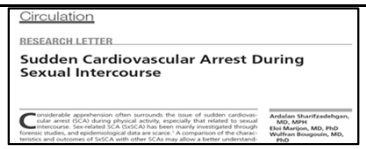
Eagles 2019
Key Articles in EMS
February/March 2019

Corey M. Slovis, M.D.
Vanderbilt University Medical Center
Metro Nashville Fire Department
Nashville International Airport
Nashville, TN


Circulation
RESEARCH LETTER
Sudden Cardiovascular Arrest During Sexual Intercourse

Circulation 2018;137:1638-40

Only 47% received CPR in these witnessed arrests

Maybe put on defib pads and hook up AED during the warm up

GENERAL MEDICINE/ORIGINAL RESEARCH
Aromatherapy Versus Oral Ondansetron for Antiemetic Therapy Among Adult Emergency Department Patients: A Randomized Controlled Trial

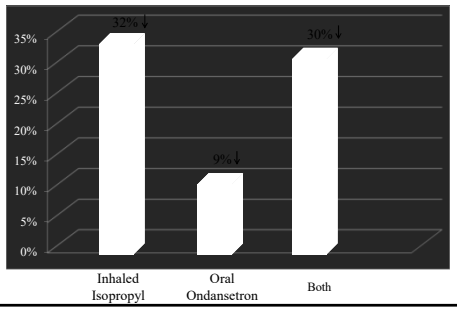
Annal Emerg Med May 2018;ePub ahead of print

How effective is inhaled isopropyl alcohol vs oral ondansetron for nausea?

- 120 subjects
- 41 isopropyl vs 41 oral ondansetron vs 40 both
- Placebo controlled with inhaled or oral placebo
- Used visual analog nausea scale
- Also evaluated rescue antiemetic therapy

Mean Nausea Decrease

Annal Emerg Med May 2018;ePub ahead of print



Inhaled Isopropyl for Nausea
Take Homes

- Inhaled alcohol pad isopropyl alcohol works better than oral ondansetron
- Use it first line, before IV even started

Airway Stuff

Bag-Mask Ventilation during Tracheal Intubation of Critically Ill Adults

Jonathan D. Casey, M.D., David R. Janz, M.D., Derek W. Russell, M.D., Derek J. Vonderhaar, M.D., Aaron M. Joffe, D.O., Kevin M. Dischert, M.D., Ryan M. Brown, M.D., Aline N. Zouk, M.D., Swati Gulati, M.B., B.S., Brent E. Heideman, M.D., Michael G. Lester, M.D., Alexandra H. Toporek, M.D., Itay Bentov, M.D., Ph.D., Wesley H. Self, M.D., Todd W. Rice, M.D., and Matthew W. Semler, M.D., for the PreVent Investigators and the Pragmatic Critical Care Research Group*

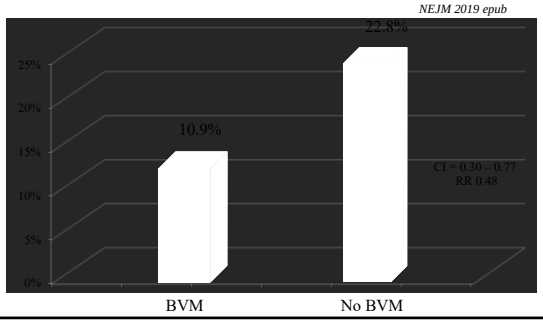
NEJM 2019 epub

Does BVM with 100% O_2 pre-intubation decrease hypoxia during ETI?

- Multicenter trial, 401 pts
- 100% O_2 by BVM vs No Assigned Ventilations
- Evaluated changes in O_2 saturation
- Also measured incidence of hypoxemia

Incidences of Hypoxemia

NEJM 2019 epub



Comments and Limitations

- No ↑ in aspirations (2.5% vs 4%)
- ICU trial not ED or EMS
- No nasal O_2 during study period

Effectiveness of Apneic Oxygenation During Intubation: A Systematic Review and Meta-Analysis

Lucas Oliveira J. e Silva; Daniel Cabrera, MD; Patricia Barrionuevo, MD; Rebecca L. Johnson, MD; Patricia J. Erwin, MLS; M. Hassan Murad, MD, MPH; M. Fernanda Bellolio, MD, MS*

**Corresponding Author. E-mail: Bellolio.Fernanda@mayo.edu, Twitter: @mfbellolio, @lucasojesilva12.*

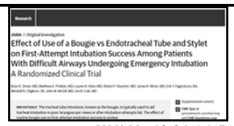
Annals Emerg Med 2017; 70:483-494

- Meta-analysis: 8 studies; 1837 pts

Apneic oxygenation decreases hypoxemia by 1/3 and significantly increases first pass success in ETI

Take Homes

Be sure to provide 100% O_2 by nasal prongs during ETI *whether you use BVM or not*

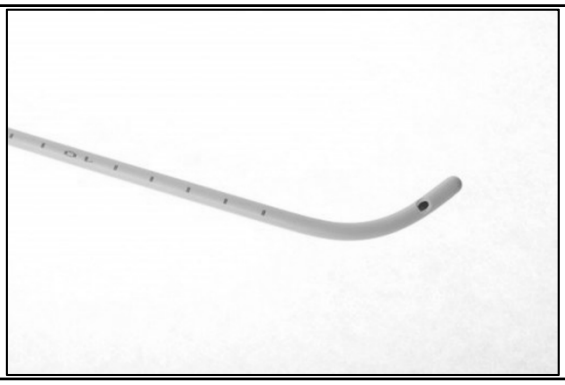


Effect of Use of a Bougie vs Endotracheal Tube and Stylet on First-Attempt Intubation Success Among Patients With Difficult Airways Undergoing Emergency Intubation A Randomized Clinical Trial

JAMA May 2018;319:2171-84

Does routine Bougie use improve likelihood of first pass endotracheal intubation success?

- 757 patients randomized, Hennepin Med Center
- Bougie first vs ETT with Stylet
- Done with Mac blades and Storz C-MAC
- 58% DL; 21% all video; 20% video passage
- ½ (380) of pts had difficult airway characteristics



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A Randomized Clinical Trial

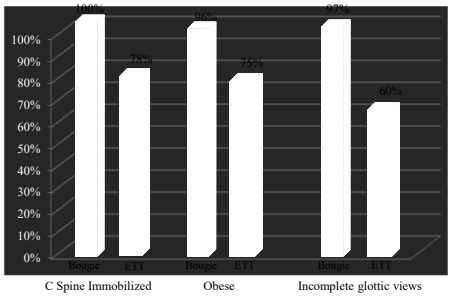
JAMA May 2018;319:2171-84

Bougie vs ETI with Stylet
Comparison Groups

- Difficult vs All vs WNL airways
- Difficult = 1 or more:
  - Body fluids obscuring view
  - Airway obstruction or edema
  - Obesity, short neck
  - Small mandible, large tongue
  - Cervical spine immobilization

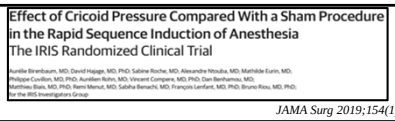
Most Difficult Airways

JAMA May 2018;319:2171-84



Bougie Use for ETI
Take Homes

- Use bougies more
- They are central to airway management
- Start with a bougie on difficult airways
  or go to one quickly after first look


Effect of Cricoid Pressure Compared With a Sham Procedure in the Rapid Sequence Induction of Anesthesia
The IRIS Randomized Clinical Trial

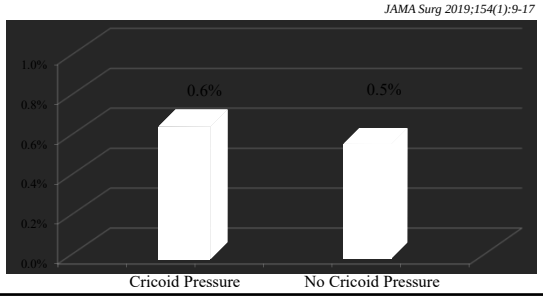
JAMA Surg 2019;154(1):9-17

How valuable is cricoid pressure?

- Randomized double blind study, 3472 pts
- Pulmonary aspiration measured
- Used laryngoscopy or trached aspiration
- Also evaluated effect on ETI

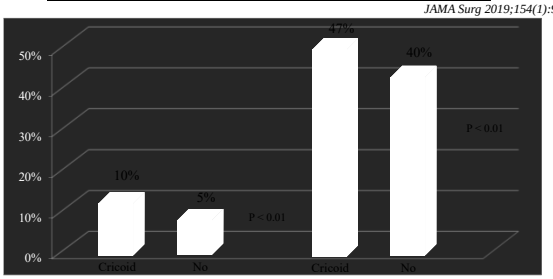
Aspiration and Airway Difficulty
Cricoid Pressure

JAMA Surg 2019;154(1):9-17



Airway Difficulty
Cricoid Pressure vs Control

JAMA Surg 2019;154(1):9-17



Grade View 3 - 4 ETI time > 30 sec

How Helpful is Cricoid Pressure Using the Sellick Maneuver Take Homes

- It won't help decrease aspiration
- But it will make your intubation harder

NTG in r/o AMI

Safety and Effectiveness of Field Nitroglycerin in Patients with Suspected ST Elevation Myocardial Infarction

Nichole Bosson, MD, MPH, Benjamin Isakson, MD, Jayson A. Morgan, MD, Amy H. Kaji, MD, PhD, Atilla Uner, MD, MPH, Katherine Hurley, MSN, ...show all

Accepted author version posted online: 17 Dec 2018, Published online: 28 Jan 2019

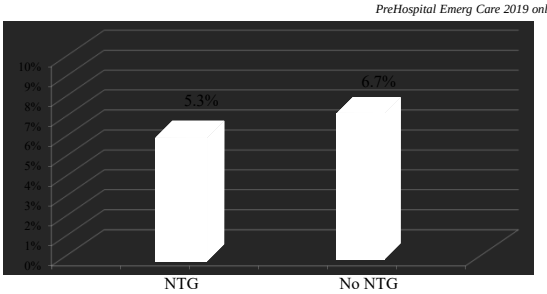
PreHospital Emerg Care 2019 online

How safe is NTG in r/o AMI and does it effectively relieve pain?

- Prospective study, 780 pts, suspected STEMI
- LA County EMS and UCLA
- "Suspected STEMI" by ECG plus paramedic
- 0.4 mg SL NTG, up to 2 more doses
- BP < 100 mm SBP pts excluded

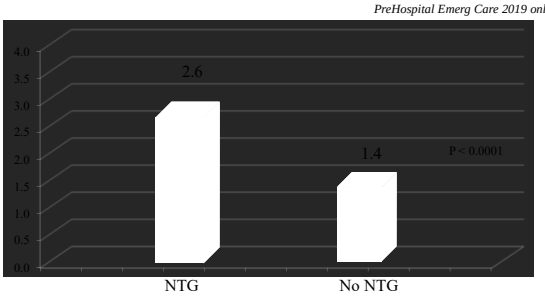
NTG in suspected STEMI
Systolic BP fall > 30 mm Hg

PreHospital Emerg Care 2019 online



NTG in suspected STEMI
Pain Relief

PreHospital Emerg Care 2019 online



NTG for r/o AMI

- NTG is safe in AMI
- NTG is safe for Inferior AMI
- NTG relieves Anginal pain in ACS
- *Respect NTG but use it*

Magnesium for Atrial Fibrillation

LOw dose MAGnesium sulfate versus High dose in the early management of rapid atrial fibrillation: randomised controlled double blind study

(LOMAGHI study)

Wahid Boulda[1,3], MD Kaouthar Beltaief[1,3], MD Mohamed Amine Msolli[1,3], Noussaiba Azalez[1,3], MD Houda Ben Soltane[1,4], MD Adel Sekma[1,3], MD Imen Trabelsi[5], MSc Hamdi Boubaker[1,3], MD Mohamed Habib Grissa[1,3], MD Mehdi Methemem[6], MD Riadh Bouker[2,3], MD Zohra Driss[7], MD Asma Belguith[8], MD, MD Semir Nouira[1,3], MD

Acad Emerg Med 2018;in press August

Is Magnesium effective for rate control in "Rapid" Atrial Fibrillation?

- 450 pts, double-blind, placebo controlled
- 3 groups of pts from 3 Tunisian hospitals
- High dose vs Low dose vs Placebo
- $MgSO_4$ 9 grams vs 4.5 grams vs Placebo
- Given over 30 minutes

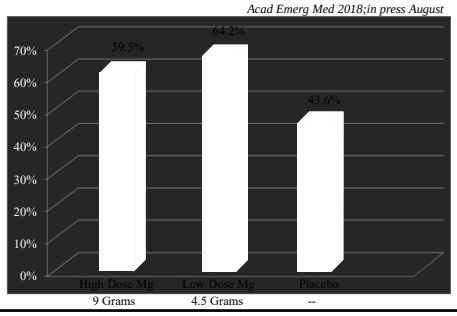
Measured effectiveness as HR < 90 or rate lowering by > 20%

Acad Emerg Med 2018;in press August

Effectiveness

HR < 90 or HR ↓ > 20%

Acad Emerg Med 2018;in press August



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Acad Emerg Med 2018;in press August

This paper is not what it seems

- Essentially all patients got other rate control agents
- 45-50% received Digoxin
- 30% received Diltiazem
- 20% received Beta Blockade

Magnesium for Rate Control in AF
Take Homes

- Adjunct? – maybe; Primary – NO
- 2.5 grams or 4.5 grams?
- 9 grams = lots of flushing (10-15%)
- Was very safe, < 1% hypotension
- Read this paper carefully

IOs in CPR

Intraosseous versus Intravenous access in Patients with Out-of-Hospital Cardiac Arrest: Insights from the Resuscitation Outcomes Consortium Continuous Chest Compression Trial

Purav Mody [a], Siobhan P. Brown [b], Peter J. Kudenchuk [c], Paul S. Chan [d, e], Rohan Khera [a], Colby Ayers [a], Ambarish Pandey [a], Karl Kern [f], James A. de Lemos [a], Mark S. Link [a], Ahamed H. Idris [g]

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https://doi.org/10.1016/j.resuscitation.2018.10.031 Get rights and content

Resuscitation 2018 Online Dec

Do IO medication administrations improve outcomes in OHCA?

- 19,731 OHCAs: 3068 IO vs 16,663 IV
- ROC EMS study sites
- Dallas, Seattle, Kansas City, Tucson EMS
- IO patients younger, F > M
- Minimally faster med times with IO

Intraosseous versus Intravenous access in Patients with Out-of-Hospital Cardiac Arrest: Insights from the Resuscitation Outcomes Consortium Continuous Chest Compression Trial

Purav Mody [a], Siobhan P. Brown [b], Peter J. Kudenchuk [c], Paul S. Chan [d, e], Rohan Khera [a], Colby Ayers [a], Ambarish Pandey [a], Karl Kern [f], James A. de Lemos [a], Mark S. Link [a], Ahamed H. Idris [g]

Show more
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Resuscitation 2018 Online Dec

1:1 propensity match of 2274 IO pts was performed and after sensitivity analysis confirmed high quality:

- Lower Rate of Sustained ROSC with IO
- No Difference in Survival IO vs IV
- NO Difference in Favorable Neurologic Outcomes

IO vs IV
Take Homes

IO insertion is an excellent fast way to obtain access in cardiac arrest however IO use does not improve outcomes in OHCA

Double Sequential Defibrillation

Title: Double sequential external defibrillation for refractory ventricular fibrillation out-of-hospital cardiac arrest: a systematic review and meta-analysis

Authors: Ashleigh Delorenzo, Ziad Nehme, James Yates, Stephen Bernard, Karen Smith

Resuscitation 2018; 135:124-29

How effective is Double Sequential Defibrillation?

- Systematic Review and Meta-Analysis
- 449 pts, 19% (95) treated by DSD
- 2 retrospective trials reviewed
- 58.7% arrests were witnessed
- Evaluated ROSC, hospital d/c, 30d survival

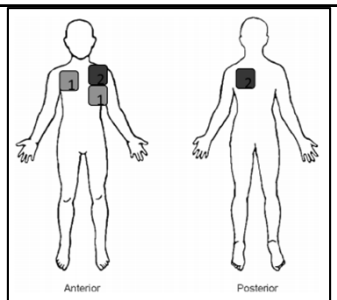


Figure 1. Graphic depiction of pad placement for DSD. The primary set of pads (*blue*) is placed in the anterolateral position. The second set of pads (*red*) is placed in the anterior/posterior orientation. DSD = double sequential defibrillation.

Acad Emerg Med 2019 in press Jan

Prehospital Double Sequential Defibrillation: A Matched Case–Control Study

Julian G. Mapp MD, MPH, Alan J. Hans MD, Anthony M. Darrington MD, Elliot M. Ross MD, MPH, Calvin C. Ho MD, MS, David A. Miramontes MD, Stephen A. Harper MD, MPHfor ... See all authors

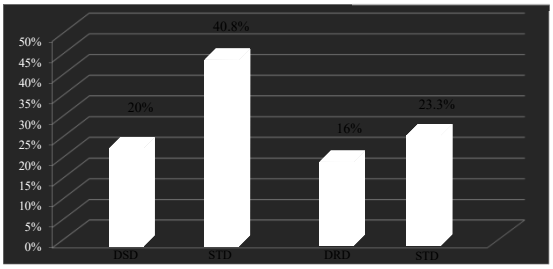
First published: 10 December 2018 | https://doi.org/10.1111/acem.13672

Acad Emerg Med 2019 in press Jan

Is DSD more effective in refractory VF?

- Matched case control comparison
- 205 patients with refractory VF (3 shocks)
- 64 DSD vs 64 Standard defibrillations
- 2 blinded observers; matched same year pts
- Same epi doses, downtimes, witnessed, bystander CPR

DSD vs Standard Defibrillation
ROSC and Survival to Discharge



ROSC Survival to D/C

"Our current protocol of considering DSD after the third conventional defibrillation in out-of-hospital cardiac arrest is ineffective"

Summary

Use high flow nasal O_2

Use Boujies

Cricoid NO

ETI experience takes time

Summary

NTG	Yes
MAG	No
IO	?
DSD	No

Things keep changing