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Practical critical care management of ESLD patients – 2018

David T. Huang, MD, MPH

Associate Professor

Critical Care Medicine, Emergency Medicine, Clinical and Translational Science

Director, MACRO (Multidisciplinary Acute Care Research Organization)

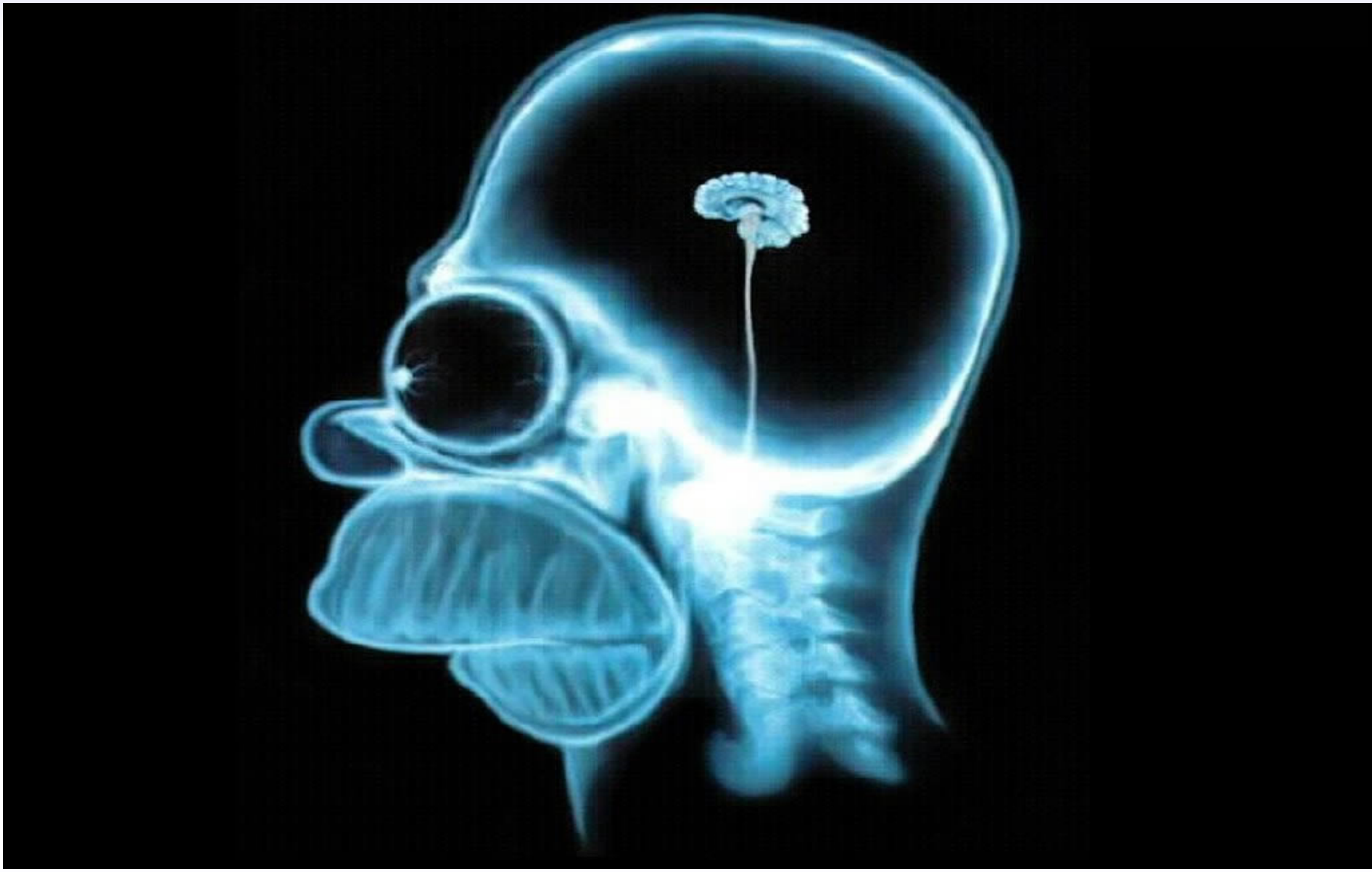
Associate Director, Montefiore TICU

University of Pittsburgh

Outline

- **60 minutes, cases**
- **Caveat**
  - I am not a hepatologist
- **Practical critical care**
  - Principles, tips, and literature
    - ~what you would give TICU docs for IPF mgmt
  - By organ system
  - Not just ICU! (ED, floor, OSH transfers)

Neurologic



Case 1

- **52yo cirrhotic, admitted with severe HE**
  - ICU Day 3 – still not waking up; nonfocal exam
  - Pooping well, on rifaximin, “stable”

- **What would be reasonable next steps?**
  - CT head
  - Golytely
  - Repeat cultures
  - EEG
  - Flumazenil
  - Examine Na trend
  - Flagyl
  - Retake history
  - Check NH3

Hepatic encephalopathy

- **Precipitating factor?**
  - Any stressor
    - Infection, GIB, dehydration, MI, procedure
    - How many are unknown?
      - Really just 20-30%? (Cash et al, June 2010)
      - Cx neg?
        - Beyond cultures - bacterial DNA, PCR, etc.

- **Airway**
  - When to intubate
  - “In-betweeners”
    - OSH transfers – do it!
    - ICU – careful watch + wait; check Mallampatti, etc.

Refractory hepatic encephalopathy

- **Sure there's no acute process going on?**
  - Occult infection, bleed
  - Liver patients get NMS, ETOH withdrawal, etc. too!
- **No clear #1 adjunct**
  - Use what they were on at home
  - Options: neomycin, rifaximin, metronidazole
- **Polyethylene Glycol for the win? (Golytely)**
  - HELP trial, Rahimi et al, JAMA IM 2014
  - 50 patients
  - Primary outcome: HE improvement at 24h
  - 91% vs 52% ($p < .01$)
    - Needs confirmation…..!

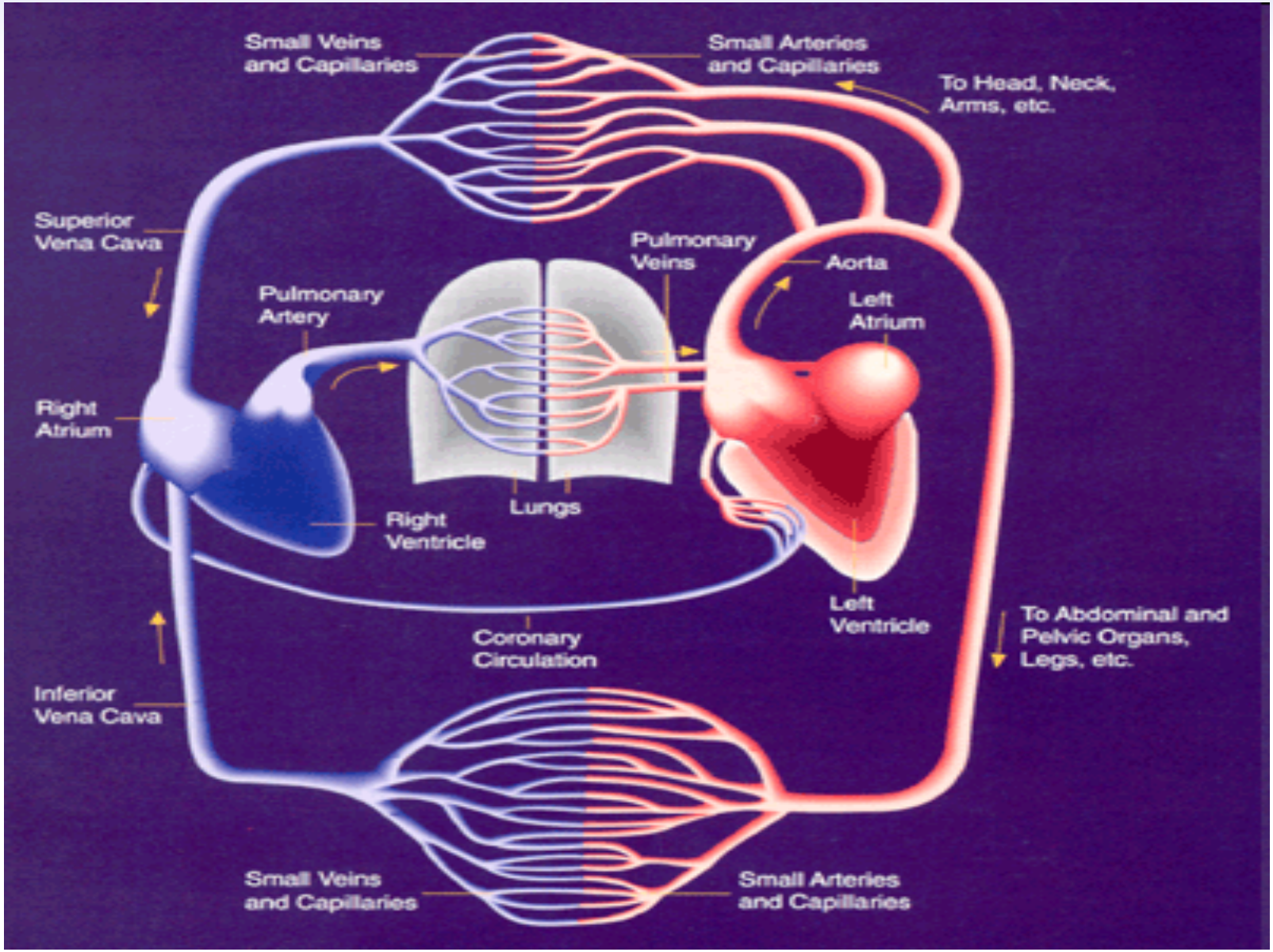
Lactulose

- **Careful with "Q2h until BM" orders!**
- **Does it really work?**
  - "There is insufficient evidence to confirm or exclude whether nonabsorbable disaccharides have an effect on patients with hepatic encephalopathy" (Cochrane Collaboration 2004)
  - "Lactulose…should no longer be part of standard care" (Shawcross + Jalan, Lancet 2005)

Neuro summary

- HE is like ileus – something caused it!
- Cirrhotics get NMS too
- Golytely a good HE tool

Cardiovascular



Case 2

- **48yo cirrhotic, admitted w severe CAP**
  - Swan placed when you weren't looking
  - CI = 2.2, SvO2 = 62, BP 90/50, HR 90

- **What to do?**
  - Go to bed
  - Recalibrate Swan / box
  - Check CXR
    - Looking for _____
  - Troubleshoot low SvO2
    - Bedside echo
    - Hgb?
    - Check ABG to 2x-check SaO2
  - Find out real baseline BP

Still homo sapiens, but…

- **General approach same**
  - Surviving Sepsis Campaign
- **Hyperdynamic, vasodilated**
  - Low baseline BP, high CO
- **Many cirrhotics on home beta blockers**

Watch for the crump!

- **Cirrhotic cardiomyopathy**
  - Cardiac dysfunction in patients with cirrhosis characterized by impaired contractile responsiveness to stress and/or altered diastolic relaxation with electrophysiological abnormalities in the absence of other known cardiac disease (such as alcoholic cardiomyopathy)
- **Paracentesis-induced circulatory dysfxn**
  - Large volume drainage for clinic, not ICU, and probably not floor
  - Watch UOP too
- **Acute on chronic liver failure**
  - Liver version of infamous trauma “talk + die” syndrome
  - Compensated ESLD -> acute illness -> crump
  - High mortality, but potentially reversible (see TICU Bed 12, y2011)

More crumping

- **Post-TIPS heart failure**
  - Usually s/p big bleed resuscitation
  - TIPS by definition shunts portal flow to systemic circulation
  - Extubation ~= 500 cc fluid bolus
  - Bottom line: Lasix before extubation?

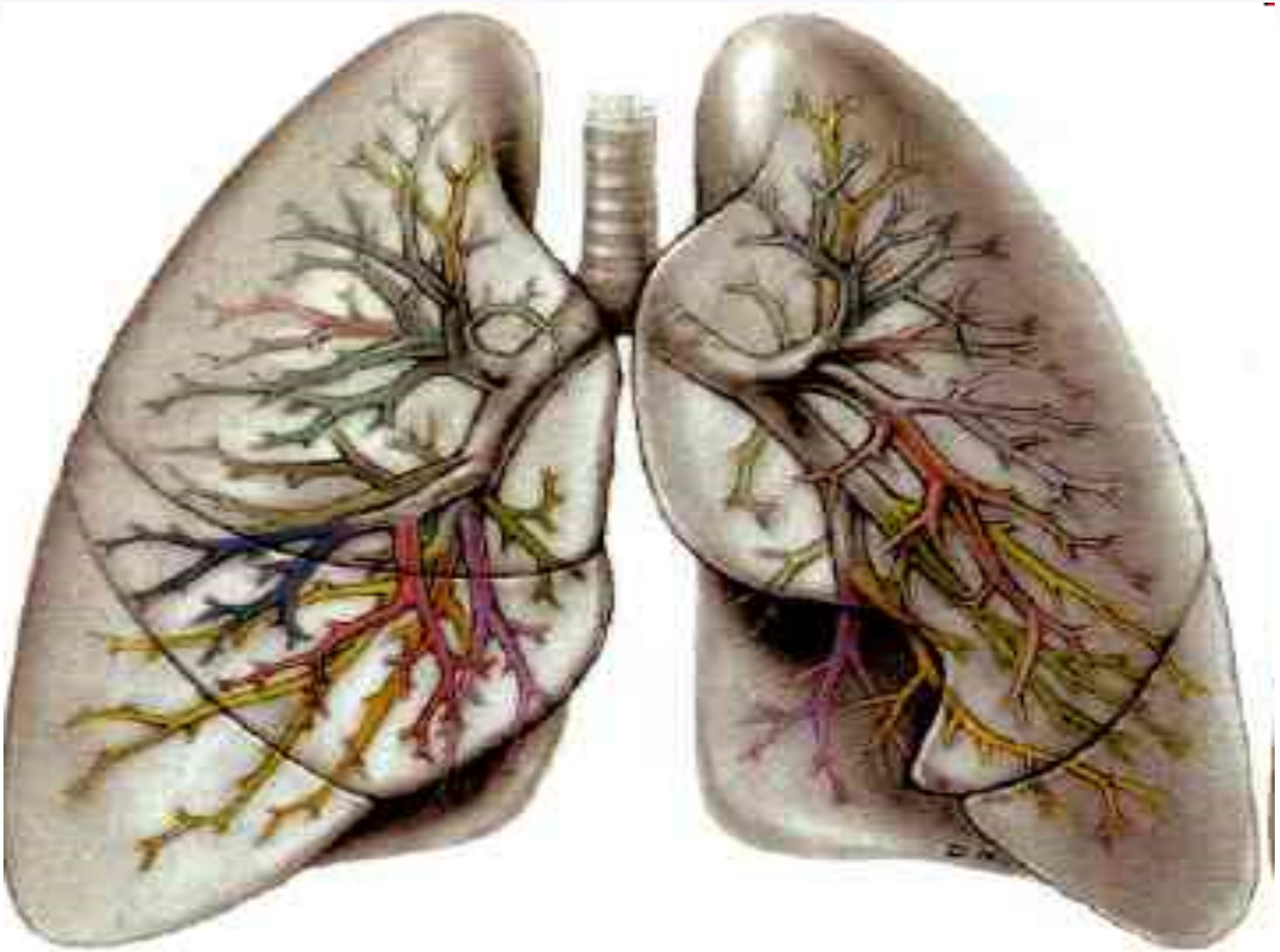
Lactate

- **High lactate ALWAYS bad (unless sz or epi drip)**
  - Don't blame the liver!
  - Compensated cirrhotics have NORMAL lactate!
    - "To establish normal levels…we studied four patients with…cirrhosis…and no acute…disease….excess lactate [was] within normal limits"
      - Rosoff, Udhoji, Weil, Septic Shock Workshop, National Academy of Sciences, 1965
    - Cirrhotics clear lactate slower, but normal at rest (multiple exer phys studies)
      - Almenoff PL et al, Crit Care Med, 1989
      - Woll + Record, Eur J Clin Invest. 1979
      - Casaburi + Oi. Eur J Appl Physiol Occup Physiol. 1989
- **Worried?**
  - Check a lactate!
- **Always get lactates w gases**
  - Venous (esp central) is fine
    - Central line VBG w lactate + ScvO2, plus (accurate) PulsOx >>> ABG!

CV summary

- Know “usual” blood pressure
- Investigate “normal” CI
- Watch for the crump – even w/ minor stress
- Love, fear, + respect lactate!

Pulmonary



Case 3

- **Cirrhotic w hydrothorax + large ascites**
  - SOB, but can talk to you and cooperate
  - INR 8
  - Platelets 60

- **Next steps?**
  - Tap which first?
  - FFP?
  - Platelets?
  - TEG?
    - Is pt oozing from IV sites?

Pigtails 101

- **Serial taps also OK**
- **“Experts” say no FFP needed, but if INR 9…**
  - EVERY vein varicolizes (incl intercostals, abd wall)
- **Drain slower in ICU (and floor) vs office**
  - Ex: 1L q8 Day 1, then if OK speed up, so can drain dry + d/c by Day 3-5
  - Watch kidneys + blood pressure
- **SPA replacement**
  - Fairly EBM
    - For “large” volume paracentesis
      - “Large” is all relative! Context dependent!
  - Don’t waste it – e.g., achieve serum albumin > 4 !
- **When to remove?**
  - “Play” with it if minimal drainage
  - D/c when down to ~ 150 cc / last 24 hours

Pulmonary

- **Hepatopulmonary syndrome**
  - Hypoxia due to ventilation – perfusion mismatch, intrapulmonary shunting, pulmonary capillary vasodilation and limitation of oxygen diffusion in patients with ESLD and portal hypertension
  - Supportive care
    - O2, TIPS?, OLTX
- **Portopulmonary hypertension**
  - Pulmonary arterial hypertension due to increase pulmonary vascular resistance in the presence of portal hypertension and a PAOP pressure < 15 mmHg
  - Epoprostenol infusion for MPAP < 25 mmHg, until OLTX

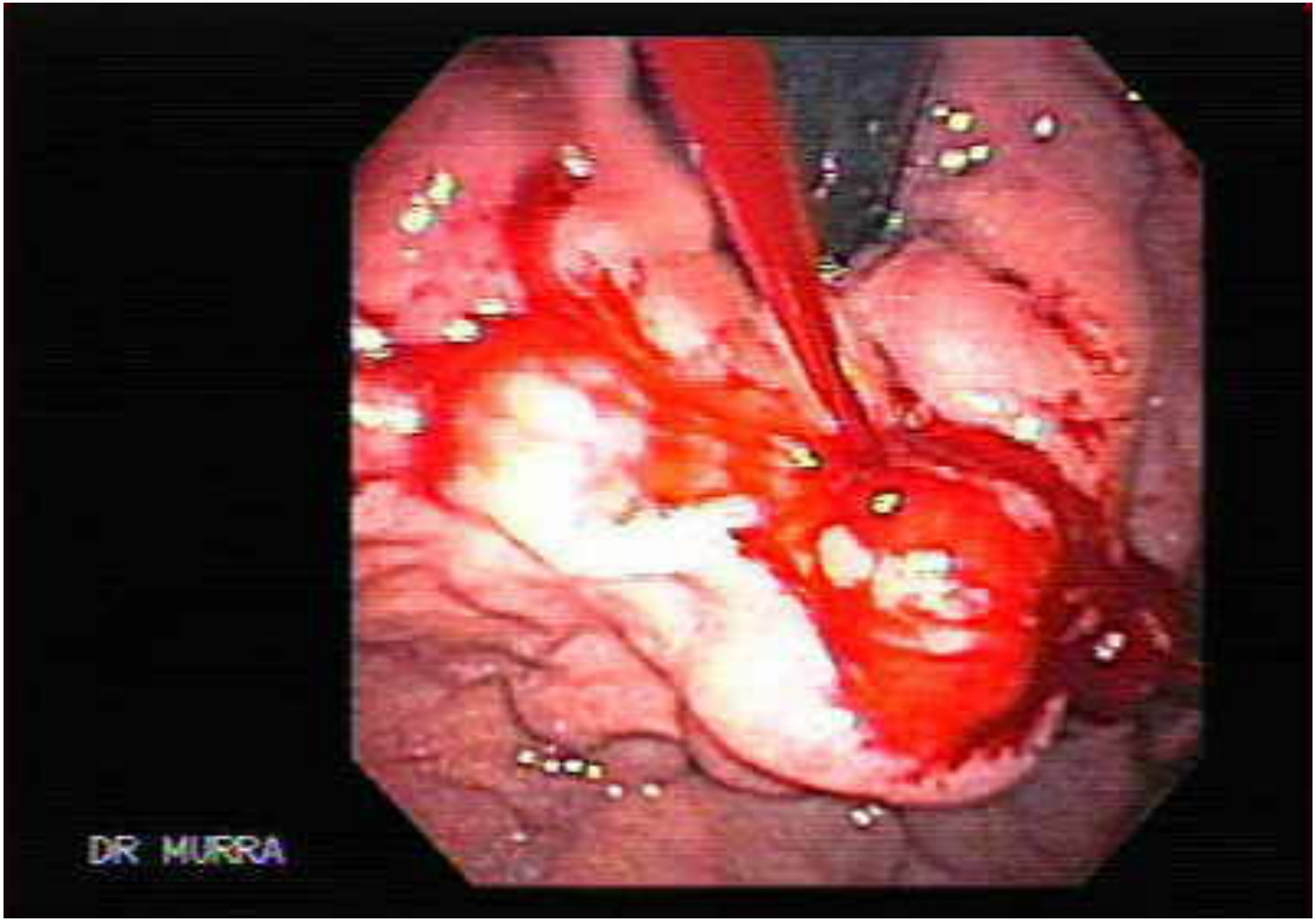
Pulmonary

- **Pulse oximetry accurate?**
  - Falsely high?
    - Abrams et al. Liver Transpl. 2002.
    - Lampert + Brandt. Anaesthesist. 1993
  - No effect?
    - Veyckemans F. Anesthesiology. 1989
  - Needs research!
    - Emory study on Conjugated Hyperbilirubinemia and Pulse Oximetry
      - http://clinicaltrials.gov/ct2/show/NCT00741117
      - "Study stopped due to insufficient personnel required to conduct trial" – accessed November 16, 2014
  - Bottom line: draw a few more ABGs, esp when bili high!
- **Mechanical factors**
  - Ascites
  - Hydrothorax
- **Do cirrhotics get PEs?**

Pulm summary

- OK to tap w mild-mod coagulopathy
- Check more ABGs when Bili > 20
- Drain ascites/hydrothoraces slowly, then speed up

GI - Bleeding



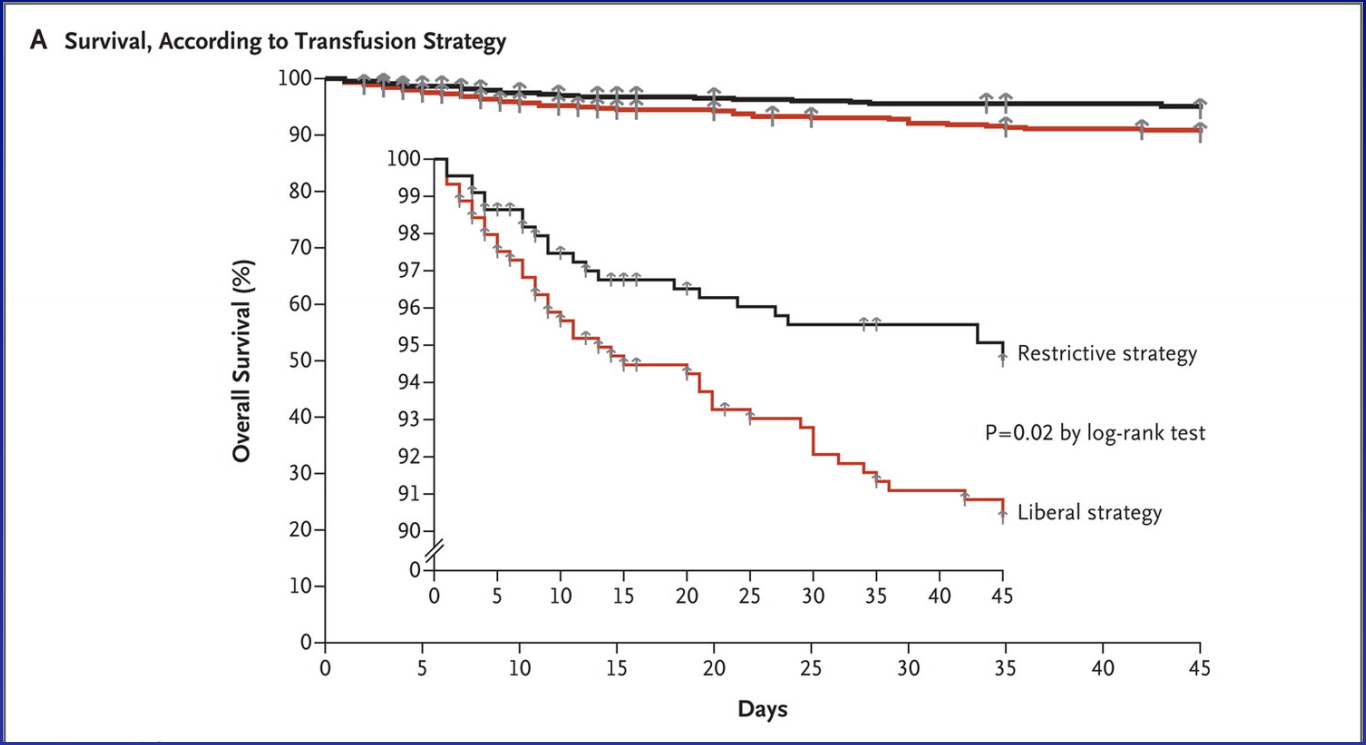
Case 4

- **44yo cirrhotic w/ hematemesis**
  - ED
    - 1L NS + 1u PRBC for Hgb 8, SBP 80
    - Intubated, lined
  - ICU
    - Hgb still 8, SBP 90
    - NGT putting out ~100 cc blood every 20 minutes
- **What's next?**
  - EGD?
  - TIPS?
  - MN tube?

GIB

- **OSH transfers**
  - Airway?
  - IV access?
- **Floor**
  - If unstable or potentially so – ICU
  - If stable, but needs scope – ICU vs GI Lab
    - If ICU, be 100% GI's doing the scope!
- **ICU**
  - By the time you come, INR will be < X!
    - **What is "right" X? (ASGE 2009 guidelines still vague)**
    - Tendon reflex, EM-like, response
      - Airway
      - Large bore IV access; introducer or HD catheter preferred
      - IVF / PRBC resus (transfusion target of _____?)
      - FFP/plts/cryo/vit K for coagulopathy
      - IV octreotide, abx, PPI
      - RUQ w dopplers
      - MN tube for good luck (when to place?)
- **Tell GI + IR to talk directly to each other**

Transfusion



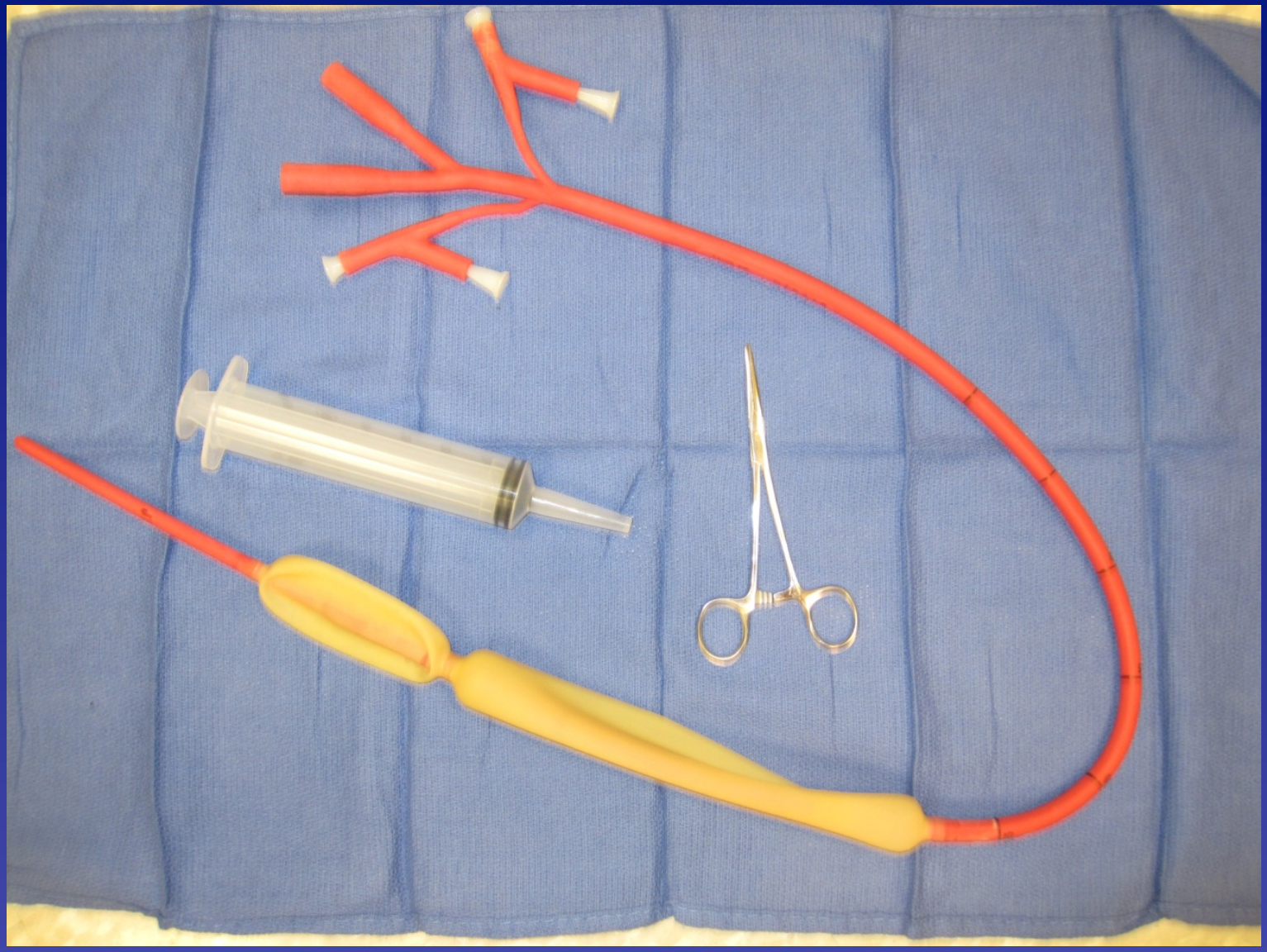
- Restrictive: Hb <7g/dl; Liberal <9g/dl
- Survival significantly higher in the subgroup of patients with cirrhosis and Child's A or B (HR, 0.30; 95% CI, 0.11 to 0.85), but not in those with cirrhosis and Child's C (HR, 1.04; 95% CI, 0.45 to 2.37).
- Within the first 5 days, the HPVG increased significantly in patients assigned to the liberal strategy (P=0.03) but not in those assigned to the restrictive strategy

Villanueva C et al. N Engl J Med 2013;368:11-21

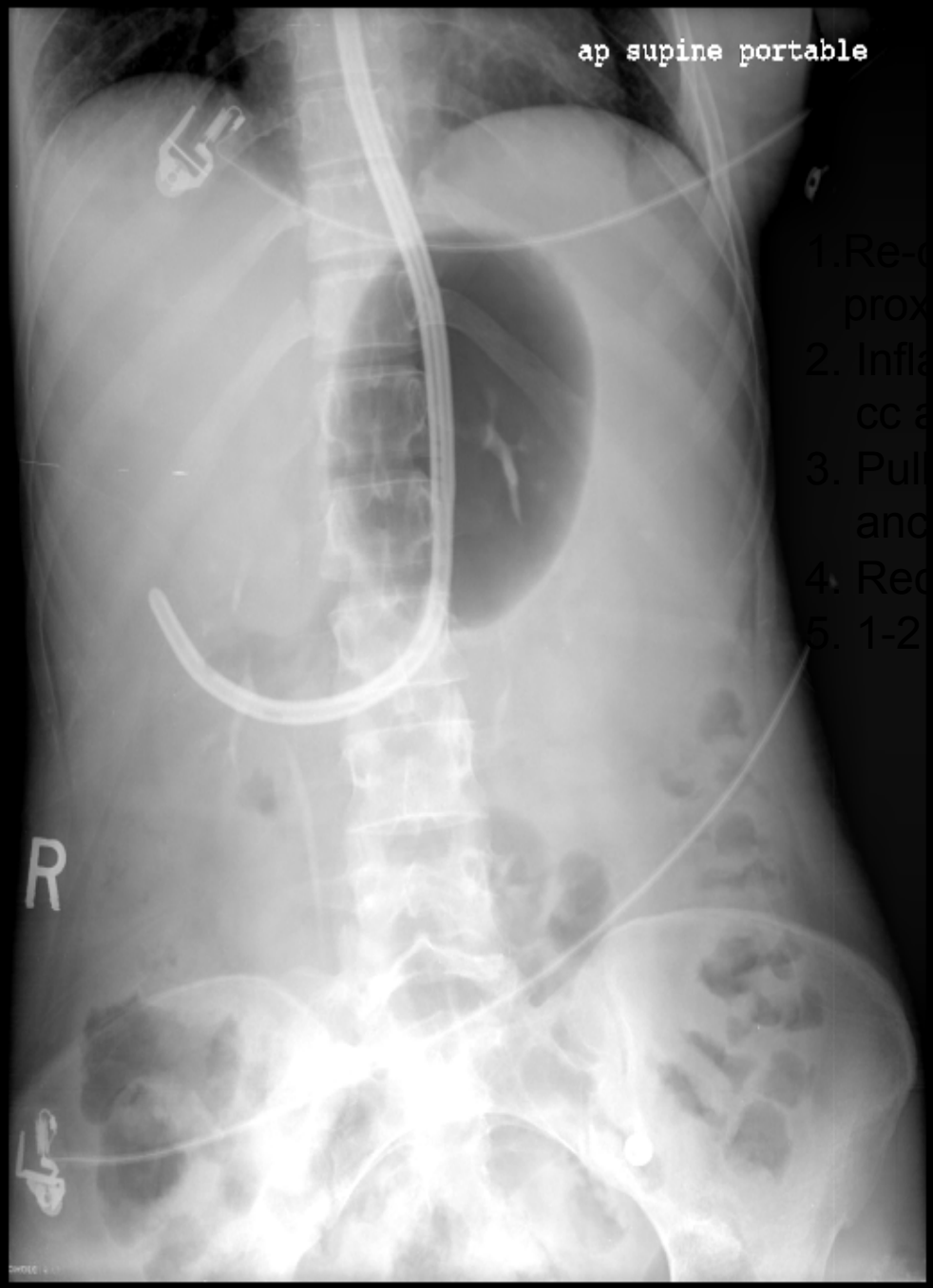
- **ICU**
  - Pre-EGD intubation is TICU default
  - Play anesthesiologist for the GI docs
  - Ask GI: What is rebleed plan?
    - Rpt EGD?
    - Straight to TIPS?
    - Other IR wizardry? (BRTO, embolization)
    - CMO?
- **TIPS…**
  - Nudge GI for bad/recurrent bleeds to do it…

Balloon Tamponade

- Controls bleeding in up to 90% of cases
- Rebleeding > 50% < 24 hrs after deflation
- Mortality of 6-20%
- Mucosal ulceration, strictures, perforation
- Indications : massive uncontrolled bleed
  delay in initial therapy
  unresponsive to therapy



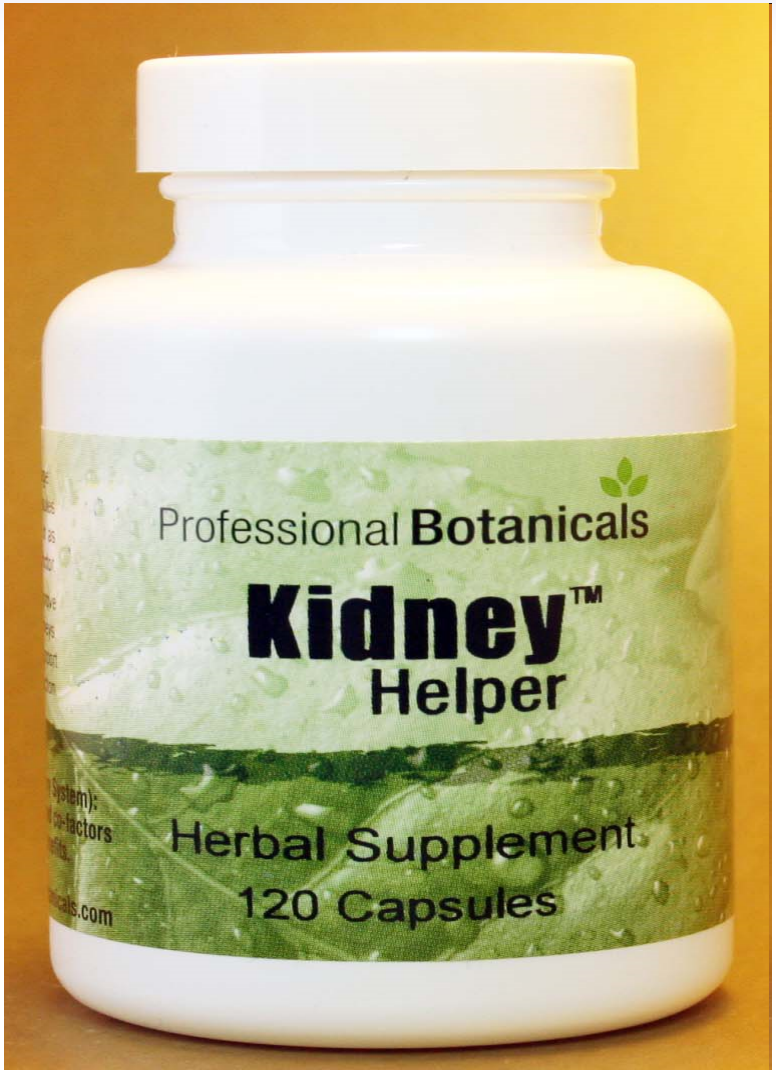
1. Tube inserted to 50 cm
2. Auscultate
3. Inflate gastric balloon with 50 cc air
4. Secure proximally
5. Stat portable XR


ap supine portable
R

GIB summary

- **Intubate suspected variceal bleeding pre-EGD**
- **Transfuse to ~8**
- **Tell GI + IR to talk directly to each other, while you stabilize pt**
- **What's rebleed plan?**
- **Balloon tamponade? – remember 50/50!**
  - 50 cm in, 50 cc air – take Xray!

Renal


Professional Botanicals
Kidney™
Helper
Herbal Supplement
120 Capsules

Case 5

- **65yo cirrhotic with septic shock from PNA, mild ARDS, on small amt norepi**
  - Kidneys slowly worsening
  - No PPV on a-line, no IVC collapse on US
- **What next?**
  - Rx?
  - RRT?

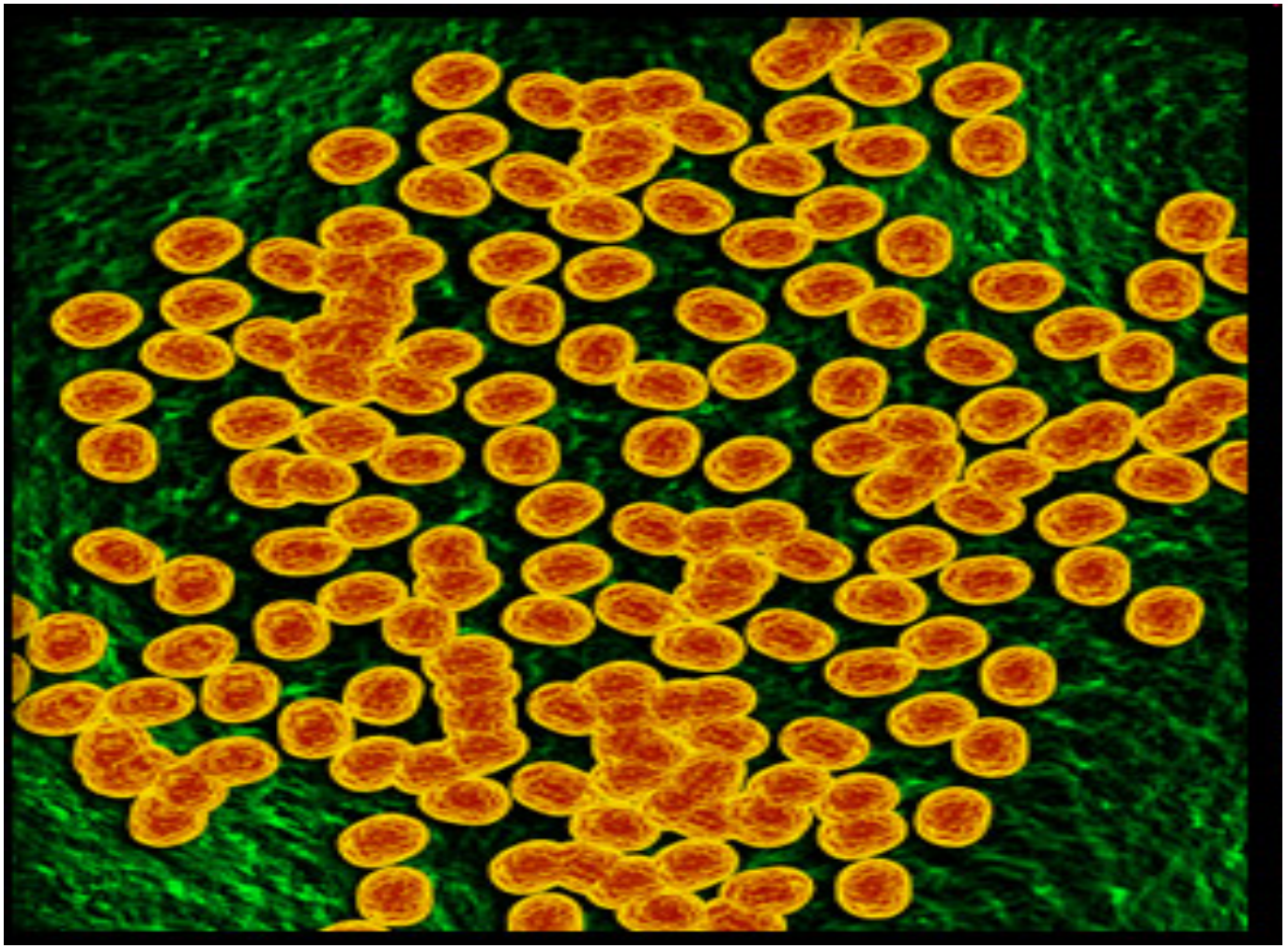
Hepatorenal syndrome

- **Definition**
  - Tanked up? Nothing else wrong? Guess it's HRS!
- **Give fluid!**
- **Drugs? Who knows?**
  - "..seems reasonable to [give] vasoconstrictors and albumin"
    - Gines + Schrier, *Renal Failure in Cirrhosis*, NEJM, Sep 2009
    - Terlipressin most studied, but not available in U.S.
    - We use octreotide+midodrine+SPA
      - Can be done on floor, unlike pressors
  - I've rarely seen effect in an ICU pt
    - Badly need large, definitive, RCT
- **Always d/w patient + family if RRT desired**
  - If not listed, utility minimal

Renal summary

- Cirrhotics get drug/sepsis/etc-induced AKI too
- Carefully err on side of more volume
- Dialysis may not be a good idea…

Infection



Case 6

- **Cirrhotic admitted to TICU for weakness, flu-like symptoms, severe HE**
  - No abdominal tenderness on exam
  - No GI complaints (per reliable spouse)
  - No fever
  - No leukocytosis
- **Tap belly?**

Infection tips / summary

- **Infection likely worsens liver function, and PHTN, per se**
- **TICU handshake = ascites tap**
- **Treat ~ as if transplant pt!**
  - Low threshold for infection hunt
  - Don't rely on fever, white count
- **Intubation a 2-step procedure**
  - Tube, then lung specimen
  - Ditto for any procedure where body fluid can be obtained (e.g. lines, thoracentesis)
- **Albumin for all SBP?**
  - That infamous 1999 NEJM paper…
  - Restrict to elevated BUN, CR, or Bili? (Sigal et al, Gut, 2007)

Liver Limbo

- **"Not at this time" listing decision**
  - 'If pt gets better, we'll reconsider'
- **What are outcomes for ICU ESLD pts given this decision?**
  - % that get better enough to reconsider (and stay better…)
    - % that get listed
      - % that get transplanted
        - % that leave hospital alive w/ acceptable QOL
- **Would be OVERJOYED if that last % is high!**
  - But if it's not…
    - Pts/families deserve to know their cohort's odds
- **Ex: Jeremy Kahn's JAMA 2010 LTAC paper**
  - ICU patients on vent in ICU and LTAC
    - > 2/3 1-year mortality, ½ dead at 3 months
    - Glass 2/3 empty or 1/3 full?

Many unresolved issues

- Should ESLD pts get SQ heparin prophylaxis?
- When is best time to TIPS variceal bleeders?
- Is rifaximin worth the $?
- Does Golytely work?
- Does bilirubin really screw up Pulsox?
- How to standardize ICU care when evidence so weak?

Conclusions

- **Love lactate**
- **Limited RCT data limit strength of recommendations**
- **Observational data**
  - Can’t show causation
  - Can’t individualize predictions
  - But CAN show cohort proportions
    - May help patients + families make better decisions