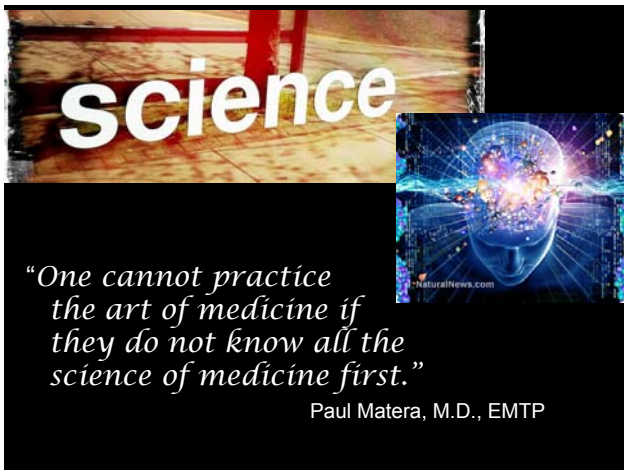
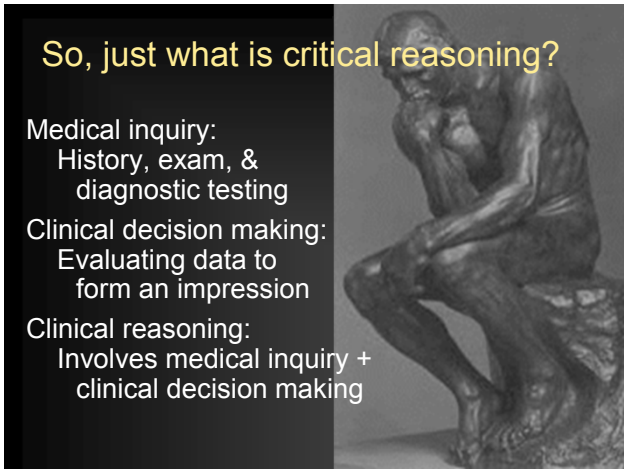
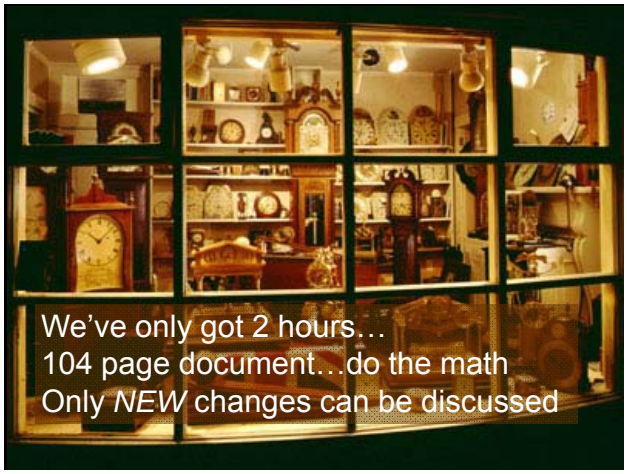
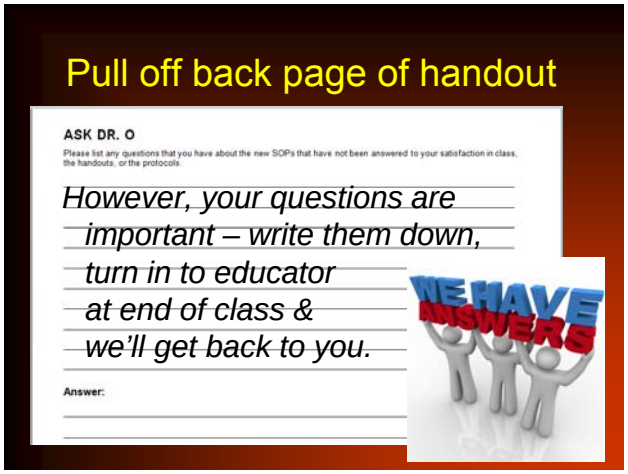

NORTHWEST COMMUNITY EMERGENCY MEDICAL SERVICES SYSTEM
1972 - 2012
40th Anniversary
Region IX
STANDARD OPERATING PROCEDURES/
STANDING MEDICAL ORDERS
Northwest Community EMS System Edition
Eff. June 1, 2014
SOP roll-out 2014


science
"One cannot practice the art of medicine if they do not know all the science of medicine first."
Paul Matera, M.D., EMTP


A clinician becomes competent through the following processes
Experience
Mentoring
Understanding pathophysiology
Learning how to form a differential diagnosis
Developing critical reasoning skills


So, just what is critical reasoning?
Medical inquiry:
History, exam, & diagnostic testing
Clinical decision making:
Evaluating data to form an impression
Clinical reasoning:
Involves medical inquiry + clinical decision making


We've only got 2 hours…
104 page document…do the math
Only NEW changes can be discussed


Pull off back page of handout
ASK DR. O
Please list any questions that you have about the new SOPs that have not been answered to your satisfaction in class, the handouts, or the protocols.
However, your questions are important – write them down, turn in to educator at end of class & we'll get back to you.
Answer:
WE HAVE ANSWERS

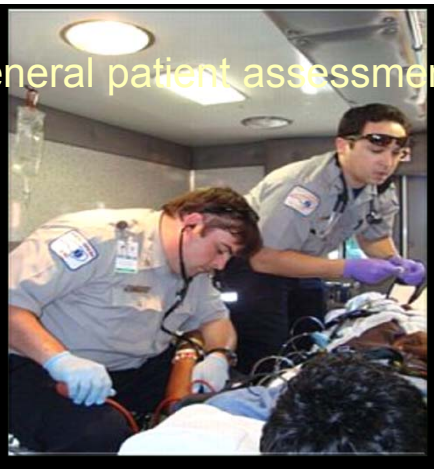
Goals

After completing the entire class, reading the SOPs & class handout, and answering the post-test bank, each participant will do the following with a degree of accuracy that meets or exceeds the standards established for their scope of practice:

- Identify the major changes in each section of the new SOPs and explain their rationales.
- Safely adapt EMS practice to implement the changes no later than June 1, 2014
- Accept and defend the need to modify the SOPs to national evidence-based standards

Introduction

General patient assessment



O_2 is a drug and must be given to specific pts based indications/contraindications and in correct doses by an appropriate route - being vigilant for adverse reactions

Which patients can be harmed by *hyper* oxia and need careful titration of oxygen?

Harmed by ***hyper***oxia

- Uncomplicated Acute MI
- Post-cardiac arrest
- Acute exacerbations of COPD
- Stroke
- Neonatal resuscitation

Why?

Give O_2 to these pts only if evidence of hypoxia and titrate to dose that relieves hypoxemia without causing hyperoxia (SpO_2 94%)

Iscor, S. et al. (2011) Supplementary oxygen for nonhypoxemic patients: O(2) much of a good thing? Crit Care, 15(3), 305

Target in COPD?

92%

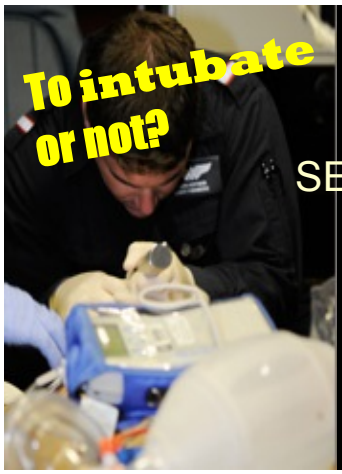
Effect of high flow oxygen on mortality in chronic obstructive pulmonary disease patients in prehospital setting: randomised controlled trial

BMJ, (2010) 341, c5462

Take home points

- Not titrating O_2 sats in COPD pts to 92% is dangerous
- High flow O_2 without regard to O_2 sats should be used in these pts with real caution
- Increased mortality, hypercarbia, & respiratory acidosis are not just theoretical with O_2 use in COPD

Corey M. Slovis, Eagles, 2011



IS A SEISMIC SHIFT in EMS airway management coming?

...see comments in handout p.3

EMS Airway Clinic
Best Practices in Airway Management & Education

Rethinking ETI

Posted on 22 February 2012

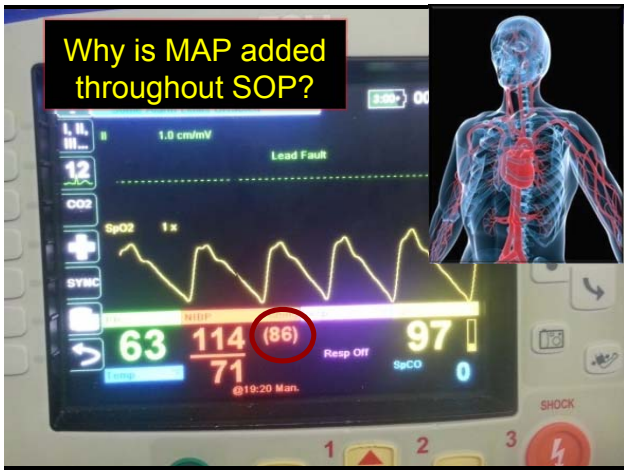
By Bryan E. Bledsoe, DO, FACEP, FAAEM, EMT-P; Darren Braude, MD, MPH, FACEP, EMT-P; Marc Eckstein, MD, MPH, FACEP, EMT-P; William E. Gandy, JD, NREMT-P; David K. Tan, MD, FAAEM, EMT-T; Henry Wang, MD, MS; & Marvin Wayne, MD, FACEP, FAAEM

The paramedic opens the airway bag and prepares to intubate the patient. An 8.0 mm endotracheal (ET) tube is selected and removed from the packaging, and the cuff is checked and readied. The patient is moved to the floor and mechanical ventilation continued

Finally, when ready, the paramedic positions the patient and inserts the laryngoscope. The patient starts to gag and reaches for the paramedic's hand. The paramedic grabs the ET tube and inserts it into his airway. He then holds the tube in place, inflates the cuff, and the EMTs remove the mask from the BVM and begin ventilating through the ET tube.

Immediately, vomitus fills the tube and begins to leak out. The paramedic quickly deflates the cuff and removes the ET tube. The mask is replaced on the BVM unit, and the patient is ventilated for approximately one minute. Then, the paramedic selects a second ET tube, prepares it and makes a second attempt to intubate the patient. As soon as the tube is placed, EMTs again remove the mask from the BVM and begin ventilating the patient through the ET tube

An EMT listens over the chest and abdomen with a stethoscope. He says he hears breath sounds over the chest but doesn't say anything about the presence or absence of breath sounds over the abdomen. An ECG monitor with capnography is attached to the patient. The EMT operating the monitor is unsure

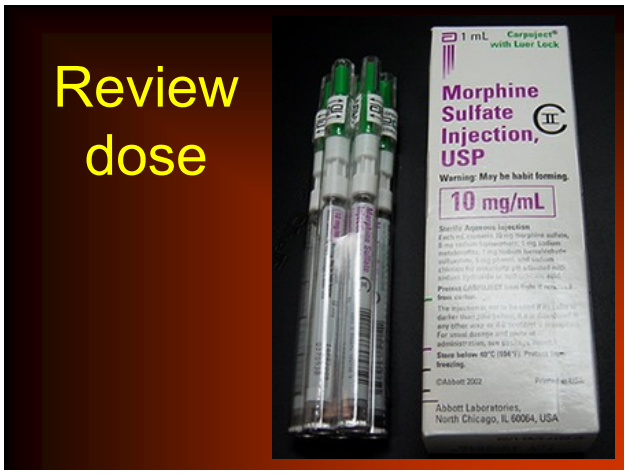


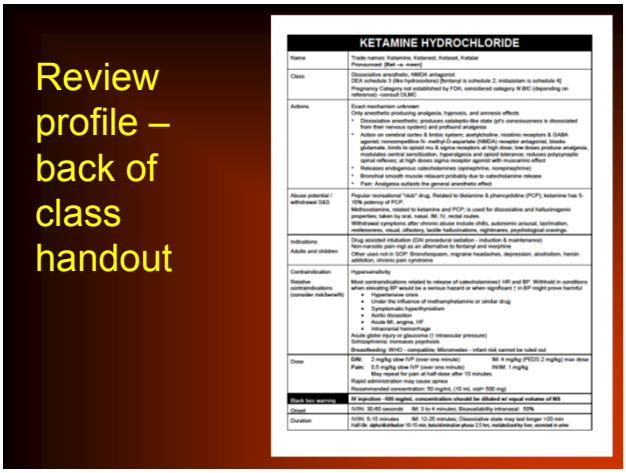
Dose clarification

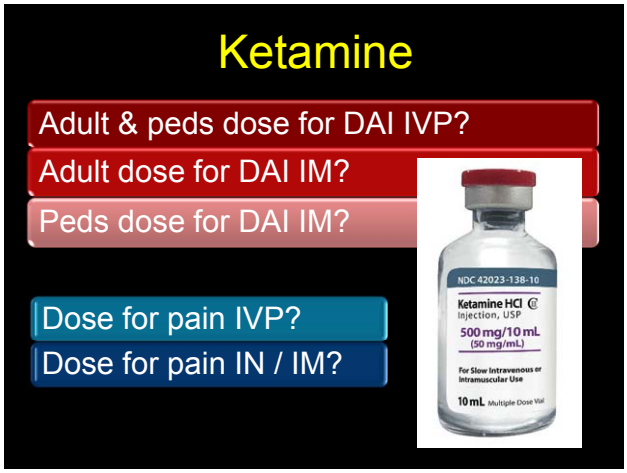
- 1st dose mcg/kg / SOP?
- 2nd dose mcg/kg / SOP?
- TOTAL max dose in mcg/kg / SOP?
- TOTAL max dose in mcg/kg/ OLMC?

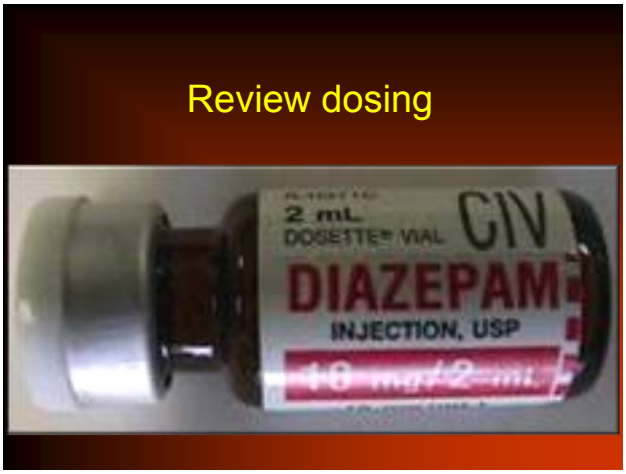
Max dose mcg | Max dose mcg | Max dose mcg | Max dose mcg

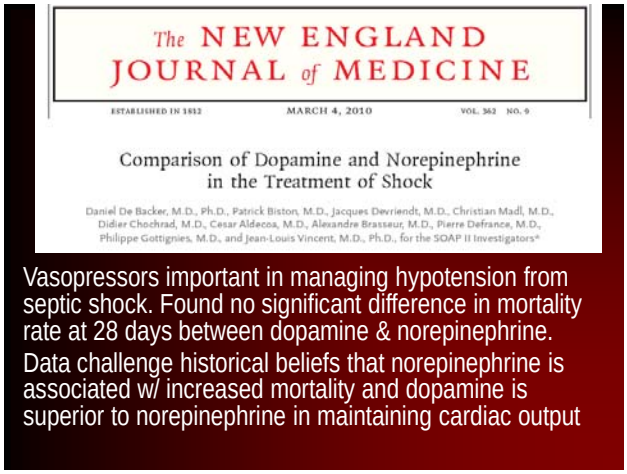

option 1
option 2
option 3
option 4
DRUG Alternatives p. 4
Why needed?


Review dose
Morphine Sulfate Injection, USP
10 mg/mL
Abbott Laboratories, North Chicago, IL 60064, USA


Review profile – back of class handout
KETAMINE HYDROCHLORIDE


Ketamine
Adult & peds dose for DAI IVP?
Adult dose for DAI IM?
Peds dose for DAI IM?
Dose for pain IVP?
Dose for pain IN / IM?
NDC 42023-138-10
Ketamine HCl Injection, USP
500 mg/10 mL (50 mg/mL)
For Slow Intravenous or Intramuscular Use
10 mL Multiple Dose Vial


Review dosing
2 mL
DOSETTE® VIAL
CIV
DIAZEPAM
INJECTION, USP


The NEW ENGLAND JOURNAL of MEDICINE
ESTABLISHED IN 1812
MARCH 4, 2010
VOL. 362 NO. 9
Comparison of Dopamine and Norepinephrine in the Treatment of Shock
Daniel De Backer, M.D., Ph.D., Patrick Biston, M.D., Jacques Devriendt, M.D., Christian Madl, M.D., Didier Chochrad, M.D., Cesar Aldecoa, M.D., Alexandre Brasseur, M.D., Pierre Defrance, M.D., Philippe Gottignies, M.D., and Jean-Louis Vincent, M.D., Ph.D., for the SOAP II Investigators*
Vasopressors important in managing hypotension from septic shock. Found no significant difference in mortality rate at 28 days between dopamine & norepinephrine.
Data challenge historical beliefs that norepinephrine is associated w/ increased mortality and dopamine is superior to norepinephrine in maintaining cardiac output

Review profile in drug appendix p.90

Elderly patients – p. 8

Extremely obese p. 9

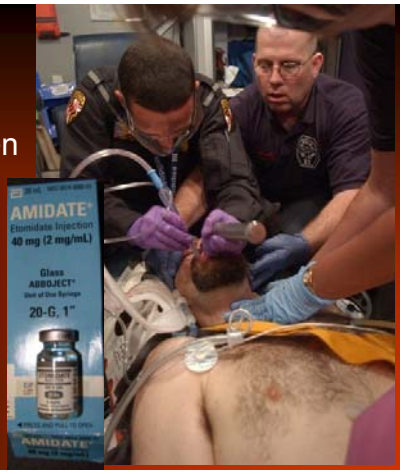
Why listen to back first?

Why is Hx of recent gastric surgery important?

DAI – p.11

What sedative should be given 1st if pt is in shock and hypotensive?

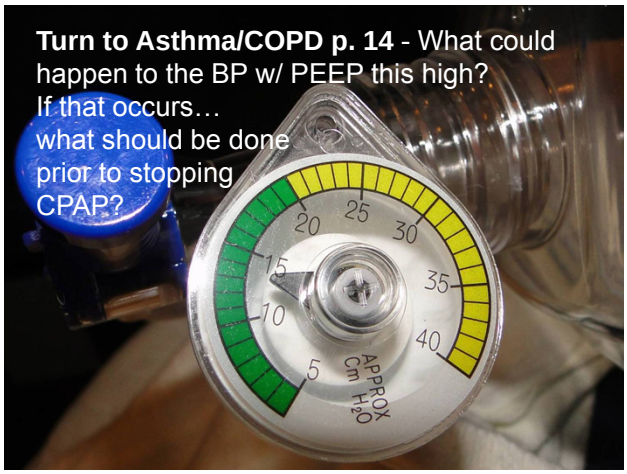
Why?

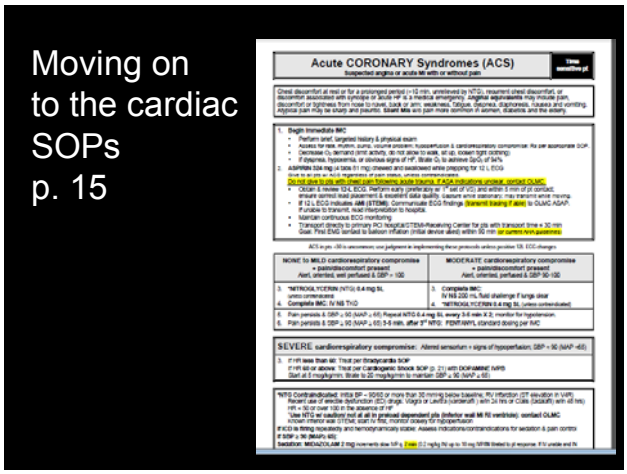


Anaphylactic shock

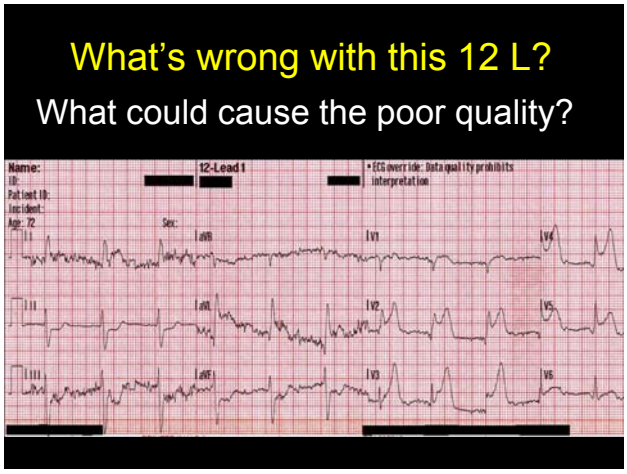
Which epi should you give 1st ?

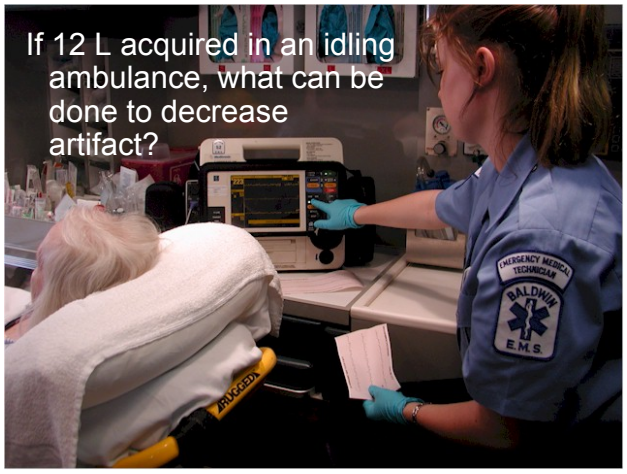
WHY?

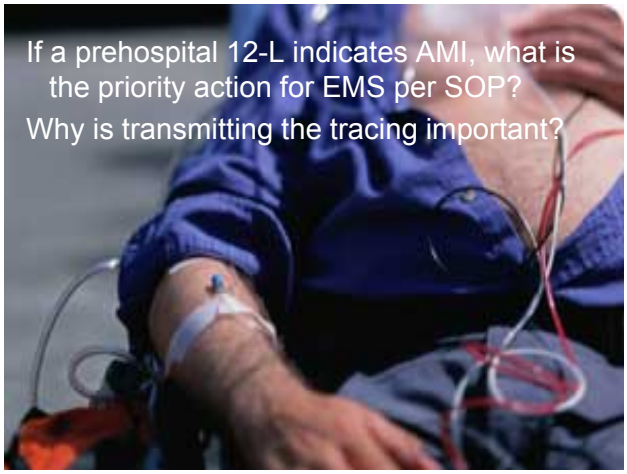

Turn to Asthma/COPD p. 14 - What could happen to the BP w/ PEEP this high?
If that occurs…
what should be done prior to stopping CPAP?
APPROX Cm H2O


Moving on to the cardiac SOPs p. 15
Acute CORONARY Syndromes (ACS)


Who should get ASA for their chest pain?
Why or why not?

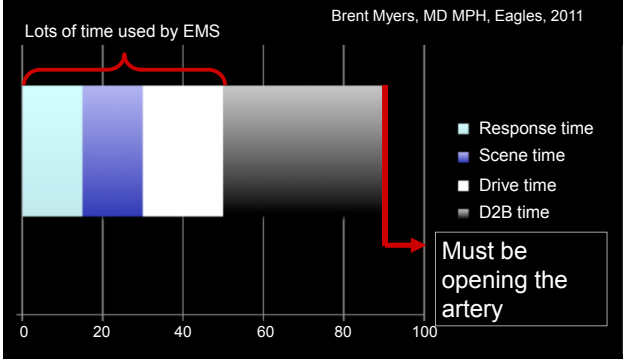

What's wrong with this 12 L?
What could cause the poor quality?
12-Lead 1
ECG override: Data quality prohibits interpretation


If 12 L acquired in an idling ambulance, what can be done to decrease artifact?


If a prehospital 12-L indicates AMI, what is the priority action for EMS per SOP?
Why is transmitting the tracing important?

What's the rush? Why the change from D2B to E2B target times?

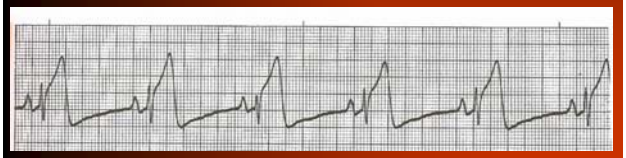
Brent Myers, MD MPH, Eagles, 2011



Bradycardia w/ Pulse p.16

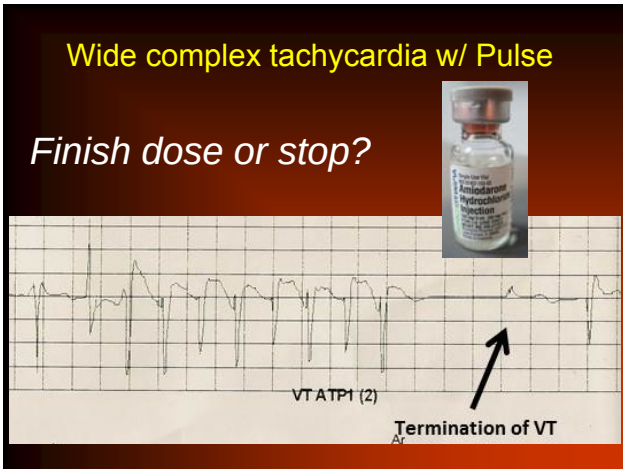
Pulse present; BP 80/60
Order of care?

1st → 2nd → 3rd



Wide complex tachycardia w/ Pulse

Finish dose or stop?

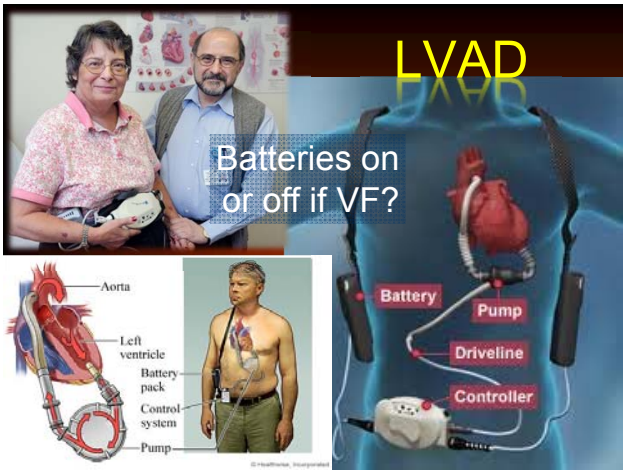


ZOLL LifeVest

Batteries on or off if pt in VF?

LVAD

Batteries on or off if VF?



How do we know if CPR quality is good?

See handout p. 4

EMERGENCY MEDICAL SERVICES/ORIGINAL RESEARCH

The Influence of Scenario-Based Training and Real-Time Audiovisual Feedback on Out-of-Hospital Cardiopulmonary Resuscitation Quality and Survival From Out-of-Hospital Cardiac Arrest

Bentley J. Bobrow, MD; Tyler F. Vadeboncoeur, MD; Uwe Stolz, PhD, MPH; Annemarie E. Silver, PhD; John M. Tobin, CEP; Scott A. Crawford, EMT-B; Terence K. Mason, RN; Jerome Schirmer, CEP; Gary A. Smith, MD; Daniel W. Spaite, MD

Patient survival to discharge more than doubled

Methods: This was a before-after study of consecutive adult out-of-hospital cardiac arrest. Data were obtained from out-of-hospital forms and defibrillators. Phase 1 included 18 months with real-time audiovisual feedback disabled (October 2008 to March 2010). Phase 2 included 16 months (May 2010 to September 2011) after scenario-based training of 373 professional rescuers and real-time audiovisual feedback enabled. The effect of interventions on survival to hospital discharge was assessed with multivariable logistic regression. Multiple imputation of missing data was used to analyze the effect of interventions on CPR quality.

Results: Analysis included 484 out-of-hospital cardiac arrest patients (phase 1 232; phase 2 252). Median age was 68 years (interquartile range 56-79); 66.5% were men. CPR quality measures improved significantly from phase 1 to phase 2: Mean chest compression rate decreased from 128 to 106 chest compressions per minute (difference −23 chest compressions; 95% confidence interval [CI] −26 to −19 chest compressions); mean chest compression depth increased from 1.78 to 2.15 inches (difference 0.38 inches; 95% CI 0.28 to 0.47 inches); median chest compression fraction increased from 66.2% to 83.7% (difference 17.6%; 95% CI 15.0% to 20.1%); median preshock pause decreased from 26.9 to 15.5 seconds (difference −11.4 seconds; 95% CI −15.7 to −7.2 seconds), and mean ventilation rate decreased from 11.7 to 9.5/minute (difference −2.2/minute; 95% CI −3.9 to −0.5/minute). All rhythms survival increased from phase 1 to phase 2 (30/231, 8.7% versus 38/252, 13.9%; difference 5.2%; 95%

Review final recommendations

See class handout page 5

Circulation

American Heart Association

CPR Quality: Improving Cardiac Resuscitation Outcomes Both Inside and Outside the Hospital : A Consensus Statement From the American Heart Association

Peter A. Meaney, Bentley J. Bobrow, Mary E. Mancini, Jim Christenson, Allan R. de Caen, Farhan Bhanji, Benjamin S. Abella, Monica E. Kleinman, Dana P. Edelson, Robert A. Berg, Tom P. Aufderheide, Venu Menon and Marion Leary

Circulation. published online June 25, 2013;

Print ISSN: 0009-7322. Online ISSN: 1524-4539

So, what 3 things reflect best practice in this photo?

See class handout p. 7

January 1, 2014, Vol 311, No. 1

< Previous Article Next Article >

Original Investigation | January 1, 2014

Effect of Prehospital Induction of Mild Hypothermia on Survival and Neurological Status Among Adults With Cardiac ArrestA Randomized Clinical Trial

Francis Kim, MD; Graham Nichol, MD, MPH; Charles Maynard, PhD; Al Hallstrom, PhD; Peter J. Kudenchuk, MD; Thomas Rea, MD, MPH; Michael K. Copass, MD; David Carlbom, MD; Steven Deem, MD; W. T. Longstreth Jr, MD; Michele Olsufka, RN; Leonard A. Cobb, MD

[+] Author Affiliations

JAMA. 2014;311(1):45-52. doi:10.1001/jama.2013.282173

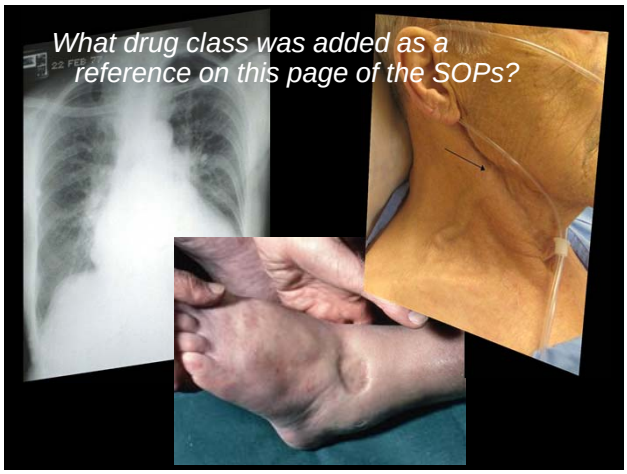
Conclusion and Relevance: Although use of prehospital cooling reduced core temperature by hospital arrival and reduced time to reach a temp of 34°C, it did not improve survival or neurological status among pts resuscitated from prehospital VF or those without VF.

So what do we do with that finding?

Are we stopping too soon?

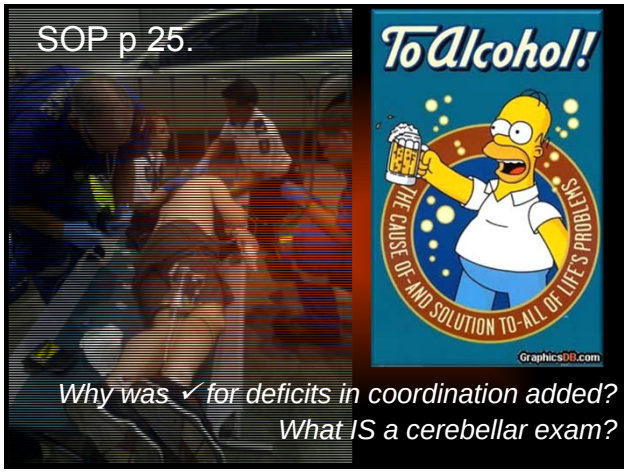
Conclusions

- 90 percent of neurologically intact survivors had ROSC at 40 minutes of resuscitation
- 29 of 42 survivors with resuscitation beyond 40 minutes had NIS (69%, (CI 54-81%)).
  - Presence of continuous compressions
  - Controlled ventilations
  - Presence of induced hypothermia
- SAS has the ability to control for these variables


What drug class was added as a reference on this page of the SOPs?


Back to LVADs – see new SOP p. 22


Acute abdominal/flank pain
Pt c/o of severe abd pain
Abdomen has tenderness, rigidity, guarding & pt winzes when heel is tapped (rebound)
BP OK
Fentanyl indicated?
© www.medindia.net


SOP p 25.
To Alcohol!
THE CAUSE OF-AND SOLUTION TO-ALL OF LIFE'S PROBLEMS
GraphicsDB.com
Why was ✓ for deficits in coordination added?
What IS a cerebellar exam?

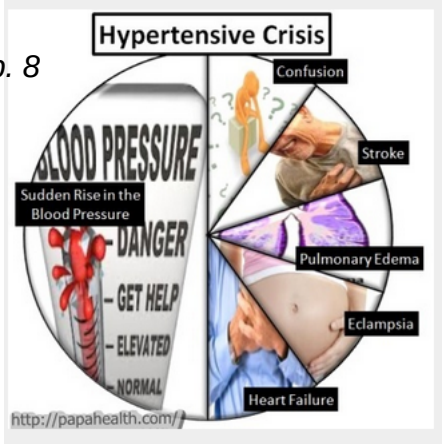

Big-boys.com


Pt is seizing –
what comes first?
2 mL
Midazolam
Injection, USP
10 mg/2 mL
5 mg/mL

SOP p. 32
Handout: p. 8

Stroke screen added

WHY?



Get **CALLBACK** Number

Stroke p. 35

SHOCK: Implications of low $EtCO_2$
Metabolic acidosis (<31)
See appendix p.100

CAPNOGRAPHY		
ABSENT	**DECREASED**	**INCREASED**
METABOLISM		
Malfunction sensor/monitor ✓ sensor, exhale into	Hypothermia	Hyperthermia Shivering Pain
PERFUSION		
Arrest w/o CPR Exsanguination	Shock Arrest w/ CPR Pulmonary embolism ↓ Cardiac output	↑ Cardiac output Reperfusion after ROSC
VENTILATION		
Apnea ET extubation ET obstruction Esophageal tube	**HYPER**ventilation Bronchospasm Mucus plugging	**HYPO**ventilation Resp depression COPD

DIANAcapnotable

Septic shock

2 or more systemic inflammatory response syndrome (SIRS) criteria + MAP < 65

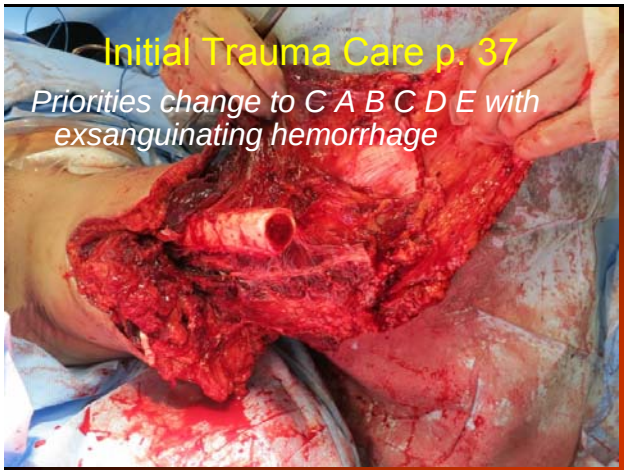
- HR > 90
- RR > 20
- T > 38 (100.4° F) or < 36 (96.8° F)
- EMS suspicion of infection
- Persistent hypotension

Severe SEPSIS

Emphasis on early fluids (30 mL/kg)
vasopressors

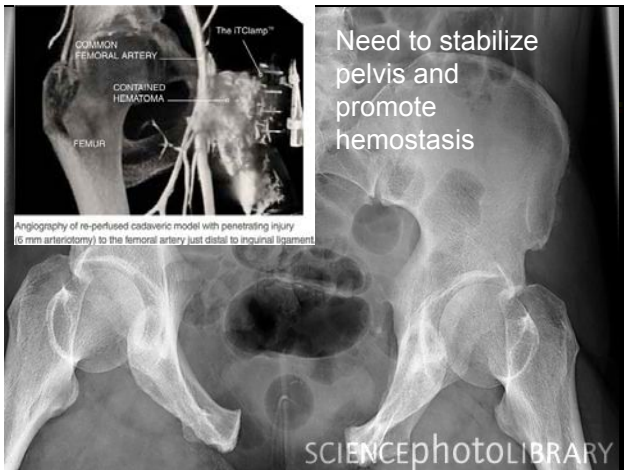
Initial Trauma Care p. 37

Priorities change to C A B C D E with exsanguinating hemorrhage



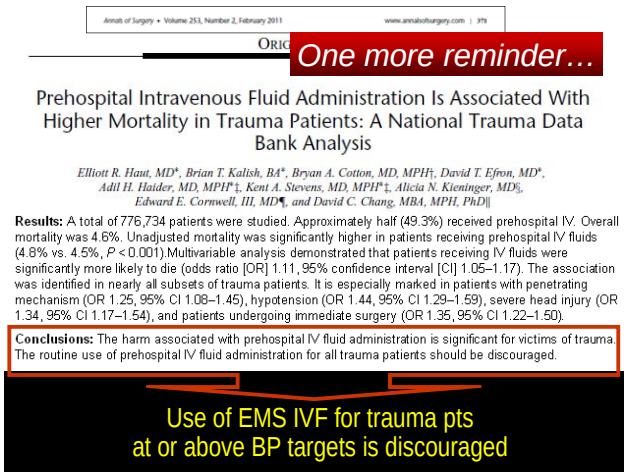
Hemorrhage control clarified

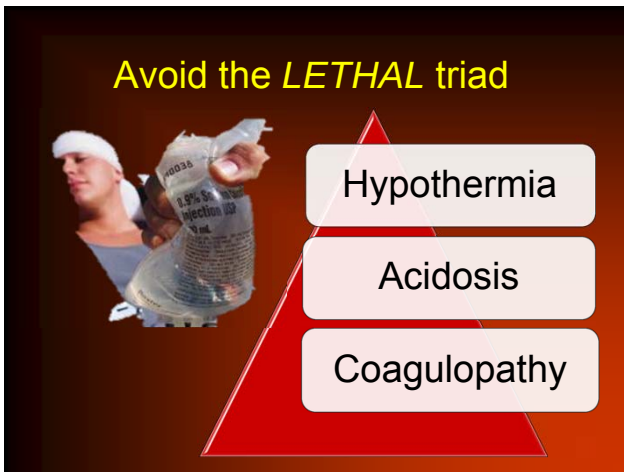

Pelvic fractures bleed a lot!


COMMON FEMORAL ARTERY
The iTClamp™
CONTAINED HEMATOMA
FEMUR
Angiography of re-perfused cadaveric model with penetrating injury (6 mm arteriotomy) to the femoral artery just distal to inguinal ligament
Need to stabilize pelvis and promote hemostasis
SCIENCEphotoLIBRARY

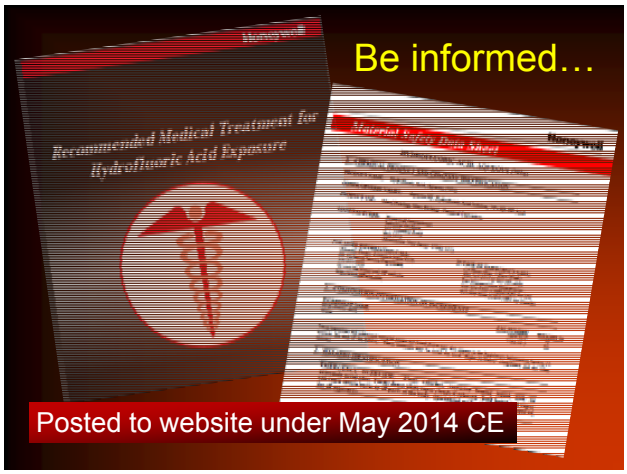

PASG out, upside down KED added

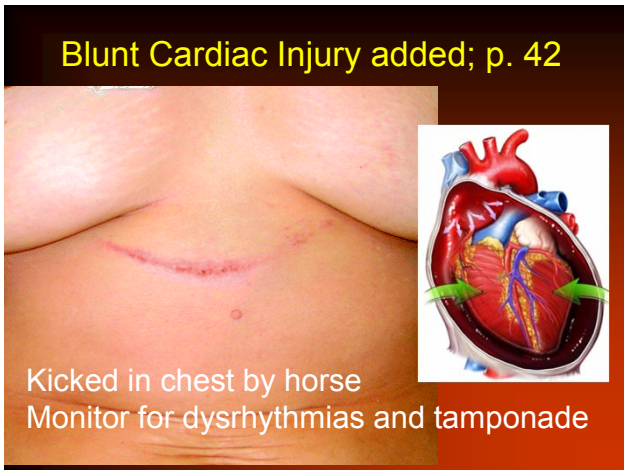

New in EMS trauma mgt?
1


One more reminder…
Prehospital Intravenous Fluid Administration Is Associated With Higher Mortality in Trauma Patients: A National Trauma Data Bank Analysis
Elliott R. Haut, MD*, Brian T. Kalish, BA*, Bryan A. Cotton, MD, MPH†, David T. Efron, MD*, Adil H. Haider, MD, MPH*‡, Kent A. Stevens, MD, MPH*‡, Alicia N. Kieninger, MD§, Edward E. Cornwell, III, MD¶, and David C. Chang, MBA, MPH, PhD‖
Results: A total of 776,734 patients were studied. Approximately half (49.3%) received prehospital IV. Overall mortality was 4.6%. Unadjusted mortality was significantly higher in patients receiving prehospital IV fluids (4.8% vs. 4.5%, P < 0.001).Multivariable analysis demonstrated that patients receiving IV fluids were significantly more likely to die (odds ratio [OR] 1.11, 95% confidence interval [CI] 1.05–1.17). The association was identified in nearly all subsets of trauma patients. It is especially marked in patients with penetrating mechanism (OR 1.25, 95% CI 1.08–1.45), hypotension (OR 1.44, 95% CI 1.29–1.59), severe head injury (OR 1.34, 95% CI 1.17–1.54), and patients undergoing immediate surgery (OR 1.35, 95% CI 1.22–1.50).
Conclusions: The harm associated with prehospital IV fluid administration is significant for victims of trauma. The routine use of prehospital IV fluid administration for all trauma patients should be discouraged.
Use of EMS IVF for trauma pts at or above BP targets is discouraged


Avoid the LETHAL triad
Hypothermia
Acidosis
Coagulopathy

Small revisions to trauma triage guidelines – see SOP p. 39

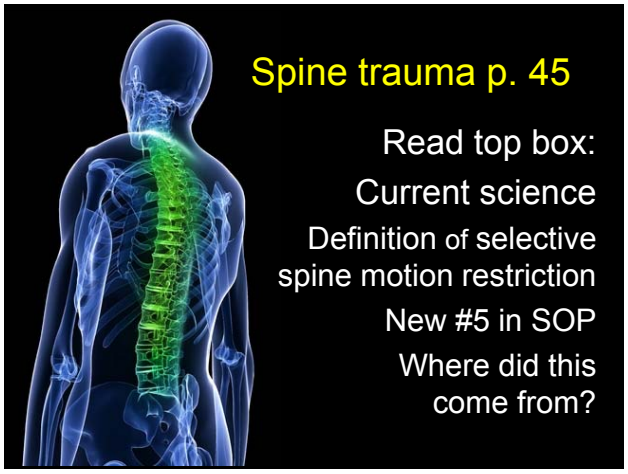


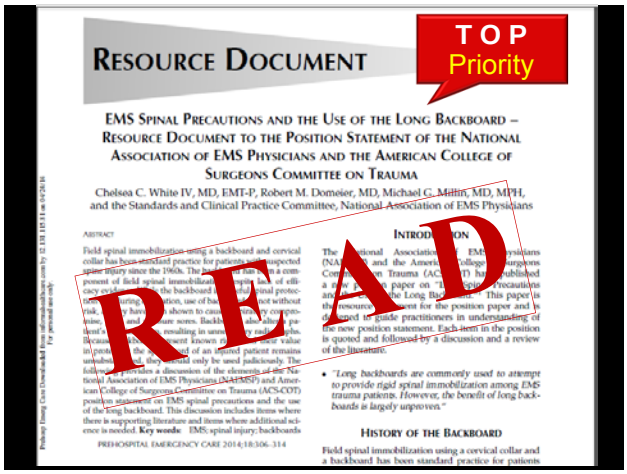


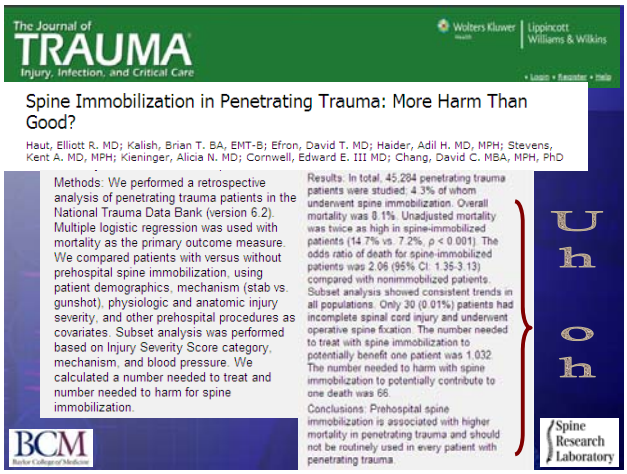
Head trauma SOP p. 44

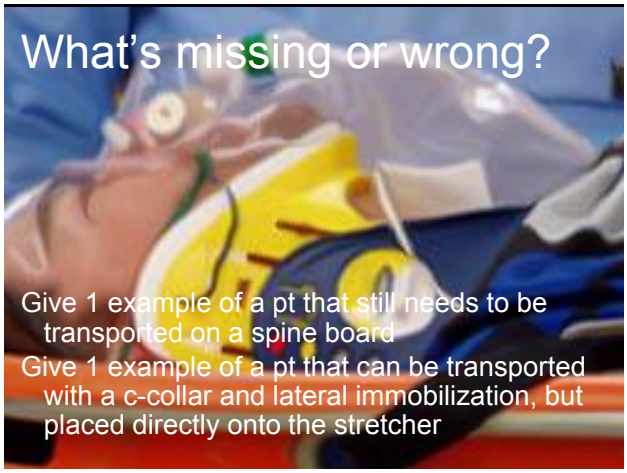
- Selective spine immobilization
- Maintain SBP at least 110 (may need to be higher)
- Expanded ↑ ICP criteria

See handout p. 14



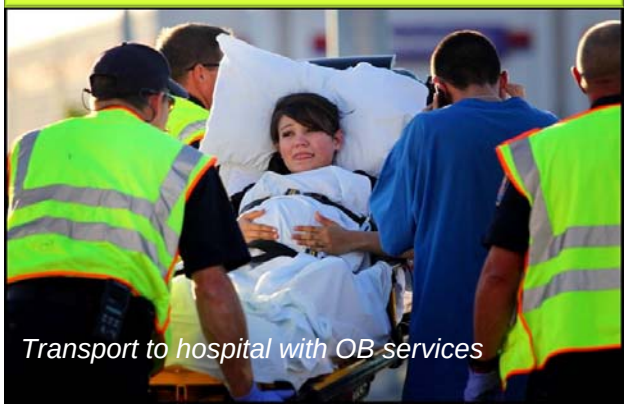






New in **Musculoskeletal Trauma**
SOP p.47
H/O p.15

Childbirth – p. 55



Transport to hospital with OB services

Newborn resuscitation – p. 58

Start resuscitation with ROOM AIR

If hypoxic: Increase O_2 in 5 L increments every 30 sec to reach targeted SpO_2 levels

Newborn Resuscitation

Neonatal hypoglycemia: Glucose level < 30 mg/dL in first 24 hrs of life

See handout p. 16

Peds IMC - p. 62

Call in all peds refusals
Even w/ parent consent

Peds Airway Adjuncts – p. 64

Minimum BP redefined throughout Peds section

SBP > 70 + 2 X age or ≥ 90 if 10 -12 yrs

Remaining peds changes mirror adult SOPs

So, where do you find?

Invalid Assist Checklist

Where do you find?

Burn center referral criteria; Rule of 9s

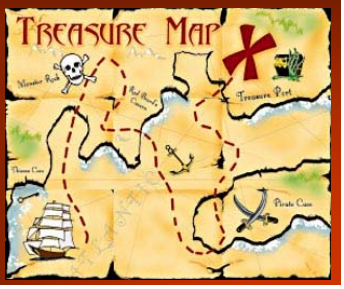
Fentanyl dosing table

Fahrenheit to Celsius conversion table

Where do you find?

Peds dextrose dose table

Capnography table



"The greater danger for most of us lies not in setting our aim too high and falling short; but in setting our aim too low, and achieving our mark." Michelangelo

Power up for full go live

June 1, 2014

Can use new SOPs as soon as you have completed the full class