Medically Optimizing the Intubated Patient

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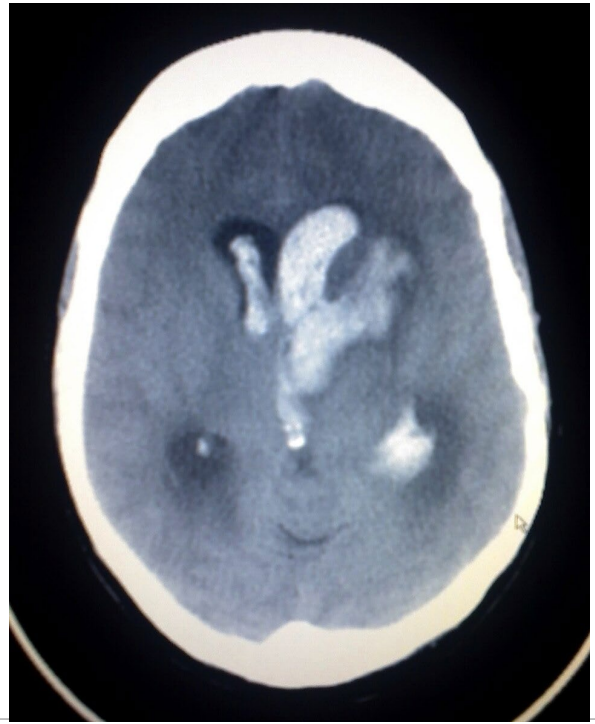
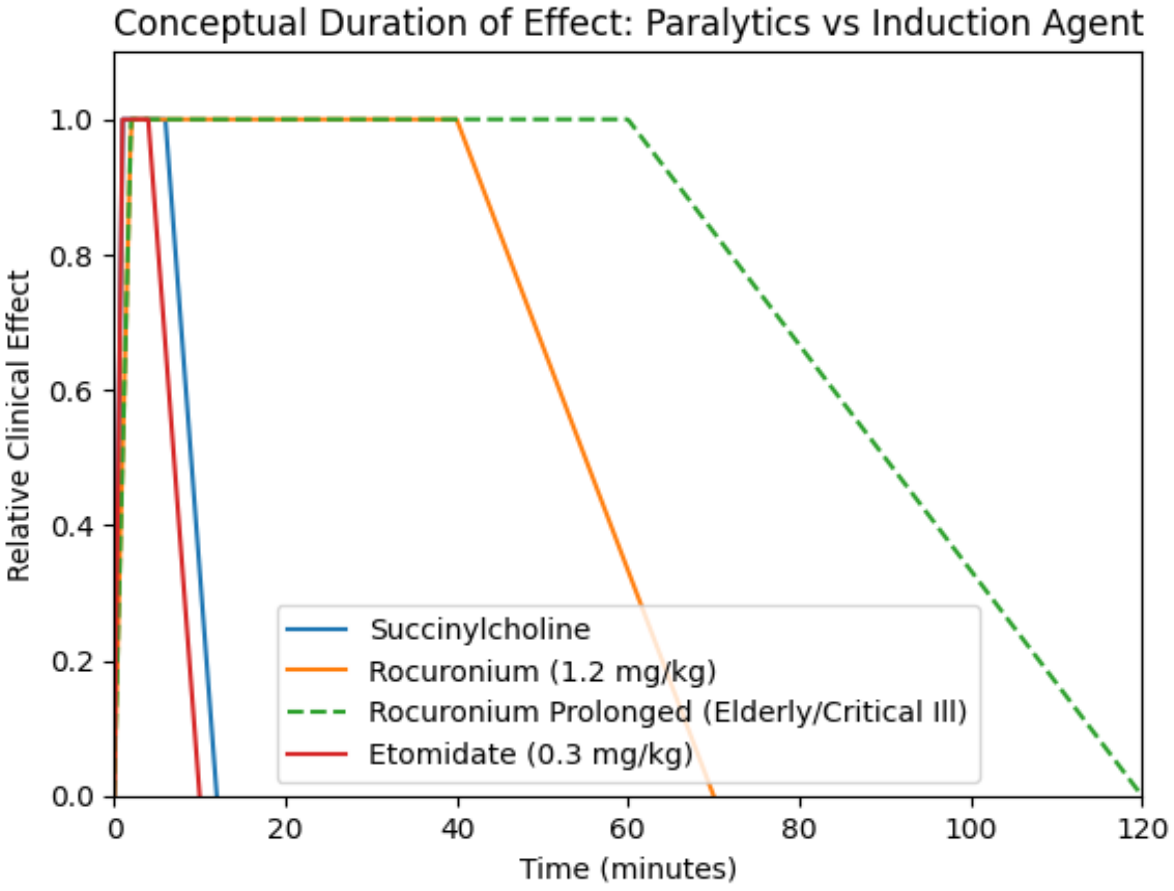
UCSF Health

RSI and Next 15 Minutes


HR
135
bpm
BP
254/181
SYS / DIA
SpO2
68%




Conceptual Duration of Effect: Paralytics vs Induction Agent
Relative Clinical Effect
Time (minutes)
0.0
0.2
0.4
0.6
0.8
1.0
0
20
40
60
80
100
120
Succinylcholine
Rocuronium (1.2 mg/kg)
Rocuronium Prolonged (Elderly/Critical Ill)
Etomidate (0.3 mg/kg)

ETOMIDATE 20 MG
ROCURONIUM 100 MG

GIVE ROC TIME TO WORK, ROC LASTS A LONG TIME

Give Roc First!?

- Etomidate onset ~30 seconds
- Roc onset ~45 seconds
- Hennepin County Hospital
  - Paralytic first: 1254 (56.6%)
  - Induction first: 962 (43.4%)
  - No difference in any complications
  - Higher 1st attempt?
- If the only line is compromised?
- Roc withdrawal phenomenon

TABLE 2 Bayesian logistic regression coefficients estimates and 95% highest-density CrIs for the outcome of first-attempt failure.

Variable	OR estimate	95% CrI
Age	1.27	(1.03–1.53)
Sex, female	0.79	(0.48–1.15)
BMI	0.95	(0.73–1.17)
Sedative agent		
Etomidate	Reference	
Ketamine	0.33	(0.08–0.64)
Paralytic agent		
Succinylcholine	Reference	
Rocuronium	0.75	(0.44–1.08)
Drug sequence order		
Sedative first	Reference	
Paralytic first	0.73	(0.46–1.02)

Note: ORs less than 1 indicate reduction of risk of first-attempt failure.
Abbreviation: CrI, credible interval.

Acad Emerg Med. 2024 Oct 18;32(2):123–129

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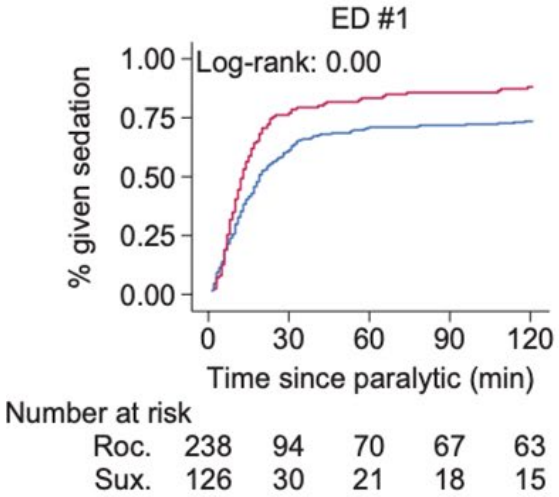
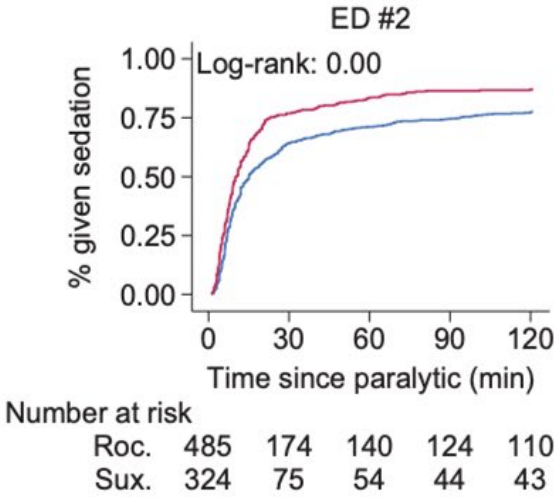
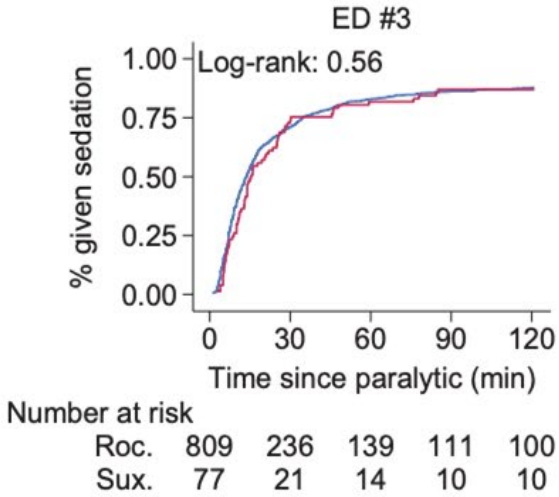
WE INTUBATE PROACTIVELY BUT GIVE ANALGESIA AND SEDATION REACTIVELY

Roc vs Sux







Am J Health Syst Pharm. 2025 May 23;82:S2929-S2936

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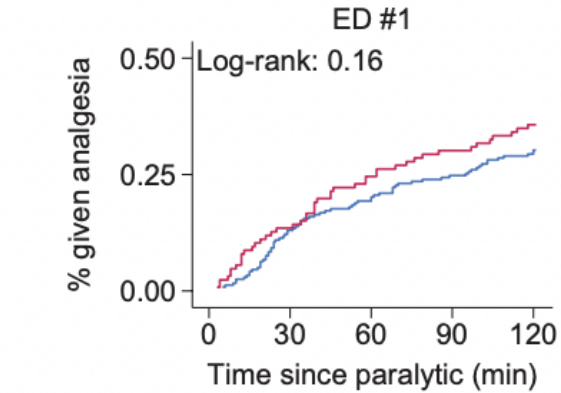

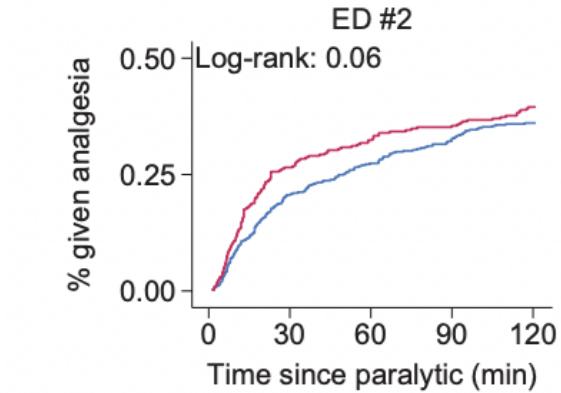

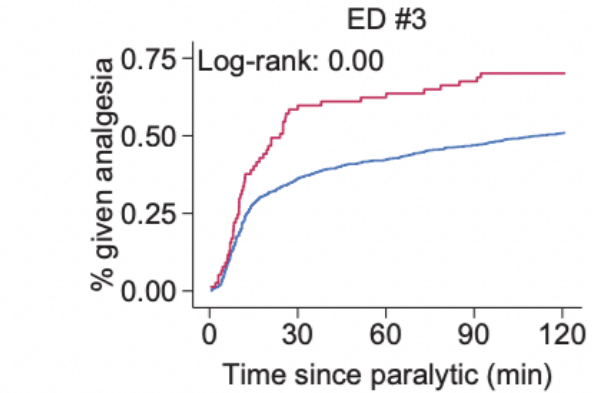

Roc. Sux.

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SUX IS PROTECTIVE FOR ANALGESIA/SEDATION
ROC IS CONVENIENT FOR PROCEDURES

Propofol dosing is low


HR
135
bpm
BP
254/181
SYS / DIA
SpO2
68%


HR
92
bpm
BP
83/60
SYS / DIA
SpO2
100%

Anticipate Post-RSI Hypotension

- ~17% of ED pts = post-RSI complications
- Choice of induction agent?
  - Avoid propofol in sepsis/HF/trauma
  - Etomidate or ketamine ok *(level B)*
- Fluid boluses?
- Push-dose pressors or gtt?
- Do not use pain as a pressor
- As BP rises prioritize analgesia/sedation
  - Then turn down pressors

Crit Care Med. 2023 Oct 1;51(10):1411-1430
Ann Emerg Med. 2025 Aug;86(2):e29-e68

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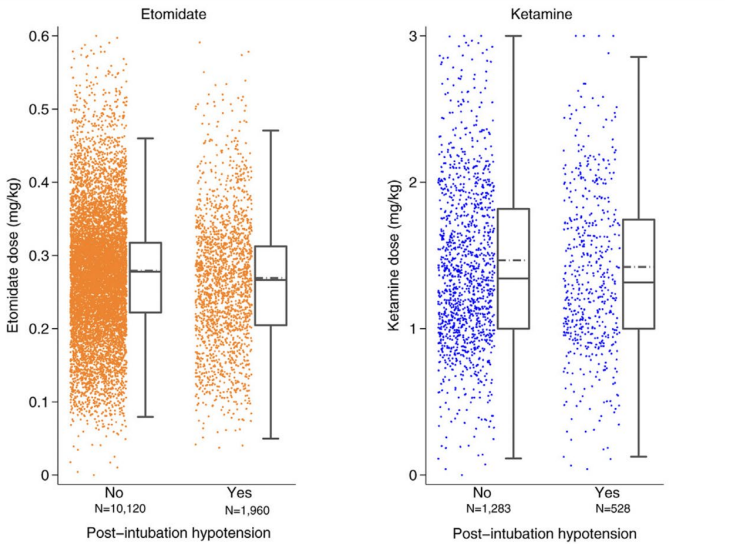
Half-the-dose of RSI Etomidate!?

- ~12,000 patients from National Emergency Airway Registry
  - SBP<100 in 15 minutes post-tube
- Etomidate
  - 16.2% HoTN
  - 0.1 v 0.3 mg/kg=no difference
- Ketamine
  - 29% HoTN
  - 1 vs 1.3 mg/kg=no difference
- "Podcast dosing" = earlier wake-up
- Procedural sedation?



Ann Emerg Med. 2023 Oct;82(4):417-424
Ann Emerg Med. 2025 Aug;86(2):e29-e68

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Ketamine For All!?

- Open label Etomidate vs Ketamine
- 14 EDs and ICUs
- Cardiovascular collapse
  - Ketamine 260/1176 (22.1%)
  - Etomidate 202/1189 (17.0%)
- In-hospital death by day 28
  - Ketamine 330/1173 (28.1%)
  - Etomidate 345/1186 (29.1%)
- Caution in catechol-depleted states

N Engl J Med. 2025 Dec 9:10.

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CAUTION REDUCING ETOMIDATE / KETAMINE
KETAMINE CAN CAUSE HYPOTENSION/CRASH

AWARENESS

Case 5 – Definite

M, 64 (84 kg)

RSI: Ketamine 80 mg + Rocuronium 70 mg

Infusions: Fentanyl + Propofol

"I remember the breathing tube going in, but I could not move."
"I was panicking inside."
"Being paralyzed and remembering it was traumatic."

M, 37 (68 kg)

RSI: Etomidate 20 mg + Succinylcholine 200 mg

Post-intubation: Vecuronium 20 mg

Infusion: Propofol

"I woke up and someone was pulling very hard on my leg."
"Worst pain I've ever had."
"I tried to move but couldn't."

(Open fracture reduction during paralysis.)

Case 23 – Definite

M, 67 (96 kg)

RSI: Etomidate 20 mg + Succinylcholine 100 mg

Infusions: Fentanyl + Propofol

"The breathing tube was being inserted while I was awake."
"I didn't think I could move."

Awareness Post-RSI Risk Factors

- ~3-7% in ED patients
- Long-acting paralytic
- Higher GCS prior to meds
- Painful procedures post-RSI
- Lack of depth of sedation / TOF monitoring
- Withholding analgesia/sedation or underdosing

Ann Emerg Med. 2021 May; 77(5): 532–544
Chest. 2023 Feb;163(2):313-323.
Am J Health Syst Pharm. 2025 May 23;82:S2929-S2936

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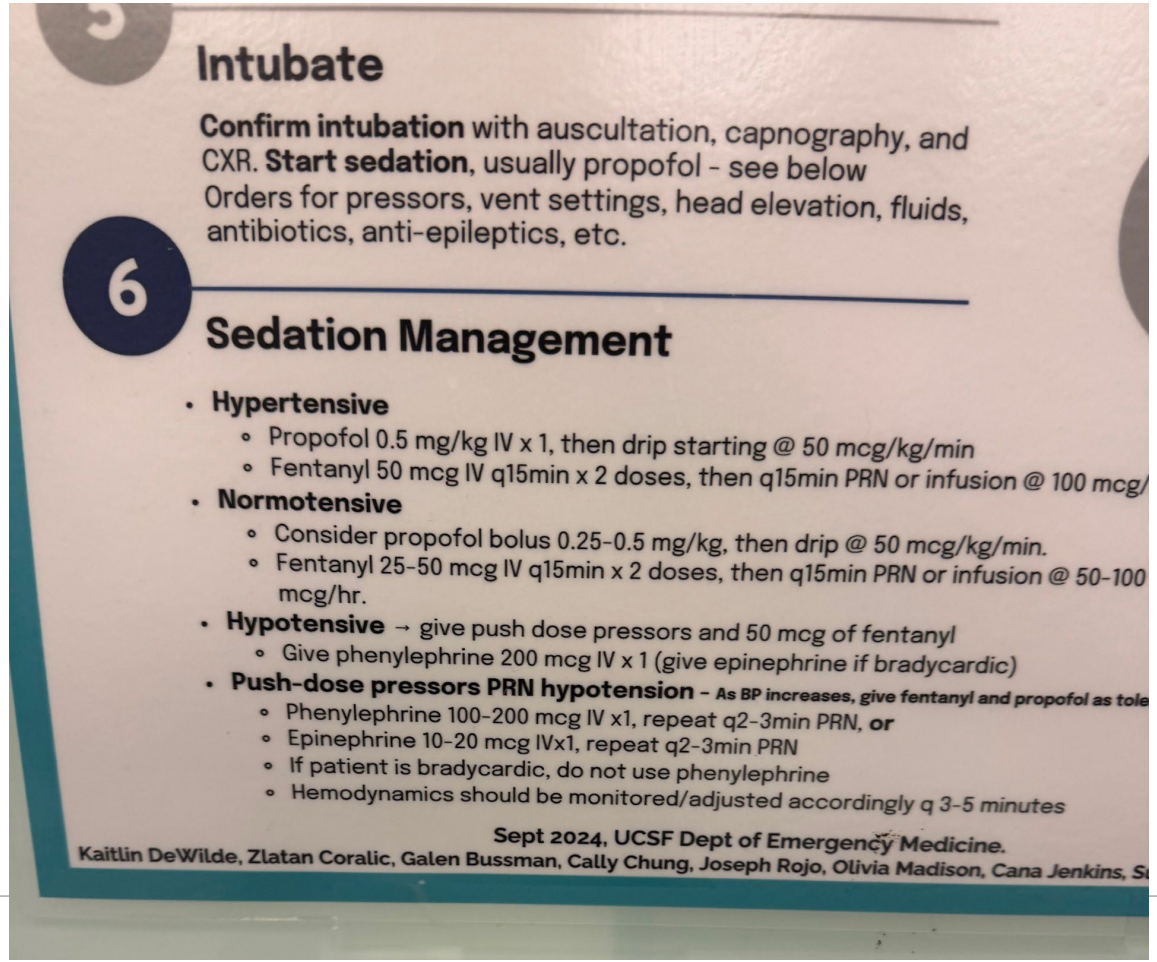
Sugammadex

- Rocuronium/vecuronium reversal agent
- Works ~1 minute
- No rocuronium/vecuronium x 24 hours
- May risk self-extubation
- Cost:
  - 4 mg/kg dose ~ (400 mg): $300
  - 16 mg/kg dose ~(1000 mg): $700

Takeaways

- Caution underdosing induction agents
- Etomidate evaporates in 5 minutes
- Roc takes a minute to start, and lasts for 1-2 hours
- Anticipate analgesia, sedation, and post-RSI HoTN - verbalize plan
- Avoid pain as a pressor
- Caution with sugammadex (self-extubation, need to re-intubate)
- **Your patients can hear you**



Intubate

Confirm intubation with auscultation, capnography, and CXR. **Start sedation**, usually propofol - see below
Orders for pressors, vent settings, head elevation, fluids, antibiotics, anti-epileptics, etc.

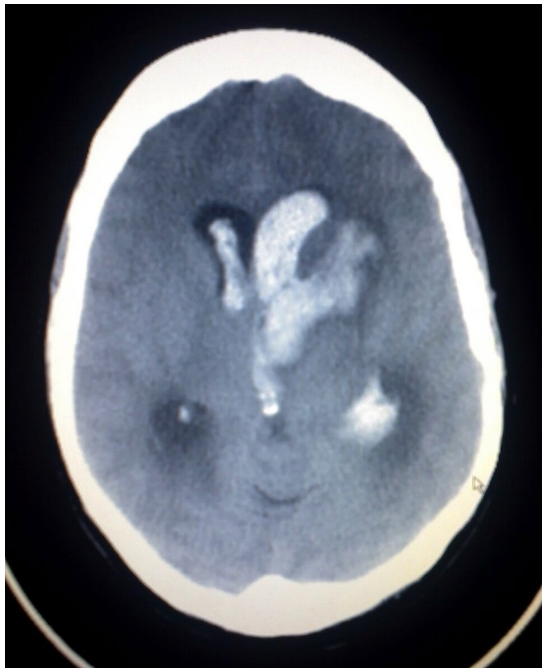
6

Sedation Management

- **Hypertensive**
  - Propofol 0.5 mg/kg IV x 1, then drip starting @ 50 mcg/kg/min
  - Fentanyl 50 mcg IV q15min x 2 doses, then q15min PRN or infusion @ 100 mcg/
- **Normotensive**
  - Consider propofol bolus 0.25-0.5 mg/kg, then drip @ 50 mcg/kg/min.
  - Fentanyl 25-50 mcg IV q15min x 2 doses, then q15min PRN or infusion @ 50-100 mcg/hr.
- **Hypotensive** → give push dose pressors and 50 mcg of fentanyl
  - Give phenylephrine 200 mcg IV x 1 (give epinephrine if bradycardic)
- **Push-dose pressors PRN hypotension** – As BP increases, give fentanyl and propofol as tole
  - Phenylephrine 100-200 mcg IV x1, repeat q2-3min PRN, **or**
  - Epinephrine 10-20 mcg IVx1, repeat q2-3min PRN
  - If patient is bradycardic, do not use phenylephrine
  - Hemodynamics should be monitored/adjusted accordingly q 3-5 minutes

Sept 2024, UCSF Dept of Emergency Medicine.
Kaitlin DeWilde, Zlatan Coralic, Galen Bussman, Cally Chung, Joseph Rojo, Olivia Madison, Cana Jenkins, S

NSX at bedside

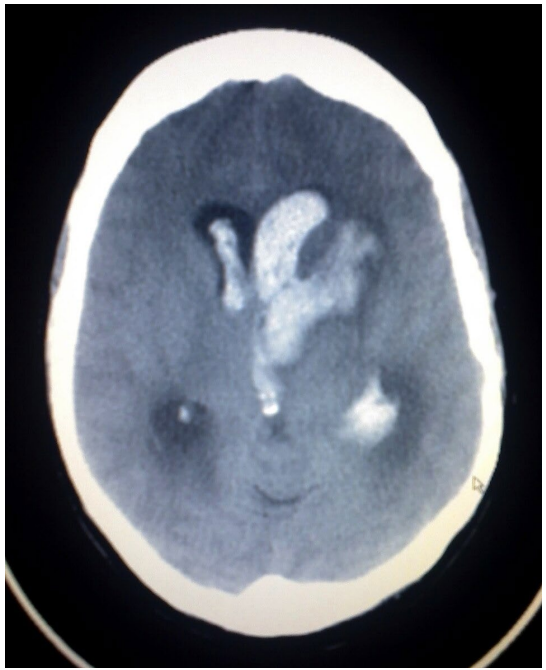


1. Turn off sedation
2. Painful stimuli
3. Give labetalol
4. See you in OR

Or

1. Brain death?

NSX at bedside



1. Place patient in soft restraints
2. Get more bodies in room
3. Plan for analgesia/sedation after exam
4. Get suction ready
5. If roc, give sugammadex
6. Wait….
7. Exam over -> bolus analgesia/sedation, restart gtts
8. See you in OR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