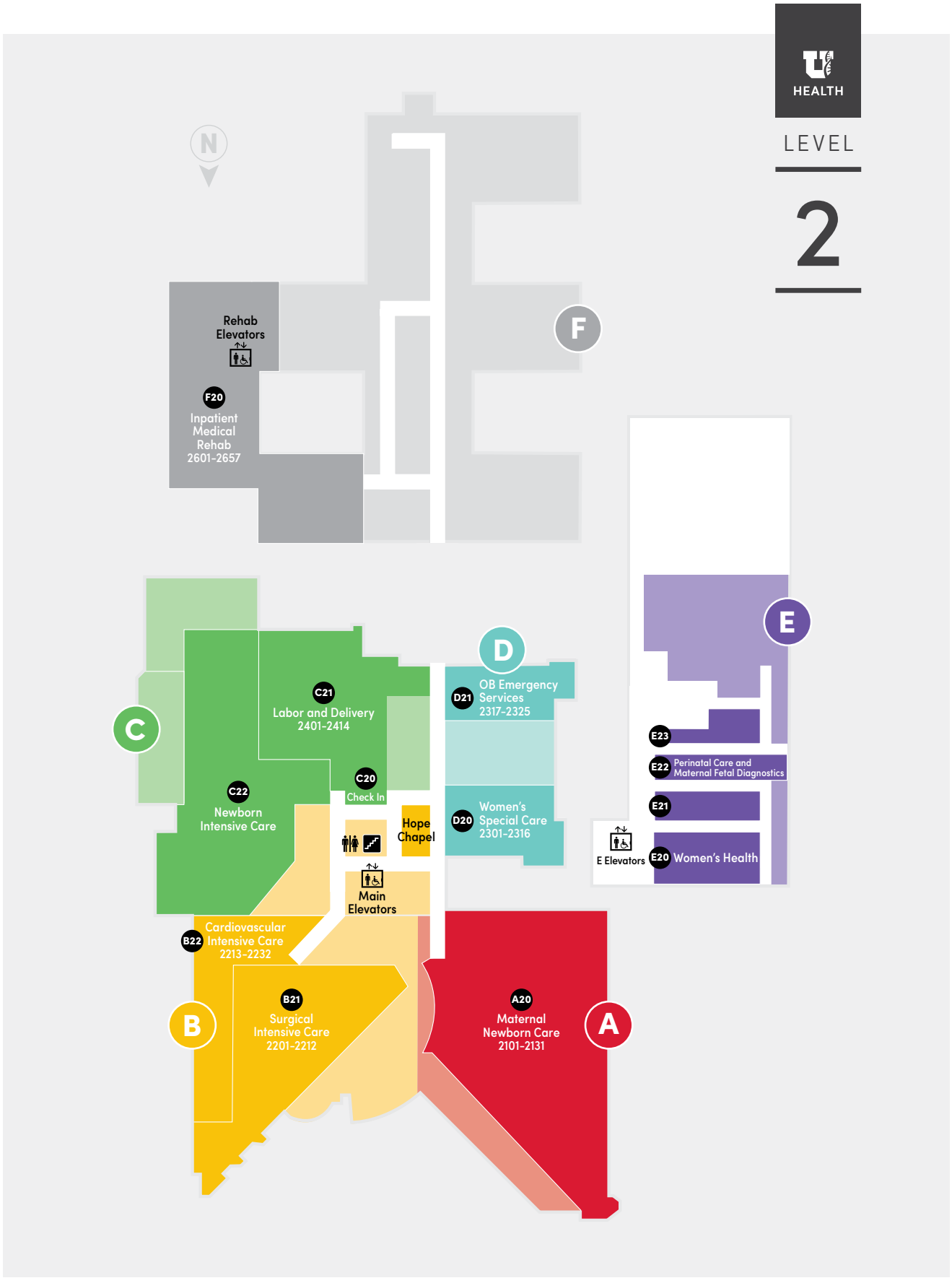
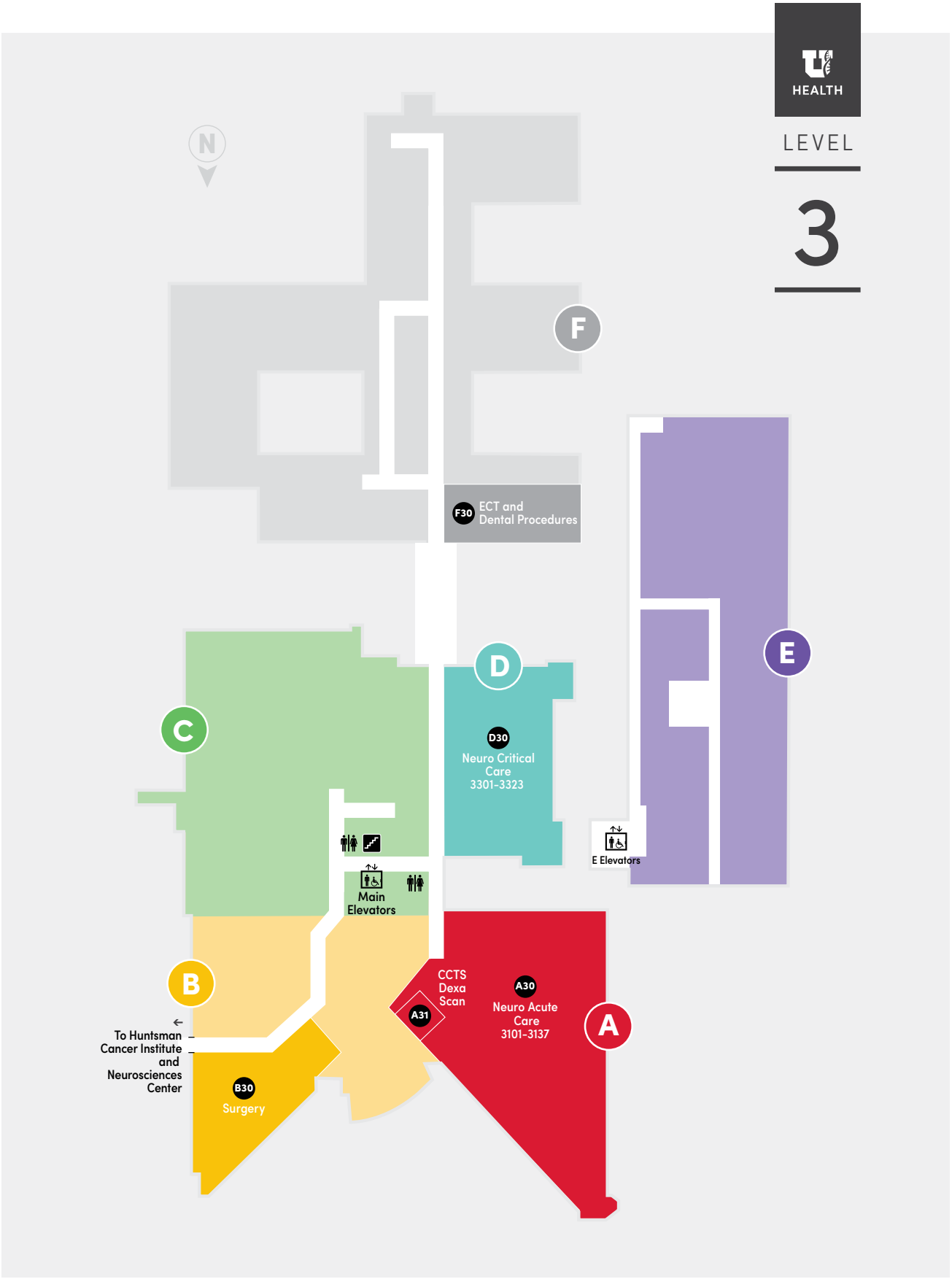

HEALTH
LEVEL
1
N
F15 Physical Medicine & Rehab/Wound Clinic
Rehab Elevators
PT Exercise Gym
OT Gym
PT Gym
Wound Clinic
Rehabilitation Psychology
F16
Travel
Endocrinology
F17
F18 Interventional Radiology
Elevator
F10
F
F14 Infectious Diseases
F13 Gastroenterology – Pulmonary
F12 Pediatrics
E
E19 Internal Medicine
E18 Rheumotology
E17
E16 Surgery
E15 Urogynecology
E14 Urology
E13
E12 Dermatology
E11 Hearing Aid Services Ear, Nose and Throat
E10 Dental
E Elevators
C14 MRI Nuclear Medicine
Radiology File Room
C13
C10 Cardiovascular
C
C12 Radiology
D
ATM
C11 Emergency Care Unit
Main Elevators
Escalator
B
B12 Urgent Care
Health Library
Lobby
B11 Urgent Care Check In
Valet Pick-Up
B10 Emergency
A
A12 Pharmacy
A11 Lab
A10 Admitting
To bus stop
Patient Pick-up and Drop-off
Free Parking
Information
Customer Service
Elevators
Escalator
Stairs
Restrooms
Gift Shop
Starbucks
ATM Machine
Parking

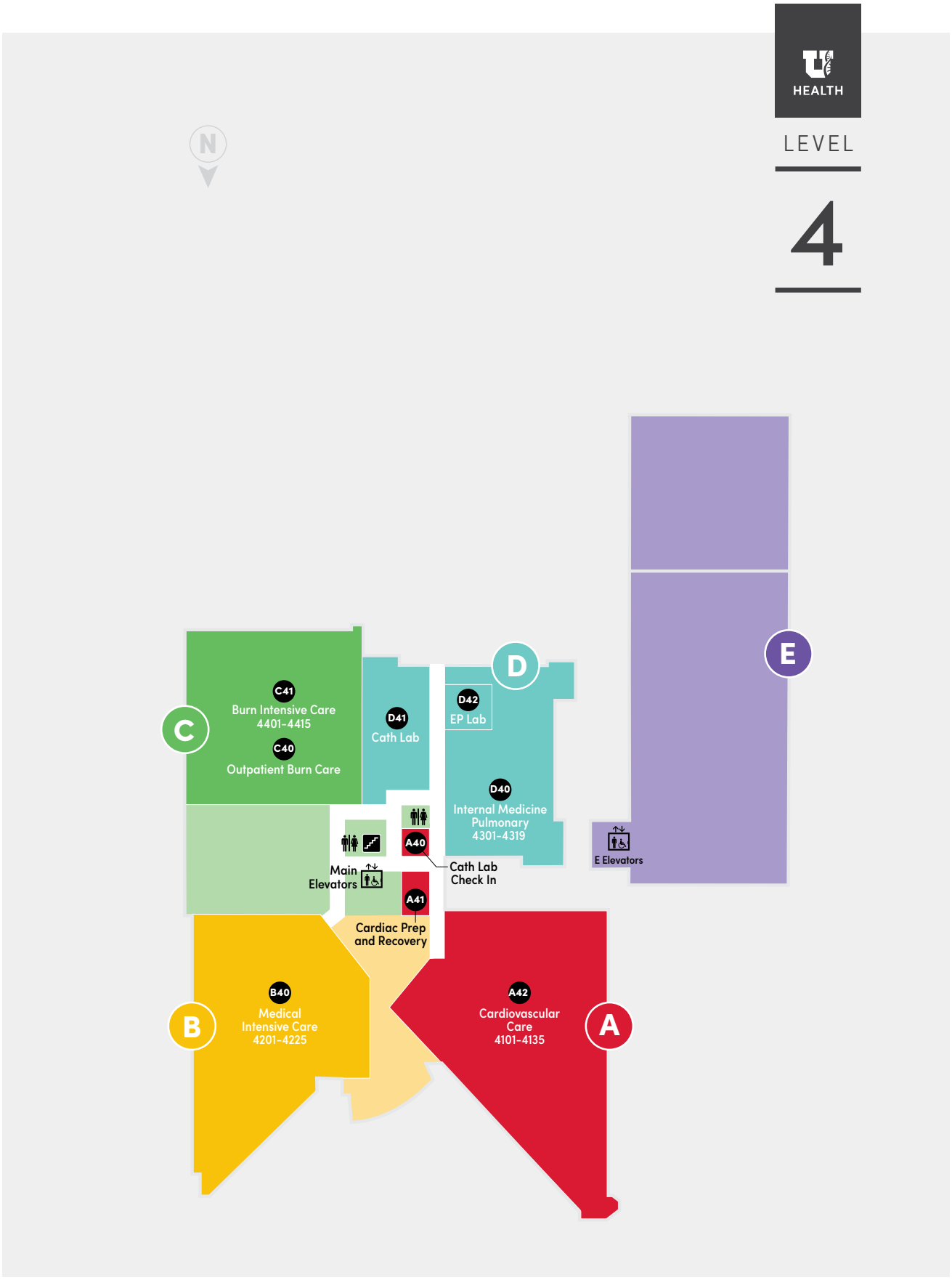
TOC


HEALTH
LEVEL
2
N
F
Rehab Elevators
F20
Inpatient Medical Rehab 2601-2657
E
D
C
C21
Labor and Delivery 2401-2414
D21
OB Emergency Services 2317-2325
E23
E22
Perinatal Care and Maternal Fetal Diagnostics
C22
Newborn Intensive Care
C20
Check In
Hope Chapel
D20
Women's Special Care 2301-2316
E21
E Elevators
E20
Women's Health
Main Elevators
B22
Cardiovascular Intensive Care 2213-2232
B
B21
Surgical Intensive Care 2201-2212
A20
Maternal Newborn Care 2101-2131
A

TOC


HEALTH
LEVEL
3
N
F
F30 ECT and Dental Procedures
D
D30 Neuro Critical Care 3301-3323
E
C
E Elevators
Main Elevators
B
CCTS Dexa Scan
A30 Neuro Acute Care 3101-3137
A31
A
To Huntsman Cancer Institute and Neurosciences Center
B30 Surgery

TOC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LEVEL
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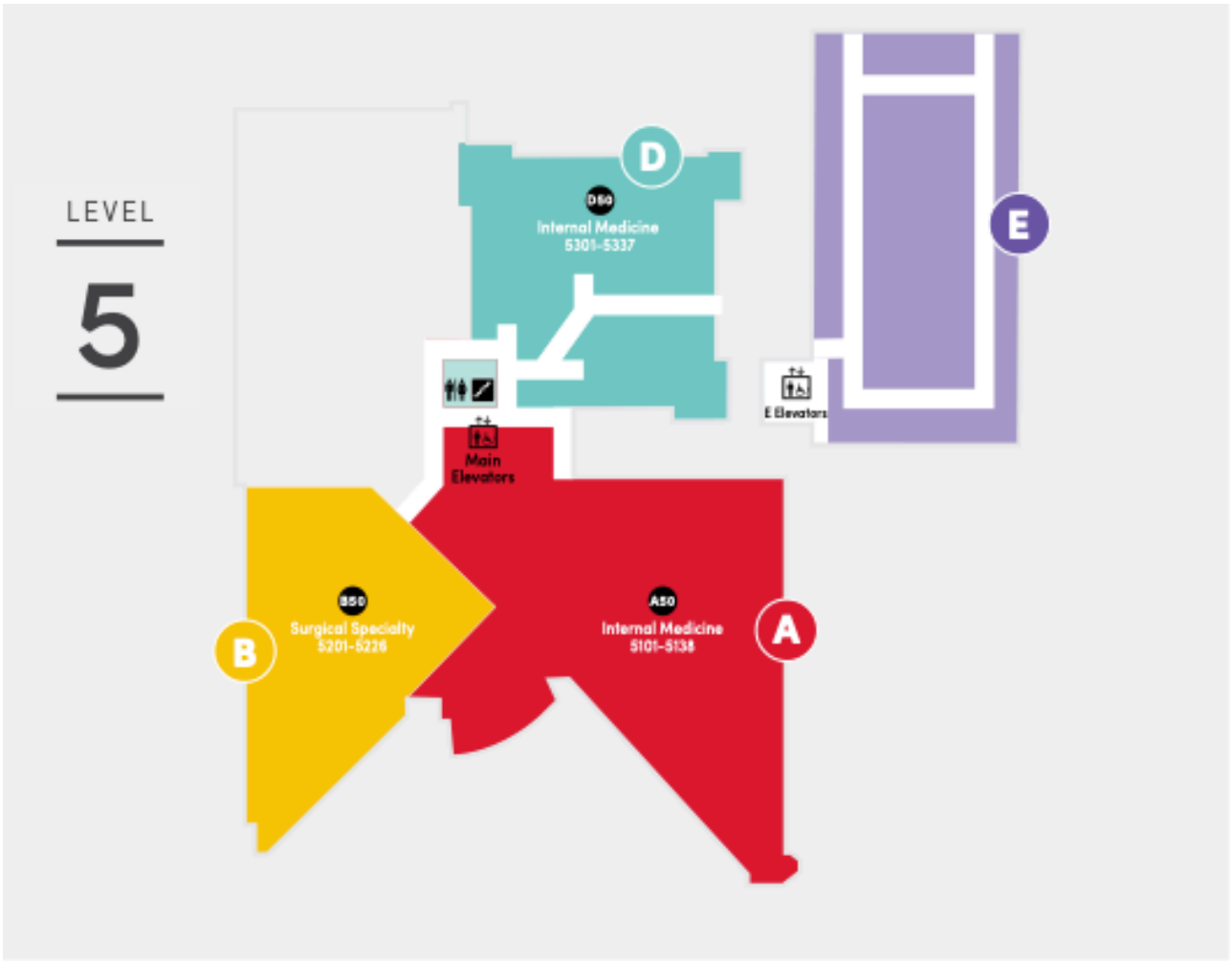
N
C
C41
Burn Intensive Care
4401-4415
C40
Outpatient Burn Care
D41
Cath Lab
D
D42
EP Lab
D40
Internal Medicine
Pulmonary
4301-4319
E
E Elevators
A40
Cath Lab
Check In
Main
Elevators
A41
Cardiac Prep
and Recovery
B
B40
Medical
Intensive Care
4201-4225
A
A42
Cardiovascular
Care
4101-4135

TOC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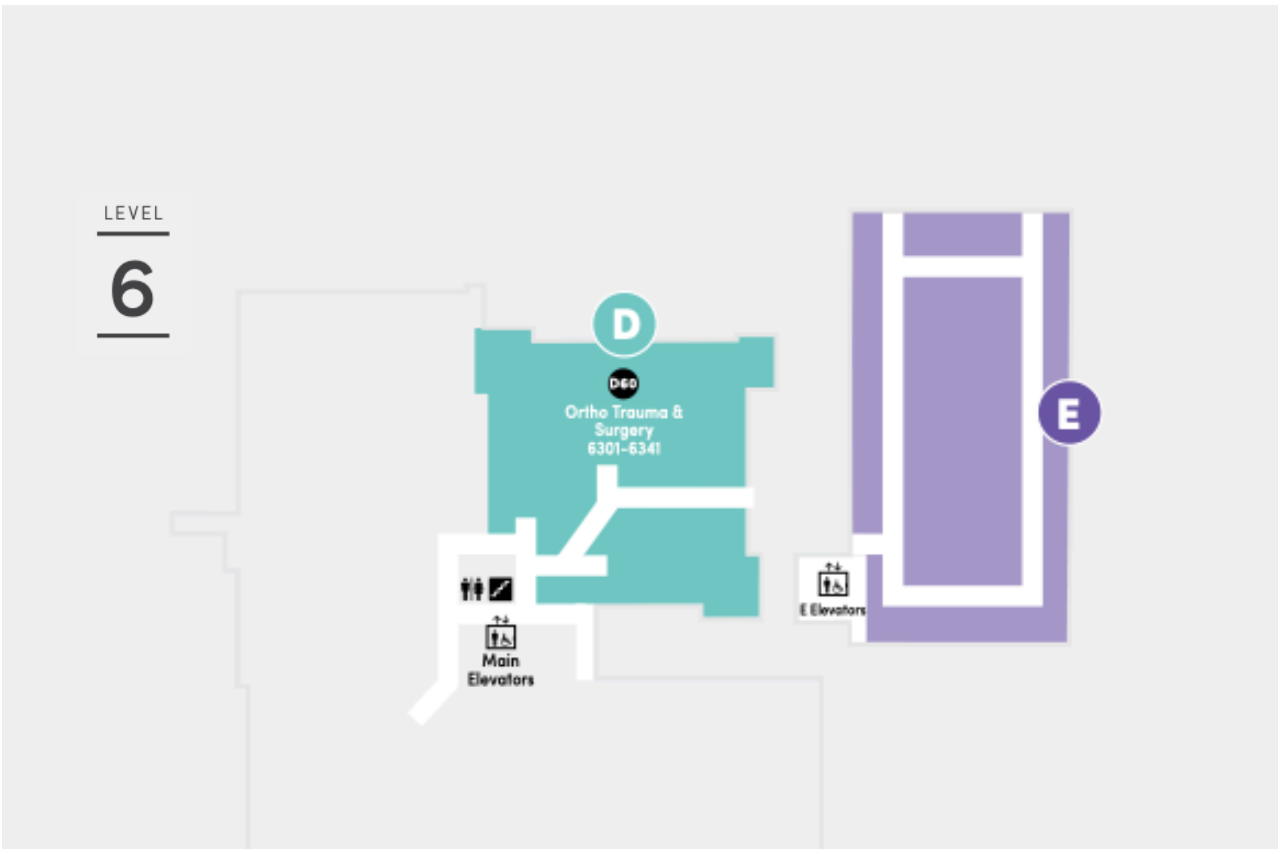
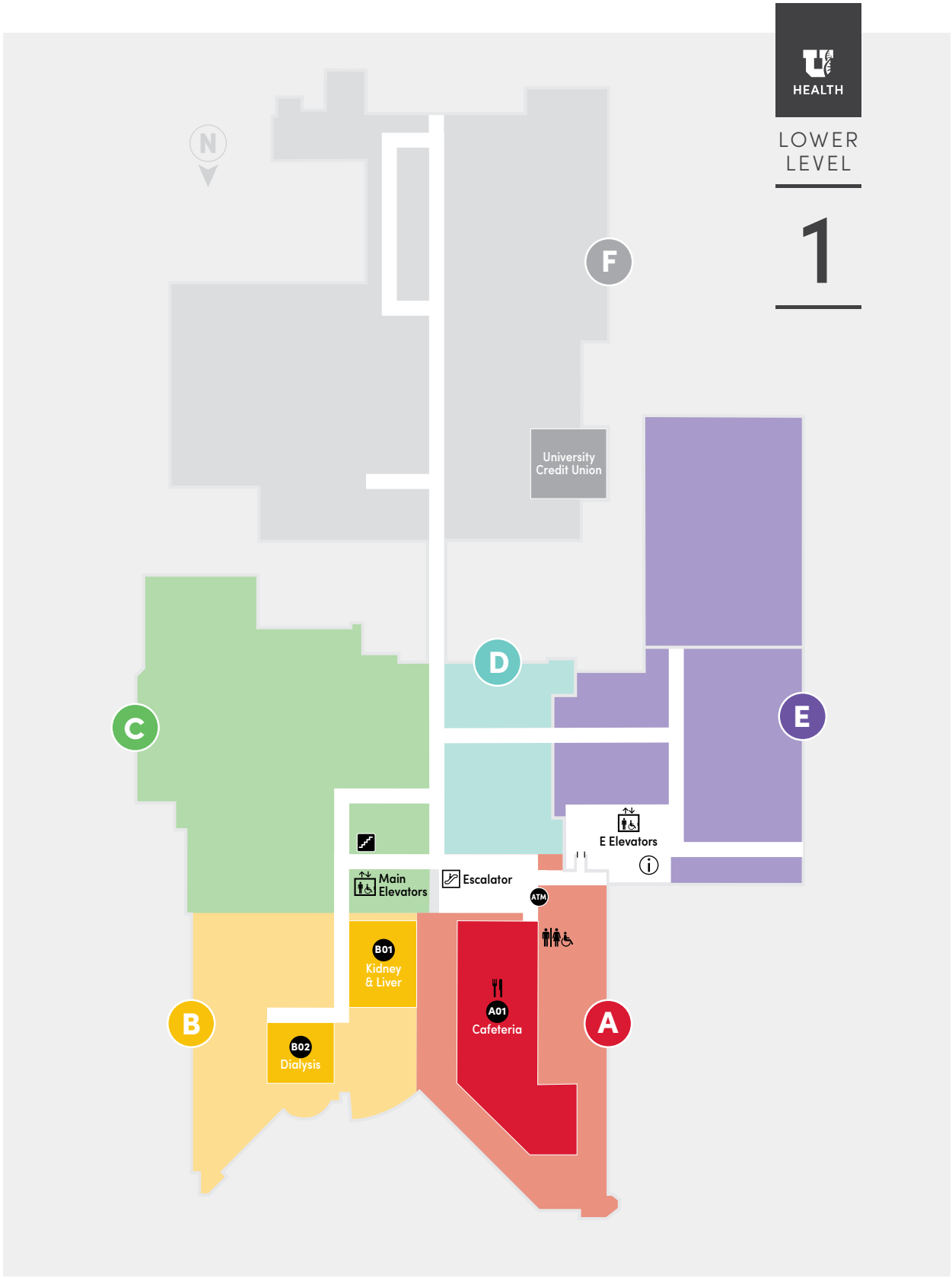
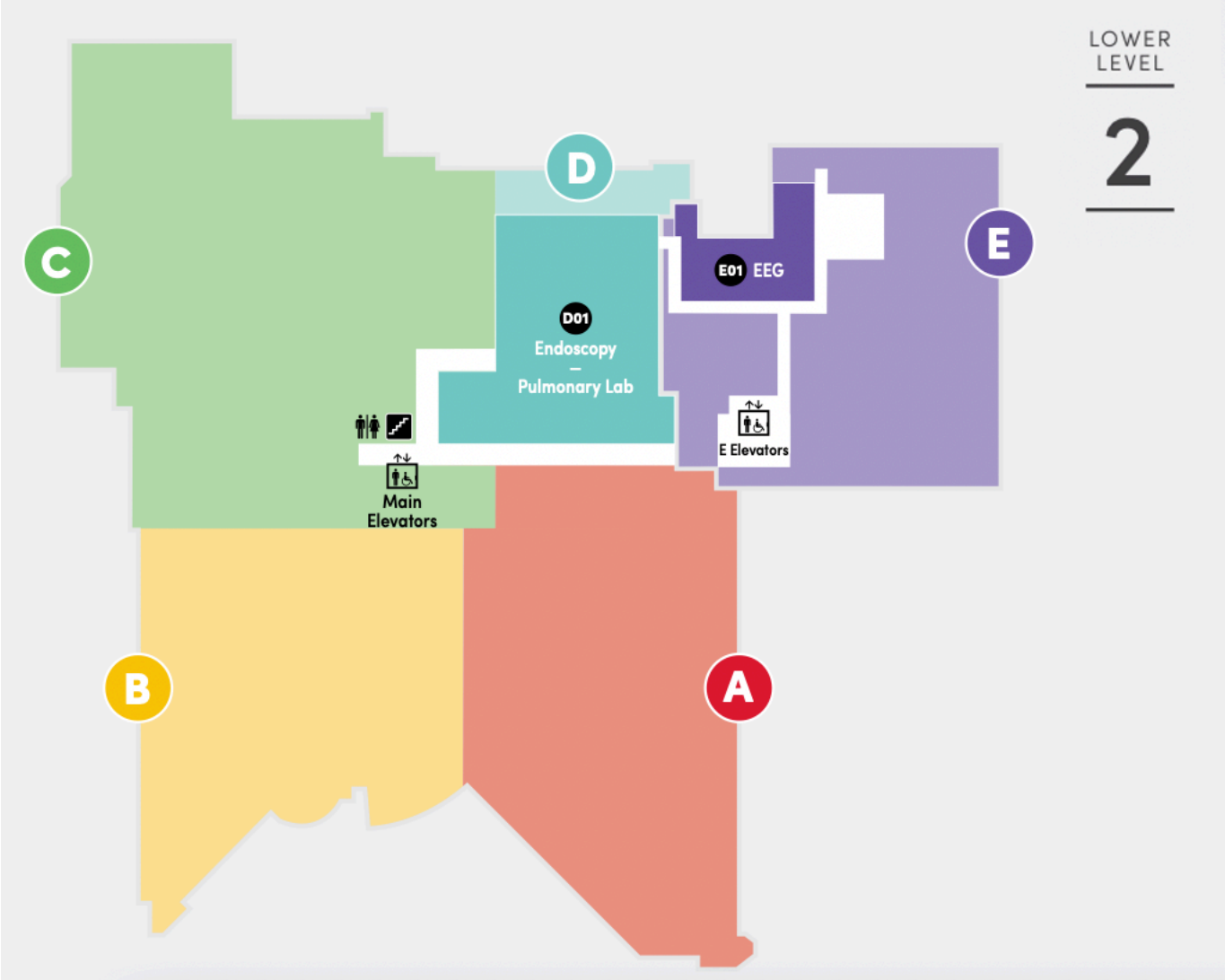
5
D
D50
Internal Medicine
5301-5337
E
E Elevators
Main
Elevators
B50
Surgical Specialty
5201-5226
B
A50
Internal Medicine
5101-5138
A


LEVEL
6
D
D60
Ortho Trauma &
Surgery
6301-6341
E
E Elevators
Main
Elevators

TOC


HEALTH
LOWER LEVEL
1
N
F
University Credit Union
D
C
E
E Elevators
Main Elevators
Escalator
ATM
B01
Kidney & Liver
A01
Cafeteria
B
A
B02
Dialysis

TOC


LOWER
LEVEL
2
C
D
E
B
A
D01
Endoscopy
–
Pulmonary Lab
E01 EEG
Main
Elevators
E Elevators

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Logistics – VA

Activation

(1) Blue button (inpatient rooms)
(2) Anywhere else (Bldg 1 or 14) dial "**#6"**- pause – "**666"**, and state:
- "code blue"
- Building # and floor
- Geographic area
- Room #

(3) Any medical emergency for a non-admitted patient who is inside the main hospital **will page out as a code blue.** Stabilize and transfer to ER.
(4) If not in Bldg 1 or 14, call 911

Who ELSE shows up

(1) MICU Resident and Intern (24/7)
(2) ED attendings – can intubate, assist with access (24/7)
   a. *Maintain leadership of code unless ED team to assume care for transfer to ED. Pass off code to ED team w/ closed loop communication*
(3) 3x RNs - 2 from ICU, 1 from tele (24/7)
(4) 2x RTs - 1 for airway, 1 for iStat labs (24/7)
(5) Clinical Nurse Officer (CNO) – code recorder, facilitate transfers (24/7)
(6) Pharmacy Support (**7am to 7pm**) – **no overnight pharmacist**

Acute Stroke Protocol

- Assign intern roles
- VS, POC glc, time of sxs onset
- Intern A - **Page neuro senior**
- Intern B – orders
  - STAT CTH w/o, CTA H&N
    - **Depending on the time of day, you may need to page a CT or MRI technician. The Neuro on-call Senior may be able to contact them for you OR the CNO can assist with getting ahold of imaging technicians.**
  - CBC, PT/PTT, INR, BMP, Trop, EKG

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Massive Transfusion Protocol

(1) Alert the RRT/Code Team & CNO as they will be able to help facilitate activation
(2) “Orders “ tab → blood bank orders → scroll down, select “MASSIVE TRANSFUSION PROTOCOL”
(3) Call blood bank immediately

STEMI

1. Alert Telemetry Tech
2. Alert CNO (x1006)
3. Page cardiology STAT

Paging Cardiology (A Smartweb Caveat):

- 7a-7p: “VAMC-Cardiology” in smartweb
- 7p-7a: “Cardiology” in smartweb

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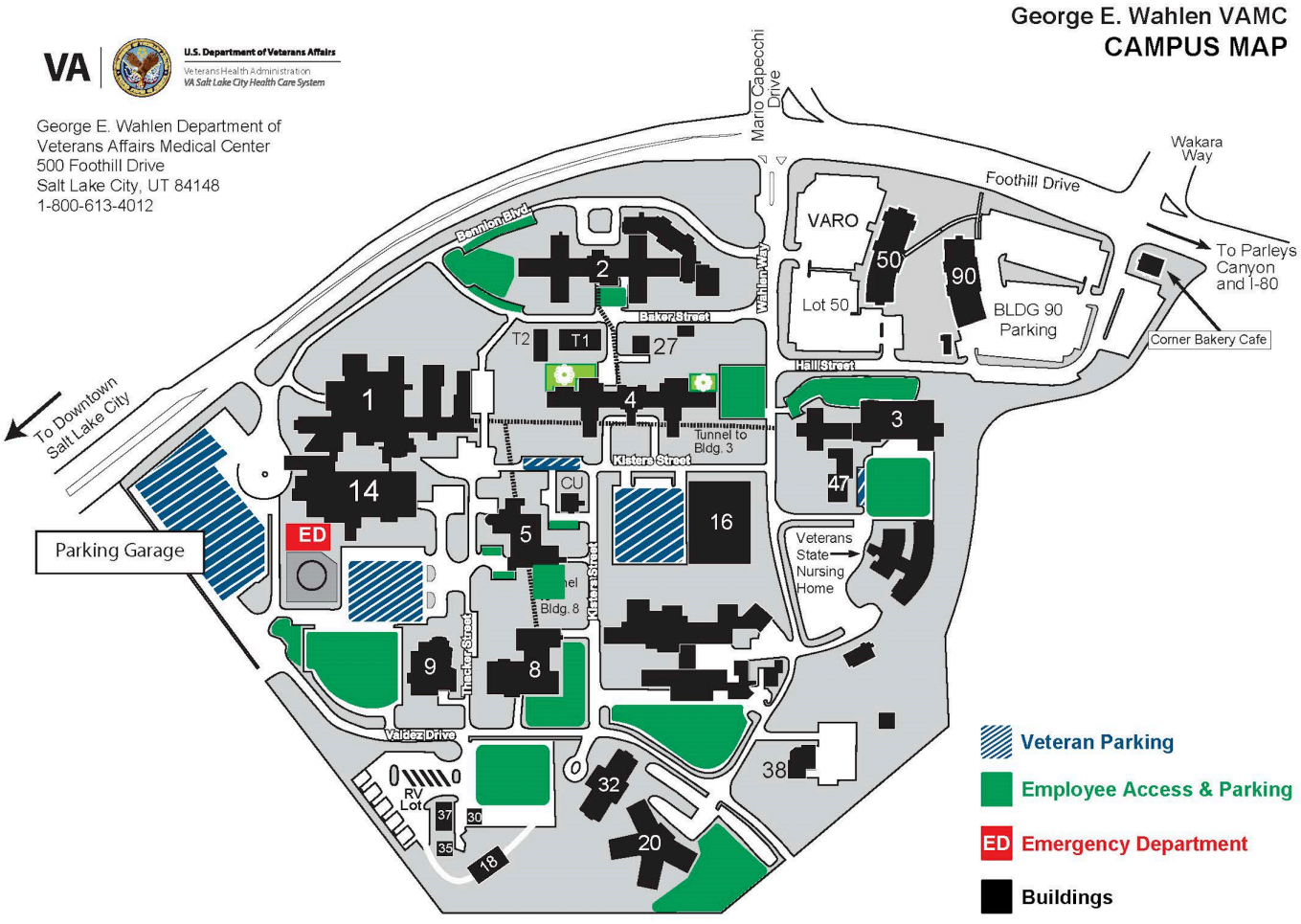
Campus Map

- **Main Hospital =** Building 1 and 14

- **Building 1**
  - G: Onc Clinic/Coffee Shop
  - 1F: Rads/Pod/SleepMed/PT & OT
  - 2F: 2E/2W/Tele/Cath lab/PT/AMU
  - 3F: 3W/3E/ICU
  - 4F: GI lab/Derm/OP clinics

- **Building 14**
  - G: Blue Clinic/ED/Optho/OP pharmacy
  - 1F: Sim center/lab
  - 2F: Dialysis/Pulm Lab/AMU
  - 3F: OR/PACU



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Logistics – IMC

General Overview & Who Shows Up

RRTs and Codes at IMC are typically well supported by nursing staff, RTs, and attending physicians. The primary challenge for residents often lies in **maintaining clear leadership and communication** due to the large number of responders.

Note:

- House staff DO NOT respond to Internal Response overhead calls.
- House staff DO NOT respond to Code Stroke calls.

Who Shows Up:

- **RRTs** → You/your team PLUS CICU RN, RN Supervisor, **Pharmacist**, RT, EKG tech, ABG & Lab techs
- **Codes** → Same as above **PLUS STICU attending and team**

RRTs → Escalation to ICU

If a patient requires ICU-level care, **start the escalation process early** to avoid delays in transfer:

1. **Be vocal and clear about your plan.**
   Announcing your clinical thinking early helps the team (especially nursing and bed management) begin coordinating ICU bed availability.
2. **RN supervisor will contact ICU attending.**
   They will vocera one of the ICU attendings to assess and potentially accept the patient.
3. **You are responsible for a verbal handoff.**
   The RN supervisor will usually hand you a vocera device with the ICU attending already on the line. Provide a concise, structured handoff.
4. **Stay with the patient.**
   Remain involved until the patient physically arrives in their ICU bed.

Maintaining Leadership During Codes

Clear leadership is critical for effective code management at IMC:

- If the **ICU attending or primary team** arrives, you can **offer them leadership** of the code.
- If you **transition code leadership**, **announce it clearly** to the room (e.g., “Dr. [Name] is now leading the code”). This avoids confusion and ensures continued coordination.

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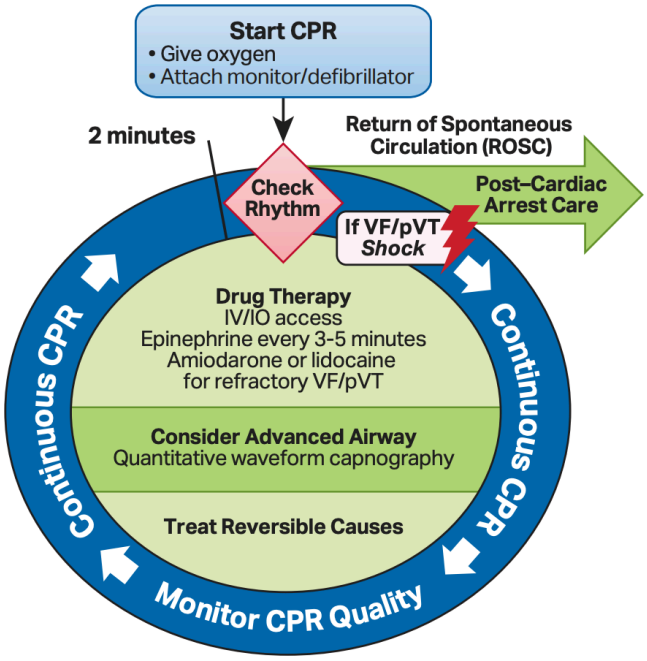
ACLS Algorithms

Adult Cardiac Arrest (Circular)



CPR Quality

- Push hard (at least 2 inches [5 cm]) and fast (100-120/min) and allow complete chest recoil.
- Minimize interruptions in compressions.
- Avoid excessive ventilation.
- Change compressor every 2 minutes, or sooner if fatigued.
- If no advanced airway, 30:2 compression-ventilation ratio.
- Quantitative waveform capnography
  - If P_{ETCO_2} is low or decreasing, reassess CPR quality.

Shock Energy for Defibrillation

- **Biphasic:** Manufacturer recommendation (eg, initial dose of 120-200 J); if unknown, use maximum available. Second and subsequent doses should be equivalent, and higher doses may be considered.
- **Monophasic:** 360 J

Drug Therapy

- **Epinephrine IV/IO dose:** 1 mg every 3-5 minutes
- **Amiodarone IV/IO dose:** First dose: 300 mg bolus. Second dose: 150 mg.
  or
- **Lidocaine IV/IO dose:** First dose: 1-1.5 mg/kg. Second dose: 0.5-0.75 mg/kg.

Advanced Airway

- Endotracheal intubation or supraglottic advanced airway
- Waveform capnography or capnometry to confirm and monitor ET tube placement
- Once advanced airway in place, give 1 breath every 6 seconds (10 breaths/min) with continuous chest compressions

Return of Spontaneous Circulation (ROSC)

- Pulse and blood pressure
- Abrupt sustained increase in P_{ETCO_2} (typically ≥40 mm Hg)
- Spontaneous arterial pressure waves with intra-arterial monitoring

Reversible Causes

- **H**ypovolemia
- **H**ypoxia
- **H**ydrogen ion (acidosis)
- **H**ypo-/hyperkalemia
- **H**ypothermia
- **T**ension pneumothorax
- **T**amponade, cardiac
- **T**oxins
- **T**hrombosis, pulmonary
- **T**hrombosis, coronary

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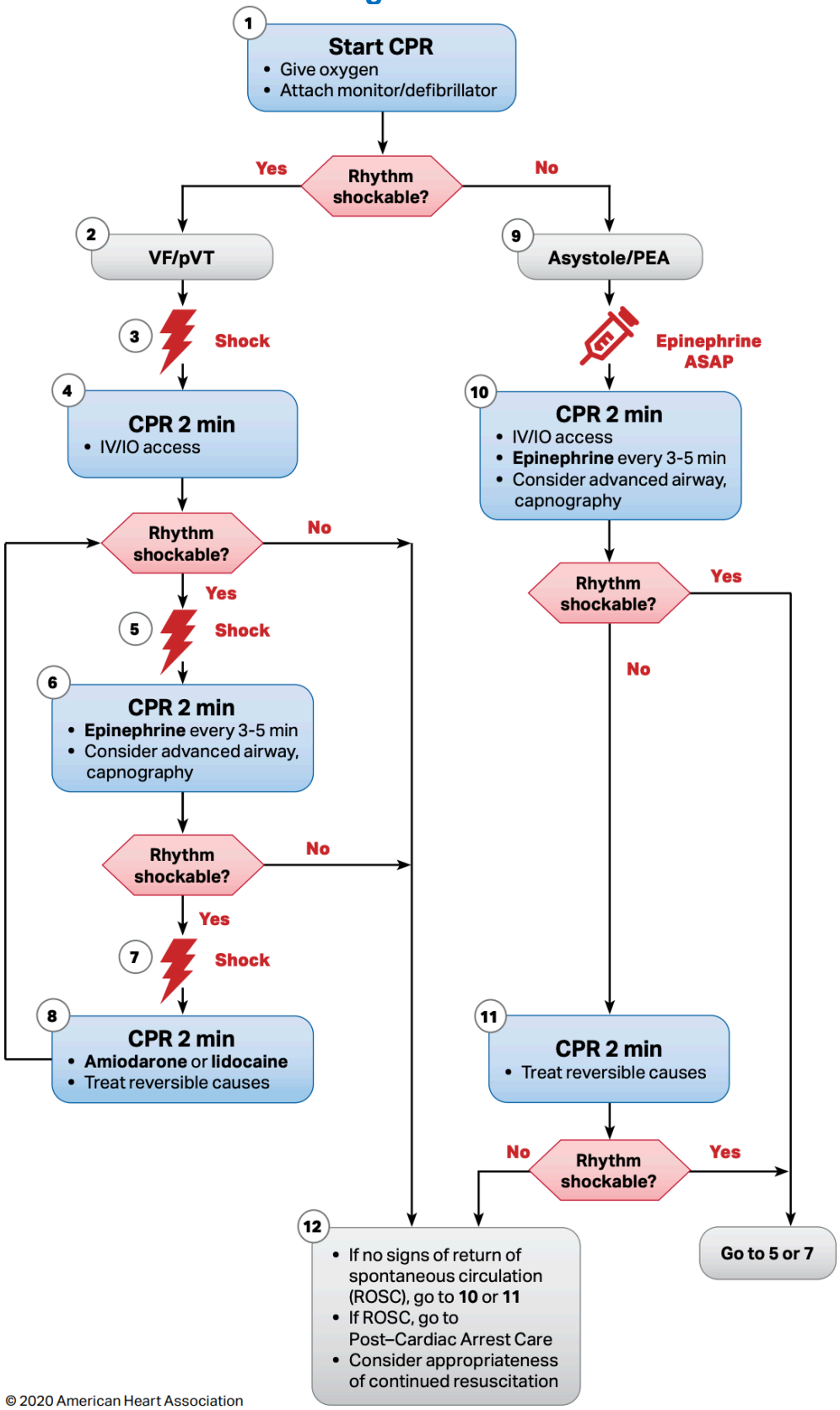
Adult Cardiac Arrest Algorithm



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- **T**ension pneumothorax
- **T**amponade, cardiac
- **T**oxins
- **T**hrombosis, pulmonary
- **T**hrombosis, coronary

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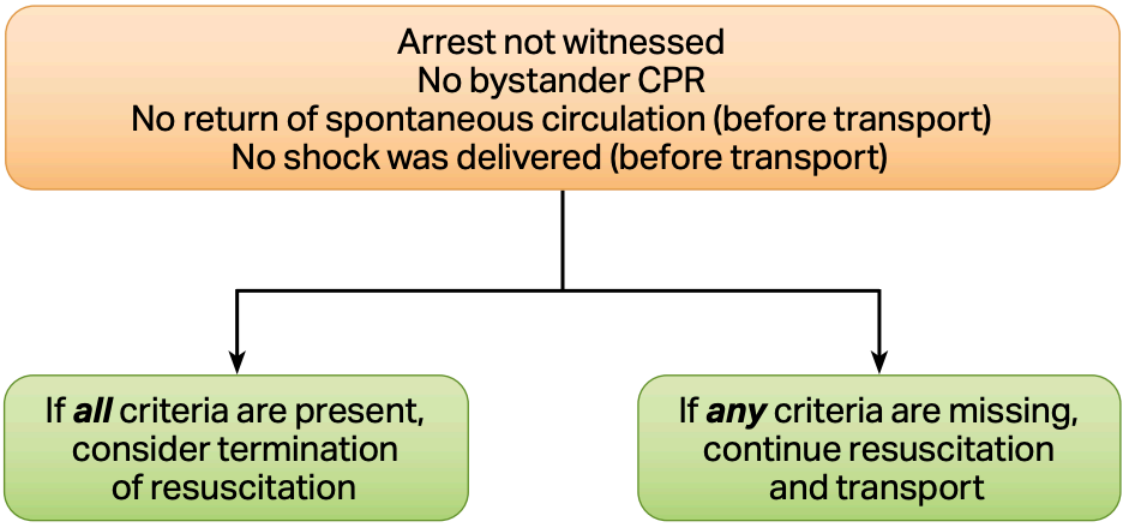
ACLS Termination of Resuscitation



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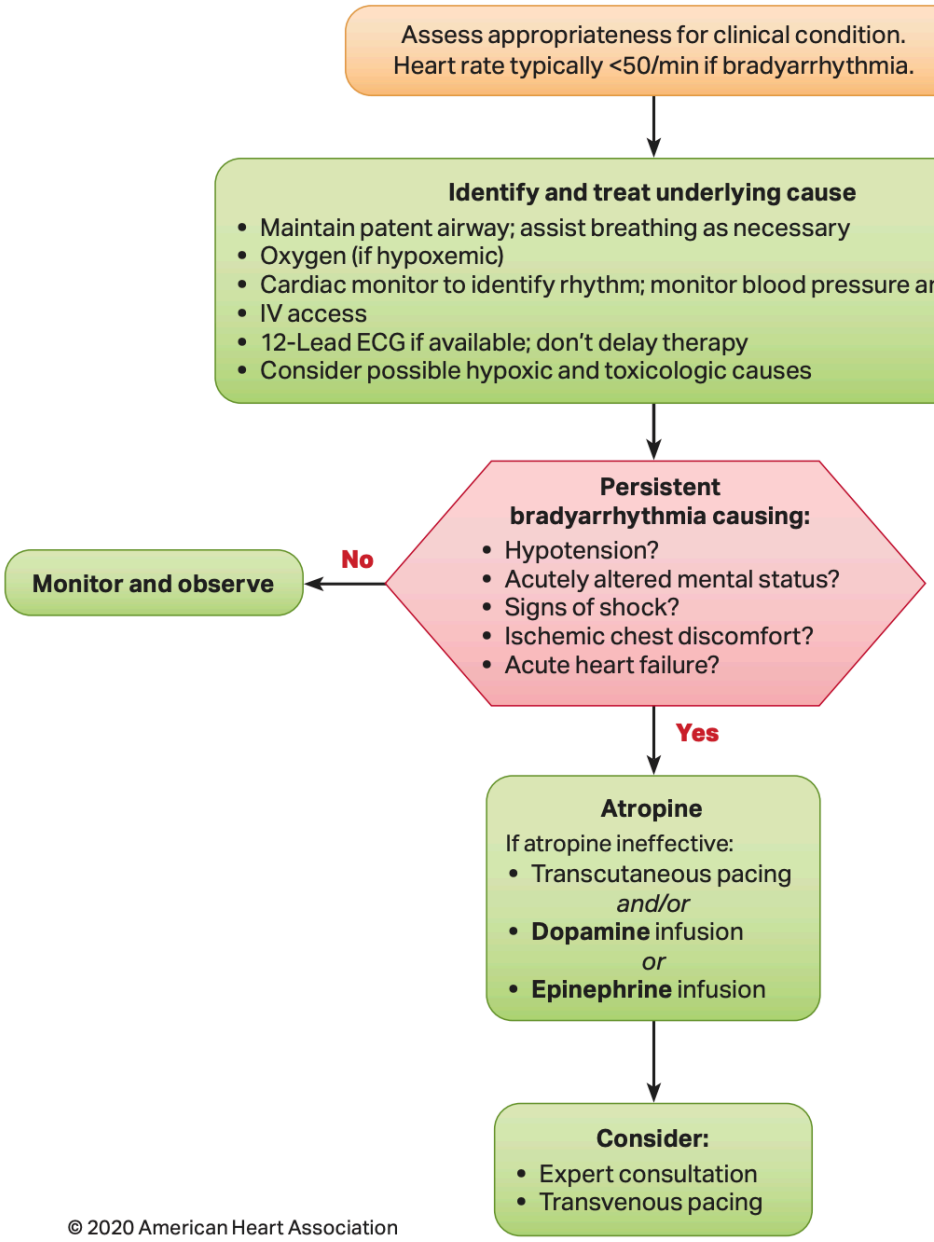
Adult Bradycardia Algorithm



Doses/Details
Atropine IV dose: First dose: 1 mg bolus. Repeat every 3-5 minutes. Maximum: 3 mg.
Dopamine IV infusion: Usual infusion rate is 5-20 mcg/kg per minute. Titrate to patient response; taper slowly.
Epinephrine IV infusion: 2-10 mcg per minute infusion. Titrate to patient response.
Causes: • Myocardial ischemia/ infarction • Drugs/toxicologic (eg, calcium-channel blockers, beta blockers, digoxin) • Hypoxia • Electrolyte abnormality (eg, hyperkalemia)

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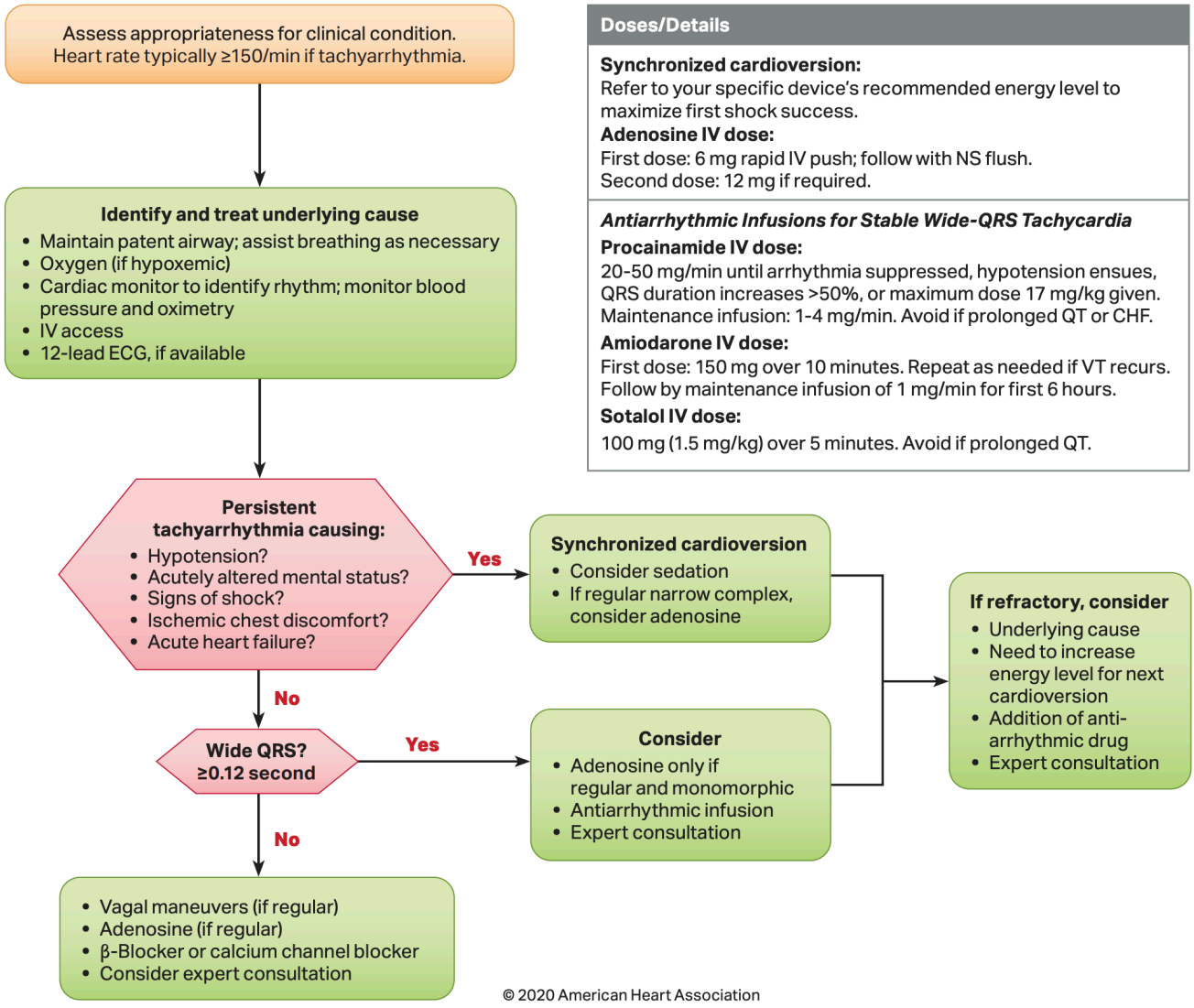
Adult Tachycardia with a Pulse



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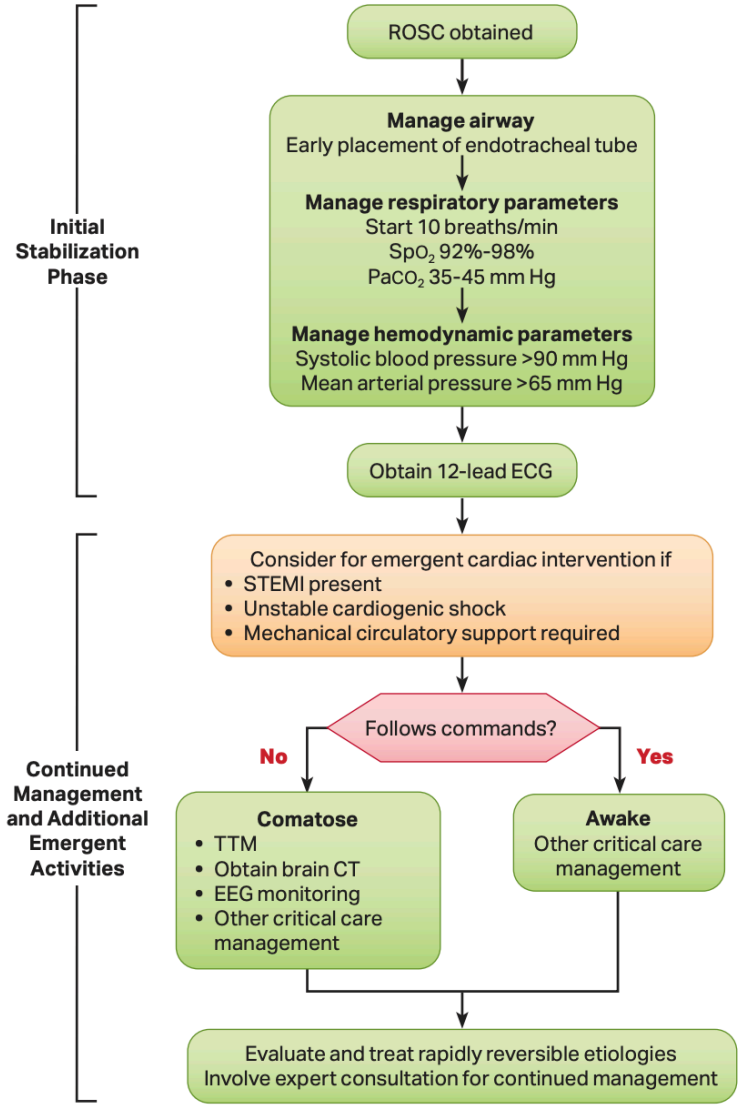
Post Cardiac Arrest Care Algorithm



Initial Stabilization Phase

Resuscitation is ongoing during the post-ROSC phase, and many of these activities can occur concurrently. However, if prioritization is necessary, follow these steps:

- Airway management: Waveform capnography or capnometry to confirm and monitor endotracheal tube placement
- Manage respiratory parameters: Titrate FIO_2 for SpO_2 92%-98%; start at 10 breaths/min; titrate to $PaCO_2$ of 35-45 mm Hg
- Manage hemodynamic parameters: Administer crystalloid and/or vasopressor or inotrope for goal systolic blood pressure >90 mm Hg or mean arterial pressure >65 mm Hg

Continued Management and Additional Emergent Activities

These evaluations should be done concurrently so that decisions on targeted temperature management (TTM) receive high priority as cardiac interventions.

- Emergent cardiac intervention: Early evaluation of 12-lead electrocardiogram (ECG); consider hemodynamics for decision on cardiac intervention
- TTM: If patient is not following commands, start TTM as soon as possible; begin at 32-36°C for 24 hours by using a cooling device with feedback loop
- Other critical care management
  - Continuously monitor core temperature (esophageal, rectal, bladder)
  - Maintain normoxia, normocapnia, euglycemia
  - Provide continuous or intermittent electroencephalogram (EEG) monitoring
  - Provide lung-protective ventilation

H's and T's

Hypovolemia
Hypoxia
Hydrogen ion (acidosis)
Hypokalemia/**h**yperkalemia
Hypothermia
Tension pneumothorax
Tamponade, cardiac
Toxins
Thrombosis, pulmonary
Thrombosis, coronary

TOC

RRT Quick Reference by Scenario

CODES

A-Access
B-Backboard
C-Code Status
D-Defib
D-Drips
E-Epi
E-Electricity (150-200J; tele)
F-Fluids
F-Family
G-Glucose

Non-Senior On Tasks:
- Confirm code status
- Confirm/stop IV infusions
- Run tele/print strips
- Check labs, med list
- Notify attending, family

LABS TO ORDER
Stat ABG with K & Hgb, CBC, BMP, LFTs, lactate, T&S, coags, fibrinogen, cardiac enzymes

H's and T's:

CAUSE	MANAGEMENT
Hypoxemia	Intubate, ECMO
Hypovolemia	Access, crystalloid, blood
H+ (Acidemia)	Bicarb
Hypo/hyperK	HyperK tx: (D50W 1-2 amp + insulin 10U IV), CaGlu or $CaCl_2$ 1-2g IV
Hypothermia	Warming
Hypoglycemia	D50
Tamponade	Pericardiocentesis
Tension PTX	Needle decompression
Thrombosis – MI	PCI, ECMO
Thrombosis – PE	tPA, ECMO
Toxin / Drugs	Stop drugs, give reversal agents

Others:

CAUSE	MANAGEMENT
Septic Shock	Abx, source control
Mucus Plug	Suction/Chest PT
Auto-PEEP	Disconnect vent
Anaphylaxis	Crystalloid, IM/IV epi

Code/Rapid Data to Obtain

[ ] Preceding events
[ ] Code Status
[ ] Access
[ ] Vitals
[ ] Focused exam
[ ] POCT glucose
[ ] One-liner, PMH
[ ] Recent procedures
[ ] Last TTE
[ ] Run MAR
[ ] Infusions
[ ] EKG
[ ] Tele
[ ] Last labs (Hgb, K, etc)
[ ] ABG/VBG

If Intubating:
[ ] Prior intubations
[ ] Difficult airway?
[ ] Hemodynamics/Heart
[ ] Aspiration Risk?
[ ] Labs

ACS

ASA 325, heparin, statin, TNG, BB
Cath lab if HD unstable, refractory CP, VT

Bradycardia

Conduction disease, R sided MI, vagal, med effect, ↑ICP, hypothyroidism, hypoxemia

Atropine 0.5-1mg q3-5m, max 3mg
Dopamine 2-20mcg/kg/min
Epinephrine 2-10mcg/min
Isproterenol 2-10mcg/min
Transcutaneous pacing (midaz/fentanyl or ativan/dilaudid)
Transvenous pacing (cards consult)

Tachycardia

Narrow: AVRT/AVNRT, AF/AFlutter, AT, MAT
Wide: MMVT, PMVT, SVT w/ aberrancy, pacemaker mediated
Synchronized Cardioversion
Narrow/regular: 50-100J
Narrow/irregular: 120-200J
Wide/regular: 100J
Wide/irregular: 150-200J
Medications
Narrow/reg: **adenosine** (6, 12, 12)
Wide/reg:
- **Amio**: 150mg→1mg/min
- **Lido**: 100mg→50mg q5 x3 →1-2 mg/min
- **Procainamide**: 20-50mg/min until hypoTN or QRS ↑50%→1-4 mg/min
- consider adenosine unless WPW

Wide/irreg:
- **PMVT**: amio, lido; tx ischemia
- **Torsades**: Mg 2mg, ↑HR Isoprot.
- **AF+WPW**: procainamide, ibutilide (1mg) (⊘adenosine, BB/CCB, dig)

GIB

2 large bore IV, T&S, IVF, pRBC, IV PPI 40mg. Octreotide 50mcg + CTX if portal HTN. Correct coagulopathy. RICU if hematemesis.

Hypotension

Cardiogenic: MI, ADHF, BB/CCB toxicity, acute myocarditis, valvular disease (AS)
Distributive:
S-Sepsis **A**-Adrenal Insuff
A-Anaphylax **S**-Spinal Shock
L-Liver dz **S**-Sleeping
T-Toxin
Hypovolemic: bleeding, diuresis, removal w/ HD, insensible losses
Obstructive: PE, tamponade

Acute Hypoxemia

Aspiration
Mucus plug
Pneumonia
Pulm edema
PE
Pneumothorax
Pleural effusion

Hypercarbia

↓RR: sedatives, central sleep apnea, OHS, brainstem stroke, tumor, infection, hypothyroidism
↓V_T: OSA, pleural effusion/fibrosis, obesity, kyphosis/scoliosis, abd dist, PTX, neuropathy, NMJ disorder, myopathy
↑V_D and/or ↓V_T: COPD, asthma, OSA, ILD, CHF, PNA, PE

AMS

CNS: CVA, ICH, sz, infxn, PRES
Metabolic toxins: NH3, CO2, BUN, Na, glucose
Exogenous toxins: meds, drugs, w/d
Vitals: HTN/HoTN, hypoglycemia, hypoxemia
Misc: TTP, AI, hypothyroid

PE

Intermediate-High risk: PE w/ abnormal VS (tachycardia, hypotension), evidence of R heart strain (TTE, EKG, or +biomarkers), central or saddle PE →
Order: TTE, EKG, CBC w diff, PT/PTT, BMP, LFTs, lactate, D-dimer, Trop, NT-proBNP, T&S, LENIs

tPA: Pulseless→50mg/2m, 50mg in 30m | Pulse→100mg/2h | Follow w/ heparin gtt
Contraindications: prior ICH, ischemic CVA <3mo., active bleeding, CNS surgery/trauma (<2-3mo)

Seizure

Lorazepam 2-4mg IV x2, diazepam 20mg PR, or leviteracetam 20mg/kg

Anaphylaxis

Epi 0.3-0.5 IM (1:1000; 1mg/mL); or 0.1-0.3mg IV (1:10,000; 0.1mg/mL)
→ repeat q5-15min; start gtt if >3 required
Other agents: Benadryl 50mg, methylpred 125mg, albuterol neb, IVF

TOC

Code & RRT Medications (Alphabetical)

Emergency Medications (ADULT ACLS MEDICATIONS)

Drug	Preparation for Administration	Concentration	Standard Doses	Pump Rate
Adenosine	6 mg/2 mL vial	3 mg/mL vial	Loading dose: 6 mg IV (flush immediately) Repeat dose: 12 mg IV q1-2 min if needed	IVP: push as fast as possible & follow with NS 10 mL flush
Amiodarone	Bolus: Cardiac Arrest Draw up 300 mg for IVP/IO Drip: Place 150 mg in 100 mL D5W Pharmacy also has premade 150 mg/100 mL drips in Omnicell of critical care units	Bolus: 50 mg/mL Drip: 1.5 mg/mL	VF/pulseless VT: 300 mg IV push (may give an additional 150 mg dose in 10 min)	IVP
			Stable VT: 150 mg over 10 minutes	600 mL/hour for 10 min
			Maintenance: 1 mg/min for 6 hours Then 0.5 mg/min for 18 hours Administer through 0.2 – 0.22 micron filter *(Doses >2.2 g in 24 hours are associated with significant hypotension)*	40 mL/hour for 6 hours 20 mL/hour for 18 hours
Atropine	Premixed syringe: 1 mg/10 mL	0.1 mg/mL	Adult Bradycardia: 1 mg IV bolus every 3-5 minutes Maximum: 3 mg	IVP
DOBUTamine	Premixed drip: 500 mg/250 mL Fluid Restricted: 1000 mg/250 mL (Made by pharmacy)	2 mg/mL 4 mg/mL	Dose: 2-20 mcg/kg/min	
DOPamine	Premixed drip: 800 mg/250 mL Fluid Restricted: 1600 mg/250 mL (Made by pharmacy)	3.2 mg/mL 6.4 mg/mL	Dose: 5-20 mcg/kg/min (start with 5 mcg/kg/min and titrate up by 5 mcg every 2 minutes) *(Rates > 20 mcg/kg/min are associated with vasoconstriction and tachyarrhythmia)*[2]	
EPINEPHrine	Premixed syringe: 0.1 mg/mL (1:10,000) Vial: 1 mg/mL (1:1,000) Drip: Place 4 mg in 250 mL NS	0.1 mg/mL 1 mg/mL Drip: 16 mcg/mL	Resuscitation: 1 mg every 3-5 minutes IV/IO Maintenance: 0.01-0.5 mcg/kg/min IV Anaphylaxis: 0.3-0.5 mg every 5-15 minutes **IM** Bradycardia: 0.1-0.5 mcg/kg/min IV **ET tube dose: 2-2.5x IV dose (2-2.5 mg)**	IVP No maximum rate
Isoproterenol	Drip: Place 1 mg in 250 mL NS (Made by pharmacy) Fluid Restricted: 4 mg/250 mL (Made by pharmacy)	Drip: 4 mcg/mL Conc. Drip: 16 mcg/mL	Dose: 2-10 mcg/min IV titrated to response	30-150 mL/hour Conc. Rate: 7.5 mg-37.5 mg/hr
Lidocaine	Premixed syringe: 100 mg/5 mL Premixed drip: 1 g/250 mL	20 mg/mL Drip: 4 mg/mL	Load (VF/VT): 1-1.5 mg/kg IVP over 2-3 minutes Refractory VF: Repeat with 0.5-0.75 mg/kg every 5-10 minutes Maximum: 3 doses or 3 mg/kg	IVP
			Maintenance: 1-4 mg/min ET tube dose: 2-2.5x IV dose (2-3.75 mg/kg)	15-60 mL/hour
Magnesium sulfate	Vial or syringe: 5 g/10 mL	500 mg/mL vial	Torsades : 1-2 g IV/IO over 1-2 minutes Can dilute with 10 mL of D5W or NS	IVP
Norepinephrine	Drip: Place 16 mg in 250 mL NS	Drip: 64 mcg/mL	Dose: 0.01-0.5 mcg/kg/min No maximum rate	

TOC

Drug	Preparation for Administration	Concentration	Standard Doses	Pump Rate
Phenylephrine	Drip: Central - Place 40 mg in 250 mL NS Peripheral – Place 10 mg in 250 mL NS	Central drip: 0.16 mg/mL Peripheral drip: 0.04 mg/mL	Dose: 0.25-3 mcg/kg/min	
Procainamide	Drip: Place 1 gm in 250 mL NS	Drip: 4 mg/mL	Load: 20-50 mg/min until arrhythmia suppression, hypotension ensues, QRS prolonged by 50%, or total dose of 17 mg/kg infused	300-750 mL/hour
			Maintenance: 1-4 mg/min (avoid in patients with long QT or CHF)	15-60 mL/hour
Vasopressin	Drip: Place 20 units in 100 mL NS	Drip: 0.2 units/mL	Dose: 0.03 units/min	9 mL/hour

Other Emergency Medications

Drug	Preparation for Administration	Concentration	Standard Doses	Pump Rate
Flumazenil	0.5 mg/5 mL vial	0.1 mg/mL	1st Dose: 0.2 mg IV over 30 seconds 2nd Dose: 0.3 mg IV over 30 seconds 3rd Dose: 0.5 mg IV over 30 seconds[2] May repeat every minute or until total 3 mg given	IVP

Drug	Preparation for Administration	Concentration	Standard Doses	Pump Rate
Naloxone	Vial: 0.4 mg/1 mL Standard drip: Place 4 mg in 1 L NS or D5W Concentrated drip: Place 10 mg in 250 mL NS or D5W	Vial: 0.4 mg/mL Drip: 4 mcg/mL Conc. Drip: 40 mcg/mL	Opioid overdose: 0.4-2 mg IV/IM/SQ every 2-3 min Maximum: 6-10 mg over <10 min[2] Continuous infusion: 0.2-6.25 mg/hour Reversal with therapeutic opioid doses: 0.02-2 mg IV/IM/SQ every 2-3 min ET tube dose: 2-2.5x IV dose	IVP Standard drip: 50-100 mL/hour
Etomidate	Premixed syringe or vial: 40 mg/20 mL	2 mg/mL	Induction: 0.2-0.6 mg/kg over 30-60 seconds Rapid Sequence Intubation: 0.3 mg/kg	IVP
Ketamine	Vial: 200 mg/mL Drip: 250 mg/250 mL (pharmacy made)	10 mg/mL Drip: 1 mg/mL	Induction: 1-2 mg/kg IV over 1 minute Maintenance: 0.1-0.5 mg/min	IVP
Cisatracurium (*Refrigerator*)	Vial: 10 mg/5mL Drip: 200 mg/40 mL	2 mg/mL Drip: 5 mg/mL	Load: 0.15-0.2 mg/kg IV over 5-10 seconds Maintenance: 1-10 mcg/kg/hour	IVP
Rocuronium (*Refrigerator*)	Vial: 100 mg/10 mL	10 mg/mL 1 mg/mL	Load: 0.6-1.2 mg/kg IV	IVP

TOC

Drug	Preparation for Administration	Concentration	Standard Doses	Pump Rate
Succinylcholine (*Refrigerator*)	Vial: 200 mg/10 mL	20 mg/mL	Load: 0.6-1.5 mg/kg IV	IVP
Vecuronium	Vial: 10 mg Reconstitute vial with 10 mL NS Drip: 100 mg/100 mL	 1 mg/mL	Load: 0.08-0.1 mg/kg IV Maintenance: 0.8-1.2 mcg/kg/min	IVP

Drug	Preparation for Administration	Concentration	Standard Doses	Pump Rate
Diazepam	Vial: 10 mg/2 mL	5 mg/mL	Status epilepticus: 5-10 mg IV over 1-2 minutes May repeat dose after 10-15 minutes Maximum: 30 mg	IVP Max: 5 mg/min in adults
Lorazepam (*Refrigerator*)	Vial: 2 mg/mL	2 mg/mL	Status epilepticus: 4 mg IV over 2-5 minutes May give an additional 4 mg after 10-15 minutes	IVP over 2-5 minutes Max: 2 mg/min
Fosphenytoin/ Phenytoin	Vial: 100 mg PE/2 mL	50 mg PE/mL	Status epilepticus: 15-20 mg/kg IV Maintenance: 4-7 mg PE/kg/day in 2-4 divided doses	IVP Max: 150 mg PE/minute
Diltiazem (*Refrigerator*)	Vial: 25 mg/5 mL Premixed drip: 125 mg/125 mL	5 mg/mL Premix: 1 mg/mL	Load: 0.25 mg/kg IV over 2 minutes May repeat 0.35 mg/kg in 15 minutes Maintenance: 5-15 mg/hour	IVP
Nicardipine	Premixed drip: 40 mg/200 mL Fluid restricted: 100 mg/250 mL (Made by pharmacy)	0.2 mg/mL 0.4 mg/mL	Acute hypertension: 5 mg/hour Titrate by 2.5 mg/hour every 5-15 minutes Maximum: 15 mg/hour	5-15 mg/hour

Drug	Preparation for Administration	Concentration	Standard Doses	Pump Rate
Nitroglycerin	Premix Glass bottle: 50 mg in 250 mL Fluid restricted: 100 mg/250 mL (Made by pharmacy)	0.2 mg/mL 0.4 mg/mL	Dose: 10-200 mcg/minute Titrate by 5-10 mcg/min every 5 minutes Max: 400 mcg/min	10-400 mcg/min
Nitroprusside	Drip: 50 mg/100 mL	0.5 mg/mL	Dose: 0.25-0.5 mcg/kg/min Titrate by 0.5 mcg/kg/min every 5 minutes Maximum: 10 mcg/kg/min	

Hematologic Emergency Medications

Drug	Preparation for Administration	Concentration	Standard Doses	Pump Rate
t-PA (Activase)	50 mg/50 mL 100 mg/ 100 mL (Made by pharmacy)	1 mg/mL	Stroke: Load: 0.09 mg/kg (max: 9 mg) over 1 minute followed by 0.81 mg/kg (max 81 mg) as a continuous infusion over 1 hour	
			Cardiac arrest due to PE: t-PA 50 mg IV bolus over 3-5 minutes followed by 50 mg IV bolus over 1 hour 15 minutes later if return of spontaneous circulation not achieved	
			Massive PE: t-PA 100 mg IV once	Infuse over 2 hours

TOC

Drug	Preparation for Administration	Concentration	Standard Doses	Pump Rate
4-Factor prothrombin complex concentrate (Kcentra)	~500 units (Factor IX) per single-dose vial or ~1000 units (Factor IX) per single-dose vial (Made by pharmacy)	Varies	Acute major bleeding due to warfarin or reversal of warfarin for urgent procedure: Use is restricted to a single dose Dosing is individualized for INR and weight -INR 2 to < 4: 25 units/kg (max dose: 2500 units) -INR 4 to 6: 35 units/kg (max dose: 3500 units) -INR >6: 50 units/kg (max dose: 5000 units) May adjust +/- 10% to match vial contents Sever bleeding in patients on direct oral anticoagulants (DOACs) or reversal of DOAC for urgent procedure: 2000 units once or 25-50 units/kg once (cap weight at 100 kg) *(preferred for factor Xa inhibitors, eg: apixaban and rivaroxaban)* Acute major bleeding due to liver disease or trauma induced coagulopathy: 25 to 50 units/kg as a single dose (cap weight at 100 kg)	0.12 mL/kg/min (~3 units/kg/min) Max: 8.4 mL/min (~210 units/min)
Activated prothrombin complex concentrate (FEIBA)	~500 units per single dose vial (Made by pharmacy)	Varies	Severe bleeding in patients on direct oral anticoagulants (DOACs): 50 units/kg as a single dose *(Last-line agent for factor Xa inhibitors; preferred for direct thrombin inhibitors, eg: dabigatran)*	Max: 2 units/kg/minute

Reference:
(1) Advanced Cardiovascular Life Support Provider Manual 2020.
(2) Drug Information Handbook 23rd edition, 2014-2015
(3) Lexi-Drugs. Lexicomp Online. Lexicomp; 2022.
(4) UUH Protocol for Massive Acute Pulmonary Embolism (PE), 2021
(5) UUH Guideline: 4-Factor Prothrombin Complex Concentrates (KCentra, FEIBA) General Use, 2022
*Optimal endotracheal doses have not yet been established.