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Dear Fellow Residents and APP's,

This guide book was created as a brain child for all those moments when we have all felt overwhelmed standing at the bedside wondering whose chest pressure was worse, the patients or our own…..

So…the following is a little ditty on the basics. The fragments of thought that run through our feeble minds at the wee hours of the night as we're struggling to keep both a semi-responsible sense of consciousness and that patient on the floor alive.

This is only a skinny skeleton of what you truly need to know; but hopefully, this will keep you afloat during the initial patient evaluations, keep the hovering nurses from interrupting you with calls on Tylenol orders, squelch the bad thoughts of your seniors on your performance. No pressure here.

This ain't the Bible/Koran/Torah/name-your-holy-scripture…but maybe (in its wee pocket-size form), it will be your mini back-up. Heck, maybe we'd go as far as to say that if you carry it in your chest pocket (next to that pocket-protector), it will be a tiny bullet-proof vest for your wise and proud heart.

Whatever… At least you'll have something to write notes on during conference or a just-in-caser when there's no toilet paper in the bathroom stall.

Good luck.

You'll need it.

NOTE: the authors of the following handbook do not claim responsibility for the actions of those who employ this manual for the care of real-life patients.

Best of luck, and remember you are not alone.
Maine Medical Center Surgical House Staff

Things to make sure you inform the senior resident about:

1. If you bolus someone more than 2 liters
2. New onset Anuria - EVER
3. Ordering blood products and transfusing a patient
4. Ordering a CT scan or other invasive test
5. Ordering Narcan or Flumazenil
6. If you have come in for work with two different shoes on (two different colored socks, still kosher…a bit odd but kosher)
7. Upgrading a patient from one level of care to another
8. Ordering pressors on a patient
9. If you are going on a Starbucks / Thai run / found free food somewhere in hospital… or you have good food to share
10. Managing new onset atrial fibrillation (or V-tach for that matter)
11. Acute desaturations
12. Mental status changes, of you or your patient
13. If you get chewed out inappropriately by another service
14. Critical lab values – especially if this is a trend/confirmed on repeat
15. Temp > 40 and symptomatic hypotension or hypotension < 70 SBP
16. Symptomatic Hypertension or HTN > 200
17. If your inner voice is talking to you (and you are not on P6)
18. New onset wound drainage or question wound infection
19. Bowels on bed… or on floor… or looking at bowel outside the OR
20. Acute change in an abdominal exam and/or peritoneal signs
21. If you think a patient needs a consult from another service
22. If you are incapacitated, preferably beforehand.
23. Anything that you are the slightest bit uncomfortable managing yourself…like crabs.
24. New patient / consults / "your patient is here"

CHART NOTES
Admissions

Every patient admitted will need a recent H+P and an order set.

H+P: Every chart needs an H&P as soon as possible. Epic catch phrases:

.surghp	Most People
.surgconsult	Pts in ED – can use if not sure
.surgtraumahp	Pt in the Trauma bay
.surgscuadmit	SCU patient

Patients who are admitted through ASU (the day of surgery) typically have an H&P in the Media Tab. Look at "**Chart Review**" on the left and then "**Media Tab**." If more than one month old, you will need to write an updated H+P, can also do a 30 day update, using the **IPHR** note type. Just type **IPHR** under note type and the template will automatically come up. ALL PATIENTS NEED AN IPHR IF COMING THROUGH ASU. (If already admitted, they need the H&P or consult note and a SOAP note from that morning.) Fill is as many fields as you can. Eventually this should automatically populate from the H&P, but this appears to be a work in progress.

ROS should include at least 10 separate systems for proper billing. Also, nothing is ever "negative," rather patient denies "SOB, dysuria etc." to reflect what you actually asked or is relevant.

*** The PMH and PSH are pre-populated in the note and are often wrong, please take a minute to update them (ESPECIALLY the PSH, with surgeon name if known, tab on the left)

All H+P's need a GOOD assessment and plan – be as complete as possible. ***Also include "Discussed with attending Dr. X who "agrees" at the end of plan and include who you saw the patient with (ie. Seen with "[Sr. Resident]")***

Order Sets: Use "**Gen Surg Admission**" for most people. Bariatric, Trauma, Surg Onc, and Vascular Patients also have specific order set. (Post op patients have a different order set).

Progress Notes Basics

General Soap Note Format
.apsoorange is the general template for most inpatient notes. People personalize notes for individual services / personal preferences.

Important to discuss here – while you can copy forward, please do so responsibly. Part of the impetus to standardize notes is to prevent this practice– don't perpetuate the stereotype. Every line, every day needs to be inspected and changed as appropriate. This includes and possibly is even more important for the physical exam – don't be the one to forget the new ostomy in the exam.

Don't forget to be sure post op day / hospital day / post injury day is accurate! Be sure to actually give an assessment, ie "Doing well" or "urinary retention" etc. Just saying the POD and procedure is not an assessment! But this also isn't the place to put subjective information – short and concise here, please.

S(Summary): A brief overview of who the patient is, (surgery and why) eg: POD 6 from sigmoid resection for diverticulitis. PERTINENT medical history (eg: Hx: CHF and uncontrolled diabetes…)

A(assessment): Recovering appropriately, hemodynamically stable, pain controlled

P(plan): This should be problem based
Each line should have an assessment and plan- for example:
1) Post op sigmoidectomy for diverticulits - Ileus resolving. Advance diet to clears.
2) Diabetes - Adequate blood sugar control. Continue insulin sliding scale.

3) Acute Kidney Injury: Resolving, decrease IV Fluids to 75 cc/hr, d/c once taking adequate PO

Be thorough – common mistakes: not including (and verifying!) antibiotics and WHY, anticoagulation, reason for central line or foley.

- Try to include end points, for example: Continue Zosyn (day 4/7)
- Try to anticipate next steps – eg Will plan on transitioning to VAC dressing prior to d/c (this helps care management decide what needs the patient will have. You should be having this discussion with CM daily anyway, but it helps everyone keep track)

S (subjective): What is the patient complaining about most.

- Are they passing flatus? Bowel movement?
- Nausea or vomiting?
- Pain Control?

O (objective): Vital signs (Tmax if relevant, blood sugars if diabetic)
Intake (separate PO and IVF) / Output (urine, drains/NG, bowel movements)
Exam
* On vascular include a pulse exam, "Doppler signals" versus Doppler pulses (pulses are palpable)
* note color and content of drains
* note ostomy condition and output
the ".nicuio" smart text will separate all I/O's if you want to use it.
* any new lab info, pathology, microbiology or new imaging of major significance

Make sure to sign the note with the service pager at the bottom!

Remember, notes have more than one purpose. They document the patient's course and plan, they are used by billing, and they are used by other services. Make them concise but inclusive without being overly involved – if too long, too verbose, or incorrect, the notes aren't useful to anyone.

Transfers & Discharges

General Notes

- Transfer summaries need to be printed & signed before patients are discharged to facility. Same information as Discharge summary.
- Keep discharge summaries up to date during the patient's stay and complete discharge summaries ASAP at time of patient discharge. You'll get a list of deficiencies in EPIC. This can quickly become overwhelming and you'll get annoying deficiency messages, and eventually the chart completion bandits will tell Dr Whiting….Just get them done, it is easier this way.
- If you get a deficiency on a patient who is not yours, email the person who should actually do it. Still working out the EPIC kinks with rerouting it to the right person.
- As a general rule, patients in house less than 24 hours do not need d/c summaries (except chemoembolization/TACE patients on Green, and most pediatric patients). However, if something important or drastic happens during that admission, it may be prudent to write a quick summary anyway – use your judgment. Example: some ruptured AAA patients go home POD 1 from EVAR.
- Discharge summaries can count as the progress note for that day, if done correctly and well (as it well should be) – must include a physical exam.
- You can dictate or just keep a Discharge Summary note up to date in EPIC. Remember to "share" it, so others can help keep it current.
- Start this early, and update it often – you will be surprised how tedious it can be to try to summarize a week long stay at the end of it. However, try not to get bogged down with the details – an overview of pertinent events is sufficient. Imagine reading this from a PCP's standpoint.
- **Every patient needs an updated discharge summary and discharge medication reconciliation every Friday. Do NOT leave this for the weekend coverage, even if there are APPs on service. Prescriptions should also be completed and in the chart, sent to the appropriate pharmacy, etc. This is NOT for the weekend coverage to do.**

Discharge Instructions can be found:

- In EPIC: type “MH IP DC GEN” and select from list
- Or Surg.us/dc/first letter of color (i.e. surg.us/dc/g for Green)
- Or find a service specific one from one of the APPs smartphrases
- Or make your own

Off service summary

When finishing a service each month, leave up to date discharge summaries in EPIC and “share” them!

PRE-OP

Remember to make your patient NPO after midnight if they're getting a procedure or operation. Also consider type and screen or type and cross.

Consider:
ECG for men > 40 and women > 50 or anyone with a cardiac history
Old ECGs can be found in EPIC or chartpop.
CXR for patients > 60 or with known cardiac or pulmonary disease

Labs:
The surgery admission order set allows you to order basic labs. A type and screen is sufficient for platelets or FFP – a crossmatch is unnecessary for these. **If you want to transfuse products** – go to order sets, "transfuse", select the product you want and and fill in the fields. Only fill in the top if you want to put blood on hold, if you want to transfuse at that time then fill in the second box as well.

Bowel Prep

Make them poop:

- Miralax 238 grams in 64 oz Gatorade (not red/blue/purple) and NPO once stools run clear

Make it Clean - at 1800 and 2359 day before surgery:

- Neomycin 1g **and**
- Metronidazole 500mg PO **OR** Erythromycin base 500mg if allergic

Remember, anyone on narcotics needs to have docusate and senna ordered once they are allowed to drink post op – add additional laxatives as needed (lactulose, miralax, suppositories, etc.) You do not want to get behind on this…

DVT PROPHYLAXIS / TREATMENT

CHEST 2012 / Caprini Score 2009

ALL patients need to be on some form of DVT prophylaxis.

- Compression devices – if they have a leg you can compress it but contraindicated in acute DVT and caution with heart failure and severe PAD.
- Heparin BID / Enoxaparin 30mg – for most surgical patients
- Heparin TID / Enoxaparin 40mg – for high risk patients (trauma, oncology, bariatrics); longer acting so needs a bit more planning if you're placing or removing an epidural
- SEE CAPRINI SCORING NEXT PAGE. Chest and Caprini are very similar for management of surgical patients. **"VTE PROPHYLAXIS"** order set in EPIC also has Caprini score listed with quick links

	Prophylaxis	**Anticoagulation**
Heparin	5000U SQ BID 5000U SQ TID 7500U BID	Heparin gtt protocol
Enoxaparin (Lovenox)	30mg QD QD 40 mg SQ QD	1 mg/kg SQ q12o OR 1.5 mg/kg SQ QD
Tinzaparin (Innohep)	4500 u SQ QD	175 u/kg QD
Fondaparinux (Arixtra)	2.5 mg SQ QD	5 mg SQ QD if <50 kg 7.5 mg SQ QD if 50-100 kg 10 mg SQ QD if >100kg
Dalteparin (Fragmin)	2500 u SQ QD	200 u/kg SQ QD
Argatroban		2 mcg/kg/min IV (MAX 10 mcg/kg/min) *goal PTT 1.5-3x baseline (60-80 at MMC)
Bivalirudin		0.15 mg/kg/hr

*Heparin sq dosage changes per patient weight and pro-thrombotic risk factors

Caprini Score

2009 Revised Caprini Venous Thromboembolism Risk Factor Assessment

Each Risk Factor Represents 1 Point

- ❑ Age 40-59 years
- ❑ Minor surgery planned
- ❑ History of prior major surgery
- ❑ Varicose veins
- ❑ History of inflammatory bowel disease
- ❑ Swollen legs (current)
- ❑ Obesity (BMI >30)
- ❑ Acute myocardial infarction (< I month)
- ❑ Congestive heart failure (< 1 month)
- ❑ Sepsis (< 1 month)
- ❑ Serious lung disease incl. pneumonia (< 1 month)
- ❑ Abnormal pulmonary function (COPD)
- ❑ Medical patient currently at bed rest
- ❑ Leg plaster cast or brace
- ❑ Central venous access
- ❑ Other risk factor _____
- ❑ Blood transfusion (<1 month)

For Women Only (Each Represents 1 Point)

- ❑ Oral contraceptives or hormone replacement therapy
- ❑ Pregnancy or postpartum (<1 month)
- ❑ History of unexplained stillborn infant, recurrent spontaneous abortion (≧ 3), premature birth with toxemia or growth-restricted infant

Total Risk Factor Score ☐

*Select only one from the surgery category

Each Risk Factor Represents 2 Points

- ❑ Age 60-74 years
- ❑ Major surgery (> 60 minutes)*
- ❑ Arthroscopic surgery (> 60 minutes)*
- ❑ Laparoscopic surgery (> 60 minutes)*
- ❑ Previous malignancy
- ❑ Morbid obesity (BMI >40)

Each Risk Factor Represents 3 Points

- ❑ Age 75 years or more
- ❑ Major surgery lasting 2-3 hours*
- ❑ BMI > 50 (venous stasis syndrome)
- ❑ History of SVT, DVT/PE
- ❑ **Family history of DVT/PE**
- ❑ Present cancer or chemotherapy
- ❑ Positive Factor V Leiden
- ❑ Positive Prothrombin 20210A
- ❑ Elevated serum homocysteine
- ❑ Positive Lupus anticoagulant
- ❑ Elevated anticardiolipin antibodies
- ❑ Heparin-induced thrombocytopenia (HIT)
- ❑ Other thrombophilia Type_____

Each Risk Factor Represents 5 Points

- ❑ Elective major lower extremity arthroplasty
- ❑ Hip, pelvis or leg fracture (< 1 month)
- ❑ Stroke (< 1 month)
- ❑ Multiple trauma (< 1 month)
- ❑ Acute spinal cord injury (paralysis)(< 1 month)
- ❑ Major surgery lasting over 3 hours*

Total Risk Factor Score	Incidence of DVT	30-day Proven DVT Incidence*	Risk Level	Prophylaxis Regimen	Legend
0-1	<10%	0%	Low Risk	No specific measures; early ambulation	**IPC** - Intermittent Pneumatic Compression **LDUH** - Low Dose Unfractionated Heparin **LMWH** - Low Molecular Weight Heparin **FXa I** - Factor X Inhibitor
2	10-20%	0.7%	Moderate Risk	IPC, LDUH (5000U BID), or LWMH (<3400 U)	
3-4	20-40%	0.97%	High Risk	IPC, LDUH (5000U TID), or LMWH (>3400U) or FXa I	
5 or more	40-80% 1-5% mortality	1.94%	Highest Risk	Pharmacological: LDUH, LMWH (>3400 U), Warfarin, or FXa I alone *or* in combination with IPC	

LMWH > 3400 = Lovenox 40mg, < 3400 = 30mg

PROCEDURE SPECIFIC ORDERS

Chemoembolization patients have an order set "**TACE**" . In addition, they need:

A brief admit note (.surgtace or .surgtacefancy)
H & P from the office (check with Green APP, though should be in EPIC)
Clears until midnight, then NPO (if admitted pre-procedure).
Embolization requisition which is under AI (angio-interventional, arterial and gastrointestinal). Call Interventional Radiology (IR) at 2326 to notify them of patient's arrival. (Most patients now present directly to IR and we admit them post op.
Clears on PPD0
CMP on PPD1
BEWARE HYPOGLYCEMIA – ominous sign after liver surgery or embolization – get a stat CMP and notify your senior.

Bariatric – Different post op plans for Cobean and Sahagian, check with attending to determine plan, hopefully this will be readdressed this year and a single order set agreed upon.
Below is an outline of typical orders for a COBEAN laparoscopic Roux-en-Y gastric bypass procedure (LRYGBP) and laparoscopic sleeve gastrectomy (also found on surg.us):

LRYGBP
IV fluids (LR) at 125 cc/h for entire hospitalization (use common sense and do not put someone into heart failure)
Clear liquids post-op
Meds:

- Omeprazole daily x 2 months
- Oxycodone (or Dilaudid) for pain control

DVT ppx:

- Enoxaparin 40 mg q 12 hrs (high risk)

Stop all diabetic medications post-op - some diabetic pt will need to be sent home on an insulin sliding scale if they have consistently elevated blood sugars post-op

Continue anti-hypertensive medications post-op
Restart ASA post-operatively (depends on attending, so be sure to clarify)
Watch video prior to discharge – R3 nurses handle this
Discharge home on POD#1 if able to tolerate 1000 cc PO intake
Follow up with PCP within 1 week
Follow up at Weight and Wellness Center in about 4 weeks (pt should have post-op appt already scheduled at time of surgery)

Sleeve Gastrectomy
Same as above except:
Meds:

- Omeprazole daily x 2 months
- Oxycodone (or Dilaudid) for pain control
- Promethazine tabs
- Hyoscyamine 0.125 mg every 4 hrs prn (30 tabs)

Discharged with scopolamine patch already in place from pre-op to be removed at 72 hours (be sure to include in d/c info to remove if develop dry mouth, drowsiness)

Vascular
Ordersets start with Vasc Surg
Includes: CEA, Open/ENDO AAA, Angio's, Amputations, General Post-op and Wounds ordersets.

Thyroid/Parathyroids
Check total calcium levels post op evening and AM following day
Total and some partial thyroids need synthroid replacement (1.5 mcg / kg)
See the attending specific discharge instructions for calcium replacement needs. Mac: Ca/Vit D 600/400 TID, Wu: Calcitriol 0.25mcg BID + 2 tums Q6H

POST-OP

TAKE YOUR PATIENT TO PACU. Speak with the nurses, give a short sign out of the case, expected or possible complications, and plan. You will be amazed how many calls this can save you.

A rundown of orders a patient may need after going to the OR, but don't hesitate to order these before the patient actually leaves the OR. If they're in place when the patient gets to PACU, it will save you at least one call from the PACU nurses.

Write a brief op note – type “brief op note” in the note type box and the template will automatically load. For complex patients, it can be useful to add a “Post op Plan” section at the top of the note.

Order sets:
Surgery General Admit / Surgery Post-op / Ambulatory Surgery Post-op are 3 basic order sets that cover most aspects you need.

Remember to cover the following: (Use the post op ADT tab, this cleans up the anesthesia and perioperative orders)

Admit (aka “Place in”)	Dressings
Service with CORRECT pager number	IV fluids (usually lactated ringers or
CPR status	normal saline – do not give lactated
Vitals / I/O	ringers to renal failure patients)
Diet	DVT prophylaxis
NG tube	Pain meds
Drains	Home meds

Pain Control:
Gen Surg Comprehensive Post-op Order Set will get you some basic pain med orders plus bowel regimen. Remember to order a bowel regimen if you're giving narcotic pain medications. The PCA orders are found in this order set as well and include PRN narcan and anti-emetic orders.

Insulin:
Blood sugar control is an important part of peri-operative care to reduce infections. Use the comprehensive insulin order set if your patient needs insulin (go to order set, type in “insulin” and choose the appropriate order based on PO diet status.)

OPERATIVE NOTES

If asked to dictate an operative note, can also type one in EPIC

Dial transcription services: 662-4013
MMC code: 01#
Enter your 4-digit code: XXXX#
Enter the 2-digit report type: 04#
Enter the pt's **CSN** #

Dictate, including the following:

- Patient Name
- Patient MRN
- Date of operation
- Surgeon
- Assistant
- Anesthesia ("general, or LMA" conscious sedation using (list meds & doses), "local" (med & dose))
- Pre-op diagnosis
- Post-op diagnosis
- Name of Procedure
- Indication (very brief HPI)
- Findings (normal and abnormal)
- Procedure (in depth description of steps in the procedure, do not repeat findings – be sure to include measurements, type and size of implants, etc)
- Also note the time required to do the procedure (helping you grade the difficulty)
- Must say "Dr. XXX was present for the above procedure."
- **Carbon Copy (CC) to pertinent care providers (PCP, consultants, etc.)**

The following are operative note **templates** for basic procedures (Courtesy of Dr. Cobean). Most attendings have templates for their common procedures as well.

Laparoscopic Appendectomy

Preoperative Diagnosis: Acute appendicitis
Postoperative Diagnosis: Same
Name of Procedure: Laparoscopic appendectomy
Surgeon:
Assistant:
Anesthesia: General
Indications: This is a 75-year-old man who presented to the emergency department with a 24-48 hour history of abdominal pain localizing in the right lower quadrant. He was nontoxic and had a surprisingly benign exam, but his CT scan showed inflammation in the region of the appendix. Diagnostic laparoscopy with presumed appendectomy seemed prudent.
Findings: His appendix was indeed acutely inflamed and also perforated just a few millimeters from an otherwise normal base. A portion of cecum immediately adjacent to it was inflamed as was the terminal ileum. Despite the perforation and immediately local inflammation, there was little evidence of peritoneal contamination away from the walled-off appendix.
Procedure: Following induction of general anesthesia and orotracheal intubation, I could still palpate nothing abnormal on physical exam. I prepped and draped his abdomen sterilely and preinjected all trocar sites with 0.5% Marcaine with epinephrine. I easily entered the peritoneal cavity using a 5 mm Ethicon XL bluntly dissecting, optically guided port through a deep vertical umbilical incision and an existing tiny umbilical fascial defect. I insufflated to 15 mmHg CO2 and the diagnosis was obvious on initial inspection. There was inflammation in the right lower quadrant, but this seemed more extensive than a simple appendicitis. I placed midline suprapubic and mid hypogastric 5 mm ports and had excellent visualization using a 30 degree 5 mm laparoscope. With triangulating dissection I was able to find the appendix. It was being walled off by the terminal ileum, cecum and the fat pad at the ileocecal junction. I peeled away the acute adhesions and could see the tiny perforation at the base of the appendix. It was not leaking anything nor was there evident contamination in the region. The cecum just superior and anterior to the appendiceal stump was injected and erythematous and angry but not indurated. I used cauterized Maryland forceps to tease away the inflamed fat

around the base of the appendix. At some point during this pinching cautery, I must have taken the cystic artery because I never identified it. The mesentery was diminutive other than its acute inflammation. To my relief, I was able to dissect it a tiny but healthy strip of viable appendix between the perforation and the cecum. I doubly ligated the base with a 0 PDS Endoloop and divided the appendix distally. I had been concerned that I was going to have to do a sutured repair of the appendiceal stump, but I saw no reason to do so at this point.

I introduced a 12 mm specimen bag through the umbilical port site, briefly removing the port itself, and removed the appendix for permanent specimen. There was perfect hemostasis and had been no blood loss. I gently irrigated the region of the appendix. Because the cecum was naturally attached to the anterolateral abdominal wall, it was unlikely any material would have reached the gutter or up toward the diaphragm. I therefore irrigated copiously the pelvis and suctioned but came back with just sterile-appearing irrigant after what looked like a brief small amount of inflammatory ascites but not pus. When I released the exposure to the appendix, the previous fat pad fell back over the stump. I was content.

I desufflated and removed all instruments. I closed the tiny fascial defect at the umbilicus with a 0 Vicryl figure-of-eight suture and the skin incisions with 4-0 Monocryl subcuticular and Dermabond. He awoke and was extubated in the operating room having tolerated this 50-minute operation well. He was transferred to the recovery area in good condition for probable overnight stay.

Cc: PCP & any other interested parties

Laparoscopic Cholecystectomy

Preoperative Diagnosis: Symptomatic Cholelithiasis
Postoperative Diagnosis: Same
Name of Procedure: Laparoscopic Cholecystectomy
Surgeon:
Assistant:
Anesthesia: General
Indications: This is a 30-year old woman with recent episodes of classic biliary colic. This, associated with multiple gallstones on ultrasonography, warranted elective cholecystectomy.
Findings: Her gallbladder was of normal size, color, and texture. The cystic duct was quite diminutive in diameter. Her gallbladder contained numerous gallstones ranging in size from gravel to several millimeters. Her common bile duct-cystic duct junction was obvious, as was the position of her cystic artery. The operation was straightforward. Her liver, duodenal bulb, and stomach were normal in appearance.
Procedure: Following induction of general anesthesia and orotracheal intubation, we prepped and draped her abdomen sterilely and preinjected all trocar sites with 0.5% Marcaine with epinephrine. Through a deep umbilical incision and upward traction on the abdominal wall I easily passed a 5mm Ethicon Xcel trocar under video guidance. I placed two more 5mm ports, in the epigastrium and right subcostal position. With 10mmHg C02 insufflation and reverse Trendelenburg position, I had excellent visualization using a 30˚ 5mm laparoscope.
With upward and outward traction on the gallbladder I bluntly dissected some flimsy omental adhesions to it. This brought the infundibulum easily into grasp. With downward and outward traction on the infundibulum, I exposed the triangle of Calot and incised the peritoneum anteriorly and posteriorly with electrocautery. This allowed me to dissect a centimeter or two of lower gallbladder away from the liver. I bluntly used spreading Maryland dissectors to isolate the cystic duct, with an overlying lymph node and lymphatic channel, from the diminutive cystic artery. The ductal and arterial anatomy was obvious. I used a cauterized Maryland dissector to hemostatically divide the cystic artery and then used hook electrocautery to easily remove the gallbladder

hemostatically from its attachments to the liver. This left it attached by only the cystic duct. I ligated the duct with a single 0 PDS Endoloop, grasped it distally to prevent bile spillage and divided it.

I brought the 5mm laparoscope laterally and used it to guide a grasper such that I could remove the gallbladder through the umbilicus. With the gallbladder partially delivered, I opened it and drained the bile from it. This allowed me to pull the gallbladder through the umbilical port site with minimal dilatation. After a final inspection of the peritoneal cavity and with perfect hemostasis and no almost no blood loss, I desufflated the abdomen and removed all ports. I closed the tiny umbilical fascial defect with a simple 0 Vicryl suture and the skin incision there with 4-0 Vicryl subcuticular. I reinforced that closure and closed the other port sites with Dermabond. She awoke and was extubated in the operating room, having tolerated this 35 minute operation well. She was transported to the recovery room in good condition for probable discharge home.

Cc: PCP & any other interested parties

ER AND FLOOR CONSULTS

Consults require a good history and physical exam, a thorough review of any relevant lab work or imaging studies and a concise **assessment** and **plan**.

Note type is Consult and EPIC smart text is ".surgconsult". Be sure to click the box holding the consult order.

Just as a regular H&P, but some things to keep in mind

- Review all **imaging** studies with the radiology attending or resident on call if the final reads have not been dictated yet
- Use EPIC and ChartPop to review old admission notes (particularly valuable for patients that are less than perfect historians) – Add all surgical history to EPIC history to save this step for others in the future
- All consults should include a thorough **ROS – remember, at least 10 systems though preferably 13. You can make a smartphrase or share from someone else who has one. (E.g. .bamros and .bambabyros)**
- All vascular consults should include a *complete* vascular exam
- Try to formulate a good *impression* and *plan* on your own and then **speak to your senior resident** before calling the attending on call
- **Patients seen in the ED become the *responsibility* of the surgical team once seen and must be adequately followed up – even if plan is to admit to a different service – until settled**

Alvarado Score

Used by ED to determine when to call a surgical consult vs get a CT to evaluate the patient. Was a study in the past, now mostly educational though not without value. Know it for appendicitis consults, especially pediatrics.

* Do not use it to diagnose appendicitis. Use your clinical judgment.

Alvarado Score	
Migrating pain …….	1
Anorexia …….	1
Nausea / vomiting ….	1
RLQ tenderness ……	2
Rebound …….	1
Fever…….	1
Leukocytosis ……	2
Bandemia …….	1

If patient has a CBC with diff:
< 7 : CT prior to consult
≥ 7 : surgical consult before CT

If patient does not have CBC with diff:
< 5 : CT prior to consult
≥ 5 : surgical consult before CT

Remember: The Alvarado score does not dictate how you evaluate the patient (i.e. if you want a CT, get a CT)

If pediatric patient, no CT until seen by team. We avoid CTs in this population in general.

Trach / PEG Consults

Simple consult note (short but sweet, Dr. Cobean and most residents have a template), make sure to check available imaging, review the indications, and obtain appropriate consent (for the procedure AND for conscious sedation). For details of arranging the procedures, see SCU PROCEDURES.

Check if patient is **coagulopathic or anticoagulated**
Check if Trach/PEG is **indicated**
Review **imaging – particularly abdominal films**
ABDOMINAL EXAM – know if the patient has had prior surgeries
Obtain **consent**.

You will generally be expected to dictate (or use a template) an operative note (under note type put "op note", not brief op note or procedure). Dr. Cobean has provided some templates:

Percutaneous Tracheostomy & PEG/J

Preoperative Diagnosis: Respiratory failure
Postoperative Diagnosis: Same
Procedure: 1. Percutaneous bedside tracheostomy 2. Percutaneous endoscopic gastrostomy and jejunostomy tube placement
Surgeon:
Assistant:
Anesthesia: Fentanyl 300mcg, Versed 6mg
Indications: 64-year old woman making a gradual recovery from open-heart surgery. She has failed extubation attempts on a couple of occasions and no longer has realistic expectations for short-term extubation. We felt she was a reasonable candidate for elective tracheostomy and reliable percutaneous enteral access. I chose the timing of the procedure to coincide with the upswing of her Coumadin anticoagulation, believing that waiting even another day would require reversal of anticoagulation.

Findings: 1. I placed an 8.0mm inner diameter Portex cuffed, non-fenestrated tracheostomy tube between approximately the second and third tracheal rings using a percutaneous dilatational technique without difficulty.
2. I placed a 24 French Boston Scientific traction-removal gastrostomy tube into the mid-body of the stomach through which I carried a 12 French Bard transgastric jejunostomy tube into the proximal jejunum. There was an approximate 1cm linear white plaque, which looked to me like a healing mid-esophageal erosion related to the nasogastric tube. Her stomach had a few punctate marks from the nasogastric tube. Otherwise, her stomach, pylorus, duodenal bulb and duodenum were all normal.
Procedure: The patient care team at bedside performed a standard time-out by identifying the patient and planned procedure. With her supine in her Intensive Care Unit bed, we administered intravenous sedation and prepped and draped her neck sterilely with her neck gently in extension. After infiltrating the soft tissues with 1% Lidocaine, I made a tiny transverse incision in a prominent skin crease. I punctured the midline tracheal air column inferior to the cricoids cartilage and easily passed a guide wire. I dilated from 12 to 38 French with a Cook Blue Rhino single-stage dilator. I then introduced the tracheostomy tube over an appropriately sized dilator without difficulty after withdrawing the orotracheal tube above the level of the dilatation. We showed immediate return of the end-tidal CO2, normal chest expansion, and returned tidal volume.
I introduced the diagnostic upper endoscope under video guidance and briefly intubated the trachea, confirming good tracheostomy positioning and perfect hemostasis. I then intubated the esophagus and performed thorough upper endoscopy to the level of the descending duodenum. With her stomach insufflated, there was a point of very clear fingertip indentation in only a small area in the subxiphoid position. I prepped and draped her upper abdomen sterilely, infiltrated with 1% Lidocaine, and made a tiny transverse incision. Through this, I passed a 15-gauge needle catheter into the stomach under video guidance, passed a looped guide wire, grasped it, and delivered it through the mouth. I brought the gastrostomy tube into position using a pull technique following which I anchored it to skin under appropriate low tension and cut it to length (4cm at the skin). I reintroduced the upper endoscope, passed the 12 French jejunostomy tube into the stomach, grasped it, and

carried it into the proximal jejunum. Upon withdrawal and release there was no residual gastric loop and the catheter irrigated easily. I desufflated the stomach and removed the endoscope.
The patient tolerated both procedures well and showed no evident blood loss. She was surprisingly alert and cheerful at the completion of the procedure, her condition unchanged.

Cc: PCP & any other interested parties

RADIOLOGY

We depend a lot on radiology. Here are a couple guidelines for maintaining a cooperative relationship.

1. Try to write a rational question in the order so the radiologists know what we're looking for. Include pertinent surgical history and symptoms in the comments box. (eg: Post op day 8 from lap appy, now abd pain and leukocytosis, assess for abscess; Prior gastric bypass with nausea/vomiting)
2. We can often be helpful by going down to radiology and speaking to the resident or attending in person. We know the operations and subsequent anatomy. We know the clinical symptoms. The more information you give them, the more they can help us. This is particularly relevant if you need help deciding +/- PO, IV, rectal contrast.
3. If you order a study, follow up on it. Always.

Phone Numbers

Angio/IR	2326	**FUSION listen line**	**5262**
CT Scan	6972		UserID: 29
ECHO Reading room	4637		PW: 2929
ECHO listen line	7990+20+3	MRI	3252
Fluoroscopy	4808	MRI Control	4028
Ultrasound	3686	Nuclear Medicine	4309
IR Consult pager	767-6768		

IR Consults

IR consults are used for everything from cholecystostomy tubes to abscess drainage to angiography. (Make the patient NPO at time of IR consult order as appropriate.) The consults are placed by entering an IR consult order into EPIC. Often the radiologist covering IR consults (or the APP) will call you to speak about the procedure, but not always. Most commonly they want to know if the procedure needs to be done STAT or if the next available/tomorrow is OK. You can prevent this call by putting it in your consult request! If you do want to speak to someone about what you are ordering, the IR consult pager is 767-6768.

COMMON CALLS

A few words of advice. When called with any of the following problems and your heart rate bumps ever so slightly: BREATHE. Being panicked only begets more panic on the floor around the patient. Breathing when called about respiratory desats, emptying your own bladder when called about a patient's low urine output, swallowing that call-room Mylanta to ease your reflux when called about chest pain and nausea—all very important.

That being said, always see the patient. ASAP. Once all is said and done, be sure to write a note.

Assume the worst possible scenario, and go with that feeling of impending doom; rather than assume that low urine output is a kinked Foley, chest pain is an ugly burp, respiratory desaturation is oxygen nasal canula blowing into the patient's eyes.

There's a good chance that your "I cant believe that ____ happened" is going to start with one of these calls. Sometimes they shock you like a nurse calling to tell you they put an ostomy bag over a bleeding wound to better collect and quantify. Other times they make you humbled as to how sick patient's can be.

And, if you're worried (and even if you're not), let someone else know, even if it's just in passing (oh, by the way Boss, X is having chest pain, turning blue, and bleeding out of his ears…just thought you should know). Do know the patient, the operation/trauma/procedure, the hospital day, current vital signs/trends, general I/Os, past medical history, medications, etc.

Know the relevant recent and past medical/surgical history, including medications and allergies. Remember to keep your seniors aware and involved. And when all else fails, remember that whatever happens to this patient is your own damned fault. Just kidding. Really.

And so: a few common patient problems.

Chest Pain

Always a stinker. Even when you're on the vascular service and the general algorithm for chest pain triage becomes as common place as say, WASHING YOUR HANDS AFTER TOUCHING C.DIFF PATIENTS—chest pain always gives you chest pain. Most of the time, a nurse will call you and not be able to give any specifics about the chest pain; i.e., quality, severity, associated symptoms, changes in vital signs, relevant medical history. So, that becomes your job, your burden, your chip, your whatever.

Let the nurse know you'll be up ASAP (we like communication skills here, even if we don't always practice them). Start some basics like:

- ECG
- CXR
- Morphine
- Oxygen
- Nitroglycerin
- aspirin
- ß-blockade
- appropriate labs
- GI Cocktail

See the patient, decide how sick he is (comfortable and oblivious, slightly uncomfortable and anxious, about to die, etc), examine them, and gather all the information you can, (i.e. compare the ECG to the prior, look at yesterday's CXR which actually showed the single pneumocyte left in that smoker's lung)… And then decide what's wrong. If you're really lucky, the patient will say: this is my usual chest pain/angina, this is what I do for it, now bugger off and let me get back to my Ambien buzz, please.

You need to rule out

- MI
- PE
- Aortic Dissection
- Pneumothorax

Low urine output

Again: know your patient. Low urine output immediately post-operatively after a renal transplant is different from low urine output three days after a gastric bypass.
Know the basics:

- Foley/no Foley
- General trend over the past few hours
- Recent changes in labs (BUN, Cr, potassium, urinalysis, FeNa) – recheck if needed!
- Associated symptoms, changes in vital signs.

And then, if that weren't enough:
Know the categories for low urine output: **pre-renal, renal, post-renal**.
And remember the things you'd feel really really bad about if you missed them:

- **hypotension/shock**
- **acute renal failure** maybe requiring hemodialysis, **hyperkalemia** with those dreaded peaked T's (that's another story).
- **a bleeding patient**

See the patient and examine him:

- **JVD** visible from the door,
- So **dry** that he's choking on his own dried-up saliva
- Bringing up **pink frothy** sputum.

Check a bladder scan! - *inaccurate in obese
>350
Has Epidural - Consider placing a foley again
No Epidural - Straight Cath x 3 before permanent cath, consider Flomax
< 350
And then, the ultimate question…to bolus or not to bolus (and the related, to *diurese* or not to *diurese*). This is a bit of a feel question. You know, you'll get the feel of it as you get on with residency. Ask a senior, if you feel at all uncomfortable.

Respiratory distress/desaturations

Important facts to ascertain during that initial phone call:

1. Rapid or slow onset of respiratory distress?
2. When you say desat, what number can you actually give me?
3. Are you saying the patient is pink or blue?

Unlike the other problems addressed here, this is an emergent/urgent issue**, so GO, go now, stop reading this in the call room before you walk and start walking!**

Really, really bad things? We're talking:

Severe hypoxia/cyanosis	CHF
Pneumothorax w/wo tension	Anaphylaxis
PE	Flash pulmonary edema…
Aspiration	…actually, almost anything that
MI	causes severe respiratory
Cardiac tamponade	distress is really really bad

Again, knowing the patient is a good thing

- past medical history
- medical events: operations/central lines/DVT prophylaxis, etc.

The basics:

Confirm airway patency, even if this means using your ungloved fingers to fish out those swallowed dentures/peanuts

Get an accurate and current set of vital signs

Slap on some friendly O's while waiting for your senior – do NOT leave the patient's bedside – have nursing page your senior

CXR

ECG

ABG

Get your **intubatin' arms ready! – Call a code blue or DART response as indicated**

To ward off evil spirits, of course. If you're a really really good intern, you'll always carry around a 14-gauge angiocath (needle decompression). Some attendings will even praise the brave few who own and surreptitiously carry a well-honed pocket knife. You never know when you'll need to crich/trach someone or open up their neck hematoma. Perish the thought.

Nausea and vomiting

Some of us can't stand dry or wet heaving—it's a saliva thing. Others can't tolerate the squirts or brown/offensive poo (as opposed to the usual poo). But, as surgical residents, we must…not exactly embrace...but perhaps just accept that one day, we will be one—or at least very very near—bodily outpourings of bad humours. Nausea and vomiting can be as simple as an adverse reaction to a medication, the ungodly aftermath of a well-deserved bender, that awful GI bug that's going around the house staff like wildfire…to the truly awful: aspiration pneumonia, bad bender with Mallory-Weiss tears and Boerhaave's, electrolyte/metabolic emergencies. Again, know your victim patient.

- Look and *examine* the patient.
- **Protect** the airway.
- Place a soul-saving **nasogastric** tube if appropriate.
- Make sure the patient is **well-hydrated** and that any abnormalities on the ordered basic metabolic panel are corrected
- Follow up on that ACUTE ABD SERIES (Chest/KUB upright/lateral)

And then, in your infinite wisdom, figure out what the heck's going on. Simple, eh? Common medications: Zofran, Phenergan, Reglan, Compazine, Scopalamine Patch, Haldol (0.5-1mg is good for nausea and potentiates Zofran when used together).

Wound Drainage

(What to do if you are called to evaluate a patient for new wound drainage)

Go **SEE** the and **ASSESS** the wound. This means taking the dressing down!

Characterize the drainage (i.e. serous, purulent, feculent, bloody, etc.)

Don't culture the fluid from a wound that was previously opened or is already packed. It will grow out everything in the hospital. Only culture the fluid if you have personally just opened the incision.

Be sure to assess the incision itself. Is there peri-incisional erythema? Is it blanching? If so, the wound may need to be opened. NEVER open a wound without talking to a senior resident.

Tachycardia

GO SEE THE PATIENT. As with all surgical problems, you must go see the patient to begin assessing the problem. Consider the differential diagnosis. Common post op causes of tachycardia are:

- Hypovolemia/bleeding
- Pain
- Atrial fibrillation/arrhythmia
- Sepsis

Pursue the appropriate workup. You are never wrong to get an ECG, CBC, BMP when you are working up a patient for a problem. If you have difficulty interpreting ECGs, ask your senior resident to help. There is never a time when a patient with persistent tachycardia should not have a current ECG on the chart.

Beta blockade treats the symptom. IT DOES NOT SOLVE THE PROBLEM. It is almost always okay to beta block a patient after you have worked them up for tachycardia, but please keep in mind that there is often an underlying reason for tachycardia. The goal is to find the underlying cause and fix it. Beta blockade is cardioprotective but again, is not the answer.

Atrial Fibrillation

Common, confirm with a 12 lead EKG. Make sure to check electrolytes, ionized calcium, magnesium and phosphorous, home meds (if someone forgot to give them their home b-blocker or levothyroxine), TSH, +/- ECHO, likely a Cardiology consult if refractory or if new-onset.

If new, transfer to telemetry, push b-blocker (Metoprolol 5mg IV x 3 doses as tolerated by BP), if this doesn't break it give a bolus 10 of dilt and start a dilt gtt. If their pressure drops give boluses to keep on dilt gtt. If this dosen't work next line is amiodarone but you should've called cards by this time.

As with all other things, call your senior. The senior should know about any patient with tachycardia.

HypOtension
HypErtension

- post-operatively can resume oral chronic antihypertensives
- if cannot take PO, don't have to continue same class of drugs. Control hypertension to below <170 systolic, <110 diastolic, and HR <100. Don't have to be perfect, and trying to make someone 120/80 is more harmful due to inadvertent hypotension.
- Use your judgement.

G and J Tubes

(What to do if you are called about a G or G tube that falls out)

There is a printed **MMC protocol** for dealing with dislodged G/J tubes.

- A **tube <7 days** old that is dislodged is an **emergency**. Have the nurse get a Foley catheter to the bedside and **run** (don't walk) to the floor. (Honestly do NOT put anything in a tract that fresh – best bet is to call the attending, and plan for endoscopy, and possibly lap assist, right away to replace the tube, hopefully through the same hole)
- If the tube is <7 days old, the attending surgeon must be called and the management of the tube is left to their discretion.
- If the tube is >7 days old, an attempt may be made with a Foley catheter or red rubber catheter to replace the tube through its tract. IF YOU REPLACE A TUBE THROUGH THE TRACT, YOU MUST OBTAIN AN IMAGING STUDY. An adequate imaging study would include either a KUB with contrast through the tube demonstrating that the tube is in the lumen of the bowel OR a fluoro study demonstrating the same. If the KUB is at all questionable, you MUST obtain a fluoro study. (Radiology will call to have you push the contrast, just take the syringe they give you and push 20-30 cc through the tube).
- If any difficulty is encountered in replacing the tube or if there is any question as to the location of the tube, an imaging study must be obtained and the attending surgeon must be informed.
- Get all the supplies you need, or think you may need before attempting tube-replacement. Those darn holes close fast!

IV Access

If a patient needs IV access, you have a few options:
1. Peripheral IV: usually inserted by nurses, they may call on you for help. Learn to use the ultrasound to help you place an IV, it can be a life-saver
2. Central lines: can be large bore or multiple lumen. See the section in SCU procedures for more details.
3. PICC lines: a central line placed by PICC nurses into the arm. Often used for patients who need long-term IV antibiotics since a patient can go home with them. Also used for patients who have very difficult IV access so the nurses don't have to keep poking them day after day after day (poking a patient with a needle hurts them, remember that when you order labs).
To get a PICC line, place a PICC consult via EPIC. The PICC team can be reached via pager at **662-4800 then 0799** if you need to speak with them. The default PICC is a double lumen antimicrobial-coated catheter.

Clogged Feeding Tubes

As with all other problems, the first thing to work at is prevention. If you ever have a patient with a post pyloric feeding tube, you should be clear that no crushed pills are **EVER** to be placed through that tube. They are not designed for crushed pills passing through and they will clog.

For J tubes/dobhoff's – use a 1 or 3ml syringe with warm saline to irrigate the tube and force it through. You may also order "Tube Clearing Solution" to try to unclog the tube (a solution of enzymes).

For G tubes – most common place to clog is where the bumper is against the skin. Move the bumper, kneed the schmutz near the skin where the bumper was and try to flush with a cath-tip syringe. Don't forget to replace the bumper.

If in doubt, call someone!! If none of that works, replace the tube. Never replace the tube without talking to a senior resident.

Never try to unclog a feeding tube with a guidewire. You could perforate the tube and the bowel.

Patient Death

"Your patient looks dead" – How to confirm the suspected

Eyes – should be fixed, likely dilated. Look/listen for respirations. Listen/feel for pulse/heartbeat for ONE FULL MINUTE.

No matter what we do, eventually you'll have a patient who dies. Hopefully you'll at least be expecting it... but not always. Usually the family is at the bedside but if they're not make sure someone calls them ASAP. Make sure you let your senior and the appropriate attending (if a SCU patient, please call the primary attending as well) know as well. Follow the patient death checklist in the "death pack". Also you need to place a "discharge" order where the "Disposition" is expired.

Death Summary – similar to a discharge summary but need to have time of death. At minimum, place a note in the chart about what happened and the time it was called. You will need to call the medical examiner's office if this was a trauma, otherwise fill out the expired patient paperwork. Most discharge summaries for this are short – e.g. "patient presented with XXX, after aggressive management patient and family elected to withdraw care, and patient was transitioned to CMO status. XXX passed peacefully at *** on xx/xx/xxxx with family at bedside."

COMMON MEDICATIONS

Analgesics

Fentanyl – shorter acting, good for older people
Morphine – Longer acting, not good in renal patients
Dilaudid – Long acting, IV 1mg Dilaudid=6.6mg Morphine, good for patients with nausea to other narcotics. Orally 2mg-4mg Q3-6 PRN is the same as Oxy
Oxycodone – PO narcotic good to send home with patients 5mg tabs 1-2 tabs Q3-6H prn
Tylenol – dosed q6h, do not ever exceed 4000 mg QD. Less in liver patients
Ibuprofen – not for Gastric Bypass patients or renal patients. Do not use with anyone at risk of bleeding, or elderly.
Ketorolac – IV NSAID, same as above, do not use with renal insufficiency or elderly. Limit total number of doses to < 10. Ok for renal failure on dialysis.
Vicodin – Tylenol and hydrocodone – do not dose with regular Tylenol. Max dose restricted based on 4000mg acetaminophen QD

Antiemetics

Zofran – 4mg q4-6h prn can dose up to 8mg q4 prn
Haldol – 0.5-1mg Q6H PRN can work well for nausea especially when used with Zofran as it will potentiate its effect
Promethazine – use small doses first as can cause respiratory depression and confusion especially in older patients start with 6.25 or 12.5 mg, also potentiates effects of narcotics. Know that IV Phenergan is a vesicant which is highly caustic to the intima of blood vessels and surrounding tissue (aka lose your IV and cause problems)
Reglan – 10mg q8h prn, can cause extra pyramidal side effects, also good for GI motility
Scopolamine patch – can cause anti-cholinergic side effects
Dexamethasone – can be used for refractory nausea
Ativan – can be used for refractory nausea – Not the best choice

Antibiotics

Bowel Coverage/Broad Spectrum

Zosyn – adjust for renal insufficiency – our "go to"

Unasyn (Amp/Sulbactam) – adjust for renal, our "go to" for pediatrics

Metropime (Flagyl-Cefepime) adjust for renal – good for PCN allergic patients (about 15% of penicillin allergic patients will also be allergic to 4th generation cephalosporins)

Cipro/Flagyl combo which provides similar coverage to zosyn and metropime but here we have some cipro-resistant bugs – zosyn or metropime are better choices.

Moxifloxacin – once daily and 100% bioavailable orally, good anerobic coverage.

Levofloxacin – Better for pulmonary penetration than moxi

Skin Infections

Cefazolin/Keflex/Augmentin – OK if 1st infection and no known MRSA

Vancomycin/Linezolid – if known MRSA

UTI

Bactrim if community acquired

Ciprofloxin – if uncomplicated and no suspected resistance

Nitrofurantoin for resistance – cannot be in renal insufficiency/failure

Ampicillin concentrates really well in urine and can defeat even amp-resistant UTI's

DO NOT USE MOXIFLOXACIN – does not concentrate in urine

Sleepers

Caution in older, obese, and patients with sleep apnea

Do not use Benadryl due to anti-cholinergic effects, disinihibition especially for older adults.

Ambien – start with 5mg dose

Ativan/Benzos – DO NOT USE AS SLEEPERS. Beware of respiratory depression and paradoxical agitation especially with age > 60

Chloral hydrate – low dose, no respiratory depression, good in older patients

Ramelteon – Works on melatonin receptors in pineal gland, good for older people, fever side effects, takes about 3 days to work (good placebo…)

Antidotes

Narcotics – Narcan (Naloxone) 0.2-0.4mg IV, may need to repeat Q3min up to 2mg max but usually not more than 1-2 times or its probably something else. Remember, if it does work that Narcan might wear off before the narcotic does!

Benzos – Romazicon (Flumazenil) 0.2mg IV, may need to repeat again in 30 seconds with another 0.3mg IV if still unconscious. Repeat dosing is 0.5mg Q1min up to max 3mg

Beta Blocker –

- **GlucaGen (Glucagon) – 5mg IV**, may need to repeat a second time in 10-15 minutes. Pediatric dosing is 50mcg/kg. Can cause nausea/vomiting so if they're awake, co-administer Zofran
- **Calcium Gluconate – 13.8meq = 3g Ca = 30ml. You order "3 gm" in EPIC**. Has been shown to work for BB overdose. Peds dose Ca = 60mg/kg max at 3g
- **Lipid Emusion Therapy (see below)**

Calcium Channel Blocker –

- **Calcium Gluconate – 13.8 – 27.6 = 3-6g Ca = 30-60ml** – Watch for hypercalcemia after your resuscitation.
- **Lipid Emusion Therapy (see below)**
- **Insulin/Glucose – See UpToDate**

Bupivicaine – Lipid Emusion Therapy – 1.5ml/kg of 20% lipid emulsion solution. Can repeat Q3-5min for 3 doses. After initial bolus then infuse 0.25-0.5mk/kg/min until hemodynamic recovery occurs (usually 30-60min). Increase drip for hypotension

Dopamine extravasation/norepinephrine – Phentolamine 5-10mg diluted in 10ml saline and injected into extravasation area. Do ASAP but can do up to 12 hours after

SCU

Welcome to your time in the SCU. For the next year you will spend more time here than anywhere else. Below is a general guide to help you along your journey. A few general principals always apply:

Be kind to the nurses, they can get you out of a lot of jams.

As the surgical resident in the ICU you will be like the chief of the service most of the time. When there is a senior anesthesia resident, they are technically chief. It is important to still respect the other residents on the service. However know that the other surgical residents will look to you to know most things about all the patients in the unit. You will be the **contact** person from most of the other surgical residents whose patients are in or about to go into the ICU. You are never alone, phone a **Senior** for help, especially at night. There may be a PA/NP in the SCU who will see patients. They are a great resource for how things work in the unit as well as helping organize things like family meetings.

You will be required to carry the **Code** pager during the day. When it goes off it gives an area of the hospital. You go there and if the pt is actually coding (50% of the time the pt is not actually coding) you as a surgical resident are responsible for placing the central line or intraosseous line (preferred these days) if they need one. So walk in the room, ask the person running the code if the need a line. Then get your line kit or IO drill kit and gloves from the code cart and place a line. (Femoral vein if going for a central line). Remember, try to keep as clean as possibly but during a code sterility is a luxury. All code lines will need replacing once the patients gets settled in the ICU, within 24 hours.

While in SCU you will get all the trauma pages. During the day it is necessary to go to only Level 1 traumas. You can attend level 2 traumas if you wish and it is helpful if you can attend any burns that end up in the burn room. You will be called by the senior trauma resident for any patients that will need a SCU admission. On weekends or call nights you must attend all traumas and burns.

The **SCU Surgery attending** must be contacted for any:

- New admission
- Any dramatic hemodynamic change or addition of pressor
- Respiratory distress requiring intubation
- Procedure that you are going to do at the bedside
- Patient death, even if expected (also contact the primary surgeon if there is one)

Rounds: Rounds take place at different times depending on the attending of the week. The trauma/critical care attendings rotate through the SCU. Remember to invite the patient's nurse and respiratory therapist to join you for rounds. They appreciate it and can provide additional, at times critical, information.

Presentations:

- Start with 1-2 sentence pt synopsis
- 1-2 sentence 24 hour events
- Problem based presentation
- Notes:
- Some helpful things to add in notes include:
- Lines and line days
- Culture data with antibiotic days
- Nutrition
- DVT/GI prophylaxis.

SCU Prophylaxis

In the ICU we use a variety of different types of **prophylaxis**.

- **DVT prophylaxis** – Venodynes and sub Q heparin for general surgery patients and Low Molecular Weight Heparin for trauma patients.
- **DVT screening** – Part of DVT prophylaxis. Trauma pt should get bilateral DVT ultrasounds twice a week. (Mondays work well) You can also screen other surgical patients if they are on prolonged bed rest or at other high risk.
- **VAP prophylaxis** – Head of Bed at 30 degrees. Oral chlorhexidine TID. (now part of a bundle)
- **Stress ulcer prophylaxis** – **Sucralfate, H2 blocker**, **or Proton Pump Inhibitor**. That's is in order of preference. Remember to **renally** dose Famotidine.
- Make sure all pt have **PT** and **OT** orders.

Orders

- **SCU admission** order set in Epic.
- **SCU sedation** is an order set to find sedation orders
- **SCU analgesia** is an order set to help keep patients comfortable

(Remember an order set does not mean the appropriate drug(s) has been chosen for your patient; that still requires a clinical judgment).

Sedation

(Also see "Sedation" order set in EPIC)

Propofol (diprivan) – the white necter of the gods…I mean a short acting sedative with hypotensive properties and about 1 kCal/mL of fatty nutrition. Good for patients who only need sedation for a short term (operative patients) or ones that are hemodynamically stable. Please do not use in patients who are on pressors! Make sure to check triglycerides when using for more than 48 hours. Look up Propofol Infusion Syndrome to sound smart on rounds.

Dexmedetomidine – related to the A2 blockers like Clonidine but works on the CNS more than the periphery, less hypotension, but you can still get some bradycardia. Worse on liver than propofol is, so keep that in mind.

Lorazepam (Ativan) – good for someone who is going to be out for a long time, make sure to check the serum osmolality (which can be elevated due to the prophylene glycol carrier).

Midazolam (Versed) – used for "breath through" agitation, can also be used as a longer term sedative but same serum osmolality warnings as Ativan. Less hyptension with versed/fentanyl

People to Know

SCU coordinator

The SCU coordinator (**662-0595)** is a nurse that is in control of the beds in the ICU. You have go through them to get any of your admissions into the unit.

Call ASAP for **new admissions** into the unit. Call even for potential admissions for any patient that you may think may be coming to the unit, such as pre-op for a sick patient. The sooner they know the better off you are. They also help get patients out of the unit and make your list smaller. Run your list with them every morning with transfers out of the unit. The sooner they know the better.

Hemodynamics (aka Hemo)

Hemo is a respiratory tech who specializes in hemodynamic equipment.
Pager **4800-0632**
Call for:

- Flotrac/Vigileo
- PA cath
- A-line
- CVP
- Bladder pressure setups
- They will help with Tracheostomies
- Call ASAP so they can get stuff ready for you!

SCU PROCEDURES

Make sure you place a note in the chart! See "Procedures" tab in EPIC

Tracheostomy

- Tracheostomy (Blue Rhino) kit or a "**Cobean kit**" (this includes a perc trach disposable kit, two #8 portex trachs and two large gowns.) You can grab your own sterile gloves from any of the SCU supply rooms.
- Contact the Hemo tech at pager **#0632** (radio pager)- they need to be present at the time of the procedure.
- Have a couple 3-0 Vicryl sutures available. Bleeding happens – have a way to stop it.
- Coordinate sedation meds with nurse, i.e. Versed, fentanyl, vecuronium, propofol, etc.
- Place Epic order for phenylephrine gtt 80mcg (standard drip) in case of hypotension during procedure.
- Some attendings want the bronchoscopy cart at the bedside – if this is so, you can coordinate this with Hemo and they will set everything up.
- If for **Dr Ciraulo** - get a **trach hook**. Order a trach hook from CSD at the same time you are ordering the "Cobean kit".

Bronchoscopy

- Notify the RRT at pager **#0630**, they will assist you with this procedure.
- Sedation meds ordered and available for procedure i.e., Versed, Fentanyl, Propofol.

Make sure the patient is:

- Monitored with pulse oximetry.
- Sedated as necessary.
- **Pre-oxygenated** with 100% for 10 minutes.
- Endotracheal Lidocaine use should be avoided, as it may affect colony count on quantitative cultures.

PEG Tube

- If you are calling to set this up a day in advance you will need to call **Central booking** at **X2665** to schedule for Endo cart.
- Contact **Endo** at **X3636**. Inquire as to whether or not the "*cart*" will be available to do a PEG tube placement.
    - If **YES**- they will bring the cart to the room w/ a PEG (24 French Boston Scientific pull-technique) and jejunal limb 10-12 French, bite block, and endoscopic grasper.
    - If **NO**- You will need to build your own cart.
- Call the OR at **X2241** to see if their Tower/Scope is available. Their tower may be available but you may have to contact Endo at X3636 to get a scope. (Specify that you need a Treatment Gastroscope). You will also need to ask for an **endoscopic grasper** and a **bite block** (a circular one that fits into the mouth).
- Call the **storeroom X2220** to get a PEG (24 F pull-technique) and 10-12 F jejunal limb delivered to the room # where procedure will take place.
- Though not required, it is usually easier to perform the procedure if the patient is NPO for at least 4 hours prior to PEG insertion. Coordinate this with the primary team.

Chest tube

- Obtain **spontaneous pneumothorax** tray from CSD/Storeroom, these are also kept in the ED and known as a Trauma tray or in the SCU as the spontaneous pneumothorax tray
- Other supplies needed:
    1. Sterile gowns, gloves, hats, masks.
    2. Appropriate size Chest Tube (usually 28-36 french with 36 french the optimal in most trauma situations)
    3. Foam tape,
    4. 0 or 2'0 silk/nylon suture,
    5. petroleum gauze, gauze,
    6. 1% lidocaine, syringe, needle,
    7. Pleurovac suction
- The trays usually have all the instruments you need including the blade.

Arterial lines

Here we mostly use the through and through (or stab) technique.

- Call Hemo and tell them you need an a-line setup
- Gather appropriate supplies
  - Hat, mask, gloves, gown, minor procedure drape
  - 20 gauge angiocath, guide wire OR Arrow kit
  - Arm board, chucks
  - T connector
  - Tape, tegaderm
  - Ultrasound machine if desired
- 1% lidocaine, syringe, needle
- Palpate radial pulse.
- Place patient's arm on arm board, tape to prevent movement.
- Prep with chlorhexidine.
- Get Sterile, Drape, palpate pulse
- Insert needle into the artery
- Remove needle leaving angiocath in place and then Thread wire then advance angiocath over wire OR advance wire in arrow kit
- Connect to t-connector and monitor,
- Flush, tape and tegaderm.

Central Lines

A number of our patients will end up with central lines. Some of them will even need them. Most SCU patients get one at some point in their stay. Just remember, central lines are not benign – you risk infection, pneumothorax, even stroke. If you are placing a central line just for venous access make sure you've tried everything else first.

On the surgical service we use a number of different central lines.

I. **Antibiotic Coated Triple Lumen catheter**: multiple ports for med infusion and lab draws. Not great for giving large amounts of fluid quickly. We prefer not to use any other non introducer central line other than this. All three SCU units have these in stock and you can order them from the store room.

II. **9 French introducer**:This is the large volume line. Use in trauma/code/bleeding situations. These are also used because you can place a PA catheter through their introducer port. They only have one lumen so they are limiting for nurses who want to put multiple meds through. These lines can be found in the trauma room, all three SCU units and from the store room

III. **MAC line**: The MAC line is a huge introducer that has two ports, has an introducer for a PA catheter and can instill fluids very quickly. The MAC line is a great line to use in a pt that will need a PA cath and a huge resuscitation. The MAC line can be found in all SCU store rooms or in the central storeroom.

IV. **SLIC Cath:** If you have an introducer or a MAC line and do not need a PA cath you can put a **SLIC Cath** into the introducer. A SLIC is a Single Lumen Infusion Catheter that fits on the end of an introducer. You can find these in the anesthesia work room or the storeroom under number **#250065**.

All lines that were inserted at an outside hospital, were placed in an emergency situation, or where there was a known break in technique, should be changed as soon as is practical using the approved protocol.

Line Insertion Protocol

- If your patient is awake, get consent. If they're not awake, get consent from the family. There is a specific CVC permission slip which should be used when possible.
- Make sure one of the nurses fills out the yellow central line bundle checklist. It covers the vital components of the protocol.
- Wash hands prior to procedure.
- Caps, masks, sterile gowns and gloves must be worn during insertion, by all staff involved. Emphasis is applying same sterile technique as is required in the Operating Room. *Use the **central venous catheter bundle** found in the SCU storerooms, it has everything except your gloves in it.
- All facial and scalp hair must be covered. (Yours not the patient)
- Wide sterile draping with disposable large paper drapes.
- Skin prep with **chlorhexidine**. Allow complete dry prior to procedure.
- **Subclavian** is the preferred site as it has the lowest infection risk.
- If you are going the internal jugular route, use the ultrasound located in SCU 4 clean supply. Dr Ciraulo might razz you about using it… and you should know how to do one without the ultrasound. That being said, standard of care is using an ultrasound for the IJ now.
- Make a new "Procedure Note" in epic
- Use the central line order set in epic to place management orders and xray (type in "CVC" under ordersets).
- Complete the vascular tab in Epic – otherwise you will get harassing emails

And remember always think **about why you are inserting the line. Is it a code situation and you just need a volume line (introducer, large bore single lumen)? Is it going to be later used as a measure of their inter-vascular volume (at least double lumen, IJ or subclavian)? Are you going to need invasive hemodynamic monitoring i.e. PA line (usually need a separate introducer)? This will help you figure out which site you are going to access.**

PRESSORS

Ok, it's a little more complicated than this table. But here's a quick guide for the middle of the night when your patient is crashing and the norepinephrine you defaulted to just isn't enough.

CO = cardiac output; Inotrop = contractility; HR = heart rate; MAP = mean arterial pressure; VR = venous return (preload); SVR = systemic vascular resistance (afterload); PVR = pulmonary vascular resistance; RBF = renal blood flow

Dosing

	Loading Dose	Infusion Dose	Duration
		mcg/kg/min	
Phenylephrine (Neosynephrine)	50 – 200 mcg	0.15 – 0.75	< 5 min
Norepinephrine (Levophed)	--	0.05 – 0.5	2-10 min
Epinephrine	2-10 mcg	**β** dose: 0.01 – 0.03	5-10 min
	2-10 mcg	**β > α**: 0.03 – 0.15	5-10 min
	2-10 mcg	**α + β**: 0.15 – 0.5	5-10 min
Ephedrine	5-10 mg	---	3-10 min
Dopamine	---	Renal dose: 0.5 - 3	< 10 min
		β dose: 3 - 10	< 10 min
		α_1 + β: 10 - 20	< 10 min
Dobutamine	---	2 - 30	< 10 min
Isoproterenol	20 – 60 mcg	0.01 – 0.5	1-5 min
Vasopressin		0.01 – 0.06 U/min	10-20 min
Milrinone	50 mcg/kg slowly	0.375 – 0.75	0.5-2 hr

At some point during your first month in SCU, be sure to look through the surviving sepsis campaign: survivingsepsis.org and ardsnet.org

Adrenergic Receptor Activity

	Alpha 1	Alpha 2	Beta 1	Beta 2
Phenylephrine	++++	0	0	0
Norepinephrine	+++	+++++	++++	0
Epinephrine	+	+	++++	++++
	+++	++	++++	++++
	+++++	+++	++++	++++
Ephedrine	++	?	+++	++
Dopamine	0 ven / ++++ art	Dopaminergic receptor stimulation		
	+ ven / ++++ art	?	+++	+++++
	+++++	?	+++++	+++
Dobutamine	0, +	0	++++	++
Isoproterenol	0	0	+++++	+++++
Vasopressin	Antidiuretic Hormone			
Milrinone	Phosphodiesterase 3 inhibitor			

Hemodynamic Effects

	CO	Inotrop	HR	MAP	VR	SVR	PVR
Phenylephrine	0,↓	0,↑	↓	↑↑↑	↑	↑↑↑	↑↑
Norepinephrine	↑,0,↓	↑	↓	↑↑	↑↑↑	↑↑↑	↑↑
Epinephrine	↑↑	↑↑	↑	↑↑	↑	0,↓	
	↑,0	↑↑	↑↑	↑	↑	↑,0↓	↑,0
	↑,o,↓	↑↑↑	↑↑	↑	↑	↑↑↑	↑
Ephedrine	↑↑	↑↑	↑	↑↑	↑↑	↑	
Dopamine	↑	0	0	0,↓	↑	0,↓	
	↑↑	↑	↑	↑	↑	↓	↑,0
	↑,0,↓	↑↑	↑↑	↑	↑	↑↑	↑↑

Dobutamine	↑↑	↑↑↑	↑	↓,0,↑	↓	0,↓	↓↓
Isoproterenol	↑↑	↑↑	↑↑↑	↑,↓	↓	↓↓↓	↓↓
Vasopressin	↓		0	↑↑		↑↑	
Milrinone	↑↑	↑↑	0,↑	0,↓	↓	↓↓	↓↓

ABG Analysis

Arterial Blood Gas Analysis

ABG Parameter			ABG result	Calculation and interpretation		
pH	>7.45	Alkalaemia		**pH**	**pCO2**	**Interpretation**
	7.36-44	Normal				
	<7.35	Acidaemia		↓	↓	Metabolic acidosis
pCO2	>45	High		↑	↑	Metabolic alkalosis
	35-45	Normal		↑	↓	Respiratory alkalosis
	<35	Low		↓	↑	Respiratory acidosis
HCO3	>26	High		**Corrected standard AG for albumin**		
	24+/- 2	Normal		$\frac{\text{Albumin} + 1.5 \times \text{Phosphate}}{4}$		
	<22	Low				
AG	> 16	High		**Anion Gap calculation**		
	12+/-4	Normal		$\{[Na+] - [Cl^- + HCO_3]\} = 12+/-4$		
	< 8	Low		**Corrected Na+ for AG in hyperglycemia**		
Glucose	>10	High		Corrected Na+ = Na + $\frac{\text{Glucose} - 5}{3}$		
	< 2	Low				
Gap: Gap	$\frac{\Delta \text{ AG}}{\Delta HCO_3} = \frac{\text{AG - 12}}{24 - HCO_3}$			**Gap: Gap calculation for metabolic acidosis**		
				<0.4	Low or Normal AG metabolic acidosis	
				0.4-0.8	Normal + high AG metabolic acidosis	
Lactate	**<1.9**	Normal		0.8-2.0	Pure high metabolic acidosis	
	>2.0	High		>2.0	Metabolic acidosis with metabolic alkalosis/respiratory acidosis	
pO2	80-100	Normal		**PAO2 = [713 x FiO2] – [pCO2 x 1.25]**		
	< 80	Hypoxia		**A-a gradient = PAO2 – PaO2 = $\frac{\text{Age}}{4}$ + 4**		

Compensation rules for				
Expected PCO2	**Metabolic acidosis**		**Metabolic alkalosis**	
	1.5 X [HCO3] + 8 (+/- 2)		0.7 X [HCO3] + 20 (+/- 5)	
Expected HCO3	**Respiratory acidosis**		**Respiratory alkalosis**	
	Acute	Chronic	Acute	Chronic
	$24 + \frac{\text{pCO2} - 40}{10} \text{ X } 1$	$24 + \frac{\text{pCO2} - 40}{10} \text{ x } 4$	$24 - \frac{40 - \text{pCO2}}{10} \text{ x } 2$	$24 - \frac{40 - \text{pCO2}}{10} \text{ X } 5$

Acid-Base Disorders Worksheet

Adapted from Joshua Steinberg MD

Step #1: Gather the necessary data (Na^+, Cl^-, $HCO3^-$, pH, pCO_2)
Preferably, all obtained from the same blood sample.

Step #2: Look at the pH.
If pH >7.4 → the patient has a primary alkalosis → proceed to Step 3a
If pH < 7.4 → the patient has a primary acidosis → proceed to Step 3b

Patient has primary:
acidosis | **alkalosis**

Step #3: Look at the pCO_2.
3a: If pCO_2 is >40 → patient's alkalosis is metabolic;
If pCO_2 is <40 → patient's alkalosis is respiratory
3b: If pCO_2 is >40 → patient's acidosis is respiratory;
If pCO_2 is <40 → patient's acidosis is metabolic

Primary process is:
respiratory | **metabolic**

Step #4: Look for disorders revealed by failure of compensation.
- If 1° process is metabolic alkalosis → pCO_2 should be >40 but <55*
  * There are several metabolic alkalosis PCO_2 prediction formulas, but fraught with clinical inaccuracy/unreliability
- If 1° process is metabolic acidosis → calc. predicted $pCO_2 = (1.5 \times HCO_3) + 8 +/- 2$
  In either case above:
  - If actual pCO2 is too high → there is additional respiratory acidosis
  - If actual pCO2 is too low → there is additional respiratory alkalosis
- If 1° process is respiratory → skip to steps 5 & 6 (where further metabolic disorders revealed)

Additional disorder:
resp. acidosis | **resp. alkalosis**
-or-
no additional disorder

Step #5: Check if the patient has a significant anion gap (>12-18). (AG = Na-Cl-HCO_3)
If AG is significantly elevated → the patient has an anion gap metabolic acidosis in addition to (or in confirmation of) whatever Steps 2 through 4 yielded

Patient
has | **does not have**:
AG met. acidosis

Step #6: Calculate the corrected bicarb. (Pt's gap – 12 + pt's serum bicarb)
In addition to whatever disorders Steps 1 through 5 yielded,
- If corrected bicarb >30 → the patient has an underlying metabolic *alkalosis*;
- If corrected bicarb <23 → the patient has an underlying non-AG metabolic *acidosis*

Patient has underlying metabolic:
non-AG acidosis | **alkalosis**

Step #7: Make the diagnosis(es) using the differentials below and knowledge of the patient

Anion Gap Metabolic Acidosis	Non-Anion Gap Metabolic Acidosis	Acute Respiratory Acidosis	Metabolic Alkalosis	Respiratory Alkalosis
"**MUDPILERS**"	"**HARDUPS**"	*anything that causes*	"**CLEVER PD**"	*anything that causes*
Methanol	**H**yperalimentation	*hypoventilation, i.e.:*	**C**ontraction	*hyperventilation, i.e.:*
Uremia	**A**cetazolamide	CNS depression (drugs/CVA)	**L**icorice*	**C**NS disease
DKA/Alcoholic KA	**R**enal tubular acidosis	Airway obstruction	Endo: Conn's/Cushing's/	**H**ypoxia
Paraldehyde	**D**iarrhea	Pneumonia	Bartter's)*	**A**nxiety
Isoniazid	**U**retero-Pelvic shunt	Pulmonary edema	**V**omiting, NG suction	**M**echanical ventilators
Lactic acidosis	**P**ost-hypocapnia	Hemo/Pneumothorax	**E**xcess alkali*	**P**rogesterone
EtOH/**E**thylene glycol	**S**pironolactone	Myopathy	**R**efeeding alkalosis*	**S**alicylates/**S**epsis
Rhabdo/**R**enal failure			**P**ost-hypercapnia	
Salicylates		(***Chronic*** *respiratory acidosis*	**D**iuretics*	
		is caused by COPD and		
		restrictive lung disease)	*associated with high urine Cl levels	

Step #8: Fix it!

Shock

Hemodynamic profiles

Hemodynamic profiles of the types of shock

Physiologic variable	Preload	Pump function	Afterload	Tissue perfusion
Clinical measurement	**Pulmonary capillary wedge pressure**	**Cardiac output**	**Systemic vascular resistance**	**Mixed venous oxygen saturation**
Hypovolemic	↓	↓	↑	↓
Cardiogenic	↑	↓	↑	↓
Distributive	↓ or ↔	↑	↓	↑

Hypovolemic

TABLE I: CLASSIFICATION OF SHOCK (based on a 70 kg patient)

	CLASS I	CLASS II	CLASS III	CLASS IV
Blood Loss (mL)	up to 750	750-1500	1500-2000	2000 or more
Blood Loss (%BV)	up to 15%	15-30%	30-40%	40% or more
Pulse Rate	<100	>100	>120	140 or higher
Blood Pressure	Normal	Normal	Decreased	Decreased
Pulse Pressure	Normal/Increased	Decreased	Decreased	Decreased
Capillary Refill	Normal	Decreased	Decreased	Decreased
Respiratory Rate	14-20	20-30	30-40	>35
Urine Output (mL/hr)	30 or more	20-30	5-15	Negligible
CNS-Mental Status	Slightly anxious	Anxious	Anxious - confused	Confused -lethargic
Fluid Replacement	Crystalloid	Crystalloid	Crystalloid + blood	Crystalloid + blood

(Modified from: Committee on Trauma of the American College of Surgeons. Advanced Trauma Life Support for Doctors.

FloTrac

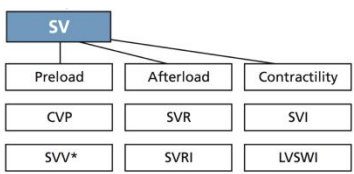
If you know how to use it, it's your best friend, otherwise its just a box with some numbers. Here's the key! Think preload, afterload and contractility!

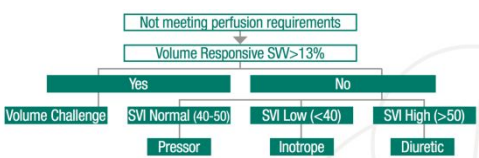
The numbers you care about:

SVV = Preload – Stroke Vol Variance > 13% = Fluid responsive
Note: Need INTUBATED patient on A/C in sinus rhythm

SVI = Contractility - Stroke Volume Index – SV / BSA
Normal = 40-50 = Appropriate for patient
Low = < 40 = Low on the starling curve
High = > 50 = High on the starling curve

SVRI = Afterload – Systemic Vasc Resistance Index (SVR/BSA)
< 1500 = Vasodilated, > 2400 = Vasoconstricted





PEDIATRIC SURGERY

Most Pediatric Surgery Order sets are under “PSURG”

Common Pediatric Medications

Most common IV antibiotics we use are Ampicillin, Clindamycin, Gentamicin, Flagyl, Unisyn, Zosyn. These are all extremely age and weight dependent and since our patients are zero to 18, the safest thing to do is to look it up EVERY time to verify.

Pain:

Acetaminophen	15 mg/kg Q4-6H
Ibuprofen	4-10 mg/kg (max 40mg/kg/day)
Ketorolac	0.5 mg/kg Q6H (max 10 doses total)

*Avoid ketorolac while with epidural to save it for use when they don’t have the epidural anymore!

Morphine	0.1 mg/kg/dose
Fentanyl	0.5-2 mcg/kg/dose
Dilaudid	0.015 mg/kg/dose

Ancef	25-50 mg/kg/day (divided Q6-8H)
Cefoxitin	20-40 mg/kg Q6H
Zosyn (pip/taz)	100 mg/kg Q8H
Unasyn (amp/sulb)	100-200 mg/kg Q6H (max 4 g sulbactam/day)

Zofran	<40kg = 0.1mg/kg/dose >40kg = 4mg/dose
Benadryl	1.25mg/kg Q6H (no more than 300mg/day)

Pyloric Stenosis

See PSURG orderset in EPIC for help!

- Most common condition requiring surgery in the first few months of life. Extremely rare in the first week of life and extremely rare after 12 weeks of life with usual onset between 3 to 6 weeks corrected age.
- Vomiting is the most common presenting symptom, nonbilious and usually projectile.
- Elevate the infant's feet to relax the abdominal wall and palpate over the spine at the midline. The "olive" can be palpated by rocking it superiorly and inferiorly.
- If the infant was transferred in with an ultrasound at an outside hospital, confer with the radiologist. Most radiologists will require an ultrasound be performed here. Ultrasound should show the pyloric pie: Muscle thickness >3 mm, length >14mm.
- If infants referred from outside with a barium study, place a nasogastric tube, and confer with the radiologist on whether additional studies are necessary to confirm diagnosis. Normally no NG tube for these kiddos.
- A clinical assessment of the infant's hydration should be made and serum electrolytes should be checked immediately upon admission to rule out a serious hypokalemic hypochloremic metabolic alkalosis. Desired chloride >100 and CO2 <30 – if not will likely delay surgery.
- If abnormal order:
  1. NaCl 0.9% bolus once (repeat if necessary) at 20 cc/kg
  2. NaCl 0.9% to infuse at 10cc/kg/hr until good urine output, then D5 ½ NS with 20meq/L KCL at a maintenance rate of 4cc/kg/hr.
  3. NPO, no nasogastric tube unless barium was used for a study.

Appendicitis

Pediatric appendicitis is treated differently than adult. Pre-operative is general care/antibiotics and preparation for the OR. After the OR you will do:

If acute/non-perforated – OR and send home from ASU

If perforated –

- Admit to BBCH
- IV Ceftriaxone + Flagyl
- CBC/CRP on POD #3 (or when tolerating diet, normalized)
- On POD #3 if taking PO and doing well, d/c on Augmentin or moxifloxacin (levofloxacin in house) if allergic to PCN or clinda/flagyl if Maine Care (they wont pay for moxi)

New project to streamline this a bit more, so may be changing in the future.

Transplant Primer

This handbook is designed to be not a general reference for transplantation, its scope is far too narrow for that, but merely a map to avoid some of the most common pitfalls that continually arise on the service.

Some general advice:

- Immunosuppressed patients are fragile and devastating complications can present in very subtle ways. Rapid utilization of laboratory tests and imaging (u/s) is often warranted.
- Transplant patients are often better informed about their disease than many physicians. Use them as a resource judiciously. Do not try and bluff them.
- There should never be an occasion on this service where a surgical house officer needs to make a decision concerning immunosuppression without the direct involvement of staff.

Rounds

Combined rounds with the surgical attending, medical attending and nephrology fellow will take place at 8 am on MWF. Transplantation is a multidisciplinary service and the Nephrology team is an integral part of it. Both surgical and medical personnel will write orders on individual patients and immunosuppressive decisions are made jointly.

Working with the Coordinators

The transplant coordinators are an invaluable resource and integral part of the team. They are responsible for pretransplant evaluation and donor preparation as well as data collection and collation and a thousand other jobs that are integral to a transplant program. In most cases they know the patients quite well and are versed in the day to day pitfalls of the service. Use them as a resource judiciously and treat them with respect and your time on the service will be significantly more productive and enjoyable

Preoperative H&P

1. Please note mode of dialysis access and any unusual complications.
2. Etiology of renal failure
3. Does the patient make urine, and if so how much?
4. When was the patient last dialyzed, what is the current fluid status, K, Hct and body wt.?
5. Complete examination of femoral, popliteal and foot pulses must be documented
6. Any signs of current or indolent infection.
7. Use the Transplant admission order set in SCM .

Postoperative Management

- ❑ Use the *Transplant* orderset
- ❑ Restart patients antihypertensives except for ARBs, and ACE inhibitors.
- ❑ Patients must remain adequately hydrated immediately postoperatively. This will often necessitate IV boluses of isotonic fluid postoperatively
- ❑ Treatment of oliguria immediately post-op:
  - suspect blood clot in foley if urine is very bloody or patient is anuric
  - if no clot is found, and the patient is not fluid overloaded clinically bolus with NS
  - depending upon clinical response after 1 liter, or clinically confident of adequate hydration, suspect ATN and obtain flow scan electively.
  - if suspicious of vascular compromise (unusual pain, abrupt drop-off in urine, gross hematuria), obtain US emergently
  - Always make sure staff is aware of post-op oliguria.

1. Foley comes out POD #2 in general, but check with attending for specifics.

Posttransplantation Hypertension

Post transplantion hypertension is common. It should be treated in order to minimize calcineurin induced vasoconstriction and to minimize ischemic damage to allograft and potential trauma to anastomoses.

1. Indication for Rx: SBP >150 or DBP > 90
2. Parenteral management
    1. Hydralazine is first line management
    2. Labetalol, 5-20 mg push over 2 min followed by 5-20 mg push at 10 min intervals. Doses up to 80 mg over 2 min at 10 min intervals can be used. If successful, follow with 0.5-4.0mg/min IV infusion
    3. Call for help

Disposition

Discharging a Transplant Patient is a lot of work. Follow the tips below to make it easier. Most patients go home Friday or Saturday after scheduled transplant – this is a prime example of a time to NOT put off the discharge summary and medication reconciliation.

1. The transplant NP will call in the meds to the appropriate transplant pharmacy, and for most patients, the outpatient pharmacy will deliver the meds to the bedside. Due to insurance issues this might not be possible in all cases. Check with the transplant NP.
2. Oxycodone cannot be called in, the patient will need a script
3. The transplant service USES THE **SIGNOUT TAB**. If you happen to discharge a transplant patient when the transplant NP is not in hourse YOU SHOULD USE IT TOO!!!
4. If there are questions about the plan of care, first check the signout tab, then ask.
5. Followup is at 19 West St, the Maine Transplant Program's offices, not at Dr. Whiting's office.

Immunosuppression

What follows is a very brief, thumbnail sketch of the major immunosuppressives now in use on the transplant service. Syntheses and protocols delineating the principles behind the various immunosuppressive regimens that you will encounter can be found in the rear of this handbook.

Medications

Steroids
They have a variety of immunologic actions affecting both cellular and humoral immunity. One of their primary modes of action seems to be the inhibition of IL-1 production by activated antigen presenting macrophages, thereby indirectly inhibiting cytokine driven T-cell proliferation. Steroids have a number of well-known adverse effects including impairment of wound healing, predisposition to infection, fluid retention, probable increase in gastrointestinal complications and psychiatric dysfunction to name only a few.

Methylprednisolone (Solu-Medrol) is the preferred IV form used in transplantation usually given in a BID fashion with conversion to prednisone when the patient is taking PO. Conversion for the two forms is 4:5 (IV to PO) although in practice it is converted 1:1 on the service. .

Cyclosporine
A fungal metabolite, the primary mechanism of action of which is through the inhibition of gene transcription of several cytokines, most notably IL-2, thereby blocking early T-cell activation. Cyclosporine has many adverse actions, most notably nephrotoxicity, which may or may not be dose related, and it may also cause hypertension, hyperkalemia, headaches and other neurologic symptoms, gingival hyperplasia and hirsutism to mention some of the most common. The nephrotoxicity may even require the cessation of use of the drug. The drug is available in IV and oral form, the conversion being 1:3. Intravenous cyclosporine is rarely used and should never be ordered without the specific order of the attending on service.

Immunosuppression is generally monitored with a combination of trough blood levels (drawn in the morning, before a patient receives their dose) and clinical effect, with attention paid to mg/kg dosing. Trough levels desired depend upon the clinical setting, there is no "normal" level for cyclosporine. (see protocols, below).

Tacrolimus (FK506 or Prograf)
Another fungal metabolite with a very similar mechanism of action, immunosuppressive effect, and adverse effect profile to cyclosporine. It is the cornerstone of most of the immunosuppressive protocols used at MMC. Tacrolimus is very well absorbed, even from the stomach still with an NG tube, generally making the IV preparation, which is available, almost irrelevant. Tacrolimus has also been successfully used as a treatment for chronic rejection and even **OKT3** resistant rejection ("salvage therapy") in liver, kidney, and pancreas grafts.

Sirolimus (Rapamycin, Rapamune)
Yet another fungal metabolite that acts by blocking Interleukin dependent T-cell proliferation after activation, thus it is further down the immune stimulation pathway than CSA or tacrolimus and is logically complimentary to these drugs. It has no nephrotoxicity and therefore there has been considerable interest in using sirolimus as a calcineurin sparing agent (this is the role you most frequently will see on the service). It's primary side effect has been hyperlipidemia and less frequently hypertension, diarrhea and thrombocytopenia. Blood levels are not routinely available, but must be sent out, the drug is usually dosed with a 6 mg loading dose then started at 2mg/day. Dosing is not weight based and the upper level of dosing where efficacy tails off and side effects dominate is not yet clear. Because of pharmacokinetic considerations, sirolimus administration is separated from cyclosporing or tacrolimus administration by a number of hours.

Azathioprine (Imuran)
An antimetabolite that inhibits purine nucleotide synthesis and the multiplication of effector lymphocytes during the immune response. The drug is inexpensive, equivalent as an IV or oral preparation, and generally well tolerated. The most common adverse effect is leukopenia through bone marrow suppression, although jaundice, alopecia, anemia and gastrointestinal upset among others have been reported.

Mycophenolate Mofetil (Cellcept)
Another purine synthesis inhibitor more often used at MMC athan azathioprine. The drug is very well tolerated, but may occasionally cause gastrointestinal upset or diarrhea as well as leukopenia or thrombocytopenia. I.V. to p.o. conversion is 1:1. Both azathioprine and MMF take advantage of the deficiency of the purine salvage pathway in lymphocytes. Thus, inhibition of de novo purine synthesis can produce a relatively specific effect.

Thymoglobulin
Thymoglobulin is a commercial polyclonal antibody made by immunizing rabbits to a human thymocyte. It seems to offer efficacy comparable to OKT3. It is used on the service as induction therapy for most cadaver transplants or for the treatment of rejection. Side effects are fever, chills and thrombocytopenia. Dosage is 1.5 mg/kg day, although intermittant dosing using CD3 levels as a guide has been shown to provide effective immunosuppression and can decrease the considerable cost of the drug and prevent overimmunosuppression.

Anti-IL-2 Receptor Antibodies, Simulect and Zenapax
There are two monoclonal antibodies directed against the IL-2 receptor of T-cells approved for use. The antibodies are considered chimeric or humanized in that the variable region is made up at least partly of mouse sequences while the constant region is human. As a result, the antibodies have long half-lives, are not immunogenic and very few doses can produce weeks of immunosuppression. Clinical studies have indicated that although useful, these antibodies are not likely to be as potent as Thymo, ATGAM or OKT3.

Infections

Transplant patients exhibit a higher susceptibility to infection in general, often secondary to unusual bacterial, viral and fungal pathogens, but the issue of **cytomegalovirus** (CMV) bears special notice both because it is a relatively common pathogen among organ recipients, and because it is unlikely to be encountered anywhere else during the average general surgeon's training.

CMV is a DNA virus of the herpes family. Immunosuppression can activate latent CMV in a serologically positive recipient, or an organ from a CMV positive donor into a CMV negative recipient can cause a primary infection.

A typical, symptomatic CMV infection begins as a spiking fever, between 4 and 10 weeks after transplantation, although primary infections from positive donors to negative recipients can occur within days. Symptoms are myriad and can range from a mild febrile illness to invasive hepatitis, esophagitis, retinitis, gastritis, colitis, or most seriously, pneumonitis requiring ventilatory support. Again, positive donor/negative recipient pairs are at higher risk for disseminated disease.

Until the development of **ganciclovir**, a guanine analogue, in the late 1980's, there was no effective treatment. The occurrence of invasive CMV disease usually meant loss of the graft in the case of kidney patients as immunosuppression was withdrawn, and often loss of life in liver transplant patients. Mild CMV infection, usually due to reactivation, is quite common following introduction of immunosuppression with up to 60% of recipients manifesting symptoms and signs of active CMV infection. Even with the availability of ganciclovir and CMV hyperimmune globulin for treatment, the virus is responsible for significant morbidity, and hence prophylaxis is undertaken with either ganciclovir or a combination of ganciclovir and oral acyclovir (see protocols). The incidence of CMV infection increases following treatment with antilymphocyte globulins. **Ganciclovir's** major side effect is bone marrow suppression, it is otherwise usually well tolerated.

Rejection

Several types of rejection of allografts have been described in clinical and experimental transplantation.

Hyperacute rejection is an antibody mediated event triggering complement activation, and occurring minutes to hours after revascularization. It most always results in allograft loss but is rarely seen currently due to the efficiency of the pretransplant crossmatch to screen for the presence of preformed anti-donor antibodies. A slightly less virulent form can be seen in the first 24-48 hours posttransplant that can be treated with plasmapharesis

Acute cellular rejection is primarily a T-cell mediated phenomenon usually occurring in the first weeks to months following transplantation. It is manifested primarily by graft dysfunction, although various nonspecific signs such as fever, graft tenderness and leukocytosis may accompany it. Non-invasive testing is of limited utility. In both renal and liver transplantation, biopsy is the gold standard. Although there are some opinions to the contrary, treatment of rejection should always be based on solid histologic evidence of rejection.

Acute Rejection is graded using the "**Banff Criteria**" based on systematic assessment of the glomeruli, interstitium, tubules and vascular spaces. Each space is graded according to objective criteria, then an overall grade is given. The system is analagous to TNM grading of tumors, for example . Rejections without a vascular component are graded as "A" and given either a 1 or 2 based on severity of the other components and rejections with vascular involvement are given a "B" and likewise a 1 or 2 based on severity. "C" rejections are essentially dead kidneys with fibrinoid necrosis.

Treatment of rejection varies, but in general, most first rejections are treated with steroids while recurrent rejections or "B" grade rejections are treated with OKT3 or thymoglobulin (see protocols).

Graft loss to acute rejection is rare, occurring in less than 1% of recipients. In most kidney-pancreas transplants, rejection is concurrent in both organs. Unfortunately, there is an incidence of pancreas alone rejection, and currently there is no reliable method of diagnosis save biopsy, which has a

higher morbidity than in renal or liver transplants. By the time glucoses rise, it is generally too late.

Lastly **chronic** rejection (now called "chronic allograft nephropathy") is a process characterized by vascular intimal hypertrophy and interstitial fibrosis. It produces a slow insidious deterioration in graft function, and is the most common form of graft loss in renal transplants, aside from dying with a functioning graft. It has recently been recognized that chronic rejection can occur independent of immune events (hence the name change) although the previous occurrence of an episode of acute rejection is the largest risk factor. One unifying hypothesis is that transplantaton of inadequate nephron mass or subsequent damage destroying nephron mass (for example through rejection) can lead to hyperfiltration by the kidney and then chronic nephropathy. There is no effective treatment currently once the diagnosis has been made on biopsy.

More Reading

1. Kidney Transplantation: Principles and Practice Peter Morris ed.
The standard text on kidney transplantation-available in MSCG office.
2. Atlas of Organ Transplantation Thomas Starzl, Ron Shapiro, Richard Simmons
A decent, if cartoonish atlas of procedures in transplantation including multiorgan donation
Available in MSCG office.
3. Transplantation and Immunology, Chapter 16 in Surgery: Scientific Principles and Practice, ed Lazar Greenfield.
Far and away the best chapter on transplantation available in the general surgery texts. Included as initial handout on service.
4. Kidney Transplant Rejection: diagnosis and treatment. Lorraine Racusen, Kim Solez , James F. Burdick eds.
Very detailed text on applied transplant immunology.
Available in MSCG office

A number of chapters, review articles and other texts are available through Drs. Parker, Vella or Whiting. Just ask.

Dr. Whiting is working on a transplant curriculum, so more resources will soon be available.

APPENDIX

The Most Important Information There Is

Food hours:

- Impression Café (Main Food)
  - Breakfast: 0630-0930
  - Lunch: 1030-1400
  - Dinner 1530-1900
  - Evening 1900-2130
  - Midnight 0030-0200
- Pavilion Grill – 0700-1600 (1500 on Friday)
- Main Entrance Coffee Shop – 0600-1600

Coffee Makers (Kerig):

- Surgery Lounge
- R3 provider room
- SCU3
- R3COR

Private bathrooms:

- Corridor towards short stay from R4 (on right, hidden!)
- On left just as you get into Maine General Building towards Dana
- Down the hall of MG building (across from the turn towards Dana)

Best view in the house:

- Back stairway of CICU – great place if you need a de-stressor
- Top of the hospital

LOGS / SCHEDULE

Logging Duty Hours

- go to New Innovations homepage: https://www.new-innov.com/login/home.aspx
- Click on “Main” → “Duty hours” (graph to the right of the screen)
- Log your hours as needed
- (you can also download the iphone app which allows you to enter and “sync” your hours to new innovation site)
- Do this daily or weekly – it isn’t worth putting off

Logging Procedures

- go to the ACGME site: https://www.acgme.org/residentdatacollection/
- The department will give you your login and password for this
- Click on “Case Entry”
- Click on “Add”
- Fill in all the areas as appropriate
- Do NOT put this off more than a month – these matter and you must have at least 200 before the end of 2nd year
- Be sure to log your critical care index cases – must have at least 10 and at least one of each category – do it early and be done with it
- Log all central lines including mediports – need 10-15 before being allowed to do them without supervision

Finding the call Schedule

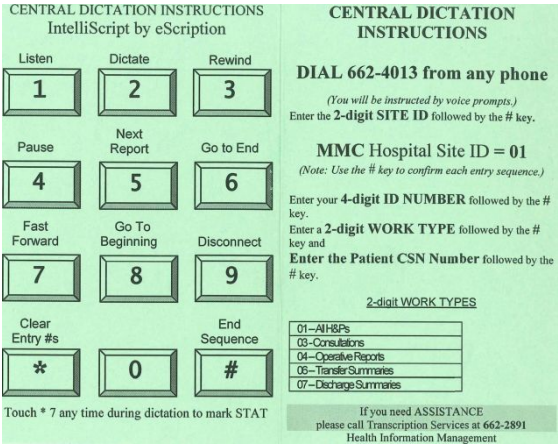
- go to: www.amion.com or surg.me/amion
- amion password: mmc (all lower case)
- to pull up your departments schedule: Surgical Residents
- to sync up your schedule to your computer calendar: http://www.amion.com/cgi-bin/ocs?Page=Help:111

SURG.ME

A series of convenient shortcuts to various useful pages and forms.

http://surg.me	Dept of Surg Homepage
http://surg.me/page	Paging Page
http://surg.me/att	Attending Page
http://surg.me/epicfail	EPIC if the regular link doesn't work
http://surg.me/dc/y	Discharge Instructions - Yellow
http://surg.me/dc/g	Discharge Instructions - Green
http://surg.me/dc/p	Discharge Instructions - Purple
http://surg.me/dc/b	Discharge Instructions - Blue
http://surg.me/sched/y	OR Schedule - Yellow
http://surg.me/sched/o	OR Schedule - Orange
http://surg.me/sched/g	OR Schedule - Green
http://surg.me/sched/b	OR Schedule - Blue
http://surg.me/sched/p	OR Schedule - Purple
http://surg.me/rounds	Weekend Rounding Schedule
http://surg.me/casco	Casco Bay Schedule
http://surg.me/who	MMC Contacts DB
http://surg.me/amion	Direct to MMC list on amion.com
http://surg.me/consent	Surgical Consent Form
http://surg.me/log	ACGME Case Logging
http://surg.me/bb	Online version of the blackbook

Dictation Information



HEADINGS AND FORMATS

EVERY DICTATION must include the following:

Your Name (dictated at the beginning and end, include spelling)
Identify for whom you are dictating if you are not the attending
Type of Report & Date of Service
Patient's Name (and the spelling)
Patient's CSN Number
Courtesy Copies - Dictate first and last name of provider and address, if out of area.

PRECAUTIONS

Dictation via cellular device is prohibited due to poor recording quality and confidentiality issues.
Transcription Services is not responsible for inaudible dictation and blanks resulting from cellular dictation.

REPORT REVIEW

Dial the LISTEN LINE at 662-7990 from an outside phone.
ENTER the appropriate site ID, followed by #.
Enter your 4-digit ID number followed by #.
Press 3 and enter the patient's CSN number followed by #.
The most recent dictation will be heard. Press 5 to listen to the next dictation that matches the Patient's CSN Number..

142036 5/13

DISCHARGE SUMMARY

PRINCIPAL DIAGNOSIS
SECONDARY DIAGNOSES (and comorbidities)
BRIEF PRESENT ILLNESS (pertinent positives only)
HOSPITAL COURSE AND TREATMENT
Brief summary describing treatment modalities
LABORATORY AND X-RAY DATA (abnormal values)
CONDITION ON DISCHARGE - Specific measurable comparison with the condition on admission
DISCHARGE MEDICATIONS (include dosages and frequency)
DISCHARGE INSTRUCTIONS (include activity, diet and followup)
PENDING DATA (labs, pathology, etc., if applicable)

HISTORY AND PHYSICAL

CHIEF COMPLAINT
HISTORY OF PRESENT ILLNESS
PAST MEDICAL/SURGICAL HISTORY
PSYCHOSOCIAL INFORMATION
SOCIAL HISTORY (include smoking and alcohol history)
FAMILY HISTORY
REVIEW OF SYSTEMS
PHYSICAL EXAMINATION
ASSESSMENT AND PLAN

If you need **ASSISTANCE**
please call Transcription Services at **662-2891**
Health Information Management

Contrast Allergy - Pre-Medication

See order set in EPIC called “Rad IV Contrast Reaction Prevention”

Most previous contrast reactions from ionic contrast will not be seen with the switch to non-ionic contrast, which we have been using in this department now for several years. However, many times patients and physicians still prefer to pre-medicate patients. For patients with a previous history of contrast reaction, this is the policy that our department should follow.

Initiate discussion to determine if the study is actually needed, and if there is not some other way to obtain the same information such as Ultrasound, non-contrast CT or MR.

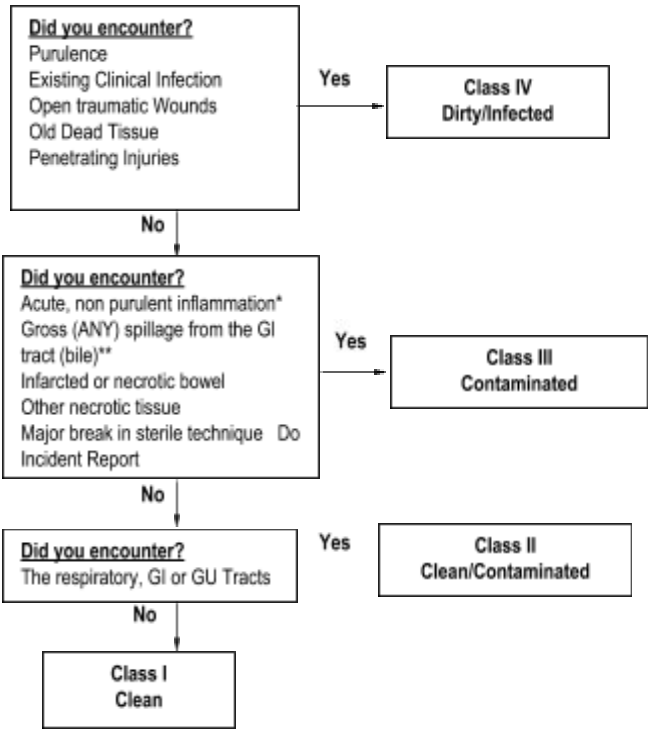
12 Hours Prior - Methylprednisolone 16 mg PO
2 Hours Prior - Methylprednisolone 16 mg PO
1 Hour Prior - Diphenhydramine 50mg PO **AND** Cimetidine 300mg PO

Pre-op Antibiotics

Can find this all under the EPIC order set called "Gen Surg Pre-Op Antibiotics"
Use higher dose it patient is >= 80kg. Alternative antibiotics are in order of best option first.

SURGERY	ANTIBIOTIC	ALTERNATE
Clean	None	None
Clean with increased risk of infection or contamination	Cefazolin 2-3g	Clindamycin 600-900mg **or** Vancomycin 1g
Breast/Hernia	Cefazolin 2-3g	Clindamycin 600-900mg **or** Vancomycin 1g
Hepatobil/Upper GI	Cefazolin 2-3g	Clindamycin 600-900 **PLUS** Aztreonam 1-2g **OR** Ciprofloxacin 400mg
Lower GI	*Cefotetan* 2-3g	Clindamycin 600-900 **PLUS** Aztreonam 1-2g **OR** Ciprofloxacin 400mg **Alternative if allergic:** Ciprofloxacin 400mg **PLUS** Metronidazole 500mg
VASCULAR **Non-MRSA**	Cefazolin 2-3g	Gentamicin 80-150mg **PLUS** Clindamycin 600-900 **OR** Vancomycin 1g
VASCULAR **Hx or suspect MRSA**	Cefazolin 1-2 g **PLUS** Vancomycin 1g	Vancomycin 1g **PLUS** Gentamicin 80-160mg

Wound Class



NOTES:

*Chronic inflammation only does not change the classification

**Gross spillage is any spillage you can see with the naked eye

Source: American College of Surgeons October 2010

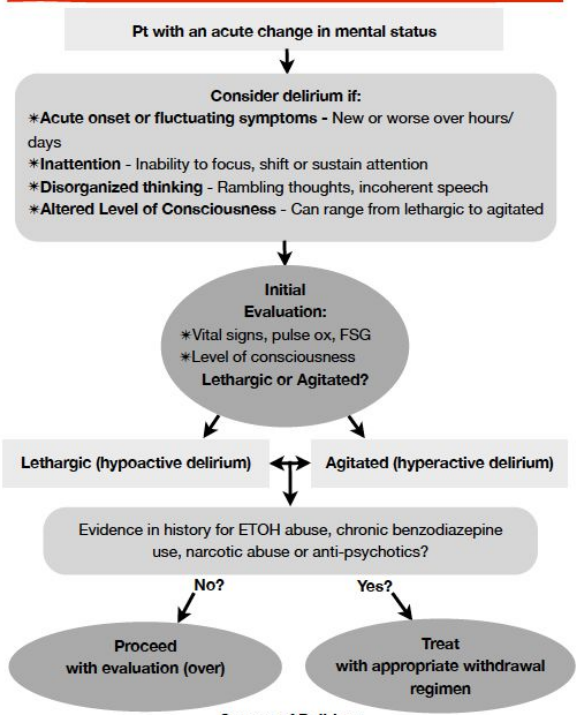
Steroids

Steroid Equivalent Chart

Steroid	Relative Potency	Dosage (mg)	t ½ (hrs)
Cortisone	0.75	25	8-12
Hydrocortisone	1	20	8-12
Prednisone	4	5	18-36
Methylprednisone	5	4	18-36
Triamcinolone	5	4	2-6
Dexamethasone	25-50	0.5	36-54

Vitamin A: Surgical patients receiving steroids should receive 50,000 units Vitamin A daily to assist with wound healing. Especially Crohn's patients.

Delirium Algorithm - pg. 1



Causes of Delirium

- ✳Drugs, polypharmacy
- ✳Infection, sepsis
- ✳ETOH/drug withdrawal
- ✳Organ failure (CHF, renal or liver)
- ✳Hypoxia, hypercarbia
- ✳Electrolyte abnormalities
- ✳Hypoglycemia
- ✳Pain
- ✳Urinary retention/fecal impaction
- ✳Iatrogenic including immobility, restraints, foley catheter, dehydration, malnutrition, sleep deprivation
- ✳Sensory deficits - vision or hearing
- ✳Hypo/hyperthermia

Evaluation:

- **Focused physical exam** - Vital signs, volume status, cardiopulmonary, skin/wound, abdomen, neurological
- **Review medications -** Pay particular attention to PRNs
- **Recent fall?** If so, consider head trauma
- **Urinary output, last bowel movement?**

↓

Consider ordering the following:

U/A, culture, CBC, BMP or CMP
EKG, CXR
Cardiac enzymes if appropriate
Toxicology screen if history of drug abuse
Head CT if neurological findings or recent fall
Drug levels if applicable (digoxin, lithium, phenobarb, phenytoin, etc.)

↓

- **Identify and treat underlying cause**
- **Supportive care** - Treat dehydration, fecal impaction, correct electrolyte imbalances or severe anemia, avoid restraints, consider foley removal (1 point restraint), encourage ambulation, provide visual and hearing aids, noise reduction, sleep hygiene, adequate nutrition, encourage family involvement
- **Prevent complications** - PT/OT, nutrition & psych/geri consults as needed

Pharmacologic therapy should used only when the patient poses a danger to self or others.

If pharmacologic therapy is needed, haloperidol is the agent of choice

- Check QTc interval on EKG (should be < 440 milliseconds)
- Start low and go slow. Begin with 0.25-1 mg PO/IV/IM. Wait 30 minutes for peak effect with IV/IM dosing or 4 hours with PO dose. If agitation persists, consider doubling dose.
- Avoid haloperidol in patients with Parkinson's disease
- Newer atypical antipsychotics may cause fewer EPSE, but studies are lacking
- Place dose restrictions and re-evaluate need frequently

ENTERAL PRODUCT FORMULARY

Nutrient Composition per 1000ml full strength

Product	Cal/ ml	Grams/% Protein	Protein Source	Grams/% CHO	Carbohydrate Source	Grams/% Fat	Fat Source	Non-Protein Calorie to N² Ratio	Ml H2O Per 1000 Cal	OSM	Ml to Meet RDA's Vitamins & Minerals
MONOMERIC											
Peptamen VHP	1	62.4/25	Hydrolyzed whey	104/42	Maltodextrin starch	39.2/33	70% MCT 30% Soybean Soy Lecithin	75:1	844	300	1500
L-Emental	1	38.2/15	Amino acids	205/82	Maltodextrin modified starch	2.7/2.5	Safflower oil	149:1	840	630	2000
POLYMERIC											
Osmolite 1 cal	1.06	44.3/16.7	Sodium and calcium caseinates, soy protein isolates	143.9/54.3	Hydrolyzed cornstarch	34.7/29	50% Safflower 30% Canola 20% MCT	125:1	794	300	1320
Jevity 1.2	1.2	55.5/18.5	Sodium and calcium caseinates	171.5/52.5	Corn syrup, maltodextrin, fructooligosaccharides, soy fiber, oat fiber, gum Arabic	39.3	48% Safflower 29% Canola 19% MCT Oil 4% Lecithin	110:1	674	450	1000
Promote	1	62.5/25	Sodium and calcium caseinates, soy protein isolates	130/52	Hydrolyzed cornstarch Sucrose	26/23	50% Safflower 30% Canola 20% MCT	75:1	840	330	1250
Ensure Plus	1.5	55/14.7	Sodium and calcium caseinates, soy protein isolates	200/53.3	Corn syrup Sucrose	53.2/32	Corn oil	146.1	512	690	1420
SPECIALTY FORMULAS											
Nepro	2.0	70/14	Calcium, magnesium and sodium caseinates	223/43	Hydrolyzed cornstarch Sucrose Fructooligosaccharides	95.6/43	90% Safflower 10% Soy	154:1	351	635	950 except phosphorus, magnesium Vit A and D
Two Cal HN	2.0	83.5/16.7	Sodium and calcium caseinates	219/43.2	Hydrolyzed cornstarch Sucrose	90.5/40.1	80% Corn 20% MCT	125:1	356	643	950
Crucial	1.5	94/25	85% peptides 15% amino acids	135/36	Hydrolyzed casein L-arginine	68/39	19% Soy Oil 25% Fish Oil 50% MCT 6% Soy Lecithin	67:1	768	490	1000
Nutri Hep	1.5	40/11	Amino acids, whey protein (50% BCAA)	290/77	Maltodextrins Modified cornstarch	21.2/12	40% Canola Oil/ Corn Oil Soy Lecithin 60% MCT	209:1	760	690	1000

1/05 avr 5-0017

ENTERAL PRODUCT FORMULARY

Nutrient Composition per 1000ml full strength

Product	Na mg/mEq	K mg/mEq	Ca mg/mEq	Magnesium mg/mEq	Phosphorus mg/mmol	Vit C mg	Vit A mg	Vit K mcg	Comments
MONOMERIC									
Peptamen VHP	560/24	1500/38.5	800/40	296/24	700/22.5	340	3332	80	Peptide based formula, minimal digestion required, lactose free. Supplemented with antioxidants.
L-Emental	460/20	783/20	500/25	200/16.5	500/16	60	2500	22.3	Predigested formula, amino acids, low fat, moderate protein content. Hypoallergenic.
POLYMERIC									
Osmolite 1 cal	930/40	1570/40	760/38	305/25	760/24.4	230	3790	61	Iso osmolar balanced nutrition for maintenance calorie and protein support. Low residue.
Jevity 1.2	1350/58	1890/47.2	1200/60	400/32.8	1200/38	300	5000	80	Fiber containing formula with increase protein content 22g fiber/L; 12g insoluble and insoluble fiber blend and 10g of FOS.)
Promote	930/40.3	1980/50.7	960/48	320/26	960/31	240	4000	64	High protein, nutritionally complete formula for patients with increased protein requirements.
Ensure Plus	1050/45.6	1940/49.7	705/35	282/23	705/22	212	3522	57	Moderately hyperosmotic formula for oral or tube feedings. Moderate caloric density.
SPECIALTY									
Nepro	845/36.7	1057/27	1373/68	211/17	686/22	105	1053	84	Calorically dense formula, moderate protein content for acute or chronic renal failure. (15.6g fiber/L)
Two Cal HN	1456/63	2456/96	1052/52	421/35	1052/34	316	5263	85	Calorically dense formula, with need of fluid restriction in the absence of renal dysfunction. (5g FOS/L)
Crucial	1168/50.7	1872/48	1000/50	400/49.5	1000/32	1000	6000	75	Immune enhancing formula for metabolically stressed or septic patients. 15g arginine and 7.2 glutamine per liter.
Nutri Hep	320/10	1320/33.8	1000/50	400/49.5	1000/32	96	5000	120	Branched chain amino acid formula for hepatic insufficiency or hepatic encephalopathy.

Modular Products	Unit of Measure	Caloric Density	Grams & % Protein	Grams & % Carbohydrate	Grams & % Fat	Fiber mg/mEq	NA mg/mEq	K mg/mEq	Ca mg/mmol	Phosphorus
PROTEIN										
Promod	1 Tbsp or 4 gm	4 per gram	3/77	0.4/5.2	0.36/17		9.09/0.39	39.9/1.0	24.2/1.2	18/0.58
CARBOHYDRATE										
Polycose Liquid	1 Tbsp or 15 ml	2 per ml		7.5/100			10.5/0.45	0.9/0.2	3/0.15	0.45/0.14
Polycose Powder	1 Tbsp or 6 gm	3.8 per gram		6/100			6.6/0.29	0.6/0.015	1.8/0.09	0.3/0.0097
FAT										
MCT Oil	1 Tbsp or 15ml	7.7 per ml			14/100					
Fiber Pectin	1 Tbsp or 4 gm	0.14 per gram				0.4 Tbsp				
Salt	1 tsp or 6 gm						2000/87			

TOTAL PARENTERAL NUTRITION

Get a nutrition consult; they are invaluable in helping you!

Weight for calculations

- Use actual weight if BMI < 25
- Use Desirable Body Weight (DBW) if BMI > 25
- To calculate DBW: 24 * (height in meters) ^2 = weigh t in kg

Calorie needs

- Non-critically ill: 20-30 kcal/kg per day
- Or start with ~1500-1800 kcal per day

Labs

- Order TPN panels daily x 3 days post TPN initiation
- Watch for refeeding syndrome (low phos is a clue!)
- All TPN patients need bedside glucose q 6hrs until stable

Dextrose

- Diabetic or high glucose: start with 150-200 gm dextrose
  - If on insulin prior to TPN or hyperglycemic (>180) may need to add regular insulin to TPN
  - Start with: 0.05 units Regular insulin per gm dextrose/bag (Do not exceed 0.3 units per gm Dextrose/bag)
  - Refer to ICOS TPN algorithm → SCM Clinical Decision Support Tools under Diabetes Mellitus: Adult.
- Non-diabetic and normal glucose: ~ 50% of total kcal (max 5 mg/kg/min)
  - Start with 2-4 mg/kg/min (should not exceed 5 mg/kg/min)
  - 3.4 kcal/gm

Amino Acids

- Protein source = FreAmine which contains phos (may change to Aminosyn Summer 2011)
- Start 1 – 1.2 gm/kg (DBW if needed)

Lipids

- Keep < 30% of total kcal but need at least 2-4% total kcal from lipids
- Max 1gm/kg/day
- Propofol has high lipid content (1.1 kcal/ml), adjust TPN accordingly

Volume

- Dextrose = 1.43 ml/gm
- FreAmine/TrophAmine = 10 ml/gm (Aminosyn = 7 ml/gm)
- Lipid = 5 ml/gm
- Additives = 100 ml
- Divide by 24 to get hourly rate (round up)

If patient at risk for re-feeding syndrome: 100-150 gm/bag
Add 100 mg Thiamine/bag

Work Sheet

Total kcal = weight (or DBW) * 20-30 kcal/kg per day

Dextrose = .5 * total kcal ÷ 3.4 kcal/gm = _____ gm dextrose

- Check that it's not > 5mg/kg/min

Amino Acids = weight (or DBW) * 1-1.2 gm/kg = _____ gm amino acids

Lipids = .3 * total kcal ÷ 10 kcal/gm = _____ gm lipids

- Check that it's not > 1 gm/kg/day

Volume

____ gm dextrose * 1.43 ml/gm = _____ ml
____ gm amino acids * 10 ml/gm = + _____ ml
____ gm lipids * 5 ml/gm = + _____ ml
+ 100 ml additives
_____ ml / 24 hours

**Adult TPNs will be delivered to the floor by 18:00 daily. To prevent waste and allow for timely delivery, orders should be placed by 13:00

Step 1: Calculate calories (kcal/kg/d)

Neonatal

Maintain Wt: 50-60

Gain Wt: *Term*: 100-120 (Wt. gain 15-30 gm/d)

Preterm: 110-140 (Wt. gain 15 gm/d)

1-3 yrs: 85-95

4-6 yrs: 75-80

7-10 yrs: 60-65

12-18 yrs: 60-75

Children

Males 11-14 yrs: 45-50

15-18 yrs: 35-40

Females 11-14 yrs: 40-45

15-18 yrs: 30-35

Adults

Harris-Benedict Equation (BEE):

Females: 655.1 + [(9.56 x W) + (1.85 x H) - (4.68 x A)]

Males: 66.47 + [(13.75 x W) + (5 x H) - (6.76 x A)]

W = weight in kg; H = height in cm; A = age in years

Then multiply BEE x (activity factor) x (stress factor)

Activity Factor Normal = 1.2

Stress factor = 1.5 for trauma, stressed, or surgical patients and underweight (to promote weight gain)

Severe burn patients = 2.0

Stress level:

Normal/mild stress level: 20-25 kcal/kg/day

Moderate stress level: 25-30 kcal/kg/day

Step 2: Calculate amino acids (4kcal/gm)

(Cal Needs / 150) * 6.25 = grams protein

1. Energy to nitrogen ratio should be 150:1 in most cases.

2. *Ex. If you calculate someone's caloric need to be 1600 then 1600/150 = 10.6gm N. So grams of protein should be 10.6gm N * 6.25 gm protein/gm N = 67gm protein*

Step 3: Calculate dextrose calories (3.4 kcal/gm)

Usually 50-60% of total calories

Adults Usually 5gm/kg/day (usually ~250-300 gm/day)

Peds

Gm Dex/day = Weight*GIR

GIR = mg/kg/min * [(60min*24hrs)/1000] = x * 1.44

Suggested GIR that will generally meet caloric needs

Preterm/infant	10-12 mg/kg/min
1-9 yr	7-10
10-16 yr	5-7
>16 yr	~5

Step 4: Calculate lipids (10kcal/gm)

Lipid = [Total Cals – (4 * prot + 3.4 * gluc)] / 10

Calculate total calories from protein and dextrose, then subtract from total calories needed. This remainder is calories from lipids

Liposyn 20% = volume x (2kcal/mL) = kcal, 5mL = 10 kcal = 1gm lipids

Should be at ~1-2gm/kg/day, maximum dose if 3mg/kg/day or 50% total calories

Finally - order TPN panels for the first 3 days and adjust TPN accordingly

Calorie Densities (cal/ml)

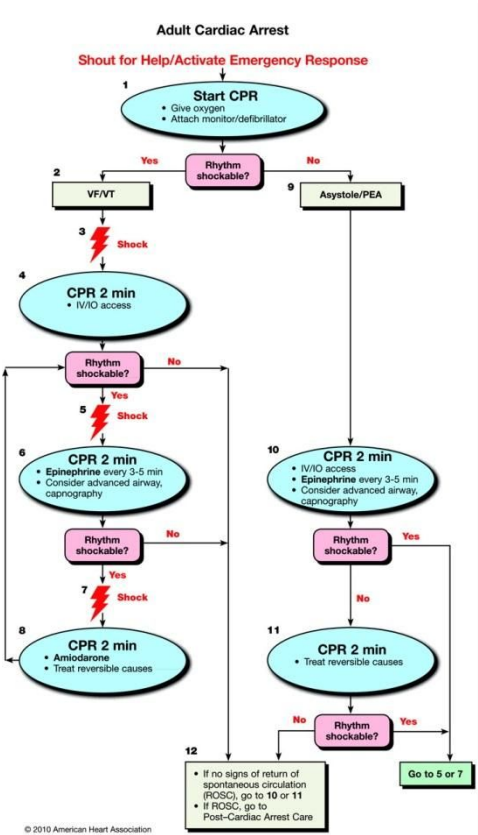
20 cal/oz =	0.67
24 cal/oz =	0.80
27 cal/oz =	0.90
28 cal/oz =	0.93
Pedialyte =	0.1

Breastmilk		
BM	20 cal	0.66
½ FBM	22 cal	0.73
FBM	24 cal	0.8

Pediatric Nutrition Notes

- In NICU
  - Lipids are ordered separately
  - < 6 month old child gets Trophamine for AA's and needs supplement of cysteine (40mg cysteine/gram of Trophamine)
  - Infants < 3kg should have additional 200mcg/kg/day zinc
  - Consider Carnatine 8-10mg/kg/day if on TPN > 2-4 weeks
- Short Gut – Limit lipids to 1g/kg
- Multivitamin additives
  - < 1kg = 1.5ml
  - 1-3kg = 3.25ml
  - 3.1-40kg = 5ml

Code Algorithms



CPR Quality
- Push hard (≥2 inches [5 cm]) and fast (≥100/min) and allow complete chest recoil
- Minimize interruptions in compressions
- Avoid excessive ventilation
- Rotate compressor every 2 minutes
- If no advanced airway, 30:2 compression-ventilation ratio
- Quantitative waveform capnography
  - If P_{ETCO_2} <10 mm Hg, attempt to improve CPR quality
- Intra-arterial pressure
  - If relaxation phase (diastolic) pressure <20 mm Hg, attempt to improve CPR quality

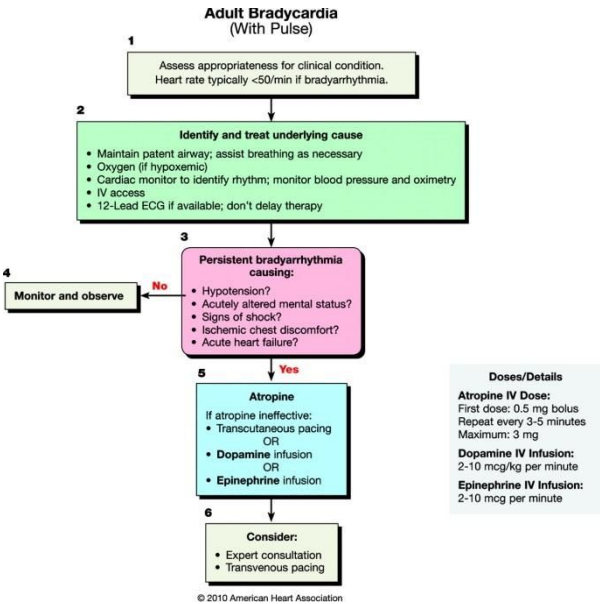
Return of Spontaneous Circulation (ROSC)
- Pulse and blood pressure
- Abrupt sustained increase in P_{ETCO_2} (typically ≥40 mm Hg)
- Spontaneous arterial pressure waves with intra-arterial monitoring

Shock Energy
- **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

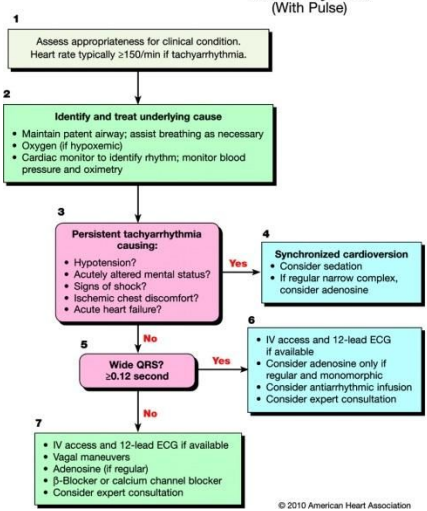
Drug Therapy
- **Epinephrine IV/IO Dose:** 1 mg every 3-5 minutes
- **Vasopressin IV/IO Dose:** 40 units can replace first or second dose of epinephrine
- **Amiodarone IV/IO Dose:** First dose: 300 mg bolus. Second dose: 150 mg.

Advanced Airway
- Supraglottic advanced airway or endotracheal intubation
- Waveform capnography to confirm and monitor ET tube placement
- 8-10 breaths per minute with continuous chest compressions

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


Adult Bradycardia
(With Pulse)
1
Assess appropriateness for clinical condition.
Heart rate typically <50/min if bradyarrhythmia.
2
Identify and treat underlying cause
• Maintain patent airway; assist breathing as necessary
• Oxygen (if hypoxemic)
• Cardiac monitor to identify rhythm; monitor blood pressure and oximetry
• IV access
• 12-Lead ECG if available; don't delay therapy
3
Persistent bradyarrhythmia causing:
• Hypotension?
• Acutely altered mental status?
• Signs of shock?
• Ischemic chest discomfort?
• Acute heart failure?
No
4
Monitor and observe
Yes
5
Atropine
If atropine ineffective:
• Transcutaneous pacing
OR
• Dopamine infusion
OR
• Epinephrine infusion
6
Consider:
• Expert consultation
• Transvenous pacing
Doses/Details
Atropine IV Dose:
First dose: 0.5 mg bolus
Repeat every 3-5 minutes
Maximum: 3 mg
Dopamine IV Infusion:
2-10 mcg/kg per minute
Epinephrine IV Infusion:
2-10 mcg per minute
© 2010 American Heart Association

Adult Tachycardia
(With Pulse)



Doses/Details

Synchronized Cardioversion
Initial recommended doses:
- Narrow regular: 50-100 J
- Narrow irregular: 120-200 J biphasic or 200 J monophasic
- Wide regular: 100 J
- Wide irregular: defibrillation dose (NOT synchronized)

Adenosine IV Dose:
First dose: 6 mg rapid IV push; follow with NS flush.
Second dose: 12 mg if required.

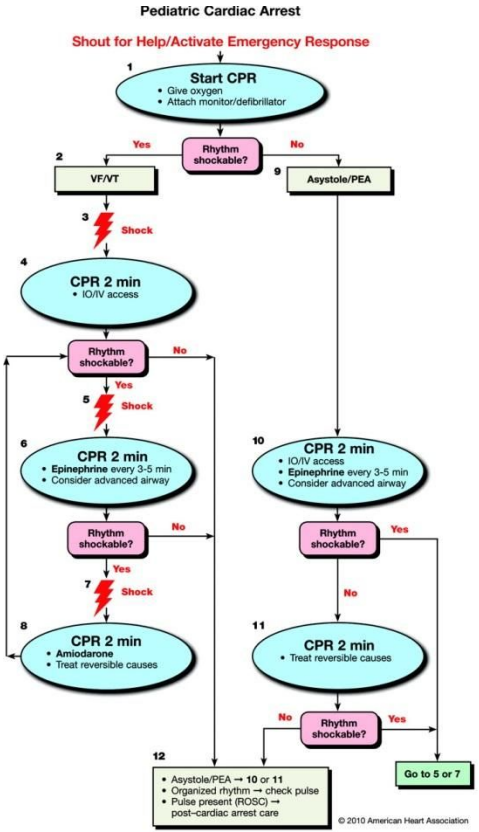
Antiarrhythmic Infusions for Stable Wide-QRS Tachycardia

Procainamide IV Dose:
20-50 mg/min until arrhythmia suppressed, hypotension ensues, QRS duration increases >50%, or maximum dose 17 mg/kg given. Maintenance infusion: 1-4 mg/min. Avoid if prolonged QT or CHF.

Amiodarone IV Dose:
First dose: 150 mg over 10 minutes. Repeat as needed if VT recurs. Follow by maintenance infusion of 1 mg/min for first 6 hours.

Sotalol IV Dose:
100 mg (1.5 mg/kg) over 5 minutes. Avoid if prolonged QT.

PALS – Pediatric Cardiac Arrest



Doses/Details

CPR Quality
- Push hard (≥⅓ of anterior-posterior diameter of chest) and fast (at least 100/min) and allow complete chest recoil
- Minimize interruptions in compressions
- Avoid excessive ventilation
- Rotate compressor every 2 minutes
- If no advanced airway, 15:2 compression-ventilation ratio. If advanced airway, 8-10 breaths per minute with continuous chest compressions

Shock Energy for Defibrillation
First shock 2 J/kg, second shock 4 J/kg, subsequent shocks ≥4 J/kg, maximum 10 J/kg or adult dose.

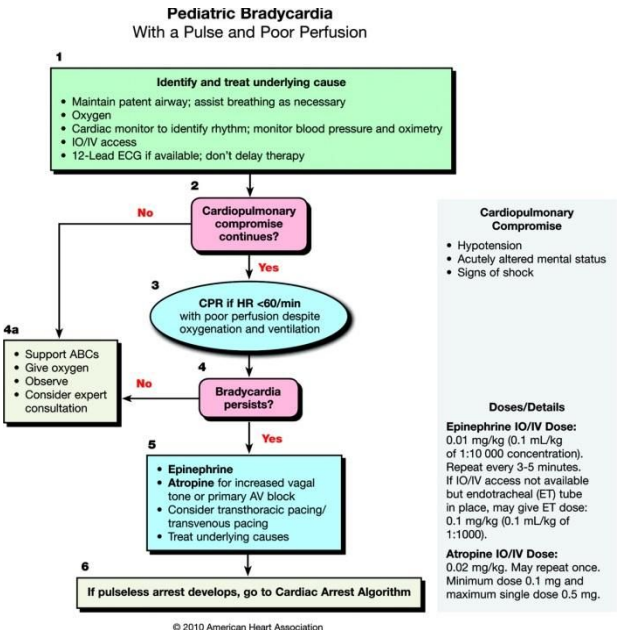
Drug Therapy
- **Epinephrine IO/IV Dose:** 0.01 mg/kg (0.1 mL/kg of 1:10 000 concentration). Repeat every 3-5 minutes. If no IO/IV access, may give endotracheal dose: 0.1 mg/kg (0.1 mL/kg of 1:1000 concentration).
- **Amiodarone IO/IV Dose:** 5 mg/kg bolus during cardiac arrest. May repeat up to 2 times for refractory VF/pulseless VT.

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 6-8 seconds (8-10 breaths per minute)

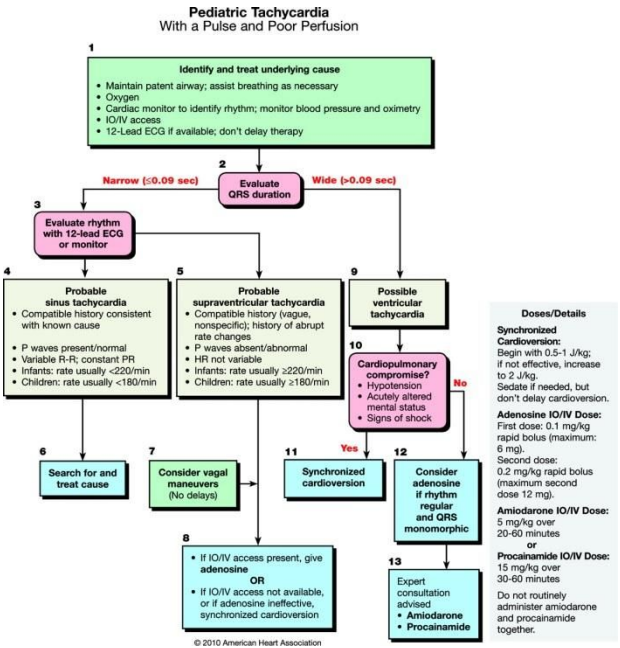
Return of Spontaneous Circulation (ROSC)
- Pulse and blood pressure
- Spontaneous arterial pressure waves with intra-arterial monitoring

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

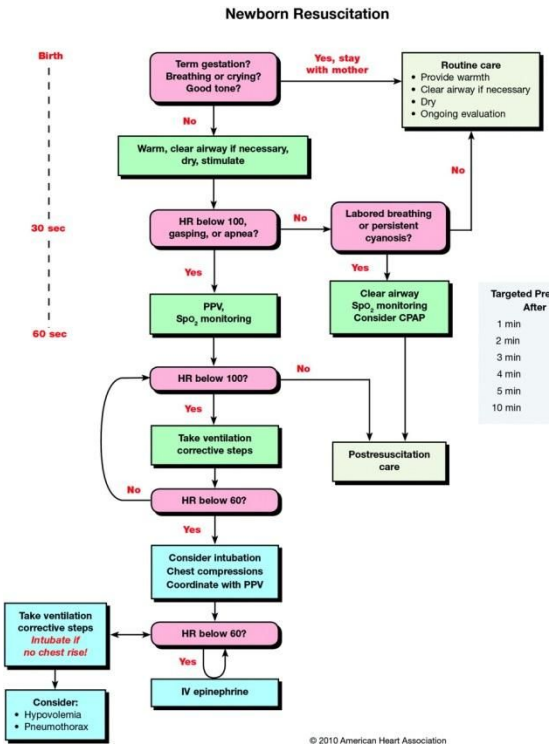
PALS – Pediatric Bradycardia



PALS – Pediatric Tachycardia



PALS – Newborn Resuscitation



NOTES

Intern Check lists:

Pre-op check-list for outpatients:

- IPHR/introduce yourself to patient (note type IPHR will pull in the template, outpatient H&P should be found under chart review -> notes or under media tab)
- Check consent is in the chart
- Check correct side is marked (mark if not yet done)
- Look over med rec - any ambiguous meds clarify with patient why they are taking them, and if on blood thinners when last taken.
- Ask if prior issues with pain meds (don't prescribe something that makes them sick)
- Start d/c summary if will be staying longer than overnight

Pre-op check-list for inpatients:

- Verify NPO status
- Check consent is in the chart
- Check correct side is marked
- Any necessary imaging/labs (type and screen/cross, etc)

Post-op check-list:

- Update sticky note for team communication (date, procedure, indication, post-op needs)
- Update patient surgical history (History tab, include indication and surgeon)
- Brief-op note
- Orders (Including post-op ADT tab so PACU orders are discontinued when patient gets to floor)
- Discharge instructions and med rec (including scripts) if expect leaving <24H
- SIMPL (OR feedback app)
- ACGME Log Case or keep sticker (Need to know date, attending, case)

How to forward/unforward pagers

- Dial the pager number (9 for outside line, then pager #)
- Dial 0 after the beep
- When prompted, enter the last 4 digits of the pager number as the "access code"
- Dial 16
- It will say "You are in page forwarding mode." Follow the prompts to forward or unforward pager
    - 6, then forward-to number, then # will forward the pager
    - 3 will unforward
    - PAGERS WILL STAY FORWARDED UNTIL UNFORWARDED so don't forget to change appropriately at shift handoff

Paging

- surg.me/page
- surg.me/att for attending paging
- Dial 9 for outside line, then pager number
- enter a call-back number (can omit 662- if within hospital). Tag page with *your own pager number (or name if text paging) - ALWAYS enter a call back number
- Return all pages ASAP, and within no more than 10 minutes if occupied when the page first comes in

Rounds

- Time and starting location given by chief – need to be early enough to get sign out and grab COW and make sure it is stocked with dressing supplies etc

The night intern must be done signing out and leaving by 05:30

Last person should be starting sign out no later than 5:15-5:20

- Write progress notes on rounds vs. take notes for writing progress notes later

- Usually goes best if one person at a time talks to patient. But do expedite by having dressing take-down/re-dressing supplies handy, giving them to person examining pt, etc
- Orders on rounds if possible or take notes for later

Daily

(Separate clinical from administrative)

- Rounds as team
- Progress notes, AM orders/changes to plan,
- Call consults early in the day
- Check in with care managers to coordinate discharge for patients leaving that day, or expected to go in next few days with complex needs (visiting nurse, home vac, home IV antibiotics, etc)
- Discharge patient's leaving that day
- Once these AM tasks are done, rest of day should include
    - Answering pager, see floor patients as needed
    - Update discharge summaries
    - See consults when called (initially with other team members, later semi-independently)
    - Go to OR for assigned cases (give pager to APP or co-resident when in OR)
    - Ordering labs for next day on pts that need them (this is the intern's responsibility primarily, coordinate with other team members to make sure it is done)
    - Verify diets (NPO for pts going to OR next day, etc)
    - Prep for next day's cases
    - Check in frequently, communicate often! If you haven't seen your chief all day that's a problem even if everything is going fine. Go down to OR and update your chief at least twice daily if you do not see them elsewhere.

- Maintain communication with APPs and rest of team (usually you will want to run issues by a senior before involving an attending, unless there is an emergency)
- Check email

Weekly

- ALL discharge summaries and ADT/discharge orders prepped. Daily updates are good, but these things must be absolutely tucked in by the end of the day on Friday. The responsibility for discharge summaries and discharge prep rests with the intern; APPs and other team members will help as needed - the intern should coordinate this.
- Check epic in basket - cosign orders, respond to queries as needed
- Log hours on new innovations (30 min increments are plenty)
- Prepare for conferences (will be in Dept email and on surg.me calendar)

Monthly

- Log cases (Usually at the end of a rotation -- but sooner is better!)
- Meet with advisor and/or research mentor -- reach out to set this up
- Complete evaluations on New-innovations
- Log scholarly activities on New-innovations or AQSAD (M&M's, conferences presented, research, etc – probably wont have much of this until end of 1st year)

Resources

- surg.me

Contains OR schedules (chiefs will assign cases weekly), department calendar, text paging interface, and some curriculum/rotation-specific info

The google doc OR schedules also have rotation-specific info on the sheets after the schedule sheet.

PHONE BOOK
House Staff and APP Pagers

PGY5

Adam Ackerman	767-6665
Judyta Lipinska	767-6883
Michael Neilson	767-6886
David Skavdahl	767-6737
Jamie Tung	767-6854
Justin Wilkes	741-3631

PGY4

Kevin Baier	767-6666
Sarah Cairo	767-6671
Alex Dowli	767-6673
Vincent Noori	767-6664
Catherine Raymer	767-6903

PGY3

Isabel Castro	767-6672
Leia Edenfield	767-1503

Blue Surgery

See surg.me/amion

Orange Surgery

Brian Cole	741-6145
Lynn Huck	741-8092
Kristen Martin	741-7642

Yellow Surgery

Judith Kerr	741-1251

Green Surgery

Chris Owens	741-6147
Angela Reed	741-7943
Jamie Thompson	741-7400
Amy Taisey	741-1949
Joseph Mack	767-6667
Scha'Chia Murphy	767-6668
Alison Pletch	767-6669

PGY2

Nikki Heidt	767-6901
Jennifer MacDowell	767-8709
Truc Ta	767-8312
Jack Vernamonti	741-3626
Gary Zhang	767-6929

PGY1

Christopher Demme	767-6927
Astrid Gleaton	767-6663
Adria Johnson	767-6605
Sylven Krause	741-1785
Josh Linscott	767-6657
Laura Nicolais	767-6703
Obieze Nwanna-Nzewunwa	767-6889

Laura LeBourdais

Purple Surgery

Valerie Fuller	741-9200
Julie Kenney	741-7351
Jenn Arich	741-8840

Pedi Surg

Emily Lagana	741-8407
Jeannie Ross	741-8093

Transplant

Deb Hoch	767-8411

APP Manager

Julie Ontengco	741-7337

Attendings' Pager Numbers

c = cell phone, o = onpage
Attendings with text pagers can be found on surg.us/att

Blazick, Beth	741-8182	MacGillivray, Dougald	741-7628
Bloch, Paul	741-1428	Macleod, Cathel	741-7365 o
Brady, Thomas	741-8029	Mallory, Baird	310-1255
Buchanan, Scott	741-3450	Mayo, Sara	741-8025
Carter, Damien	741-6475	Neilson, Ian	807 8175 c
Cheung, Nora	741-8287	Nolan, Brian	741-1390
Chung, Bruce	741-1515	Palma, Juan	741-7755
Ciraulo, David	741-6192	Pandya, Kartik	741-1243
	653-5531 c	Quinn, Reed	741-3451
Cobean, Roy	741-8026	Radke, Fred	741-6091
Cushing, Brad	741-8416	Rappold, Joseph	741-6256
Dreifus, Jon	741-8721	Roberts, Parker	838-0182 c
Eddy, Virginia	741-8415	Sahagian, Kirk	(931)933-1576 c
Fitzgerald, Tim	741-1357	Sawhney, Jaswin	741-6259
Halter, Jeffery	741-6180	Teller, Paige	741-1449
Hallagan, Lee	741-8101	Turner, Christopher	741-1610
Hawkins, Robert	741-6098	Turner, Elizabeth	741-1589
Healey, Christopher	741-7629	Whiting, James	741-3394
Hochheiser, Gary	741-1853	Wu, Leslie	741-7343
Jorgensen, Jens	741-6089		

Service Pagers

741-0363	Trauma
741-0365	Surg Onc
741-0124	Thoracic
741-6241	Breast/Soft Tissue
741-0119	Transplant
741-8664	ACS/EGS
741-6244	Gen Surg Elective
741-0362	Bar/MIS
741-6248	Colorectal

741-6239	Peds
741-0364	Vascular – Purple
741-3627	Vascular – Red

Office Numbers

Casco Bay Surgery	761-6642
Maine Med Partners	774-2381
Breast Center	885-7760
ME Pedi Surg Assoc	662-5555
ME Surg Care Group	774-6368
Plastic and Hand	775-3446
Orthopedic Associates	828-2100
Maine Neurosurgery	885-0011

Forwarding /Unforward Pagers :

1. Dial pager you want forwarded.
2. Hit "0" - enter last 4 digits of pager you want to forward
3. Enter "16" - initiates page forwarding mode
4. Enter "3" to UN-forward pager OR Enter "6" to forward pagers.
5. Enter the 7 digit pager number and "#" to forward
6. Re-enter the 7 digit pager number and "#" to forward.

OnPage instructions:

Option 1 – Email ###@onpage.com

Option 2 – http://surg.us/att – Attending paging website

Option 3 – Call 855-266-7243 and follow directions

Radiology

Angio/IR	2326	IR Consult pager	767-6768
CT Scan	6972	FUSION listen line	5262
ECHO Reading room	4637	MRI	3252
ECHO listen line	7990+20+3	MRI Control	4028
ER Reading Room	0662	Peds Rads Reading	2144
Fluoroscopy	4808	Nuclear Medicine	4311
FUSION listen line	5262	Ultrasound	3686
IR	2326		

Floor Phone Numbers

R9	2191	R3 Fax	4140
CICU	2236	R3COR	5974 or 5972
R7	2708	R2	0777
R6	2322	R1	2686
Fax	4967	R1 IMC	3879
R608	3298	SCU 1 (CTICU)	2168
Barbara Bush	2541	SCU 2 (Peds)	2273
Fax	3172	SCU 3	2342
Gibson Sec 1	2586	SCU 3 Fax	6324
Fax	6305	SCU 4	6223
Gibson Sec 2	2127	SCU 4 Fax	3659
Gibson Sec 3	2568	ASU	2881
R5	2217	PACU	2292
Fax	6399	ER (for us)	0520
R4	2564	(for pts)	2381
R4AVU	5976	Fax	0571
Short Stay	3320	ED Critical Care	050*
R3	2456	(1-6)	

Common Phone Numbers

Operator	**0111**
Admitting	2116
Blood Bank	2121
Chief's office	6138
CSD	2540
eICU	3399
ER	0520/0521
ER Senior Resident	3988
ERCP	4703
Consult	767-8307
Endoscopy	3636
Lab/Micro	2711
Learning Center	2488
Library	2202
R3 Provider Room	3930
R5 APP Office	5488 or 5490
OneCall	6632
OR Main Desk	2241
OR Booking	2665
OR (OR Rooms)	**661-49xx**
SSC OR's	396-71xx

Storeroom	2220
Pathology	2843
Pharmacy	2151
Richards Radiology	2611
Rad. Reading room	4517
Nuc Med Reading	4309
Film Room	6368
Help Desk (IT issues)	6400
REMIS (consults)	2950
SCU Coordinator	0683
Phone	0595
Surgery Office Admin	2934
Surgery Residency Program Manager	2515
Vascular Residency Program Manager	6901
Fax	6389
Transcription	2891

EVS 2271
NICU 0296
Burn Room 0922

Other Pagers / Consults

Anesthesia Floorwalker	4800-0610
APMS	4800-0656
Hemo	4800-0632
PICC	4800-0799
Psychiatry	4800-0234
GYN	4800-2062
Hepatibiliary	4800-0706
Medicine Consult	741-3075
Neurology	883-1414
Neurosurgery PA	741-3090

Door Codes

R2 Supply	0741
R3 Supply	2456
Gibson Supply (all)	2487
R5 Supply	4148
R6 Supply	2122
REMIS	0911
SCU 4 Supply	2176*
SCU Copy Room	2179
Provider work room (All)	1218