EMERGENCY MEDICINE

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REFERENCES & HELPFUL RESOURCES
1. https://depts.washington.edu/emed/wordpress/ (check out procedure videos)

WARD TIPS
1. With every patient, ask yourself “Is this patient sick or not sick?” “While in the ED, does this patient need to be in a monitored bed?” and “Do they need to be admitted?” (Consider social support situation and ability to care for self outside)
2. Think ahead, get labs and imaging early, call consults early with appropriate diagnostics completed and results in front of you.
3. D/C Home if:
   - ED care is completed
   - Patient has normal vital signs
   - Patient is awake, alert, and in stable condition
   - Patient is ambulatory or at baseline
   - Patient has received appropriate care, discharge instructions, follow-up

NOTES
• Strive to be legible and succinct
• Record patient Time in / time out of ED
• Address CC as documented on chart by nursing staff (this may be different than CC given to you by patient)
• Recheck vital signs if abnormal on first check
• Abbreviations
  - STHB: said to have been
  - STHB: said to have
  - HOD: heroin overdose
  - MVC: motor vehicle collision
  - CBIB: courteously brought in by
  - CTLS: cervical, thoracic, lumbar spine
  - LOC: loss of consciousness
  - AOB: alcohol on breath
  - BAL: blood alcohol level
  - GCS: Glasgow coma scale
  - PTA: prior to arrival
• Things to include in HPI (some info may be gathered from paramedic notes):
  - ______ y.o. male/female referred by Dr.______ from ______ hospital (or CBIB medics from _____)
  - STH/STHB_______+ / - LOC
  - VS and GCS at scene, interventions prior to arrival (CPR, meds, fluids)
  - complaints on arrival
  - document dominant hand and occupation for any UE injury
• Physical Exam (examples of items to include, as appropriate)
  - Gen: AO x 3, NAD, interacts appropriately
  - HEENT: NC/AT, PERRL, EOMI, TM's clear, oropharynx wnl
  - CTLS: Ø tenderness, Ø stepoff, Ø contusions/abrasions/lacs
  - Neck: C-collar in place, supple, Ø STS (soft tissue swelling), Ø ecchy, Ø abrasion, nl range of motion
  - Lungs: CTA bilaterally, symmetric chest excursions, no crepitus
Cardiac: RRR, no murmur/gallop/rub
Abd: soft, NT/ND
Pelvis: NT, stable to AP and lateral compression
Rectal: nl prostate and tone, Ø gross blood, guaiac + or -
Ext: AT, pulses, Ø STS, Ø ecchy, Ø contusion/abrasions/lacs
Neuro: MS, CN II-XII intact, sensory intact, DTRs, gait/cerebellum, GCS (3-15)
Motor: D B T WE WF Q H DF PF
R 5 ---------------------------------------------------------------
L 5 ---------------------------------------------------------------

• Imaging/EKG: studies obtained in ED, compared to prior if available
• Labs: labs obtained in ED (often draw a “rainbow.” Order usually: red, green, blue, lavender, but in trauma get lavender and blue first—Hct and coags are priority!)
  RED = chemistries (M7, LFTs), amylase, lipase, EtOH, hCG, hep serologies, drug levels, thyroid, ANA, PSA, RPR, methemoglobin, CPK isoenzymes
  LAV = CBC, platelets, ESR
  BLUE = coags, PT, PTT, INR
  GREEN = ammonia, thiamine, chest pain panel
  PEARL = BNP

• ER Course: Describe events and time course while in ED. This is hard to remember, but very important when someone asks you why your patient was in the ED for 5 hours
  1400 Pt. Seen by med student / M.D.
  1430 Pt. In CT
  1500 CT read by radiology
  1530 D/C to home

• Assessment / Plan, Dispo, Safety
  Pt. D/C to home with instructions for wound care, meds, follow-up in _____ clinic, and instructions for when to return to ED/UCC.

SELECTED TOPICS IN EMERGENCY MEDICINE
(From Surgery 684 Student Manual, 2000, Baernstein and Sparks)

Trauma Primary survey = ABCDE
Fix deficits before moving to next step. If pt status changes, go back to A, then BCD...

Airway (If pt can talk, airway is OK)
(& C-spine) Otherwise start with chin lift/jaw thrust, then oropharyngeal/nasopharyngeal airways, then intubation, with cricothyroidotomy the last resort.
All trauma patients need c-spine immobilization.

Breathing Inspect (movement, rate, tracheal shift, JVD, accessory, chest wounds)
Auscultate (upper/lower airway (stridor, wheeze, gurgle)
Percuss (hyper-resonant or dull to percussion)
Palpate (crepitance, rib fx, flail chest)
During this stage place chest tubes, flutter valves if tension PTX, 3 sided occlusive dressings if open chest wound. May also need to intubate here if work of breathing is increased
If intubated, check for CO2 return and bilateral breath sounds!
Circulation: Assess perfusion AND bleeding
BP estimation by pulse site (pulse present = BP > than number)
   Radial = 90mmHg pressure  Femoral = 70
   Brachial = 80  Carotid = 60
Assess UOP, mental status, cap refill, skin
Important -- BP is not a reliable indicator of volume
Address massive bleeding at this time
   The treatment for hypovolemic shock is volume.  Put direct
   pressure on bleeding wounds; if bleeding severe and ongoing, pt
   may need emergent surgery.

Disability  Glasgow Coma Scale  Coma = score < 8
Eye  4 pts if opens spontaneously  Verbal  5 if appropriate answers
   3 if opens to command  4 if confused
   2 if opens to pain  3 if inappropriate words
   1 if does not open  2 if incomprehensible
   1 if no verbalization
Motor  6 if obeys commands
   5 if localizes painful stimulus  If intubated, omit verbal
   4 if withdraws from pain  portion
   3 if decorticate posturing  Highest score is then 10T
   2 if decerebrate posturing
   1 if no movement

NB: A dead patient has a GCS = 3

Exposure – remove pt’s clothing and examine (then cover to prevent hypothermia)

6 life-threatening conditions to be diagnosed during primary survey
   •  Airway obstruction (Tx=intubate, or surgical airway)
   •  Tension pneumothorax (Tx= fluttervalve or chest tube)
   •  Open pneumothorax (sucking chest wound) (Tx= 3 sided dressing + chest tube)
   •  Flail chest (more than 3 continuous ribs fractured in 2 locations). Tx= intubate
   •  Cardiac tamponade (Beck’s triad = muffled heart sounds, high neck veins, and
     hypotension) Tx= pericardiocentesis
   •  Hemothorax (decreased breath sounds dull to percussion). Tx = Chest tube

Secondary survey  is a physical exam from head to toes looking for other traumatic injuries
   (fxs, puncture wounds, dislocations, amputations, etc)
   •  Consider NGT to decompress GI tract or w/suspected OD, etc
   •  Foley cath unless blood at perineum/urethral meatus or “high-riding” prostate

Imaging = Trauma Series
   1.  Lateral C-spine (look at airway and for obvious c-spine fx / alignment)
   2.  AP chest (to diagnose pneumothorax, hemothorax, check ET tube placement,
       widened mediastinum as evidence for aortic dissection, etc)
   3.  AP pelvis (for fractures)
General trauma info:
1. All trauma patients get monitors (cardiac, BP, O2 sat at least), 2 or more IVs (16-18 gauge or larger), supp O2, foley after rectal exam
2. Labs: “Trauma Panel” = CBC, chem 7, Coags, Type and Cross, amylase, ABG, ETOH level, U dip and Utox, (hCG for women of child-bearing age)
3. Fluid: 3:1 rule. 3cc crystalloid for 1 cc blood. Basically bolus adults w/ 2 liters of LR, may repeat times one, if still unstable move on to blood transfusion. (Unless obviously needs blood right away). Don’t let fluid replacement delay OR.
4. Be available when trauma patients arrive; the trauma doc at Harborview will give you a task. Don’t take it personally if you are elbowed out of the way because you are taking too long to put in the foley or fem stick. It needs to be done quickly.
5. Trauma “codes” at Harborview:
   - Green= trauma doc only needs to see
   - Yellow= third year surgical resident must see and work-up patient
   - Red= “trauma code” very unstable and requires the attending or trauma fellow and chief resident to be present upon arrival to ER.

Potential spaces for life threatening internal hemorrhage
1. chest 2. pelvis 3. abdomen 4. femur 5. scalp

Shock
Five types: All result in decreased blood pressure, hypoperfusion, and eventually multiple organ system failure and death if patient not resuscitated.
1. Hypovolemic – not enough blood volume to perfuse
2. Cardiogenic – heart not pumping well enough to push adequate volume to perfuse
3. Septic – cardiac output increased, but vasculature so dilated due to inflammatory reaction that insufficient pressure to perfuse (functional hypovolemia)
4. Neurogenic – dilated vasc due to spinal cord injury (loss of sympathetic tone)
5. Anaphylactic – similar to septic

Hypovolemia
Physiologic response to hypovolemia:
- Early = tachycardia, decreased urine output, narrowed pulse pressure
- Late = hypotension
- Na+/H2O retention via renin/aldosterone
- H2O retention via ADH
- Vasoconstriction via Angiotensin II and sympathetic response

Low-speed MVC (<35mph)
Likely injuries include neck strain, back strain, contusion, abrasion, concussion
History  Description of crash - speed, wearing seatbelt?, airbag deployed?, LOC?, passenger or driver?, side of impact
PE  Head, spine, abd, neuro and any area that hurts.
Labs  2 Hcts 30 min apart, urine dip, stool guaiac
Imaging  C-spine series, Head CT for LOC, other imaging as needed
Rx  Handouts on neck strain, back strain, etc.
    Pain: ibuprofen 600 mg PO QID or naproxen 500 mg PO BID until F/U
    F/U in UCC 4-7 days
    F/U in 1-2 days with concussion or LOC
If C-spine is cleared by x-ray, but tender to palpation, 2 options:
- Have patient wear soft collar x 2 wks (including sleeping and showering), then return for Flexion-Extension films
- Do Flexion-Extension films before patient leaves ED

Lacerations
History
How and when they occurred, possible retained foreign objects?

PE
Fever, signs of infection, neurovascular integrity distal to wound, measure size and record location (draw picture)

Labs
Hct, EtOH if indicated

Imaging
To look for foreign body at site, involvement of underlying bone, or head CT for patient with head laceration and intoxication

Rx
Tetanus toxoid, unless documented in past 5 years
If >8-12 hrs old, clean but do not suture

Clean skin with Betadine, anesthetize with 1% lido w/ epi (no epi for ear, finger, nose, toes, etc.)
Shave area (do not shave eyebrows)
Irrigate with 1-2 L warm, sterile saline
Explore: joint space involved? (call ortho), hand/wrist tendons involved? (call ortho hand)

If laceration of tongue or through cheek, call OMFS
If laceration of ear with cartilage damage, call ENT
If laceration near eye, call ophtho
Suture according to table below

<table>
<thead>
<tr>
<th>Location</th>
<th>Suture</th>
<th>Suture Removal</th>
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<tbody>
<tr>
<td>Scalp</td>
<td>4-0 Dermalon</td>
<td>7 days</td>
</tr>
<tr>
<td>Face</td>
<td>5-0 Dermalon</td>
<td>5 days</td>
</tr>
<tr>
<td>Oral Mucosa</td>
<td>4-0, 3-0 Chromic gut (absorb.)</td>
<td>NA</td>
</tr>
<tr>
<td>Ext</td>
<td>3-0, 4-0 Dermalon</td>
<td>10-14 days</td>
</tr>
<tr>
<td>Over joint</td>
<td>3-0 Dermalon</td>
<td>10-14 days</td>
</tr>
<tr>
<td>SubQ</td>
<td>4-0, 3-0 Dex/Vicryl</td>
<td>NA</td>
</tr>
</tbody>
</table>

F/U for suture removal in UCC.
Give patient wound care instructions, antibiotic ointment, gauze and tape

IVDU Abscess
History
Fever, nausea, H/O murmur, H/O endocarditis

PE
Murmur, fluctuance, induration, cellulitis, neurovascular function distal to abscess

Labs
If T > 38.5, do CBC and blood culture x 2
CBC if temp is nl

Imaging
Consider if osteomyelitis or gas-forming organisms are of concern

Rx
Fever, large area, or deep abscess -> candidate for admission
Hand abscesses should be seen by ortho
Give Tetanus toxoid
I & D Abscess:
- Consider pre-medication for pain/anxiety
- Clean area with Betadine, prep/drape in sterile fashion
- Wear mask with eye protection and sterile gloves
- Anesthetize area with lidocaine/epi
- Open abscess with scalpel. Evacuate pus. Irrigate with saline
- Pack wound with iodoform gauze, cover with dry bandage

If there is surrounding cellulitis, give antibiotics:
If MRSA, Vancomycin 1g IV q12h or Bactrim 1 tab DS PO BID x 7-14 days
If MSSA, Cephalexin 500 mg PO QID x 7 days or Dicloxacillin 500 mg PO QID x 7 days

Return to UCC daily for repacking of wound

Bites

History
How and when did injury occur? Animal / Human

PE
Neurovascular integrity distal to wound, signs of infection, fever

Labs
CBC if wound appears infected

Imaging
If concern for fracture, osteomyelitis, gas-forming organisms

Rx
Tetanus toxoid
Clean skin with Betadine
Irrigate with sterile saline

Do not close bite wound
Give Timentin 3.1 gm IV x 1 dose in ED
Give Augmentin 875 mg PO BID x 7 days
Ortho should see hand infections
F/U in UCC in 24-48 hrs.

Low Back Pain

History
Trauma, heavy lifting, radiculopathy, bowel or bladder incontinence, “saddle anesthesia” (numbness in perineum), fever, weight loss, cancer, IVDU

PE
Spinal tenderness, muscle tenderness, neuro exam of lower extremities, straight-leg raise, rectal tone, saddle anesthesia

Imaging
Only if patient has concerning symptoms and signs: fever, H/O IVDU or cancer, weight loss, incontinence, decreased rectal tone or numbness

Rx
For most back pain, treat conservatively
Toradol 30 mg IV x 1 dose in ED (if normal renal function)
Robaxin 1 gm IV x 1 dose in ED
D/C with ibuprofen 600 mg PO QID or naproxen 500 mg PO BID, robaxin 500-1000mg PO QID
Back physical therapy once acute episode has resolved
Ice / heat, No bed rest

Alcohol Intoxication

A few things to think about when caring for intoxicated patients:
DDx of decreased level of consciousness
- Head injury, stroke, CNS infection, metabolic abnormalities, other ingestions – opiates, methanol, acetone, ethylene glycol, isopropyl alcohol, cocaine, benzodiazepines, barbiturates, carbon monoxide, inhalants (gas, glue)

Level of consciousness should improve over time: document this with repeat VS/mental status/brief neuro exams; if no improvement - suspect other Dx too

Co-morbidities that can be present in intoxicated patients
- Pneumonia, upper GI bleed, subdural hematoma, hypothermia, cellulitis,
fractures, pancreatitis

History
Substances used, trauma?, GI bleeding?, H/O withdrawal or seizure? If patient cannot give hx, do PE, and get history later

PE
Skin, CV, Resp, Abd, Extremities (trauma, infection), Neuro. Do stool guaiac if patient cannot give history regarding GI bleed

Labs
BAL!
Do CBC, Chem 7 if other pathology is present
Ca, Mg, PO4 if seizures or withdrawal
Alcohol Screen (methanol, acetone, ethylene glycol) if warranted
Udip / Utx

Rx
Thiamine 100 mg IV/IM at every ED visit
2-pt. restraints if needed
Recheck abnormal vital signs
Warm blankets / dry clothing, esp. if T < 35.0C
Consult social work for alcohol treatment options

Dispo
Assume drop of 50 mg/dL per hour in BAL, D/C when BAL < 150 (Beware of withdrawal) and pt is alert, oriented, talking, and ambulating safely

In most people, EtOH level 50-100 mg/dL = disinhibition
200 mg/dL = slurred speech
400-500 mg/dL = coma, resp depression, vascular collapse

Tolerance develops with chronic alcohol use (you may see chronic alcoholics that will have withdrawal symptoms at a BAL of 200 mg/dL)

Alcohol Withdrawal
Signs and symptoms of withdrawal include seizure, tremor, hypertension, tachycardia, insomnia, vomiting, visual hallucinations, delirium tremens

History
Time of last drink, H/O withdrawal, H/O HTN, H/O head injury

PE
Monitor VS (P, BP) and watch for changes

Neuro
Tremor, asterixis, focal neurologic signs

Labs
BAL (withdrawal unlikely if BAL > 200 mg/dL)
Chem 7, Mg, PO4, Ca
CBC

Imaging
Head CT if first seizure or H/O head trauma
CXR if concern for aspiration, pneumonia

Rx
IVF, electrolyte replacement
Thiamine 100-200 mg IV/IM
Prochlorperazine 10 mg IV/IM for nausea/vomiting
Diazepam 5-10 mg IV q 15 min prn

Dispo
If in mild withdrawal, D/C to home, street, jail, or medical detox
If mod-severe withdrawal, admit

Abdominal Pain

History
N/V/D, constipation, appetite, change in stool, blood in stool, hematemesis, dysuria, hematuria, frequency, vaginal bleeding, vaginal discharge, pregnancy, LMP, trauma, drugs/EtOH/meds, cough, fever, pleuritic chest pain, chills

PE
VS, skin rash, peritoneal signs, size of spleen/liver, ascites, Murphy’s sign, CVA tenderness, hernia, pelvic exam in females, rectal exam

Labs
CBC, Chem 7, B-HCG, UA. Consider Hct x 2, coags, amylase, bili, LFTs,
hepatitis panel

**Imaging**
- CXR if suspect pneumonia
- Abd series if patient has peritoneal signs
- EKG for cardiac suspicions
- Abd US for liver, gallbladder, appendix
- Pelvic US for ectopic pregnancy, ovarian torsion/abscess
- Testicular US for torsion/abscess
- CT-KUB, non-contrast, good for kidney stones, hydronephrosis
- Abd CT with IV contrast for vascular
- Abd CT with IV and PO contrast (time-consuming). Look for abscess, diverticulitis, appendicitis, pancreatic pseudocyst

**Rx**
- If patient has surgical condition: IVF, CBC with plts, M7, coags, amy, bili, UA, B-HCG, EKG for older men and women, NPO, appropriate imaging, and surgical consult.
- Otherwise, Rx with appropriate meds and outpatient follow-up

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**Seizure**

**Causes**
- Epilepsy, post-traumatic, drugs, toxins, fever, electrolyte abnl, hypoxia, alcohol withdrawal

**History**
- Symptoms before and after seizure, H/O seizure, drugs/EtOH/meds, H/O head trauma, trauma sustained during this event, loss of continence

**PE**
- Head, neck, tongue. Look for trauma, incontinence
- Neuro (if post-ictal/Todd’s paralysis, patient may not be able to do fully)
- Repeat neuro exam
- Look for signs of alcohol withdrawal

**Labs**
- IV access always, Chem 7, CBC, Ca, Mg, BAL
- Dilantin, Tegretol, phenobarb, Depakote levels
- LP if signs of meningitis, encephalitis, bleed

**Imaging**
- CXR if aspiration suspected
- Head CT w/o contrast for new trauma, new focal neuro finding, no improvement in mental status, severe HA
- Head CT w/ contrast for 1st time seizure
- C-spine series for neck pain, fall, head trauma

**Rx**
- Status epilepticus: Intubate, C-spine precautions, meds (Diazepam, Phenytion)
- First-time seizure: Admit for work-up
- Epilepsy: Usually due to sub-therapeutic on meds, refill meds
- F/U with Neuro Clinic
- Withdrawal Seizure: See Alcohol Withdrawal above

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**Asthma**

**Risk fxs**
- H/O intubation, >2 admissions in past year, >3ED visits in past year, for death: H/O sudden, severe exacerbation, poverty

**History**
- Triggers – URI, allergies, exposures, exercise, cold
- Meds, using meds properly?
- Symptoms – chest tightness, wheezing, cough, nocturnal cough

**PE**
- Able to speak in full sentences?
- Resp: wheezing, RR, O2 sat, chest hyperinflation

**Labs / Tests**
- Serial Peak Flows
- CXR if suspect PNA, CHF
ABG for severe exacerbation
Theophylline level, if indicated

**Rx**

Assess ABC’s, give O2
Give nebulized albuterol & ipratropium, +/- IV steroids

**Mild exac**

Several nebulized albuterol doses or MDI w/ spacer (many puffs)
Prednisone 40 mg PO QD x 5 days
F/U In UCC or with PMD in 2-3 days

**Severe exac**

O2, continuous nebulized albuterol, ipratropium
Prednisolone 125 mg IV x 1 dose
Epinephrine if pt. is deteriorating (1:1000) 0.3-0.5 mg SQ q15-20 min up to 3 doses
Consider aminophylline 5 mg/kg IV over 45 minutes
Admit

Intubate for
Apnea, mental status changes, acute respiratory acidosis pH < 7.1
Use low tidal volumes, low resp. rate, high inspiratory flow rate

**Rx of Chronic Asthma:** Education is important! Short-acting B-2 agonists, long-acting B-2 agonists, inhaled corticosteroids

**Chest Pain**

**Ddx**

Acute MI, unstable angina, stable angina, PE, pericarditis, aortic dissection, mitral valve prolapse, cardiac tamponade, pneumonia, PTX, asthma, COPD, pleuritis, bronchitis, GERD, esophageal spasm, esophagitis, cholecystitis, costochondritis, rib fx, muscle strain, herpes zoster

**History**

Onset, timing, quality and character of pain, progression of pain, constant or intermittent, factors that alleviate or exacerbate, radiate?, positional?, responsive to SL NTG?, cardiac risk factors: CAD, HTN, tobacco, DM, high cholesterol, Fam Hx

**PE**

Resp: crackles?  Chest wall: tenderness?
CV: S3, murmur, friction rub?, neck veins, pulses
Abd: pulsatile mass?

**Labs/Tests**

12-lead EKG
Cardiac enzymes
CBC, Chem 7, coags, Ca, ionized Ca, Mg

**Imaging**

CXR

**Rx**

For presumed coronary chest pain:
Monitor cardiac rhythm
O2 2-4 L via NC to keep O2 sat > 95%
ASA 325 mg chewed
0.4 mg SL NTG q 5 min x 3 doses (can do NTG drip 10 mcg/kg/min if chest pain persists)
Morphine 2 mg IV prn
Metoprolol 5 mg IV q 5 min x 3 doses (longer-acting) or esmolol 500 mcg/kg IV over 1-2 min load, then 50-250 mcg/kg/min IV drip (shorter-acting in case patient develops side-effects)
Heparin 80 u/kg IV bolus, then 16 u/kg/hr maintenance
Consider reperfusion therapy (thrombolytics or PTCA)

If patient has Acute MI or unstable angina, admit and follow
If patient has stable angina and chest pain resolves quickly and is not out of ordinary for patient, then D/C home

**Pericarditis**
Indomethacin 50 mg PO tid or ibuprofen 800 mg PO tid

**Aortic dissection**
Thoracic CT w/o contrast
Control HTN with esmolol
Add sodium nitroprusside 0.5-10 mcg/kg/min if SBP remains >130
Morphine for pain

**Tension PTX**
If unstable, flutter valve
If hypotensive, 1-2 L isotonic fluids
Chest tube

**Muscular pain / Costochondritis**
Ibuprofen 600 mg tid-qid x 7 days

**GERD**
GI cocktail for immediate relief (and dx)
- Viscous lidocaine & Maalox
Smaller meals, avoid caffeine, alcohol, fatty foods
Elevate HOB
Start PPI

**Overdose**

**History**
Substances and quantity ingested, time of ingestion, prior H/O OD, drug & alcohol use

**PE**
Mental status, pupils, resp. rate and pattern, gag reflex

**Labs**
CBC, M7, B-HCG, EtOH, ASA, Tylenol, extended urine tox (calculate anion gap). Consider serum osmolality

**Tests**
EKG, look for prolonged QRS, prolonged QT interval

**Rx**
Assess ABC’s. Intubate if patient cannot protect airway
Give O2, telemetry, pulse O2, IV access, IVF if needed
Consider Thiamine 100 mg IV, glucose 25 gms IV, Naloxone 0.8 mg IV
Admit if ↓ LOC, ECG or rhythm abnl, toxic serum drug levels, or ingestion of sustained-release pills.
Evaluation by social work and/or Psych for suicide precautions

**Overdose & Antidotes**

**Organophosphates**
Atropine 1-2 mg IV then 1-4 mg IV q15 min prn
Naloxone 0.8 mg IV load, 0.4-0.6 mg/hr IV drip
Pyridoxine 1 gm per gm INH ingested over 5 min. Max 5 gms.
N-acetylcysteine 140 mg/kg per OG after lavage
Ethanol 10 mL/kg of 10% solution load, then 1.0-2.0 mL/kg/hr
100%O2, hyperbaric O2
Digoxin antibody fragments 10-20 vials for arrhythmias
Physostigmine 0.5-2.0 mg IV over 2 min q30 min prn

**Isoniazide**
For ASA, Phenobarb: 3 amps NaHCO3 to 1 L D5W, infuse at 250cc/hr

**Acetaminophen**
N-acetylcysteine 140 mg/kg per OG after lavage

**Methanol**
Ethanol 10 mL/kg of 10% solution load, then 1.0-2.0 mL/kg/hr

**Carbon Monoxide**
100%O2, hyperbaric O2

**Digoxin**
Digoxin antibody fragments 10-20 vials for arrhythmias

**Anticholinergics**
Physostigmine 0.5-2.0 mg IV over 2 min q30 min prn

**Block Absorption**
Gastric Lavage, Activated charcoal

**Enhance Elimination**
For ASA, Phenobarb: 3 amps NaHCO3 to 1 L D5W, infuse at 250cc/hr

**Hemodialysis**
Severe ASA, lithium, methanol, ethylene glycol, mushroom
Hemoperfusion: Severe theophylline OD
Chelation: Heavy metal intoxication. Dimercaprol for lead, deferoxamine for iron

Pain Management (From An Introduction to Emergency Medicine by Mengert)
Acute Pain: opioids are a good choice in this situation
Chronic Pain (non-malignancy): opioids not a good choice, choose NSAIDS, APAP (but screen for renal impairment, h/o ulcer or GIB, allergies, and liver disease)

### NSAIDS

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<tr>
<th>Medication</th>
<th>Usual Dosing</th>
<th>Max Dose</th>
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<tbody>
<tr>
<td>ASA</td>
<td>325-975 mg PO q4-6hr</td>
<td>4000mg/24hr</td>
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<tr>
<td>Ketorolac (Toradol)</td>
<td>30-60 mg IM, then 30 mg IM q6hr or 10 mg PO q6hr</td>
<td>120mg/24hr IM 40mg/24hr PO</td>
</tr>
<tr>
<td>Ibuprofen</td>
<td>300 mg PO QID up to 800 mg PO tid</td>
<td>2400 mg/24hr</td>
</tr>
<tr>
<td>Naproxen</td>
<td>250-500 mg PO BID</td>
<td>1250 mg/24hr</td>
</tr>
<tr>
<td>Naproxen sodium</td>
<td>550 mg PO, then 275 PO q6-8hr up to 550 mg PO bid</td>
<td>1375 mg/24hr</td>
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### OPIOIDS

<table>
<thead>
<tr>
<th>Medication</th>
<th>Dosing</th>
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<tbody>
<tr>
<td>Codeine</td>
<td>30-60 mg PO q4-6hr</td>
</tr>
<tr>
<td>Meperidine (Demerol)</td>
<td>50-150 mg PO q3-4hr</td>
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<tr>
<td></td>
<td>25-50 mg IV q15-60 min prn</td>
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<td></td>
<td>50-125 mg IM q3-4hr</td>
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<tr>
<td>Hydrocodone (Vicodin)</td>
<td>5-10 mg PO q4-6hr</td>
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<tr>
<td>Oxycodone</td>
<td>5 mg PO q4-6hr</td>
</tr>
<tr>
<td>Hydromorphone (Dilaudid)</td>
<td>2 mg PO q4-6hr</td>
</tr>
<tr>
<td></td>
<td>1-2 mg IV q4-6hr</td>
</tr>
<tr>
<td></td>
<td>1-2 mg IM/SC q4-6 hr prn</td>
</tr>
<tr>
<td>Morphine</td>
<td>2-5 mg IV q10min prn</td>
</tr>
<tr>
<td></td>
<td>5-10 mg IM/SC q4hr prn</td>
</tr>
<tr>
<td>Fentanyl</td>
<td>1-2 µg/kg IV, then 1µg/kg IV q5-10min prn</td>
</tr>
</tbody>
</table>