BoB TALK

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EBM Worth Spreading

BoB TALK

BEEM | BEST EVIDENCE IN EMERGENCY MEDICINE

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South Huron Hospital

- Farming community of 4,000
- 5 bed ED, 10,000 visits/yr and 19 in-patient beds
- No lab or xray after 7pm
- No CT scanner
- 2 units of O-neg
- We are the “ologists”

The Little Hospital That Does

BEEM

- Knowledge translation and dissemination project
- Started in 2005
- Founded by Dr. Andrew Worster, McMaster
- Does not have any financial or other affiliation with any commercial organization

Dr. Worster
BEEM Founder

BEEM Filter

McMaster University

Health Information Research Unit
Evidence-Based Health Informatics

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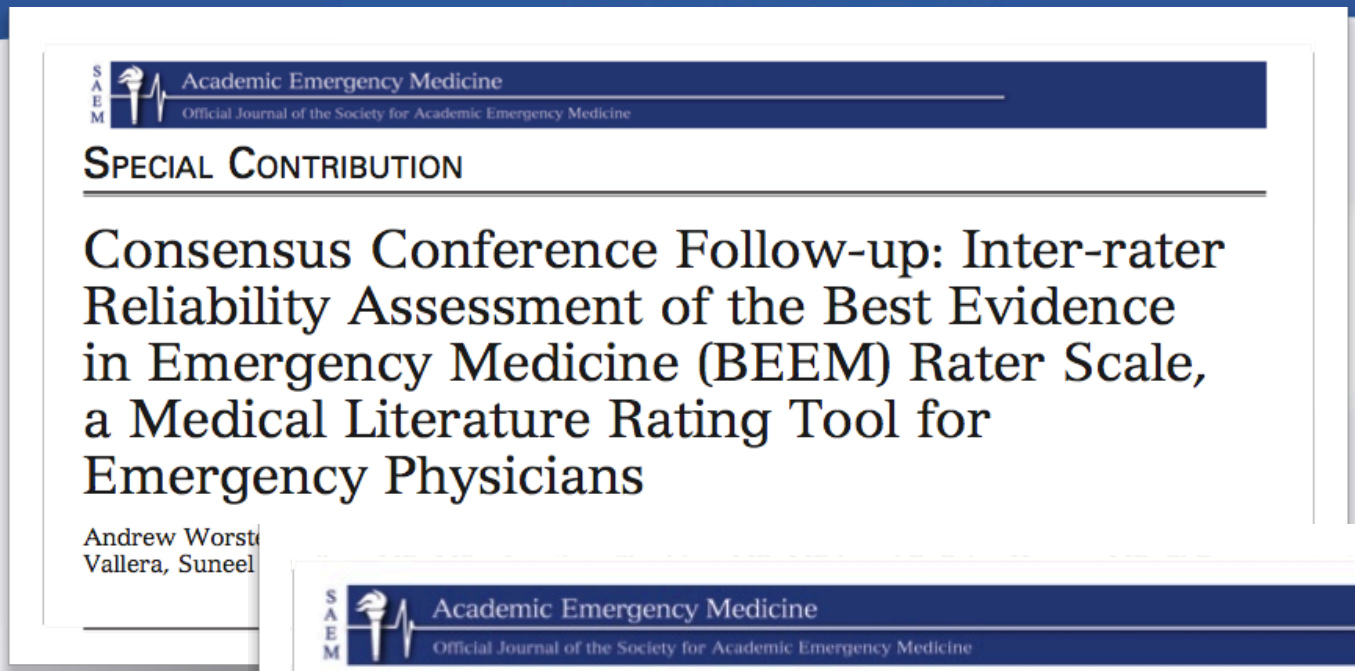
Reliable and Validated Tool

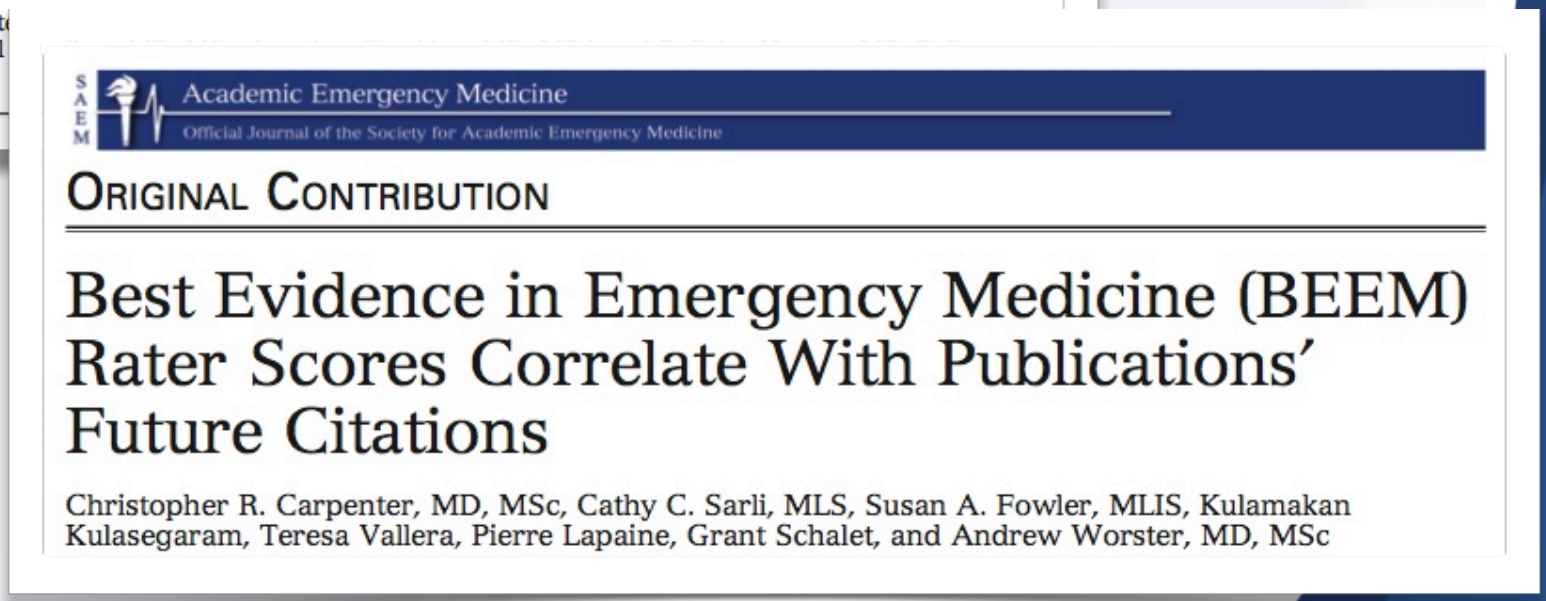


Academic Emergency Medicine
Official Journal of the Society for Academic Emergency Medicine

SPECIAL CONTRIBUTION

Consensus Conference Follow-up: Inter-rater Reliability Assessment of the Best Evidence in Emergency Medicine (BEEM) Rater Scale, a Medical Literature Rating Tool for Emergency Physicians

Andrew Worst
Vallera, Suneel



Academic Emergency Medicine
Official Journal of the Society for Academic Emergency Medicine

ORIGINAL CONTRIBUTION

Best Evidence in Emergency Medicine (BEEM) Rater Scores Correlate With Publications' Future Citations

Christopher R. Carpenter, MD, MSc, Cathy C. Sarli, MLS, Susan A. Fowler, MLIS, Kulamakan Kulasegaram, Teresa Vallera, Pierre Lapaine, Grant Schalet, and Andrew Worster, MD, MSc

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Evidence Based Medicine Worth Spreading

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BoB Talk Objectives:

- **Recent ED Papers**
  - Pediatric Strep Throat
  - Hypothermia OHCA
  - Honey for Cough
  - ACLS for OHCA
  - Pediatric Vitals
  - Thrombolysis for CVA

- **www.TheSGEM.com**

Disclosure

- Physician in Ontario
- Medical Director and Division Head, Peds ER, McMaster
- No industry sponsorship
- Images ‘borrowed’ liberally from the internet

Modification: T. Chan

Signs and Symptoms of Streptococcal Pharyngitis

Clinical Case

- 6 year old girl:
  - Presents with symptoms of a URTI including fever
  - On exam: Enlarged tonsils with pus, cervical nodes, no cough

Clinical Case

- What do you do?
  1. Treat with antibiotics
  2. No antibiotics
  3. Swab and treat
  4. Swab and don't treat

Clinical Case

- Why?
  1. My gut feeling
  2. Avoid unnecessary abx
  3. Avoid letters of complaint
  4. Risk score (i.e. McIssac)

Warning!

Accuracy and Precision of the Signs and Symptoms of Streptococcal Pharyngitis in Children: A Systematic Review

Nader Shaikh, MD, MPH[1], Nithya Swaminathan, MD[2], and Emma G. Hooper, BA[1]

- Non-Cochrane systematic review (2012)
- Good literature search, limits on language, limited grey literature search
- Some methodological changes
  - Age change from 2-18y to 0-24y
  - Antibiotic use removed as exclusion

Accuracy and Precision of the Signs and Symptoms of Streptococcal Pharyngitis in Children: A Systematic Review

Nader Shaikh, MD, MPH[1], Nithya Swaminathan, MD[2], and Emma G. Hooper, BA[1]

- Authors wanted to perform a meta-analysis
  - Excluded studies that could not be combined
  - Risk of ignoring potentially useful
- 34 papers included

EBM Moment

- No such thing as perfect evidence
- Can only find 'best'
- EBM is more than the evidence…

Table III. Accuracy of history and physical examination elements in the diagnosis of streptococcal pharyngitis sorted according to overall positive LR

Symptoms and signs	Positive LR (95% CI)	Negative LR (95% CI)	Sensitivity (95% CI)	Specificity (95% CI)
Scarlatiniform rash[16,36,38,42,44,49,51,54-57]	3.91 (2.00-7.62)	0.94 (0.90-0.97)	0.08 (0.05-0.14)	0.98 (0.95-0.99)
Palatal petechiae[36-38,41,47-49,51,53,54,57,60]	2.69 (1.92-3.77)	0.90 (0.86-0.94)	0.15 (0.10-0.21)	0.95 (0.91-0.97)
Chills[34,36]	2.16 (0.94-4.96)	0.88 (0.79-0.98)	0.21 (0.18-0.24)	0.90 (0.83-0.97)
Anorexia[36,44]	1.98 (0.83-4.75)	0.53 (0.26-1.10)	0.62 (0.12-1.11)	0.62 (0.12-1.12)
Pharyngeal exudate[35,45,50,54,58,59]	1.85 (1.58-2.16)	0.78 (0.74-0.82)	0.38 (0.32-0.44)	0.79 (0.73-0.84)
Vomiting[17,34,36,39,48,49,54]	1.79 (1.56-2.06)	0.85 (0.81-0.90)	0.28 (0.21-0.36)	0.84 (0.79-0.89)
Tender cervical nodes*[14,16,26,35,36,38,41,49,54,60,61]	1.72 (1.54-1.93)	0.78 (0.75-0.81)	0.40 (0.35-0.46)	0.77 (0.71-0.82)
Sibling with sore throat[48,55]	1.71 (0.82-3.53)	0.92 (0.82-1.03)	0.18 (0.14-0.23)	0.89 (0.83-0.94)
Halitosis[44,51]	1.54 (0.79-2.99)	0.95 (0.81-1.12)	0.12 (0.05-0.29)	0.92 (0.86-0.99)
Tonsillar and/or pharyngeal exudate[16,26,34,36,43,46-49,52,60-62]	1.40 (1.10-1.77)	0.86 (0.75-0.98)	0.37 (0.28-0.46)	0.74 (0.68-0.78)
Large cervical nodes*[16,26,35,36,42,44,45,48-50,52,54,56-59,61,62]	1.39 (1.16-1.67)	0.67 (0.53-0.84)	0.64 (0.50-0.76)	0.54 (0.41-0.67)
Lack of cough[14,16-18,26,34,36,41,42,44,49,52,54,55,57-59,62]	1.36 (1.18-1.56)	0.59 (0.48-0.73)	0.73 (0.66-0.78)	0.46 (0.38-0.55)
Tonsillar exudates[38,39,44,49,50,53,55,57]	1.35 (0.98-1.87)	0.81 (0.63-1.06)	0.46 (0.27-0.67)	0.66 (0.48-0.80)
Tonsillar swelling[39,45,50,54,57,61]	1.27 (1.04-1.54)	0.67 (0.52-0.85)	0.70 (0.64-0.76)	0.44 (0.32-0.57)
Dysphagia[34,39,48,50,54,60]	1.22 (1.00-1.48)	0.68 (0.51-0.91)	0.72 (0.55-0.85)	0.41 (0.23-0.62)
Headache[17,18,34,36,39,44,47,49,51,57,58]	1.22 (0.95-1.57)	0.90 (0.77-1.04)	0.39 (0.28-0.51)	0.68 (0.58-0.76)
Lack of coryza[14,16-18,26,39,42,44,49,52,55,57,58]	1.21 (1.08-1.35)	0.69 (0.55-0.88)	0.72 (0.64-0.79)	0.40 (0.34-0.48)
Abdominal pain[18,34,36,39,44,48,49,51,54,56,57]	1.18 (0.92-1.51)	0.95 (0.89-1.03)	0.24 (0.19-0.30)	0.79 (0.75-0.83)
Red tonsils and/or pharynx[26,35,38,42,46-48,60]	1.13 (0.96-1.33)	0.41 (0.16-1.02)	0.93 (0.85-0.96)	0.18 (0.09-0.35)
Reported fever[14,36,47,48,52,56,58-60,62]	1.07 (0.96-1.19)	0.86 (0.67-1.11)	0.71 (0.58-0.82)	0.33 (0.23-0.49)
Red tonsils[50,53,54]	1.07 (0.86-1.34)	0.82 (0.40-1.69)	0.80 (0.60-1.00)	0.25 (0.00-0.51)
Red pharynx[45,50,53,58]	1.06 (0.95-1.18)	0.56 (0.27-1.17)	0.93 (0.81-0.98)	0.12 (0.03-0.34)
Documented temperature >38° or >38.5°C[16-18,26,35,39,42,43,46,49,51,54,57]	1.02 (0.87-1.21)	0.98 (0.83-1.15)	0.50 (0.36-0.63)	0.51 (0.38-0.65)
Summer[47,57]	0.86 (0.61-1.20)	1.02 (1.00-1.05)	0.13 (0.00-0.33)	0.85 (0.65-1.04)
Arthralgia[44,54]	0.74 (0.18-3.08)	1.02 (0.97-1.06)	0.09 (0.00-0.25)	0.90 (0.77-1.04)
Conjunctivitis[36,42,44,54]	0.73 (0.46-1.16)	1.02 (0.98-1.05)	0.05 (0.02-0.11)	0.94 (0.85-0.98)
Acute otitis media[36,55]	0.65 (0.14-2.91)	1.04 (0.93-1.16)	0.03 (0.01-0.05)	0.94 (0.84-1.04)
History of tonsillectomy[36,40]	0.64 (0.49-0.84)	1.07 (1.03-1.11)	0.11 (0.08-0.13)	0.84 (0.81-0.86)
Hoarseness[17,18,34,36,37,39,41,44,54,58]	0.62 (0.46-0.83)	1.04 (1.03-1.06)	0.06 (0.03-0.12)	0.90 (0.85-0.93)
Diarrhea[17,36,44]	0.51 (0.33-0.79)	1.04 (0.99-1.11)	0.03 (0.00-0.06)	0.93 (0.86-1.00)

*Because data from articles reporting on "cervical node enlargement" (location not specified) were very similar to the data from articles reporting on "anterior cervical node enragement," they were combined. Similarly, data on "cervical node tenderness" and "anterior cervical node tenderness" were combined.

Accuracy and Precision of the Signs and Symptoms of Streptococcal Pharyngitis in Children: A Systematic Review

Nader Shaikh, MD, MPH[1], Nithya Swaminathan, MD[2], and Emma G. Hooper, BA[1]

Table IV. Clinical prediction rules for streptococcal pharyngitis in children with sore throat*

Prediction rule	Description	Score	LR† (95% CI)
Breese score‡[18,34,63]	9-category scoring system §	>30	2.58 (2.15-3.09)
Centor score[59,61-65]	One point for each of the following findings:	0	0.57 (0.44-0.74)
	History of fever, exudate, absence of cough,	1	0.47 (0.40-0.55)
	tender nodes	2	1.23 (0.76-1.98)
		3 or 4	1.73 (1.28-2.35)
McIssaac score[14,63,66-69]	One point for each of the following findings:	1	0.38 (0.21-0.69)
	Temperature ≥38°C, no cough,	2	0.54 (0.35-0.85)
	tonsillar swelling or exudate,	3	1.03 (0.89-1.19)
	tender nodes, age <15 y	4	1.48 (1.09-2.02)
		5	2.52 (1.13-5.59)
Wald score[63,66,70]	One point for each of the following findings:	1	0.34 (0.13-0.85)
	Age 5-15 y, November to May, Temperature >38.3°C,	2	0.56 (0.41-0.78)
	adenopathy, pharyngitis,	3	0.61 (0.40-0.94)
	absence of upper respiratory tract symptoms	4	0.94 (0.59-1.49)
		5	1.39 (1.13-1.72)
		6	2.53 (1.61-3.98)
Attia score[19,51]	Moderate to severe tonsillar swelling (1 point),	0	0.21 (0.05-0.92)
	moderate to severe large cervical nodes (1 point),	1 to 3	0.88 (0.82-0.95)
	scarlatiniform rash (2 points),	4 or 5	5.90 (3.00-11.6)
	absence of moderate to severe coryza (1 point)		

*Some articles appear here but not in Table II because the article contained no data regarding individual signs and symptoms.
†All LRs (except for Breese score ≥30) represent multilevel LRs.
‡Breese score of ≥30 had a negative LR of 0.41 (CI, 0.16-1.08).
§A maximum of 4 points in 9 categories: season, age, white blood cells/mm^3, temperature >38° C, lack of cough, headache, sore throat, abnormal pharyngeal exam, abnormal cervical glands.

Accuracy and Precision of the Signs and Symptoms of Streptococcal Pharyngitis in Children: A Systematic Review

Nader Shaikh, MD, MPH[1], Nithya Swaminathan, MD[2], and Emma G. Hooper, BA[1]

- "no finding in isolation has a sufficiently high likelyhood ratio to permit a definitive diagnosis"
- "Prediction rules were also not accurate enough to allow for a definitive diagnosis of streptococcal pharyngitis"
- "children 3-18 years of age with sore throat require the use of confirmatory testing"

What Do I Do?

- Generally do not start antibiotics immediately
- If suspicious - swab
- Follow-up results phoned to parents
- Pain control
- Education

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Hypothermia OHCA

- **Two NEJM 2002**
  - n=273 good neuro 6 months (55% vs 39%)
  - n=77 good neuro at d/c (49% vs. 26%)
- **Bernard SA et al. Circ. 2010**
  - n=234 OHCA with V.Fib
  - Prehospital of 2L of ice-cold RL
  - No Difference (48% vs. 53%)
  - Scoop and run (SGEM#21 Ice, Ice, Baby)
- **Nielsen et al NEJM 2013**
  - n=950
  - TTM 33°C vs. 36°C after OHCA
  - 33°C did not confer a benefit

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Pre-Hospital Hypothermia for OHCA

Original Investigation

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

Kim F et al. JAMA Published online November 17, 2013

P: 1359 adults with OHCA
I: Pre-hospital 2L of 4C NS
C: Standard pre-hospital care
O: Survival and neurological status at d/c and safety data
Exclusion: Age<18yrs, traumatic arrest, being awake, temp<34C , not intubated and no IV access

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Main Result:

- **No Difference**

Primary Outcomes with 95% Confidence Intervals

	Cooled	Control	P Value
VF Survive to D/C	62.7% (57.0-68.0)	64.3% (58.6-69.5)	0.69
Non-VF Survive to D/C	19.2% (15.6-23.4)	16.3% (12.9-20.4)	0.30
VF Full or Mild Recovery	57.5% (51.8-63.1)	61.9% (56.2-67.2)	0.59
Non-VF Full or Mild Recovery	14.4% (11.3-18.2)	13.4% (10.4-17.2)	0.74

- More re-arrests 26% vs. 21% p=0.008
- Increase diuretics and pulmonary edema on CXR

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Authors Conclusion

"Although use of prehospital cooling reduced core temperature by hospital arrival and reduced the time to reach a temperature of 34C, it did not improve survival or neurological status among patients resuscitated from prehospital VF or those without VF."

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BEEM Bottom Line

Scoop and run after cardiac arrest with no cooling required in the field. (SGEM#54: Baby It's Cold Outside)

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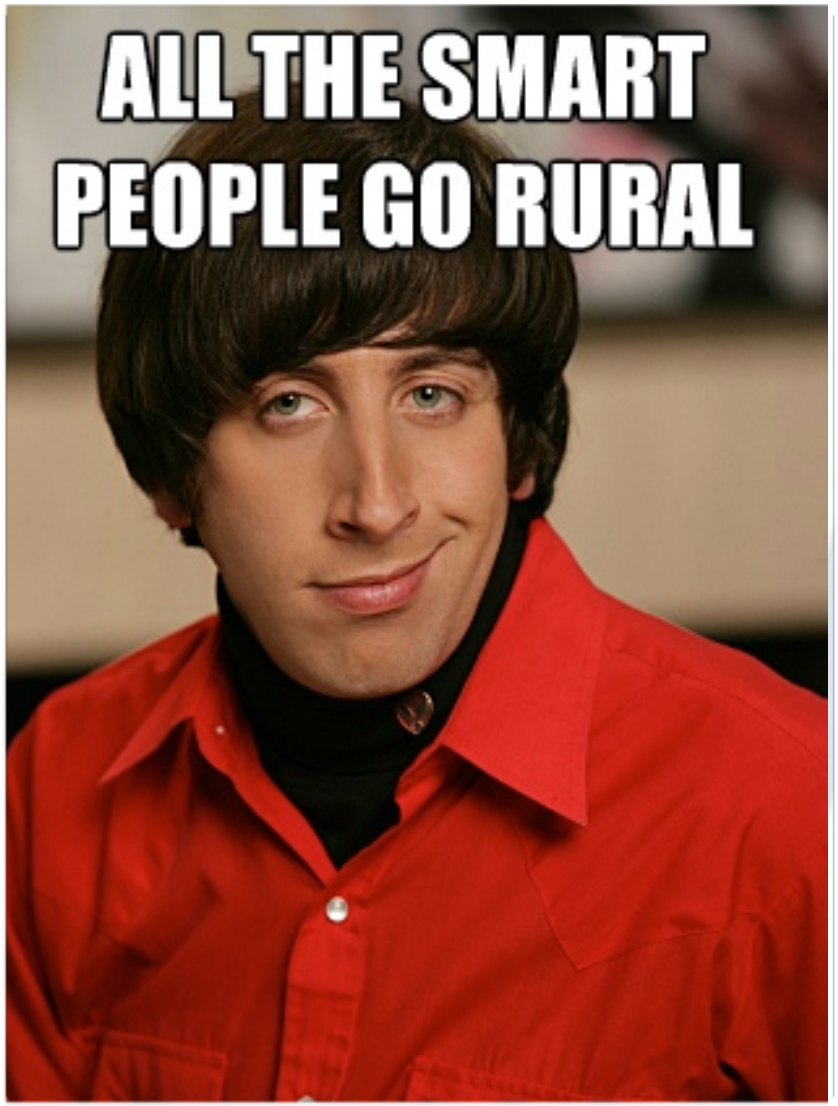
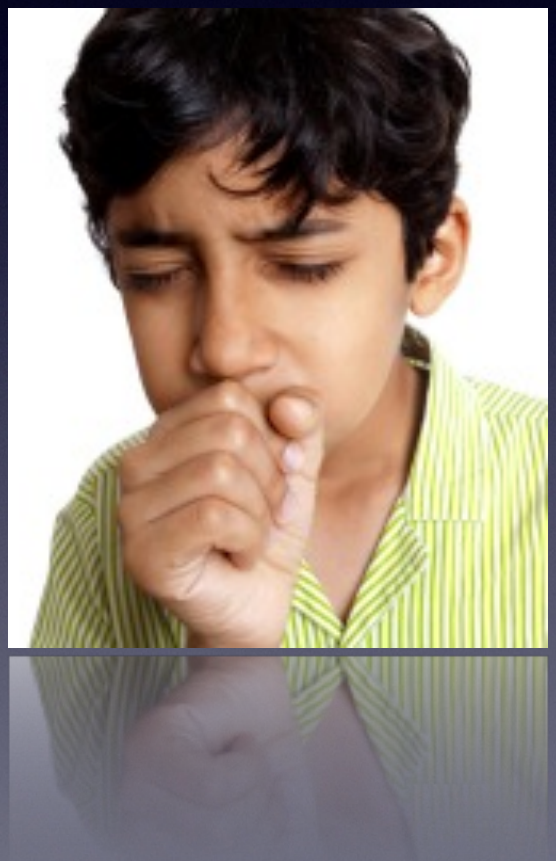


Honey For Cough

Clinical Case

- 8 year old boy:
  - Presents with URTI and cough
- What do you think of honey?

1. Good on toast!
2. Good for cough!
3. Good for nothing!



[Intervention Review]

Honey for acute cough in children

Olabisi Oduwole[1], Martin M Meremikwu[2], Angela Oyo-Ita[3], Ekong E Udoh[2]

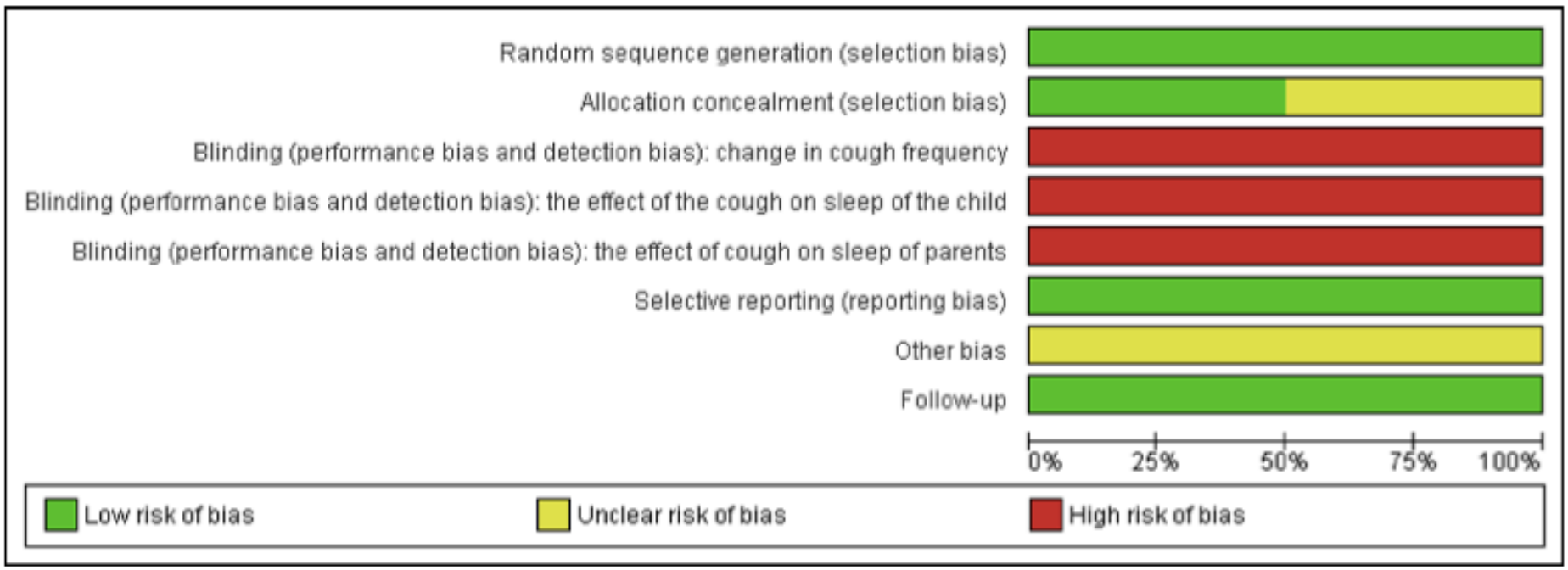
- Cochrane systematic review (2012)
- Well performed exhaustive systematic review
- Only 2 studies met inclusion criteria

[Intervention Review]

Honey for acute cough in children

Olabisi Oduwole[1], Martin M Meremikwu[2], Angela Oyo-Ita[3], Ekong E Udoh[2]

Figure 1. Risk of bias graph for included studies



EBM Moment

- Bias:
  - Methodological error that leads to a systematic deviation away from the 'truth'
  - i.e. non-blinded studies

Effect of Honey on Nocturnal Cough and Sleep Quality: A Double-blind, Randomized, Placebo-Controlled Study

AUTHORS: Herman Avner Cohen, MD,[a,b] Josef Rozen, MD,[b,c,†] Haim Kristal, MD,[b,d] Yoseph Laks, MD,[b,e] Mati Berkovitch, MD,[b,f] Yosef Uziel, MD,[b,g] Eran Kozer, MD,[b,h] Avishalom Pomeranz, MD,[b,i] and Haim Efrat[j]

- Well performed RCT (2012)
  - Control group included honey-like placebo
- Less coughing! ($p < 0.04$)
- Better sleep for children! ($p < 0.014$)
- Better sleep for parents!! ($p < 0.018$)

Warning!

- <1 year old child...
  - Honey...
    - Botulism...
      - Paralysis...
        - Improved cough!

What Do I Do?

- I recommend honey!

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ACLS for OHCA

Do advanced life support techniques, specifically pharmacologic interventions, improve survival to discharge versus basic life support (rapid defibrillation and CPR) in patients with out-of-hospital cardiac arrest?

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OHCA Background

- Sudden cardiac arrest is common
- Half are OHCA
- Survival rate is poor
- AHA has a five step *"Chain of Survival"*
- 4th step is early ACLS

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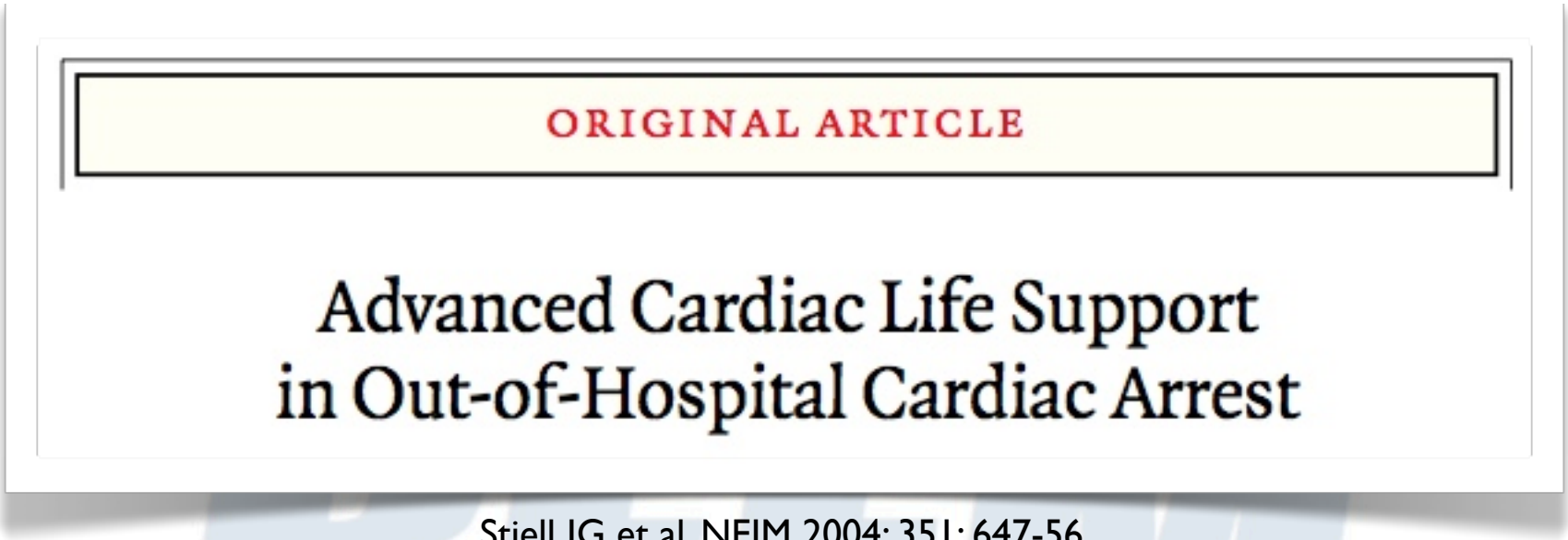
ACLS for OHCA NEJM 2004


ORIGINAL ARTICLE

Advanced Cardiac Life Support
in Out-of-Hospital Cardiac Arrest

Stiell IG et al. NEJM 2004; 351: 647-56.

P: >16yo with OHCA and resuscitation was attempted
I: ACLS (lines, airway and drugs)
C: BLS – defibrillation + CPR
O: Primary- survival to hospital discharge
Secondary- ROSC, admit to hospital and CPC

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Main Result:

- **5638 patients** (1391 BLS and 4247 ACLS phase)

Table 2. Survival and Functional Outcomes of Patients from the Two Study Phases.*

Outcome	Rapid-Defibrillation Phase (N=1391)	Advanced-Life-Support Phase (N=4247)	Absolute Increase (95% CI)	P Value
	no. (%)		*percentage points*	
Return of spontaneous circulation	180 (12.9)	766 (18.0)	5.1 (3.0 to 7.2)	<0.001
Admission to hospital	152 (10.9)	621 (14.6)	3.7 (1.7 to 5.7)	<0.001
Survival to hospital discharge	69 (5.0)	217 (5.1)	0.1 (−1.2 to 1.5)	0.83
Survivors' cerebral performance category, level 1†	54 (78.3)	145 (66.8)	—	0.73
	score			
Survivors' Health Utility Index, Mark III, at one year			—	0.67
Median	0.84	0.79		
Interquartile range	0.49–0.97	0.43–0.91		

- **NO DIFFERENCE 5.0% vs. 5.1% (p 0.83)**

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Authors Conclusion

"The results of the OPALS study did not show any incremental benefit of introducing a full advanced-life-support program to an emergency-medical services system of optimized rapid defibrillation."

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BEEM Comments

- Very well done large study with good methods
- Before-after study
- Not randomized
- Blinding not possible
- Multiple interventions in ACLS

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BEEM Bottom Line

Addition of an advanced life support algorithm to BLS management did not increase the survival to hospital discharge for patients with OHCA and increased the number of patients alive with poor neurologic status.

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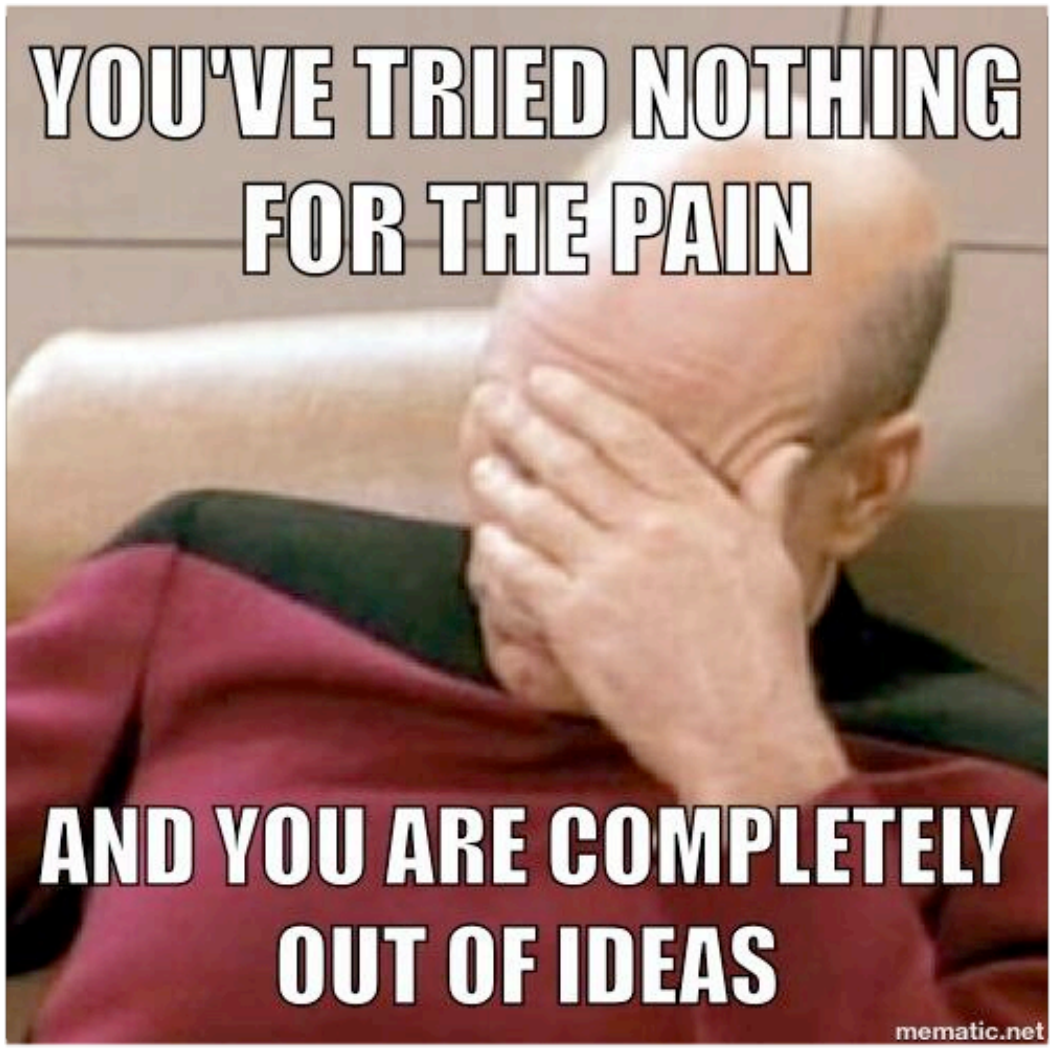

Normal Vital Signs

Clinical Case

- 18 month old girl:
  - Presents to the ED with viral gastroenteritis
  - Vomiting, diarrhea, fever
  - HR: 130

Clinical Case

- 18 month old girl with heart rate of 130
- How do you know if this is normal or not?
  1. Gestalt
  2. PALS/APLS
  3. Formula
  4. Other source

Normal ranges of heart rate and respiratory rate in children from birth to 18 years of age: a systematic review of observational studies

Susannah Fleming, Matthew Thompson, Richard Stevens, Carl Heneghan, Annette Plüddemann, Ian Maconochie, Lionel Tarassenko, David Mant

- Non-Cochrane systematic review of normal heart rate and respiratory rate in children
  - N = 143,346 (heart rate)
  - N = 3,881 (respiratory rate)
- Compared results to values from APLS and PALS

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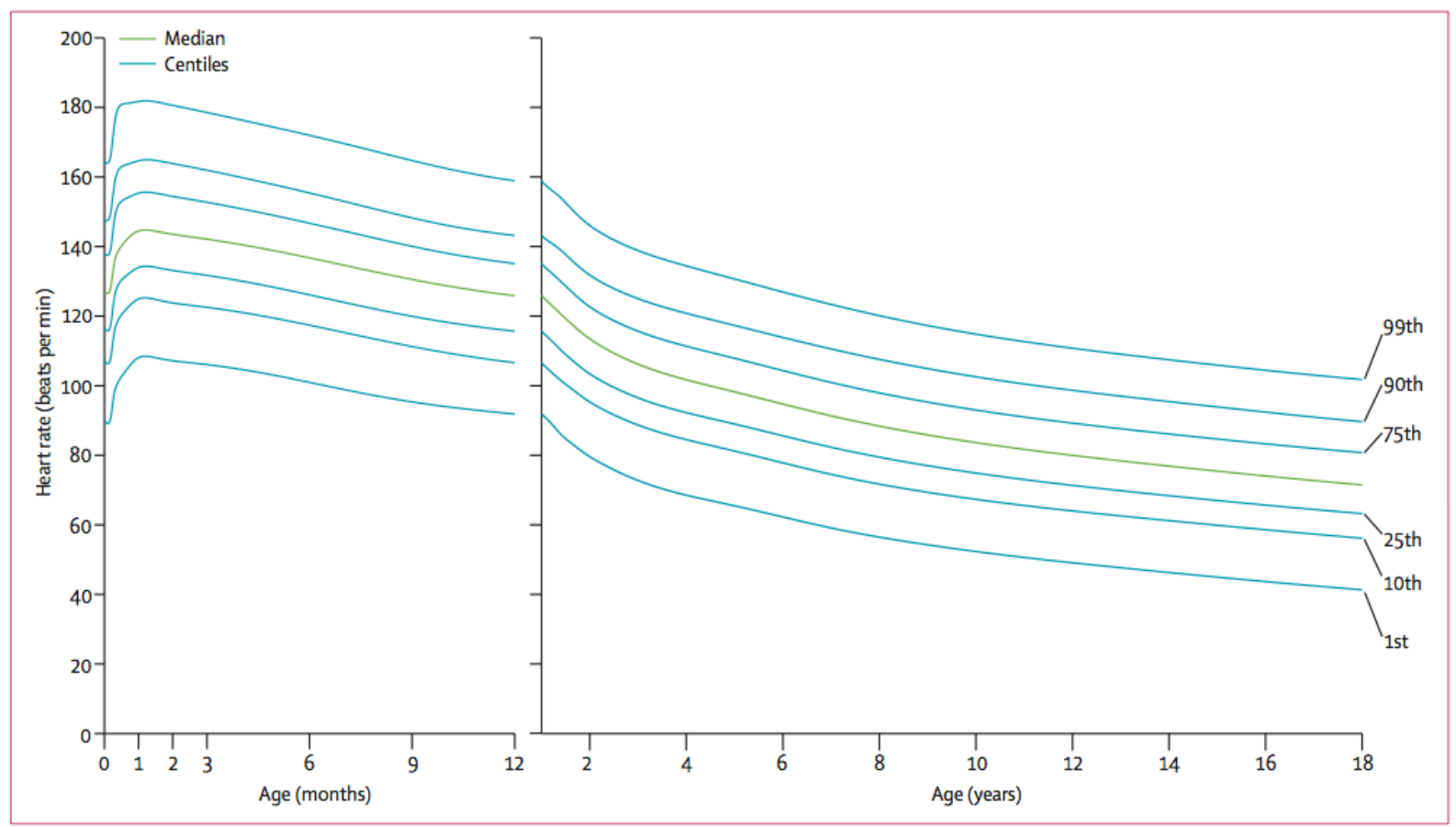

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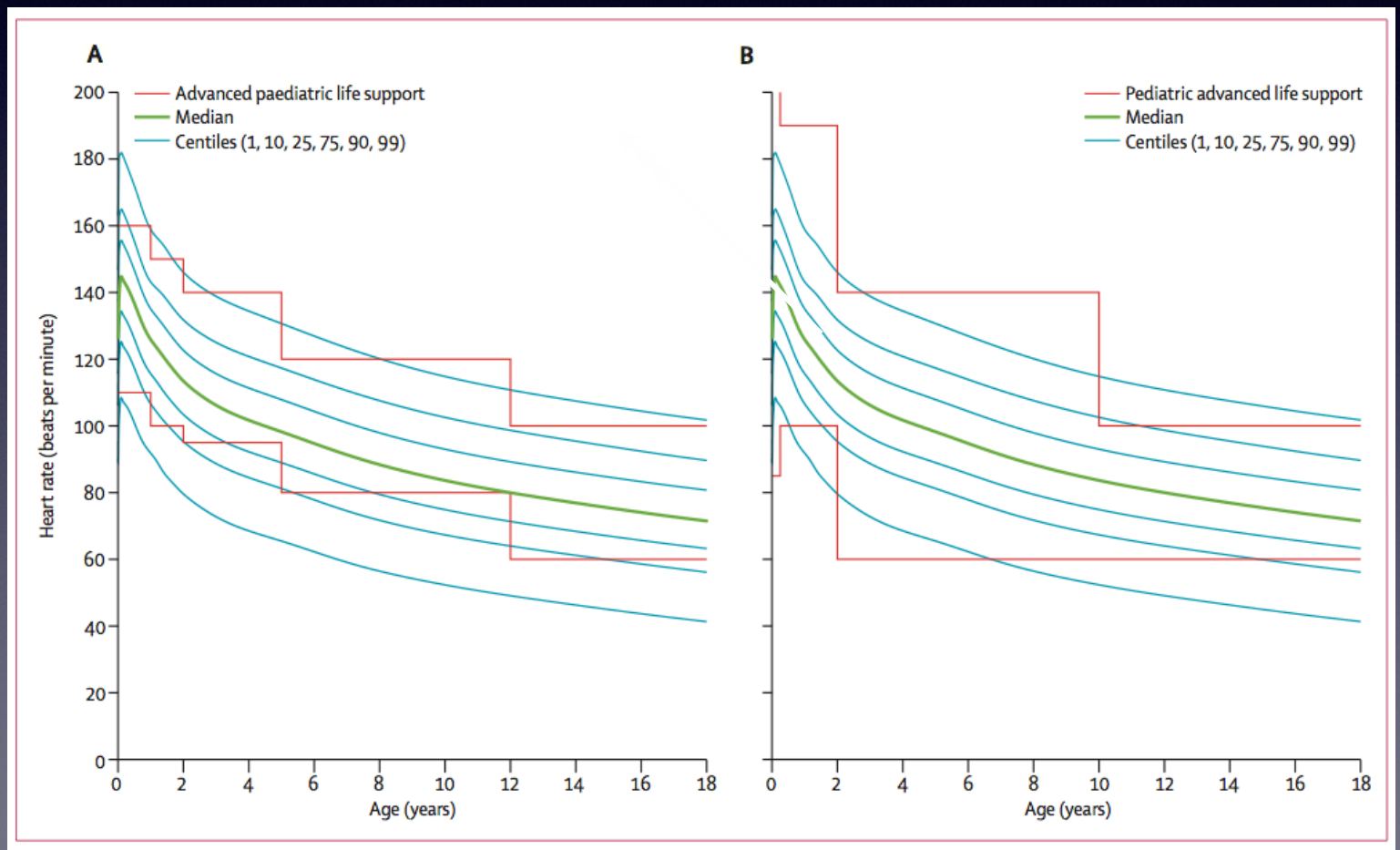

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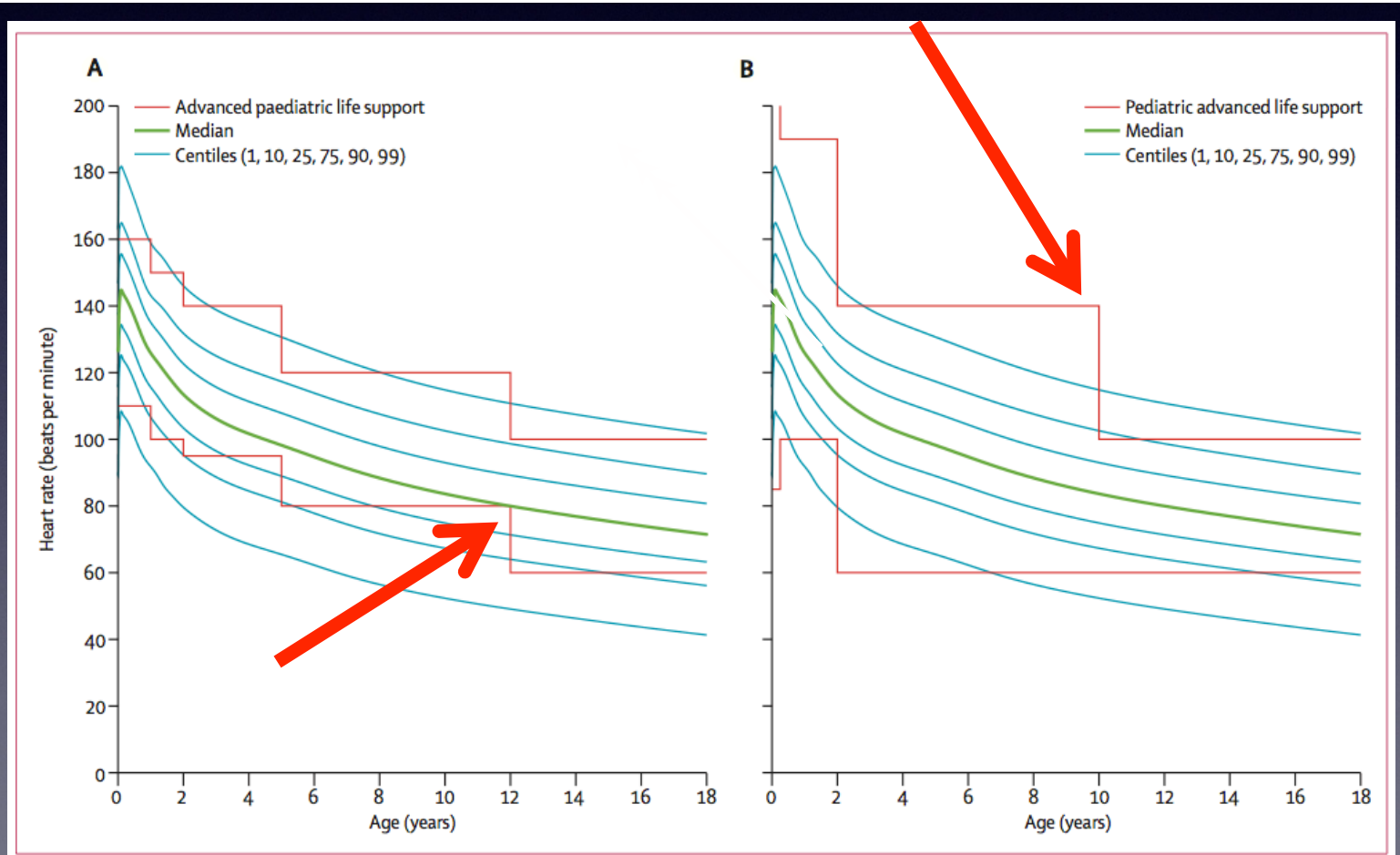

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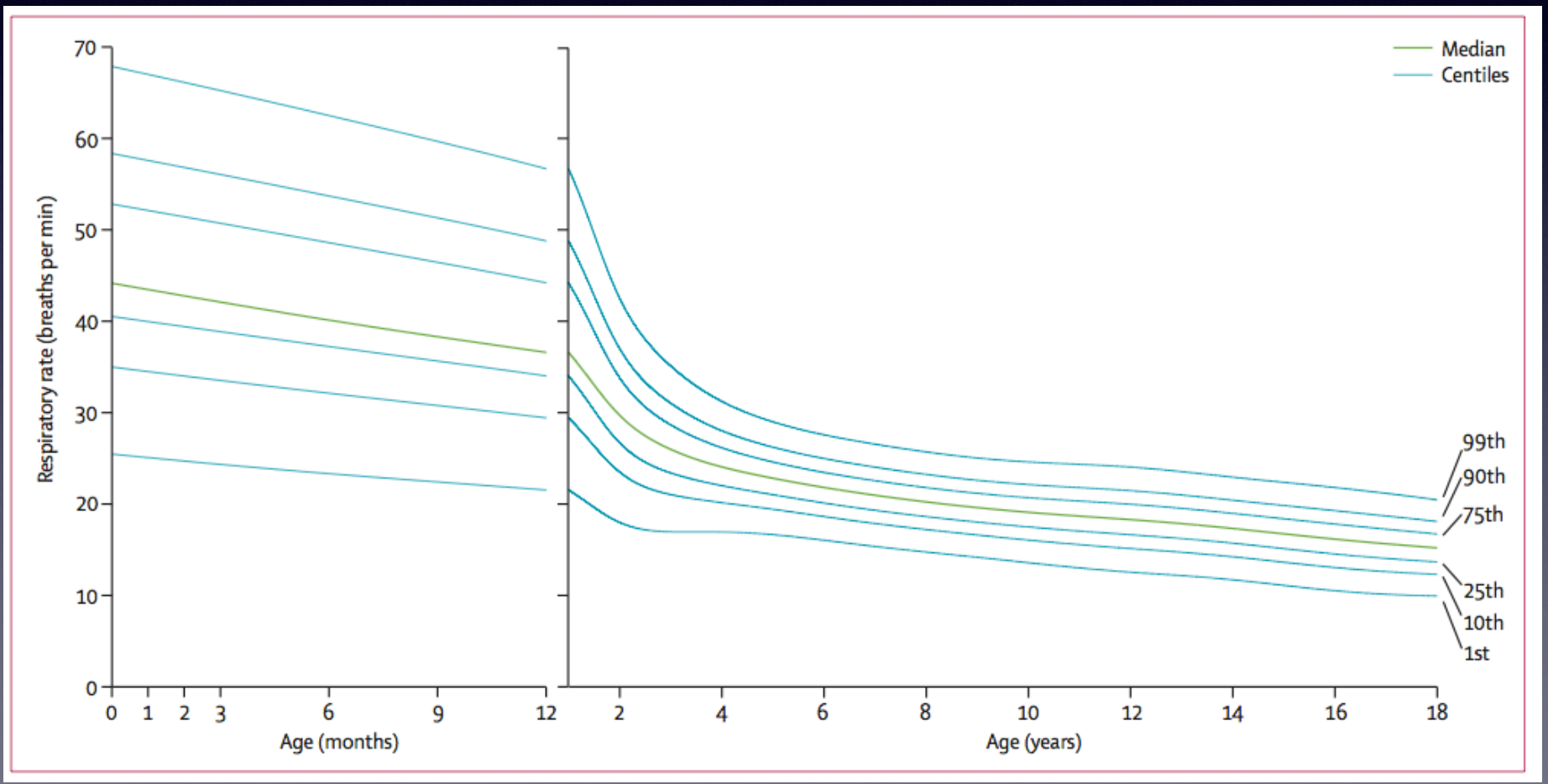

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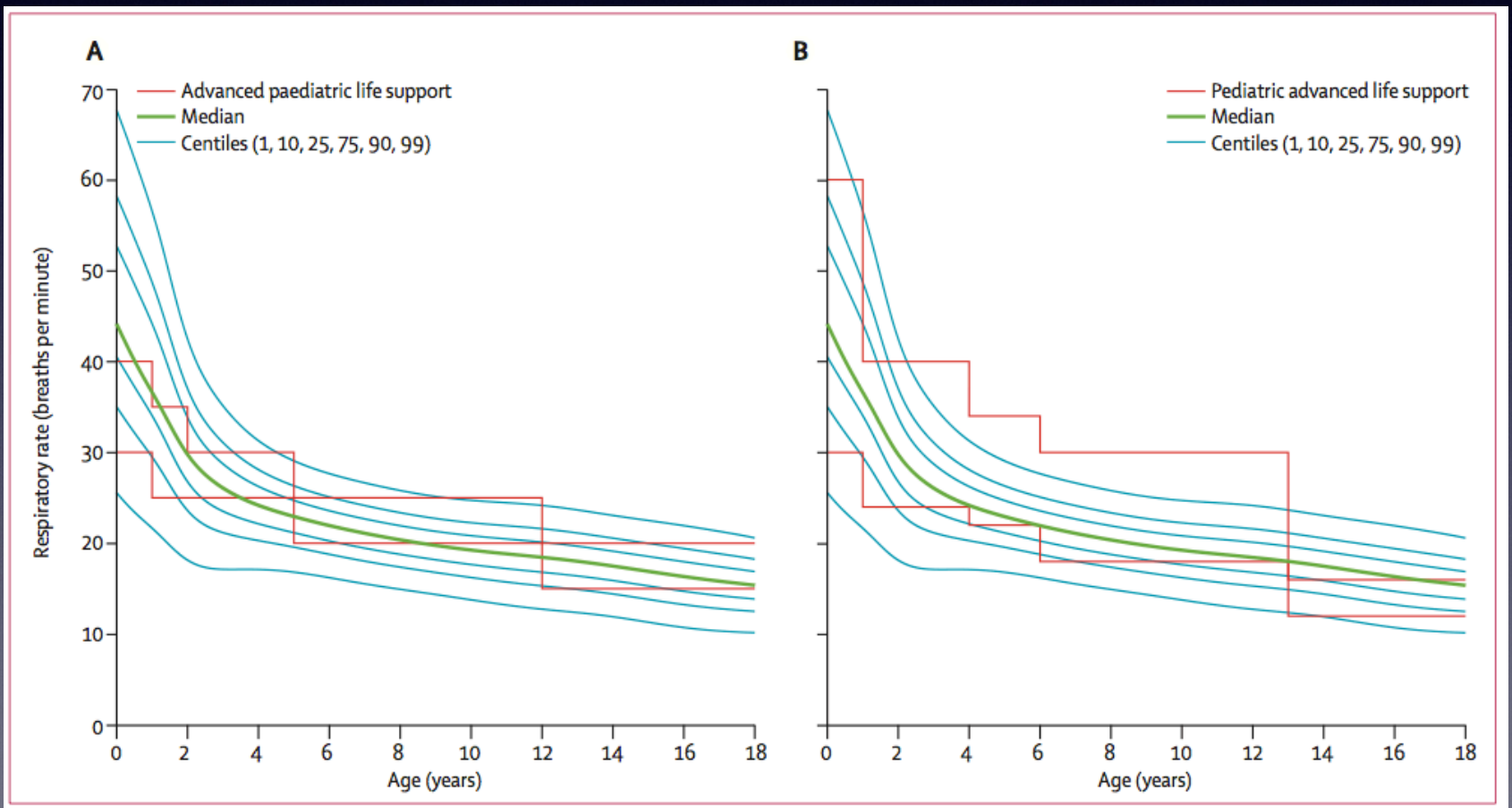

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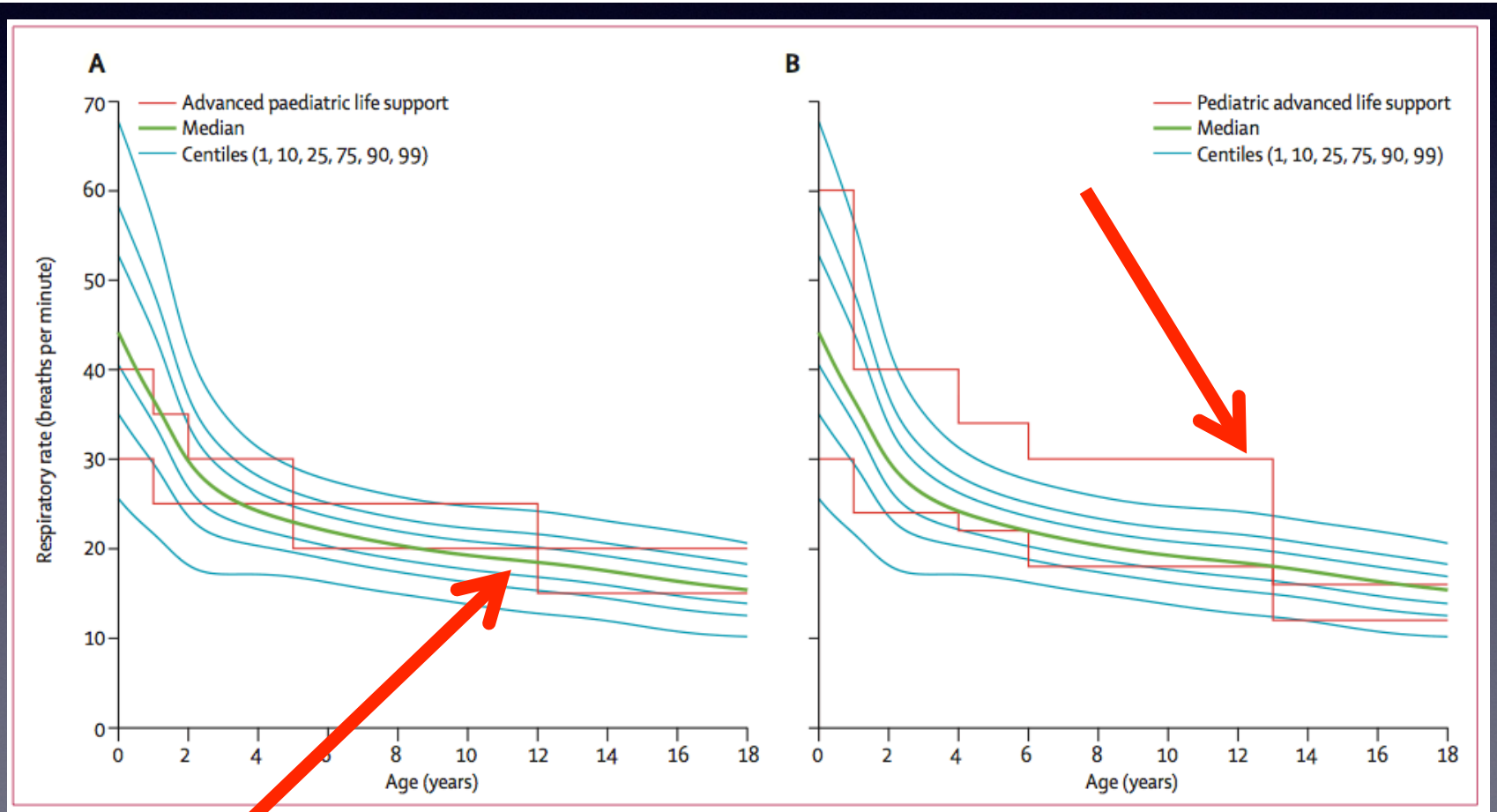

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- Implications:
  - Vital signs often dictate management:
    - Triage
    - Fluid resuscitation
    - Discharge
- A much more accurate tool than APLS/PALS

What Do I Do?

- I quote and reference this paper ALL THE TIME!
- Triage vitals are measured against this graph
- Easy to have PDF of charts on iphone/tech

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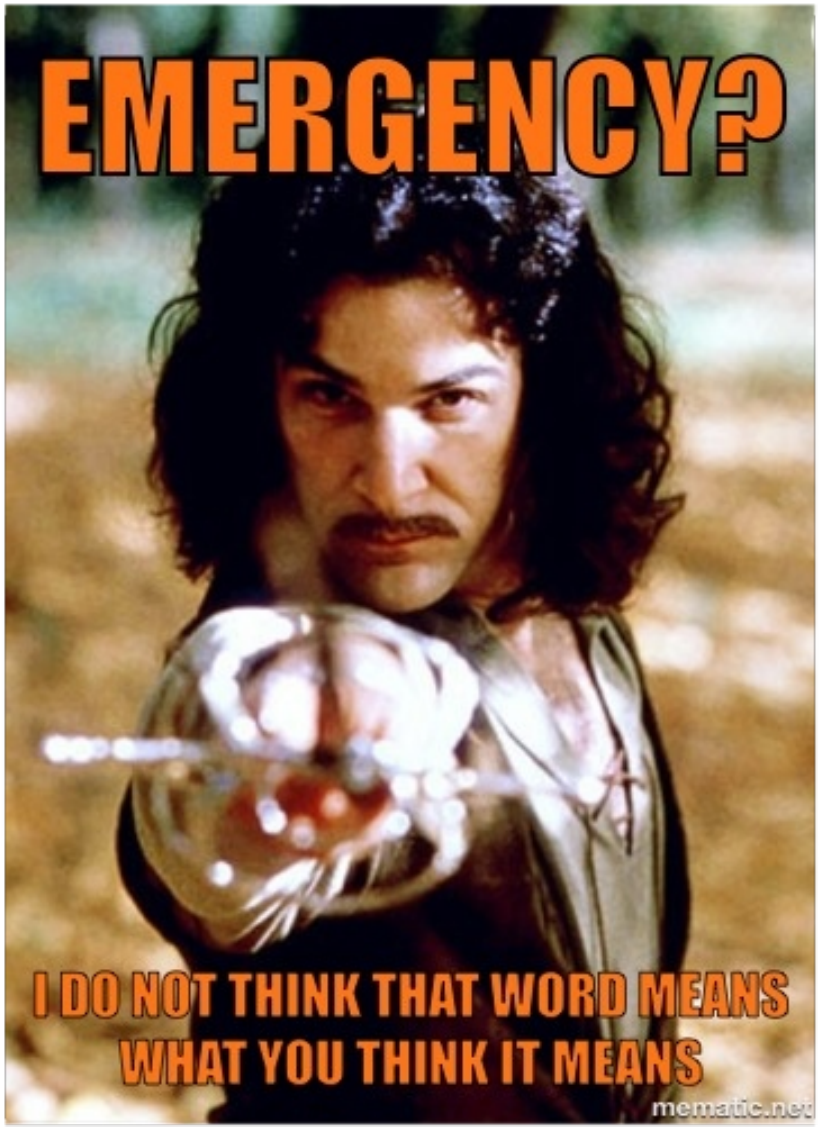

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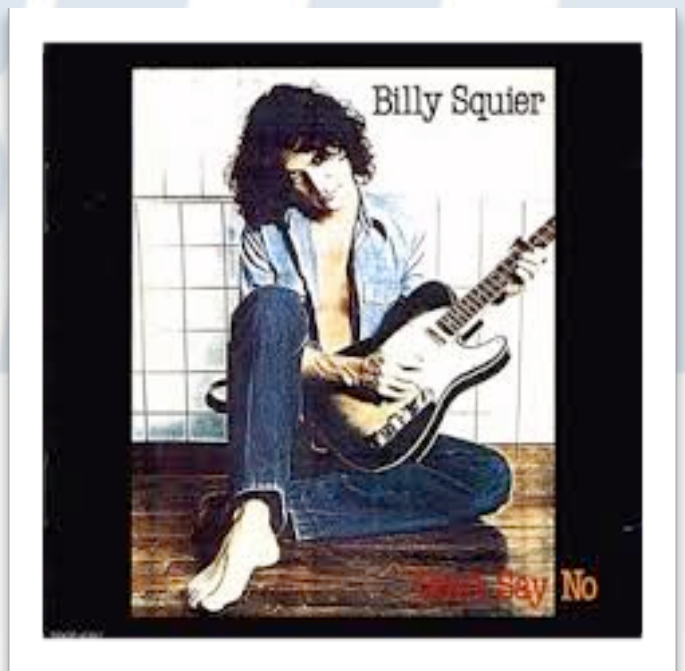
Stroke Me, Stroke Me

- *"Now everybody, Have you heard, If you're in the game (of emergency medicine), Then the stroke's the word, Don't take no rhythm, Don't take no style, Gotta thirst for killin', Grab your vial (of tPA) and stroke me, stroke me…"* Billy Squier The Stroke



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Acute Ischemic Strokes

- Leading cause of disability
- Third most common cause of death
- Things have never been the same since NINDS

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Trial	Journal	Time	Primary Benefit	Harm
MAST -Italy (n=622)	Lancet 1995	<6hr	**None**	Increased early death
ECASS-I (n=620)	JAMA 1995	<6hr	**None**	Beneift not outweigh the risk
NINDS-I (n=291)	NEJM 1995	<3hr	**None**	No difference
NINDS -II (n=333)	NEJM 1995	<3hr	~13% absolute benefit mRS at 90d	Increase ICH
MAST - Eu (n=310)	NEJM 1996	<6hr	**None**	**Stopped early due to harm**
ASK (n=340)	JAMA 1996	<4hr	**None**	**Stopped early due to harm**
ECASS-II (n=800)	Lancet 1998	<6hr	**None**	No difference
ATLANTIS-B (n=613)	JAMA 1999	3-4hr	**None**	**Stopped early *"unlikely to prove beneficial"***
ATLANTIS-A (n=142)	Stroke 2000	<6hr	**None**	**Stopped early due to harm**
ECASS-III (n=821)	NEJM 2008	3-4.5hr	7% absolute benefit	Increase ICH
DIAS-2 (n=193)	Lancet 2009	3-9hr	**None**	No difference
IST-3 (n=3035)	Lancet 2012	<6hr	**None**	No difference

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IST-3: tPA <6hr for CVA

The benefits and harms of intravenous thrombolysis with recombinant tissue plasminogen activator within 6 h of acute ischaemic stroke (the third international stroke trial [IST-3]): a randomised controlled trial

The Lancet May23,2012 DOI:10.1016/S0140-6736(12)60768-5

P: Multi-centre with half >80yrs (n=3035)
I: tPA 0.9mg/kg
C: Placebo
O: Alive/independent on OHS at 6 months

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Main Result:

- **Benefit**
  - Alive and independent at 6 months (OHS 0-2)
  - **NO DIFFERENCE** tPA 554 (37%) vs. control 534 (35%) OR 1.13, 95% CI 0.95–1.35, p=0·181

- **HARM**
  - Fatal or non-fatal symptomatic ICH <7 days
    - tPA 104 (7%) vs control 16 (1%) OR 6.94, 95% CI 4.07–11.8; increase of 58/1000
  - Death <7 days
    - tPA 163 (11%) vs. control 107 (7%) OR 1.60, 95% CI 1.22–2.08, p=0·001; absolute increase 37/1000
  - Death 6 months (**NO DIFFERENCE**)
    - tPA 408 (27%) vs. control 407 (27%)

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Authors Conclusion

"despite the early hazards, thrombolysis within 6h improved functional outcome. Benefit did not seem to be diminished in elderly patients."

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Angry Face

- Like reading a CAM study
- Pragmatic, open-label (blinding)
- Small blinded (300) favored control
- Only pts docs thought would benefit (bias)
- Missed target by 50%
- After 7yrs they moved the goal post
- Another Stats was brought in to "persuade"
- Came up with 2ndary outcome with ordinal logistic regression analysis
- Primary end point was **NEGATIVE**
- Reported as a positive study - ???

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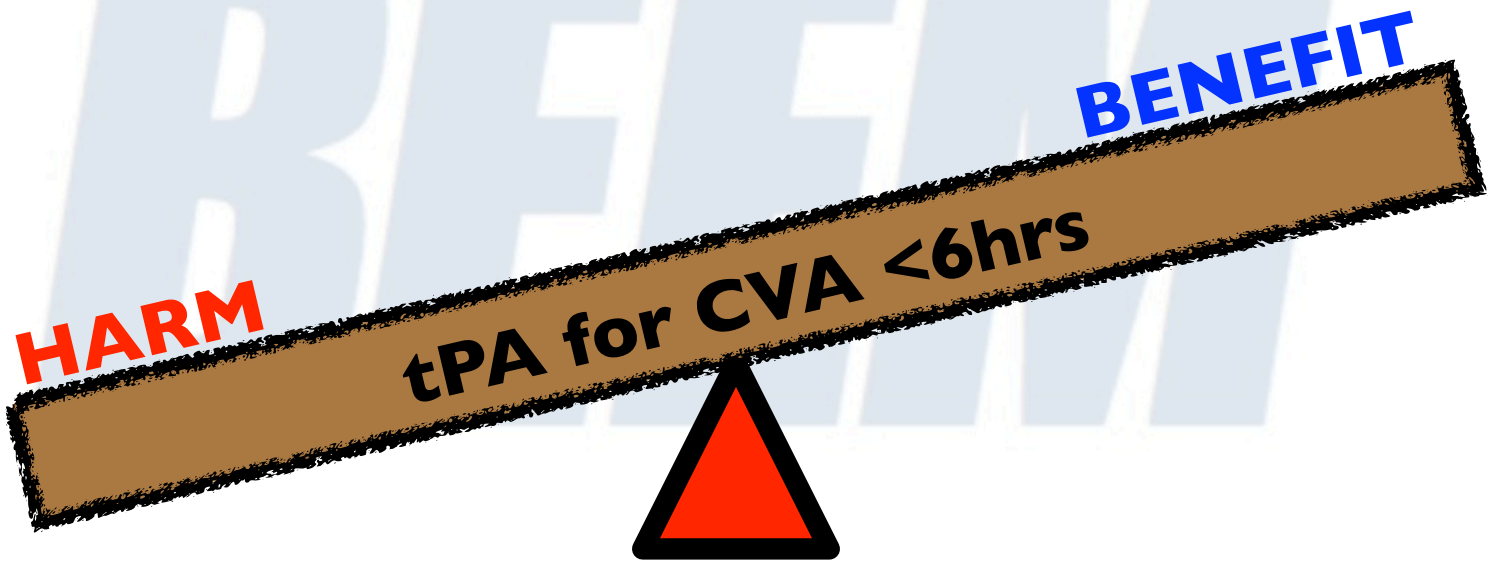
BEEM Bottom Line

- tPA harmed (death) 1 in 25 early, the bleed rate went up 600% (relative) and there was no benefit seen at 6 months (primary outcome).




Breaking Bad
Canada
You have cancer
Treatment starts next week
END

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BoB Talk Conclusions:

- **Recent ED Papers**
  - Pediatric Strep Throat
  - Hypothermia OHCA
  - Honey for Cough
  - ACLS for OHCA
  - Pediatric Vitals
  - Thrombolysis for CVA

- **www.TheSGEM.com**

BoB TALK

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EBM Worth Spreading