

Rap #7, 03/16 Regions Rap Summary (Neurology)

Friday, March 4 2016, 2:05 PM

Rap #7, 03/16 Regions Rap Summary (Neurology)

Ketamine Brain Continuum (Emergency Medicine Updates 12/25/13, Authored by Reuben Strayer) - Reviewed by Brian Mehus

- [ERCast Brain on Ketamine](#) - podcast with Reuben Strayer and Rob Orman discussing this topic
- Overview
 - Ketamine can have wide range of effects at various doses
 - Analgesia
 - Recreational dose
 - Partially dissociated
 - Dissociated
 - Ketamine was developed in the 1960s as a dissociative anesthetic that would induce less craziness in people than PCP
 - Mechanism
 - NMDA receptor antagonism
 - Interferes with the ability of outside information to get into the brain
 - High doses lead to dissociation
 - Patients maintain airway reflexes and cardiorespiratory function
 - Unable to perceive any external stimuli
- Historical complications include
 - Elevated ICP
 - Elevated IOP
 - Worsening agitation in psychiatric disease
 - These have mostly been debunked
- **Analgesic Dose (0.1-0.3 mg/kg)**
 - Minimal to no effect on perception or emotion
 - Good second line agent (maybe even first line...)
 - When opiates are not adequate
 - Hypotensive patients
 - Pushing ketamine accentuates effects on awareness
 - Can provide higher doses for analgesia without pushing pt into recreational territory by setting up a drip
 - Drip setup
 - 50 mg/ml ketamine (usual dose)
 - Add 5 mL ketamine to 250mL NS bag
 - Now you have a 1mg/ml solution
 - Give 20mL in first 10 minutes
 - Then 20mL/ hour
 - Also provides continuous analgesia while push dose ketamine lasts 15-20 minutes
- **Recreational Dose (0.2-0.5 mg/kg)**
 - Great analgesia but also induces a wicked high
 - Can typically converse and follow commands
 - This dose range does not typically induce psychiatric distress
- **Partially-Dissociative Dose (0.4-0.8 mg/kg)**
 - Patients still have some awareness and ability to make some purposeful movements, but limited connection with outside world, reality or their bodies
 - May be unable to move, see, hear, or talk, these abilities may fade in and out
 - Kinda terrifying
- **Dissociative Dose (>0.7 mg/kg)**
 - Awake but unconscious
 - Patient does not perceive any external stimuli, sights, sounds, or pain.
 - Brain does not build memories.
 - May have nystagmus and reflexive movements but are incapable of volitional action
 - Cardiorespiratory function preserved or stimulated
- Overlapping dose ranges for different stages
 - These are variable between patients
 - Effects are consistent at:
 - Low dose for pain (<0.1 mg/kg)
 - High dose for dissociation (2 mg/kg)
 - Anything in between can be unpredictable.
 - Can avoid these intermediate stages by providing adequate initial dose for full dissociation.
- Psychiatric Distress/Emergence Phenomenon

- o If patient develops psychiatric distress on initial sedation attempt, give more ketamine to fully dissociate
- o Emergence phenomenon
 - o Patient begins re-integrating external stimuli as they pass through the partially-dissociated stage of the continuum
 - o Author argues that management of emergence phenomenon/psych distress is more straightforward and safer than managing potential cardiorespiratory adverse effects of conventional sedative medications
- o Mind is activated but disconnected
- o Deactivate the mind with midazolam or propofol
- o Incidence of emergence can be reduced with:
 - o Pre-induction comfort
 - o Aggressive analgesia prior to procedure if patient has pain
 - o Pre-induction coaching - tell patients they are going to have vivid dreams, choose a good one.
- Wide Margin of Safety
 - o Dissociation threshold
 - o At a certain point, higher doses do not produce further effect
 - o Higher doses only prolong duration of sedation
 - o One study examined inadvertent Ketamine overdoses
 - o No severe adverse outcomes in 9 cases of children receiving from 5 to 100x the intended dose of ketamine
 - o prolonged sedation in all 9 children (3-24 hours)
 - o brief respiratory depression in 4 children, 2 needed assisted ventilation
 - o 2 children without respiratory difficulty or hypoxemia were prophylactically intubated
 - o One notable case: 3 year old boy given 800mg of Ketamine instead of 8mg when nurse mistook 100mg/mL bottle for a 1mg/mL bottle. Pt had normal onset of sedation, no oxygen desaturations noted. Mistake was realized, physician noted "erratic respirations" despite normal O2 sats and was prophylactically intubated. Pt woke up and was extubated after 9 hours. No hypoxemia or hemodynamic compromise throughout his hospital stay.

• **Bottom Line: Go big (or small) or go home.**

• **Evaluation**

- o [AIR Grade:](#)

Tier 1: BEEM Rater Scale	Score-choose only 1	Tier 2: Content accuracy	Score-choose only 1	Tier 3: Educational Utility	Score-choose only 1	Tier 4: EBM	Score-choose only 1	Tier 5: Referenced	Score-choose only 1
Assuming that the results of this article are valid, how much does this article impact on EM clinical practice?		Do you have any concerns about the accuracy of the data presented or conclusions of this article?		Are there useful educational pearls in this article for residents?		Is this article reflect evidence based medicine (EBM) and thus lack bias?		Are the authors and literature clearly cited?	
Useless information	<input type="radio"/>	Yes, many concerns from many inaccuracies	<input type="radio"/>	Low value: No valuable pearls	<input type="radio"/>	Not EBM based, only expert opinion (and thus more biased)	<input type="radio"/>	No	<input type="radio"/>
Not really interesting, not really new, changes nothing	<input type="radio"/>		<input type="radio"/>		<input type="radio"/>		<input type="radio"/>		<input type="radio"/>
Interesting and new, but doesn't change practice	<input type="radio"/>	Yes, a major concern about few inaccuracies	<input type="radio"/>	Yes, but there are only a few (1-2) valuable or multiple (>=3) less-valuable educational pearls	<input type="radio"/>	Minimally EBM based	<input checked="" type="radio"/>		<input checked="" type="radio"/>
Interesting and new, has the potential to change practice	<input checked="" type="radio"/>		<input type="radio"/>		<input type="radio"/>		<input type="radio"/>		<input type="radio"/>
New and important: this would probably change practice for some EPs	<input type="radio"/>	Minimal concerns over minor inaccuracies	<input checked="" type="radio"/>	Yes, there are several (>=3) valuable educational pearls, or a few (1-2) KEY educational pearls that every resident should know before graduating	<input checked="" type="radio"/>	Mostly EBM based	<input type="radio"/>		<input type="radio"/>
New and Important: this would change practice for most EPs	<input type="radio"/>		<input type="radio"/>		<input type="radio"/>		<input type="radio"/>		<input type="radio"/>
This is a "must know" for EPs	<input type="radio"/>	No concerns over inaccuracies	<input type="radio"/>	Yes, there are multiple KEY educational pearls that residents should know before graduating	<input type="radio"/>	Yes exclusively EBM based (unbiased)	<input type="radio"/>	Yes	<input type="radio"/>
Your Score	4		5		5		3		3

- o 4 - Interesting, has potential to change practice for providers not as familiar with dosing and safety of ketamine
- o 5 - Minimal concerns over accuracy
- o 5 - Several good pearls about dosing, and margin of safety
- o 3 - Minimally evidence based - did provide links to studies busting myths of ketamine contraindications and evidence for margin of safety, but the remainder was mostly expert opinion
- o 3 - clearly written by one author, links to other studies but not everything clearly cited

Sepsis 3.0? (First 10 EM 2/25/16, Authored by Justin Morgenstern)- Reviewed by Sakib Motalib

Sakib's presentation regarding this topic



- Nice video from JAMA



- Lot's of coverage on the topic:

- [PulmCrit Sepsis 3.0 Take](#)
- [EMCrit Sepsis 3 Take](#)
- [EMCrit Additional Thoughts](#)
- [REBEL EM Sepsis 3 Take](#)
- [FOAMCast Sepsis 3 Take](#)
- [St. Ellyn's Sepsis 3 Take](#)

- Definitions:

- Sepsis
 - Life threatening organ dysfunction caused by dysregulated host response to infection = INFECTION + ORGAN DYSFUNCTION
- Organ Dysfunction
 - Now defined by [SOFA score](#)
 - an acute change in total [SOFA score](#) ≥ 2 points consequent to the infection
- qSOFA
 - Screening tool used to screen for sepsis
 - Hypotension (SBP ≤ 100 mmHg)
 - Altered mental status (GCS ≤ 13)
 - Tachypnea (resp rate ≥ 22)
- Septic Shock
 - Sepsis with persisting hypotension requiring vasopressors to maintain MAP ≥ 65 mm Hg and having a serum lactate level >2 mmol/L (18 mg/dL) despite adequate volume resuscitation



- **First question: Why do we need these new definitions?**

- Sepsis is a broad, syndromic term that is difficult to define.
 - Distinguishing sepsis from uncomplicated infection, which is a primary goal here, is reasonable.
 - Clearly there are patients that meet the current definition of "sepsis" who we don't worry about i.e. influenza
- Whereas there are many sick patients that don't meet SIRS criteria.
- Argument for new definition
 - Public awareness of sepsis is poor.
 - Although this may be true, the number of patients who come to the emergency department because they are worried about an infection clearly indicates that the public is aware of serious infectious diseases.
 - Making the definition highly technical and based on laboratory findings will do nothing to help the public understand sepsis.
 - "Health care practitioners require improved clinical prompts and diagnostic approaches to facilitate earlier identification and an accurate quantification of the burden of sepsis".
 - Unsure of the evidence regarding this statement.
 - Sepsis experts have argued that [ProCESS](#), [ARISE](#) and [ProMISe](#) all failed to show a benefit to protocolized care because we are getting so good at treating sepsis.

- **How good are these new definitions?**

- In this large retrospective database review, SOFA had a higher association with mortality than SIRS in ICU patients
 - Area under the curve 0.74; 95% CI, 0.73-0.76 versus 0.64; 95% CI, 0.62-0.66.
 - This was not compared to clinical judgement.
- Outside of the ICU, SOFA and SIRS were almost the same.
 - Area under the curve 0.79; 95% CI, 0.78-0.80 versus 0.76; 95% CI, 0.75-0.77.
 - So for our emergency department patients, there may be little difference.
- What about qSOFA?
 - Similar predictive value to the SOFA score
 - Not prospectively validated
 - Is fully clinical.
 - Is this useful?
 - How many hypotensive patients with altered mental status were you missing the diagnosis of sepsis in?
 - Needs to be compared to usual care.

- **How bad is SIRS?**

- "The current use of 2 or more SIRS criteria to identify sepsis was unanimously considered by the task force to be unhelpful."
 - SIRS criteria are neither sensitive nor specific.
 - However, if they are truly unhelpful, how exactly have we been identifying sepsis for the last decade?
 - Argues using clinical judgment in addition to the SIRS criteria.
 - Clinical judgement will likely apply when interpreting the SOFA score.

- In order to have sepsis you have to have a SOFA score ≥ 2 , but you also need an infection.
 - To diagnose infection you'll need changes in temperature, white blood cell count, heart rate, and respiratory rate.
 - ie SIRS criteria.

• Is it worth the work?

- The current definition of sepsis is not ideal.
- Blog author argues that there is nothing in this paper to convince me that the new definitions are any better.
- Changing the definition of sepsis is not a trivial matter.
- A lot of money has been spent developing sepsis protocols around the world.
- All of our current research uses the old definitions. Without evidence that these new definitions result in patient oriented clinical benefit, I see no reason to adopt these definitions into daily emergency medicine practice.

• Discussion

- New definitions recognize that "there are inherent challenges in defining sepsis and septic shock".
- Sepsis is a very broad term
 - Applied to a heterogenous, incompletely understood condition.
- Unsure if these new definitions are clinically relevant and should change management.
- At this point, the definitions that guide management should still be those used in the clinical trials.
- "Neither qSOFA nor SOFA is intended to be a stand-alone definition of sepsis"

• Bottom line

- Not ready for prime time without prospective validation
- Could this be helpful?
 - Sure but more to come.
- Sepsis is currently very well treated.
- New definitions could help, but they could also harm.
- We should not be in any rush to change without validation.

• Evaluation

- [AIR Grade:](#)

Tier 1: BEEM Rater Scale	Score-choose only 1	Tier 2: Content accuracy	Score-choose only 1	Tier 3: Educational Utility	Score-choose only 1	Tier 4: EBM	Score-choose only 1	Tier 5: Referenced	Score-choose only 1
Assuming that the results of this article are valid, how much does this article impact on EM clinical practice?		Do you have any concerns about the accuracy of the data presented or conclusions of this article?		Are there useful educational pearls in this article for residents?		Is this article reflect evidence based medicine (EBM) and thus lack bias?		Are the authors and literature clearly cited?	
Useless information	<input type="radio"/>	Yes, many concerns from many inaccuracies	<input type="radio"/>	Low value: No valuable pearls	<input type="radio"/>	Not EBM based, only expert opinion (and thus more biased)	<input type="radio"/>	No	<input type="radio"/>
Not really interesting, not really new, changes nothing	<input type="radio"/>		<input type="radio"/>		<input type="radio"/>		<input type="radio"/>		<input type="radio"/>
Interesting and new, but doesn't change practice	<input type="radio"/>	Yes, a major concern about few inaccuracies	<input type="radio"/>	Yes, but there are only a few (1-2) valuable or multiple (>=3) less-valuable educational pearls	<input type="radio"/>	Minimally EBM based	<input type="radio"/>		<input type="radio"/>
Interesting and new, has the potential to change practice	<input checked="" type="radio"/>		<input checked="" type="radio"/>		<input checked="" type="radio"/>		<input type="radio"/>		<input type="radio"/>
New and important: this would probably change practice for some EPs	<input type="radio"/>	Minimal concerns over minor inaccuracies	<input type="radio"/>	Yes, there are several (>=3) valuable educational pearls, or a few (1-2) KEY educational pearls that every resident should know before graduating	<input type="radio"/>	Mostly EBM based	<input checked="" type="radio"/>		<input type="radio"/>
New and Important: this would change practice for most EPs	<input type="radio"/>		<input type="radio"/>		<input type="radio"/>		<input type="radio"/>		<input type="radio"/>
This is a "must know" for EPs	<input type="radio"/>	No concerns over inaccuracies	<input type="radio"/>	Yes, there are multiple KEY educational pearls that residents should know before graduating	<input type="radio"/>	Yes exclusively EBM based (unbiased)	<input type="radio"/>	Yes	<input checked="" type="radio"/>
Your Score	4		4		4		5		7

[REBEL EM tPA for Stroke Overview \(R.E.B.E.L. EM 11/9/15, Authored by Salim Rezaie\) - Reviewed by Maria Goertz](#)

Lytics for Stroke

MAST-I → No Benefit
 ECASS-I → No Benefit
 NINDS-1 → No Benefit
 NINDS-2 → 12% Disability Benefit
 MAST-E → Stopped Early Deaths Incr 9%
 ASK → Stopped Early Deaths Incr 16%
 ECASS-2 → No Benefit
 ATLANTIS-B → Stopped Early Deaths Incr 14%
 ATLANTIS-A → Stopped Early Deaths Incr 16%
 DIAS-2 → Stopped Early Death Incr 16%
 ECASS-3 → 8% Disability Benefit
 IST-3 → No Benefit
 DIAS-3 → No Benefit

- ACEP Clinical Policy 2015
 - Is IV TPA safe and effective for patients with acute ischemic stroke if given within 3 hours of symptom onset?
 - Level B recommendations: IV TPA should be offered and given to selected patients within 3 hours after symptom onset
 - Level C recommendations: Shared decision making between patient and health care team should include discussion of benefits and harms of administering TPA
 - Is IV TPA safe and effective for patients with acute ischemic stroke treated between 3 to 4.5 hours after symptom onset?
 - Level B recommendations: IV TPA may be offered and may be given to carefully selected patients with acute ischemic stroke.
 - Level C recommendations: Shared decision making between patient and health care team should include discussion of benefits and harms of administering TPA
- tPA in Stroke Deeper Dives
 - [SMART EM Overview on tPA in Stroke](#)
 - [SMART EM Update After IST-3](#)

Interventional Therapy for Large Vessel Occlusion Stroke

IMS-III → No Benefit
 MR RESCUE → No Benefit
 SYNTHESIS → No Benefit
 MR CLEAN → 23% Disability Benefit
 ESCAPE → 24% Disability Benefit
 EXTEND IA → 31% Disability Benefit
 SWIFT PRIME → 26% Disability Benefit
 REVASCAT → 16% Disability Benefit

- What should we take away from the above endovascular studies?
 - Only a very limited population will benefit from endovascular therapy
 - Patients with "severe strokes"
 - Proximal large vessel occlusions (anterior circulation)
 - Salvageable brain tissue (small infarcted core and collateral blood flow)
- **Evaluation**

o [AIR Grade:](#)

Tier 1: BEEM Rater Scale	Score-choose only 1	Tier 2: Content accuracy	Score-choose only 1	Tier 3: Educational Utility	Score-choose only 1	Tier 4: EBM	Score-choose only 1	Tier 5: Referenced	Score-choose only 1
Assuming that the results of this article are valid, how much does this article impact on EM clinical practice?		Do you have any concerns about the accuracy of the data presented or conclusions of this article?		Are there useful educational pearls in this article for residents?		Is this article reflect evidence based medicine (EBM) and thus lack bias?		Are the authors and literature clearly cited?	
Useless information	<input type="radio"/>	Yes, many concerns from many inaccuracies	<input type="radio"/>	Low value: No valuable pearls	<input type="radio"/>	Not EBM based, only expert opinion (and thus more biased)	<input type="radio"/>	No	<input type="radio"/>
Not really interesting, not really new, changes nothing	<input type="radio"/>		<input type="radio"/>		<input type="radio"/>		<input type="radio"/>		<input type="radio"/>
Interesting and new, but doesn't change practice	<input type="radio"/>	Yes, a major concern about few inaccuracies	<input type="radio"/>	Yes, but there are only a few (1-2) valuable or multiple (>=3) less-valuable educational pearls	<input type="radio"/>	Minimally EBM based	<input type="radio"/>		<input type="radio"/>
Interesting and new, has the potential to change practice	<input type="radio"/>		<input type="radio"/>		<input type="radio"/>		<input type="radio"/>		<input type="radio"/>
New and important: this would probably change practice for some EPs	<input checked="" type="radio"/>	Minimal concerns over minor inaccuracies	<input type="radio"/>	Yes, there are several (>=3) valuable educational pearls, or a few (1-2) KEY educational pearls that every resident should know before graduating	<input checked="" type="radio"/>	Mostly EBM based	<input type="radio"/>		<input type="radio"/>
New and Important: this would change practice for most EPs	<input type="radio"/>		<input checked="" type="radio"/>		<input type="radio"/>		<input checked="" type="radio"/>		<input type="radio"/>
This is a "must know" for EPs	<input type="radio"/>	No concerns over inaccuracies	<input type="radio"/>	Yes, there are multiple KEY educational pearls that residents should know before graduating	<input type="radio"/>	Yes exclusively EBM based (unbiased)	<input type="radio"/>	Yes	<input checked="" type="radio"/>
Your Score	5		6		5		6		7

- Extra, Extra – Endovascular Stroke Treatment – David Newman, MD on EMRAP July 2015
 - o 2013 trials: No benefit
 - o MR CLEAN/ESCAPE/EXTEND IA: Most patients had TPA before endovascular therapy. All had large vessel occlusions.

• MR CLEAN:

- o Non blinded.
- o Industry sponsored.
- o Usual care versus usual care + endovascular (received TPA).
- o 0-6 hours.
- o Large vessel occlusion.
- o Median NIHSS 17.
- o Neurologic status at 90 days.
- o Modified RANKIN score 0-2 independent at 90 days à 33% - 19% = 14%,
- o NNT 7.
- o 6% complications.
- o Did not prove ischemic penumbra.
- o Terrible outcomes in this study 66% of patients were dependent or dead at 90 days.

• EXTEND IA

- o Industry supported.
- o Usual care versus usual care + endovascular (all received TPA).
- o Large vessel occlusion distal ICA, MCA, anterior cerebral artery
- o Perfusion scan – large penumbra with small ischemic core on perfusion CT
 - o Different than MR CLEAN
- o Median NIHSS 15.
- o Modified RANKIN 0-2. 72%-->39% = 33%.
- o NNT 3.
- o Stopped early because data from MR CLEAN.
- o 6% complications
- o ESCAPE
 - o Industry supported.
 - o Usual care versus usual care + endovascular. (did not require TPA prior).
 - o Proximal occlusion.
 - o ¾ of patients had TPA before.
 - o Ischemic penumbra + small core on CT angiography.
 - o 0-12 hours could be enrolled.
 - o NIHSS 17.
 - o Stopped early because data from MR CLEAN.
 - o 53%- 29% = 24%
 - o NNT 4.
 - o Mortality reduction 13%-->6%. NNT 15.
 - o 6% complications

- Non blinded trials and stopped early so could have exaggerated the effects.
- Selection is key to endovascular treatment.
- REVASCAT

- Usual care versus usual care + endovascular (did not have to have TPA prior).
- Proximal occlusion.
- Used ASPECTS (Alberta stroke program early CT score) score to determine amount of ischemic core.
- 0-8 hours enrolled.
- Stopped early because of positive results from previous trials.
- NIHSS 17.
- Modified Rankin 0-2 at 90 days 44%-->28%= 16%.
- NNT 6.5.
- Rates of death 18% in thrombectomy versus 15.5% in control.
- Stopped early because of presentation of other trials "loss of equipoise"
- SWIFT PRIME
 - Industry sponsored.
 - Usual care versus usual care + endovascular (received TPA).
 - Proximal occlusion.
 - 0-6 hours enrolled.
 - Ischemic penumbra.
 - Modified Rankin 0-2 at 90 days 60% à 35% = 25%.
 - NNT4.
 - Stopped early because of efficacy

Hangng Patient (EMDocs 2/16/16, Authored by Angela Hua) - Reviewed by Edgar Austria

- Definitions
 1. Hanging – Death from a form of strangulation that involves suspension by the neck
 2. Near Hanging – Patients who survive from a hanging injury long enough to reach the hospital
 3. Complete Hanging - Whole body hangs off the ground
 4. Incomplete Hanging – Some part of the body is touching the ground
- Epidemiology
 - Hanging is the SECOND most common form of successful suicide in the US (1st in UK and Canada)
 - It is the most common form of successful suicide in the jail system
- Pathophysiology
 - Judicial hanging – drop is at least the height of the victim, hanging is complete
 - Neck hyperextends à fracture of the upper cervical spine (MC = spondylolisthesis of C2 "hangman's fracture")
 - Transection of spinal cord
 - Other injuries:
 - Death ultimately results from cerebral hypoxia, neuronal death
 - Airway compromise plays minimal role in immediate death; survivors may suffer significant pulmonary injuries (ARDS, aspiration, etc.)
- Physical Exam Findings
 - Abrasions, lacerations, contusions, edema to the neck
 - Tardieu spots
 - Subpleural/subpericardial petechiae observed in the tissues of someone who has been strangled or otherwise asphyxiated (autopsy finding)
 - Pain to trachea with gentle palpation
 - Laryngeal fracture
 - Stridor, muffled voice, respiratory distress
 - Hypoxia (late finding)
 - Mental status changes
- ED Care
 - ABCs, cardiac monitor
 - ET intubation, cricothyrotomy or percutaneous translaryngeal ventilation if unsuccessful
 - Fluid resuscitation
 - Judiciously (at risk for ARDS, cerebral edema)
 - Altered patient – treat as cerebral edema with elevated ICP
 - Imaging studies:
 - Soft tissue radiograph
 - CXR
 - CT head/neck
 - Consider CTA head/neck, MRA head/neck
 - All near-hanging victims and those with vascular compromise should be admitted for 24 hours even if initial presentation benign (risk of delayed airway/pulmonary complications)
- Complications
 - Respiratory complications are a major cause of delayed mortality in near-hanging victims
 - Pulmonary edema
 - Neurogenic
 - Massive sympathetic discharge
 - Often associated with anoxic brain injury
 - Poor prognosis

- Post-obstructive
 - Due to marked intrapleural pressure generated by forceful inspiration against extrathoracic obstruction
 - Can be rapid onset leading to ARDS
- Aspiration pneumonia
- Carotid dissection/thrombus formation
- Tracheal stenosis
- Neuro Sequelae
 - Transient hemiplegia
 - Seizures
 - Central cord syndrome
 - Spinal cord injuries
- Prognosis
 - GCS on initial presentation is NOT a predictor of outcome
 - Predictors of poor outcome:
 - Anoxic brain injury on imaging
 - Long hanging time
 - Cardiopulmonary arrest
 - Cervical spine injury
 - Hypotension on arrival
 - PaO2/FiO2 <100 on arrival

• Evaluation

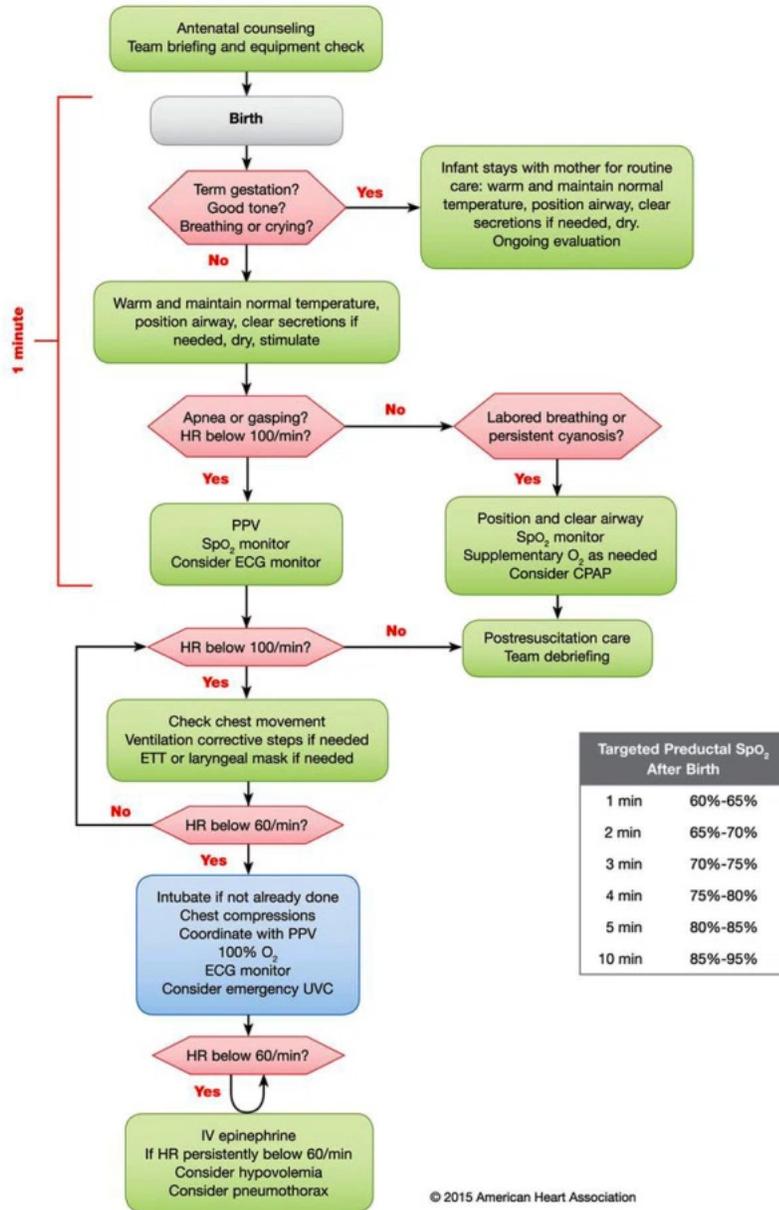
- [AIR Grade:](#)

Tier 1: BEEM Rater Scale	Score-choose only 1	Tier 2: Content accuracy	Score-choose only 1	Tier 3: Educational Utility	Score-choose only 1	Tier 4: EBM	Score-choose only 1	Tier 5: Referenced	Score-choose only 1
Assuming that the results of this article are valid, how much does this article impact on EM clinical practice?		Do you have any concerns about the accuracy of the data presented or conclusions of this article?		Are there useful educational pearls in this article for residents?		Is this article reflect evidence based medicine (EBM) and thus lack bias?		Are the authors and literature clearly cited?	
Useless information	<input type="radio"/>	Yes, many concerns from many inaccuracies	<input type="radio"/>	Low value: No valuable pearls	<input type="radio"/>	Not EBM based, only expert opinion (and thus more biased)	<input type="radio"/>	No	<input type="radio"/>
Not really interesting, not really new, changes nothing	<input type="radio"/>		<input type="radio"/>		<input type="radio"/>		<input type="radio"/>		<input type="radio"/>
Interesting and new, but doesn't change practice	<input type="radio"/>	Yes, a major concern about few inaccuracies	<input type="radio"/>	Yes, but there are only a few (1-2) valuable or multiple (>=3) less-valuable educational pearls	<input type="radio"/>	Minimally EBM based	<input type="radio"/>		<input type="radio"/>
Interesting and new, has the potential to change practice	<input checked="" type="radio"/>		<input type="radio"/>		<input type="radio"/>		<input type="radio"/>		<input type="radio"/>
New and important: this would probably change practice for some EPs	<input type="radio"/>	Minimal concerns over minor inaccuracies	<input type="radio"/>	Yes, there are several (>=3) valuable educational pearls, or a few (1-2) KEY educational pearls that every resident should know before graduating	<input checked="" type="radio"/>	Mostly EBM based	<input checked="" type="radio"/>		<input type="radio"/>
New and Important: this would change practice for most EPs	<input type="radio"/>		<input type="radio"/>		<input type="radio"/>		<input type="radio"/>		<input type="radio"/>
This is a "must know" for EPs	<input type="radio"/>	No concerns over inaccuracies	<input checked="" type="radio"/>	Yes, there are multiple KEY educational pearls that residents should know before graduating	<input type="radio"/>	Yes exclusively EBM based (unbiased)	<input type="radio"/>	Yes	<input checked="" type="radio"/>
Your Score	4		7		5		5		7

[Neonatal Resuscitation](#) (First 10 EM 11/2/15, Authored by Justin Morgenstern) - Reviewed by Kayla Odegard

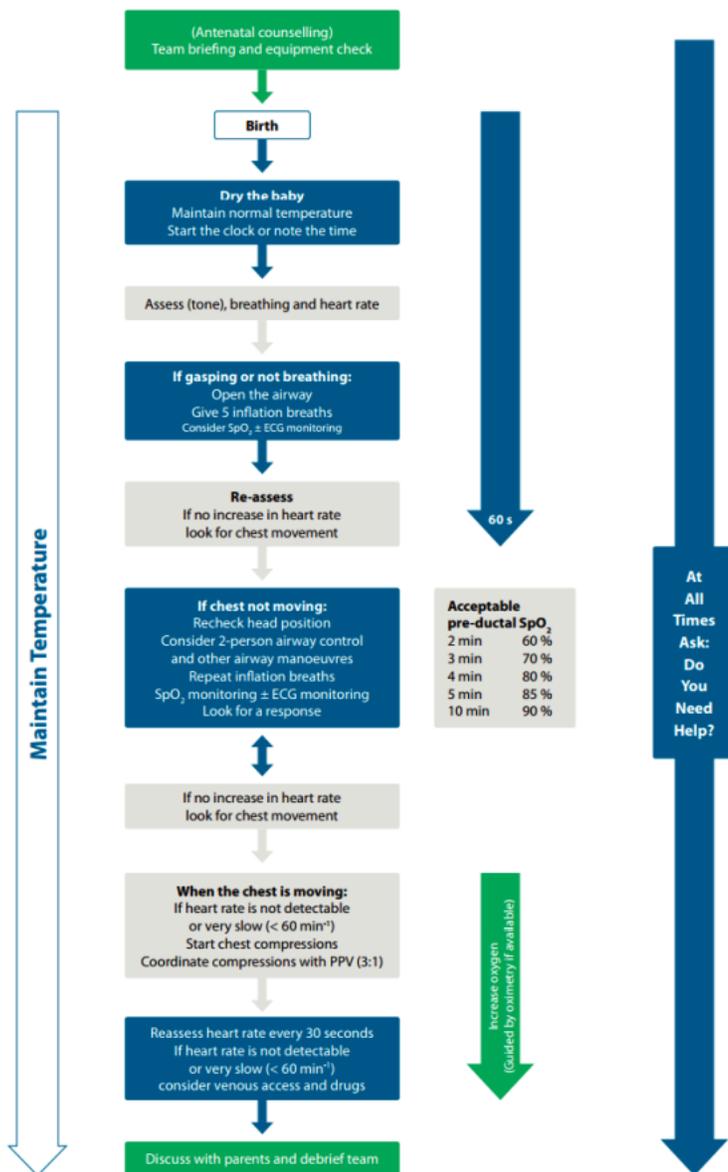
AHA NRP Algorithm

Neonatal Resuscitation Algorithm—2015 Update



ERC NRP Algorithm

Newborn Life Support



- NRP Updates:
 - Don't intubate and suction for meconium → same procedure w/ and w/o meconium
 - HR via ECG leads
 - CPAP OK
- 3 Questions
 1. Term?
 2. Tone?
 3. Breathing or crying?
- Initial evaluation
 - Stimulate, position, warm
 - Don't rub babies less than 28 weeks
 - Instead wrap baby in plastic
- First 30 seconds
 - Evaluate:
 - HR
 - Respiration
 - Color
 - Tone

- If HR <100 or apneic
 - BVM 30-60/min
 - O2 sat probe
 - EKG leads
- If there is central cyanosis or labored breathing
 - Position
 - Clear airway
 - 100% O2
 - O2 sat probe
 - consider CPAP
- At 60 seconds
 - Re-evaluate:
 - HR
 - Respiration
 - Color
 - Tone
 - If HR 60-100
 - BVM
 - If difficult consider
 - LMA (if >34 weeks)
 - Intubate
 - If HR <60
 - CPR 3:1
 - 90 compressions and 30 breaths/min,
 - Intubate
 - Obtain IV Access
 - Umbilical line
- At 90 seconds
 - Re-evaluate:
 - HR
 - Respiration
 - Color
 - Tone
 - If HR <60
 - Epi at 0.01mg/kg
 - Continue CPR
 - DON'T use atropine
 - No longer recommended
- 120 seconds
 - Re-evaluate:
 - HR
 - Respiration
 - Color
 - Tone
 - If HR <60
 - Fluid bolus 10mL/kg
 - Evaluate for PTX (ultrasound)
- Ventilation problems
 - Obstruction
 - ie meconium aspiration
 - Management options
 - Suction
 - Intubate
 - Prone
 - LMA
 - Reposition
 - BVM
- Lung problem
 - PTX
 - 10 Fr chest tube
 - Diaphragmatic hernia
 - Get CXR

- Intubate ASAP
- Right mainstem ETT
 - CXR
 - Adjust tube
 - Tube depth ~3x tube size
- Management
 - Get CXR
- Not breathing
 - Hypoglycemia
 - D10W bolus 2mL/kg
 - Then D10W 4mL/kg/hr
 - Opiates
 - Naloxone 0.1mg/kg IV or IM
- Cardiac
 - Consider in ongoing cyanosis or bradycardia despite good ventilations
 - PGE 0.1mcg/kg/min IV
- Hemorrhagic shock
 - ie abruption
 - O neg blood ASAP (10 mL/kg)
- Sepsis
 - Culture
 - Early antibiotics
- Normal Oxygen levels
 - At 1 min 60-65%
 - At 2 min 65-70%
 - At 3 min 70-75%
 - At 4 min 75-80%
 - At 5 min 80-85%
 - At 10 min 85-95%
- Evaluation
 - [AIR Grade:](#)

Tier 1: BEEM Rater Scale	Score-choose only 1	Tier 2: Content accuracy	Score-choose only 1	Tier 3: Educational Utility	Score-choose only 1	Tier 4: EBM	Score-choose only 1	Tier 5: Referenced	Score-choose only 1
Assuming that the results of this article are valid, how much does this article impact on EM clinical practice?		Do you have any concerns about the accuracy of the data presented or conclusions of this article?		Are there useful educational pearls in this article for residents?		Is this article reflect evidence based medicine (EBM) and thus lack bias?		Are the authors and literature clearly cited?	
Useless information	<input type="radio"/>	Yes, many concerns from many inaccuracies	<input type="radio"/>	Low value: No valuable pearls	<input type="radio"/>	Not EBM based, only expert opinion (and thus more biased)	<input type="radio"/>	No	<input type="radio"/>
Not really interesting, not really new, changes nothing	<input type="radio"/>		<input type="radio"/>		<input type="radio"/>		<input type="radio"/>		<input type="radio"/>
Interesting and new, but doesn't change practice	<input type="radio"/>	Yes, a major concern about few inaccuracies	<input type="radio"/>	Yes, but there are only a few (1-2) valuable or multiple (>=3) less-valuable educational pearls	<input type="radio"/>	Minimally EBM based	<input type="radio"/>		<input type="radio"/>
Interesting and new, has the potential to change practice	<input type="radio"/>		<input type="radio"/>		<input type="radio"/>		<input checked="" type="radio"/>		<input type="radio"/>
New and important: this would probably change practice for some EPs	<input type="radio"/>	Minimal concerns over minor inaccuracies	<input type="radio"/>	Yes, there are several (>=3) valuable educational pearls, or a few (1-2) KEY educational pearls that every resident should know before graduating	<input type="radio"/>	Mostly EBM based	<input type="radio"/>		<input type="radio"/>
New and Important: this would change practice for most EPs	<input type="radio"/>		<input checked="" type="radio"/>		<input type="radio"/>		<input type="radio"/>		<input type="radio"/>
This is a "must know" for EPs	<input checked="" type="radio"/>	No concerns over inaccuracies	<input type="radio"/>	Yes, there are multiple KEY educational pearls that residents should know before graduating	<input checked="" type="radio"/>	Yes exclusively EBM based (unbiased)	<input type="radio"/>	Yes	<input checked="" type="radio"/>
Your Score	7		6		7		4		7

Edited by Joe Walter