



Advanced Emergency Nursing **JOURNAL**

Presents
Collected Clinical Tips©
*from the experience and wisdom of its Editors
as published on its website*

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240 Something machines can't do

In line with the current Advanced Emergency Nursing Blog (**Automated Vital Signs – Who's the automaton?**), here are some things that your VS machine can't do, but are useful to you.

A conventional aneroid sphygmomanometer can help you start a difficult IV. Very often, the problem in finding a vein is due to an inadequate tourniquet, inadequate filling of the limb, or poor blood pressure.

When there's no time for hot towels or heel-warmers, invert the cuff on the arm (tubing running straight to the gauge without kinking) so as to leave the entire lower arm free of interference. Inflate the cuff to a pressure between the diastolic and the systolic. Lower the limb below the table or trolley. The cuff (wider and more comfortable) gives better compression and sequestration of venous return, especially in shocky patients (e.g. BP = 46/40; {true case}).

I've previously reported using a stethoscope to assess for leg fractures. There is some updating of that in "[Tuning fork ultrasound](#)." Useful for austere conditions, and suggested for occult fracture screening. [The study](#) has an 'n' of 20 but with MRI control; decrease in amplitude was noted with 80% accuracy.

And, of course, a machine can't swing a stethoscope head as a substitute reflex hammer.

241 Masking Communication in *La Grippe* of Influenza

This is a hard season of Influenza with possibly harder conditions to follow. It seems that many staff are continuously wearing masks throughout their shifts. Whether this is because they are unvaccinated (I hope not.) or *are* vaccinated (I hope so.) and are

protecting themselves because of the less-than-desired efficacy of the vaccine, remains a barrier to communication as well as to droplets.

Many cultures pride themselves upon open-faced communications and community. To be open-faced is a synonym for forthright honesty. We look to the animation of expression and clarity of speech, for intimations of perceived character and honest interaction. Being masked in public seems as if there is something to hide, and ordinances often prohibit it.

What is known to be true is that concealing the mouth, and much of the face, deprives the listener of non-verbal clues to speech articulation and nuances of mood upon which we rely more than we think about it. This is worse if task fixation averts gaze so that the eyes are unread, and a somewhat muffled voice is directed away. Think of dramatic operating room scenes in movies or TV, where everything is controlled in an ideal way, yet some quality of communication is lost.

Remind all staff of these things, and how extra measures must be made by them, to ensure clarity.

1. Engage the patient directly with the eyes, as much as possible.
2. Use a *slightly* louder and more crisp articulation of speech.
3. Discern if possible, even by direct question, of any deficits the patient may have in hearing, seeing, speaking, translation, medical literacy, that will impair interaction.
4. Say to them that masks can make it harder to understand and that it's OK to ask for a repeat or explanation.
5. Draw out feedback that one is clearly understood despite the mask.
6. Assure the other person the mask is used, not from fear, or that the patient is dangerous, but is a neutral protection for everyone in minimizing transmission of disease.

(As one who is required to use a Powered Air Purifying Respirator due to glasses and beard, I am very conscious of people's reaction to it, reminiscent of epidemic thrillers and biologic warfare, and must assure them that it is just the safety equipment that I am required to wear.)

If a PAPR *is* worn, be aware of the optical and auditory impairment (wild sound from the motor), limited field of vision and difficulty with fine vision or charting, and how some head movements can displace the position of the mask. Battery life, and spare charged battery is critical. Spare headgear is important if there is contamination or scratching of the plastic view plate. Auscultation can be worsened by the additional noise.

242 Three "Cs" of Procedural Sedation and Analgesia

When we, as health professionals, must ourselves must be a patient, we can usually compose ourselves with equanimity due to our knowledge base, comprehension, and

rationality. This is not always true for our unprepared patients, stricken with sudden injury, and very real emotional responses (which, in ourselves, we choose not to admit).

In pre-op areas, I've (so far) been able to forego 'pre-meds' intended to tranquilize the anxious. My mantra has been that I am "Comfortable, Calm, and Confident." To my thinking, these three spheres, as in a Venn diagram, comprise the elements of mental/emotional preparation/resuscitation before significant procedures, to which assessment and attention need to be paid before beginning.

Many emergency clinicians most want reliability and pragmatically choose a good dose of Propofol rather than "woo-woo" stuff, such as hypnosis that take time and have variability. Strength in chemicals, as it were, rather than engagement in feelings. Yet the unprepared mind may need more chemicals than it otherwise might, and agitation during induction or emergence may be fear-based apart from pharmacology.

The upshot of the chemical approach is that often, for something that is painful, 'sedated' procedures are *not really* 'conscious' sedation, 'moderate' sedation, but "brief general anesthetics without paralysis". There, it's said; —what couldn't be said for legal and billing reasons. If it weren't for prowess at airway management and resuscitation, and attention to guidelines, there might have been some unfortunate incidents.

This doesn't mean that attending to the three C's removes all risk, but one may be able to use less sedation, or help someone through a moment with an encouraging word, rather than another bolus.

- Comfortable: Ease pain. Good local or regional block. Warmth. Positioning. Family concerns met. Assurance of less or controllable pain afterwards. The patient should seem 'snug'.
- Calm: Anxieties addressed. Teaching done. Expectations explained. "*And, when you wake, the cast will hold the bones steady so that there is less pain.*" (A suggestion of a new possibility and expectation.) Listen for voice changes and look for anxious mannerisms.
- Confidence: "*And, so you're ready now to fix it to heal quickly and well?*"

We're good at making sure the 'just in case' equipment is ready; let's make sure that the patient is mentally ready in every way.

243 Professional Growth and Development

N.B. Please check "Upcoming Conferences," below, for new AAENP gatherings and in conjunction with ENA and ACEP. Direct links and brochures! Don't pass it up!

Would you like staff nurses to be able to know or do 'a little more'? Use the immediate teachable moment, of course, but consider checking with the Educator or CNS as to

plans [verify, also, permitted scope, etc.], and contribute to a newsletter, or ideally co-opt the nurse with whom the issue arose to prepare an in-service with your assistance and backing, tag-teaming the presentation. *The best form of learning is preparing the subject matter for teaching.* Stepping out of the “providers’ charting room”, in this way, promotes unity with staff and breaks down walls. *Everything we do is collaborative.*

Better care. Better unity. Goals shared in a better way. Encouragement of staff development. Staff may decide to prepare for an extended role or qualify as ENPs, themselves!

244 Is Trouble BRUEing?

There is nothing more frightening to a caring parent than the sudden helpless fear that the infant suddenly died or is dying. If moments later, the child seems recovered: “*What was that? Is it going to happen again? What should I do? Could he die?*” Finding good answers puts us on the spot. Historically, increased awareness of ‘Cot Deaths’ led to the term Sudden Infant Death Syndrome. Babies who had strange spells colloquially were thought to be “*Near-* SIDS.” To lessen confusion, the term became ALTE (Apparent Life-Threatening Event). For clearer definition and guidelines, the AAP replaced it with BRUE (Brief Resolved Unexplained Event) “intended to better reflect the transient nature and lack of clear cause and removes the ‘life-threatening’ label.”^{Tieder, q.v.}

The value of the new definition and the evidence for it is as a RISK STRATIFICATION TOOL to determine which child is Low-Risk who may, after history and physical, some observation and monitoring, be safely discharged. It is a diagnosis of exclusion; outliers will be at higher-risk requiring further focused evaluation. It is a springboard for discussion with parents of an otherwise healthy child as to risks/perils of extensive/expensive work-up which evidence suggests is unlikely to be fruitful. The parent is a sensitive monitor, of greater benefit, and should further help be needed—it is available. Sensitive and practical suggestions may be included (first aid and CPR training) in a general sense to give confidence and immediate rescue, which nonetheless does not suggest an imminent crisis.

Tieder, J. S., Bonkowsky, J. L., Etzel, R. A., Franklin, W. H., Gremse, D. A., Herman, B., ... & Percelay, J. (2016). [Brief resolved unexplained events \(formerly apparent life-threatening events\) and evaluation of lower-risk infants](#). *Pediatrics*, 137(5), e20160590 (May 2016). [PDF] A [correction regarding anemia](#) appeared, but, “*The corrected algorithm appears in the online version of this article.*” **Clinical Practice Guideline from American Academy of Pediatrics.**

Chow, Jessica ,MD; Bin, Steven, MD. [PEM Pearls: Brief Resolved Unexplained Events \(BRUE\)](#). *ALIEM; Academic Life in Emergency Medicine*. February 1st, 2017. **Nice precis of definitions, inclusions and exclusions, and approach.**

Mills, William A., MD; Levine, Amy, MD. [Which Is BRUE](#). *Emergency Physicians Monthly*. July 8, 2016. **Summary of management.**

Esch, Mackenzie, MD; Levine, Amy, MD. [When Techie Baby Monitors Cry Wolf](#). *Emergency Physicians Monthly*. October 12, 2017. **Of interest re consumer monitors for apnea.**

Tieder, JS, MD. [Brief Resolved Unexplained Events \(BRUE\) Criteria for Infants](#). [MDCalc.com](#). No Date, but ©2005-2018. ****Diagrammatic calculator for Is/Is Not determination of BRUE by the Lead Author of the AAP Guideline.**

Carolan, Patrick L., MD. [Brief Resolved Unexplained Events \(Apparent Life-Threatening Events\)](#). [emedicine.medscape.com](#). Updated: Dec 12, 2017. ****Additional background data and suggested management and evaluations.**

Fox, Sean, MD. [BRUE](#). [pedemmorsels.com](#). Published September 2, 2016. Updated July 23, 2017.

245 Stomach Contents; Not In The Airway

Airway managers give great attention to preventing aspiration into the lungs. Success isn't guaranteed. Unlike elective surgery, we cannot fast the patient, medicate him overnight, or do studies. Sonography, in other anesthetic settings, is in early studies to estimate the volume of gastric contents. Someday, this may help inform our approach to the unprepared patient.

Point-of-care sonography is rapidly evolving. These are initial studies, and not ready for clinical decisions in emergency care, Studies in our arena may yield future utility and minimize surprises.

Meanwhile, consider risk and practice caution. Decompression may have value. A smooth RSI may conquer. Positioning may help; be ready to instantly turn the patient to drain emesis. Know how to rapidly lower the table to Trendelenburg's position so fluids puddle (for suctioning) below the glottis. Two suctions! Two Sources! ([DuCanto Catheter™](#); [HI-D® "Big Stick®"](#))

Spencer, A. O., Walker, A. M., Yeung, A. K., Lardner, D. R., Yee, K., Mulvey, J. M., & Perlas, A. (2015). [Ultrasound assessment of gastric volume in the fasted pediatric patient undergoing upper gastrointestinal endoscopy: development of a predictive model using endoscopically suctioned volumes](#). *Pediatric Anesthesia*, 25(3), 301-308. [[PDF](#)] {Abstract & Paywall}

Schmitz, A., Thomas, S., Melanie, F., Rabia, L., Klaghofer, R., Weiss, M., & Kellenberger, C. (2012). [Ultrasonographic gastric antral area and gastric contents volume in children](#). *Pediatric Anesthesia*, 22(2), 144-149. {Abstract & Paywall}

Chen, C., Liu, L., Wang, C. Y., Choi, S. W., & Yuen, V. M. (2017). [A pilot study of ultrasound evaluation of gastric emptying in patients with end-stage renal failure: a comparison with healthy controls](#). *Anaesthesia*, 72(6), 714-718. {Abstract & Paywall}

Arzola, C., Perlas, A., Siddiqui, N. T., Downey, K., Ye, X. Y., & Carvalho, J. C. A. (2017). [Gastric ultrasound in the third trimester of pregnancy: a randomised controlled trial to develop a predictive model of volume assessment](#). *Anaesthesia*. [[PDF](#)] {Abstract & Paywall}

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Orr, D. A., Bill, K. M., Gillon, K. R. W., Wilson, C. M., Fogarty, D. J., & Moore, J. (1993). [Effects of omeprazole, with and without metoclopramide, in elective obstetric anaesthesia.](#) {Abstract} *Anaesthesia*, 48(2), 114-119. {Free} [\[PDF\]](#)

Robinson, M., & Davidson, A. (2014). [Aspiration under anaesthesia: risk assessment and decision-making.](#) *Continuing Education in Anaesthesia Critical Care & Pain*, 14(4), 171-175. {Free} [\[PDF\]](#)

Salem, M. R., Khorasani, A., Saatee, S., Crystal, G. J., & El-Orbany, M. (2014). [Gastric tubes and airway management in patients at risk of aspiration: history, current concepts, and proposal of an algorithm.](#) *Anesthesia & Analgesia*, 118(3), 569-579. {Free} [\[PDF\]](#)

246 Do I need to be worried?

There may be times when you are uncertain as to the intentions of 'visitors' to an injured 'perpetrator' or other combatant receiving care. Absent a *skilled* security service in your ED, this is a time for "*I'm sorry, there are no visitors allowed right now*" and getting hold of security, police, and administration before doing anything. These should be instantly available. Most active EDs need continuous on-site security service.

Security service, in this sense, means skilled professionals with training, powers, and authority similar to those of police. It does not mean overaged overweight chairwarmers who sometimes patrol with a clock-recorder, and who clearly never would qualify for 'real' law enforcement. When security services are needed, more is needed than just a flashlight, radio, and a "policy of 'observe and report.'"

Many ED staff have pretty good judgment as to who might be a trouble-maker. Remember, of course, that appearances can be deceiving. We also are trained in 'pre-violence indicators.' Presence of pre-violence indicators should be reasonable grounds to exclude someone from a patient care area. Behaviors that might be furtive or shifty are less easy to define but should be reason to call for security presence.

In most North American jurisdictions, searches may only be done by properly constituted authorities, and then upon "*probable cause.*" Clues that might give rise towards an *officer's* probable cause, among other requirements, include: visibility or familiar bulge of a weapon; the familiar sound of it clunking against furniture or the floor; an unnatural gait due to its weight or manner of concealment (boot or ankle; concealed in pants leg); 'reassurance pats or checks' to hold it in place or adjust position in waistband; fiddling with waistband or inside of garments. Pre-violence indicators may be darting or hovering the hand over the object.

Viewers of TV/Hollywood dramas have seen emulations of murders by 'shank' attacks in prisons with sharpened plastic toothbrushes hidden in scrubs, must realize that there are covert means and when there is murderous will, a way will be found, even in ultimate 'Gun-Free Zones.' Weapons may be hidden in hair, between fingers, in folded-back hoodies, or carried by a confederate.

Notwithstanding, there are many lawfully armed citizens, who may be carrying when needing emergency care. These people will not be your problem, being lawful in their

lives, but may feel awkward or embarrassed under the circumstances. It may be necessary, *e.g.*, sedated procedures, to offer them safekeeping of their sidearm until appropriately returned.

This information is provided for perspective by emergency care professionals and is not legal advice, nor does it authorize any action by any person not trained, qualified, and empowered to do so. Be sure of your local laws, policies, and restrictions.

247 A Fishy Reaction

EMS calls you while *en route* from a seafood restaurant with a patient who is described as distressed. His companion, a passenger in the ambulance, initially symptom-free, is now, ~30 minutes after the first patient's onset, developing similar, but milder symptoms.

#1 has a florid flat red rash of the chest (no edema), including hot, peppery sensations of the skin, mouth, and throat. He is anxious, tachycardic, tachypneic and 'short of breath' with diminished, slightly wheezy breath sounds throughout. He denies any drug or food allergies.

#2 appears flushed, itchy, has palpitations, some abdominal discomfort, and mild headache. She, too, denies drug or food allergies. Both, and the remainder of their party, ate tuna in their meal. The others are well, but will bring samples of the tuna to the hospital for assay.

You decide to continue supportive treatment, with H1 and H2 antihistamines, nebulized bronchodilator combined with Ipratropium Hcl, observation and monitoring \pm corticosteroid or epinephrine/adrenaline if there is grave worsening, but you anticipate an unremarkable recovery.

What happened in this case? Despite lack of allergic history, the symptoms seem histamine mediated; >1 victim further suggests this. Non-victims are probably due to not sampling the spoiled or contaminated portion. Naturally occurring Histidine in the muscles of dark-meat oily fish, typically from the Scombroid family (*e.g.*, tuna, skipjack, or bonito; but not always, as cases have occurred with Mahi-Mahi or sardines) if not properly chilled or have bacterial contamination leads to conversion of Histidine to Histamine. Even if subsequently cooked, which may kill the bacteria, the Histamine that has evolved is not destroyed and causes adverse effects.

This is a notifiable public health illness. Histamine levels in the fish can confirm the source, and histamine or tryptase levels in the human can confirm the etiology. Standard antihistaminic treatment and support should suffice, although fatal cases are known. This episode will not create an allergy, and correctly stored and prepared fish in the future should be no problem. Histamine Fish Poisoning may be a better term, as non-scombroid fishes have been implicated also.

Attaran, R. R., & Probst, F. (2002). [Histamine fish poisoning: a common but frequently misdiagnosed condition](#). *Emergency Medicine Journal*, 19(5), 474-475. [PDF. Scroll down, many articles]. DOI: [10.1136/emj.19.5.474](https://doi.org/10.1136/emj.19.5.474).

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Guly, H. R., & Grant, I. C. (2006). [Case of the month: Lesson of the week: don't forget scombroid](#). *Emergency Medicine Journal*, 23(12), 955-956. {Paywall} PMID: [PMC2564266](#). [\[PDF\]](#)

D'Aloia, A., Vizzardi, E., Della Pina, P., Bugatti, S., Del Magro, F., Raddino, R., ... & Dei Cas, L. (2011). [A scombroid poisoning causing a life-threatening acute pulmonary edema and coronary syndrome in a young healthy patient](#). *Cardiovascular toxicology*, 11(3), 280-283. {Preview & Paywall} [\[PDF\]](#)

Tortorella, V., Masciari, P., Pezzi, M., Mola, A., Tiburzi, S. P., Zinzi, M. C., ... Verre, M. (2014). [Histamine Poisoning from Ingestion of Fish or Scombroid Syndrome](#). *Case Reports in Emergency Medicine*, 2014, 482531. <http://doi.org/10.1155/2014/482531>. PMID: [PMC4273511](#). [\[PMC PDF\]](#)

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Birkun, Alexei, III, MD, PhD. [Histamine Toxicity from Fish Treatment & Management](#). emedicine.medscape.com. Updated: Sep 26, 2016.
248 The knife-point of necessity

We have all wondered how we would perform if crisis necessity compelled us to do a rescue Front-Of-Neck-Access. Especially if it was out of one's Scope of Practice or authorized procedures. As I've heard it described, "*if it was successful, one might be a hero; if not successful, one would then be the schmuck who used to work here!*"

Nonetheless, the possibility of encountering a critical airway emergency always exists, and with a likelihood that higher personnel or resources are not there. It is best to have documented official training of appropriate standard. In any emergency, to paraphrase Louis Pasteur, "success favors the prepared mind." Emergency Professionals live their convictions and prepare their minds diligently for all circumstances, even the uncommon.

Read, below, the experience of a New Zealand Midwife who acted when needed and saved a life. Additional useful links to prepare your mind are also listed.

"Ketaminh" Minh Le Cong, MBBS, FRACGP, FACRRM, FARGP, FACAsM(Assoc), GDRGP, GEM, CertIVTAA, PGDAeroRT. [Midwife does Cric at BBQ, saves life! PHARM: Prehospital and Retrieval Medicine](#). March 10, 2018. Links Simon Wilson's Tweet of

Stewart, Matt. "[Heroic midwife uses Stanley knife to cut choking boyfriend's airway open](#)." stuff.co.nz. Last updated March 10, 2018.

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Morgenstern, Justin. [Emergency Airway Management Part 4: Cricothyroidotomy \(surgical front of neck access\)](#) An approach to managing the emergency department patient in a can't intubate can't oxygenate scenario. [First10EM.com](#). December 17, 2017. ****Instruction, Guideline, Resources, Videos, References.**

[Surgical Airway \(Cricothyrotomy\) Performed by Ram Parekh](#) from [Scott from EMCrit](#).

Cited in "Ketaminh" Minh Le Cong, MBBS, FRACGP, FACRRM, FARGP, FACAsM(Assoc), GDRGP, GEM, CertIVTAA, PGDAeroRT. [Real Surgical Airway Video Here](#). [PHARM: Prehospital and Retrieval Medicine](#). April 19, 2015.

249 Personal Survival Kit for those shifts!

Many emergency professionals make a habit of 'Every Day Carry' of practical items for unexpected needs. In EDs (and other emergency missions), the most important person to save is our self; to bear up longer under adverse conditions, see that next patient now, and to recover as quickly and completely if brief respite comes.

I imagine that you already bring your 'Peripheral Brain' of reference data on cards or smart phone. At least one spare pen that you like. Spare batteries or charging cord? Music/Video player. Grooming aids and cosmetics. PRN meds for one's allergies or pain.

Small kits in an 'Altoids®'-type tin or a pouch are popular. Consider:

- Menthol Inhaler to mask unpleasant odors.
- Small toothbrush & paste, breath freshener.
- Lip Balm.
- Hand Sanitizer & Lotion.
- Body wipes.

- Safety pins for clothing repair.
- Gum, candy, or protein bars.

- Spare Contact Lenses, *etc.*, or spare glasses.
- Preloaded card for fancy coffee, food.

- Caffeine tablets (when you really can't slow down).
- Earplugs & sleep mask, if there's a safe place to nap.
- 24-hour supply of regularly taken medicines.

- Preloaded card for sudden money needs (not tied to your accounts).
- \$50-\$100 emergency cash (taxi home, car tow, plastic 'declined').
- Reminder how to find/lock/delete your cellphone data, if stolen.

If you have the luxury of a locker: spare shoes, clothing change, outer garment for unexpected weather. Remember a 'disaster' (not a drill) *is when you come to work and don't leave until three days later --still in the same clothes.*

250 Do you really need that line?

A best clinical poster at Australian College of Emergency Medicine presents an intervention to reduce those “*just in case*” IV starts that don’t actually get used. Practice, before and after, was studied; fewer IVs were started, those that were started were more likely to be used in the ED or upstairs, savings in costs and staff time were found.

This is a promising field for study and change. There are cultural practices to question. We tend to assume that patients are sicker than they look. Busy EDs develop workarounds to hasten flow that drive costs and complexity upwards. Protocol-driven EMS crews and nurses may tend to over-treat, and to ‘CYA’ with the IV that may not be absolutely needed, or to send tests that may be reasonable but discretionary. It’s possible to increase the patient’s bill, through good intentions, by large amounts.

Front-end triage by providers is said to focus initial care efforts with time and cost savings compared with conventional triage and nurse actions before exam by a provider.

So, let’s look at what we do, and why we do it, and see if some efficiencies and economies can be effected. It may be worthwhile.

The review of the study, from an evidence-based and skeptical viewpoint, is from “*The Skeptic’s Guide to Emergency Medicine.*”

Heitz, Corey, Dr. [SGEM#204: Hold the Line – IVs Aren’t Always Required. The Skeptic’s Guide to Emergency Medicine.](#) January 25th, 2018. **Podcast Link:** [SGEM204.](#)

Reviews: Hawkins et al. [Peripheral Intravenous Cannula Insertion and Use in the Emergency Department: An Intervention Study.](#) *AEM Jan 2018.* [\[PDF\]](#)

251 Gastric Rupture & Tension Pneumoperitoneum

Though you may rarely, or never, see this complication (I truly hope so), it can progress from inklings of “*what, the hell?*” to massive astonishment!

One cause of Tension Pneumoperitoneum is Gastric Rupture which can occur from esophageal intubation, usually (but not always) along the lesser curvature of the stomach. Other iatrogenic causes are bag-valve-mask ventilation, difficult intubation, perforations due to instrumentation especially with insufflation during endoscopy, during surgery; by blunt trauma, or spontaneously through diseased or damaged tissues, including perforation of a hollow viscus, or carcinomatosis. Pneumomediastinum can leak to the abdomen.

If not detected quickly, the hugely distended abdomen can push the diaphragm up impeding ventilation and alter cardiac output by mediastinal shift. The high tension becomes an abdominal compartment syndrome, and may threaten distal circulation to the lower extremities.

If a non-endotracheal advanced airway has been placed in the field, and function is satisfactory, do not hasten to intubate ‘around it’ as this an awkward circumstance that can lead to esophageal intubation past the other device. Consider waiting until ‘Return

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Of Spontaneous Circulation' is stable, when the procedure can be done in calmer fashion, possibly augmented by video or flexible laryngoscopy.

This is a clinical diagnosis. The patient may be too unstable for a scan. Cross-table portable X-ray may be all that can be done initially. Emergency Needle Decompression or a pigtail catheter may temporize. Do other imaging when feasible. Surgical repair is needed.

Lu, T. C., Chen, S. Y., Wang, H. P., Lee, C. C., & Chen, S. C. (2006). [Tension pneumoperitoneum following upper gastrointestinal endoscopy](#). {Abstract & Refs.} *Journal of the Formosan Medical Association*, 105(5), 431-433. [PDF, full text]

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Thornton, S. L., Scott, M., & Hunter, J. (2015). [Fatal Tension Pneumoperitoneum Due to Non-Accidental Trauma](#). *Western Journal of Emergency Medicine: Integrating Emergency Care with Population Health*, 16(5). [PDF]

García-Santos, E., Puerto-Puerto, A., Sánchez-García, S., Ruescas-García, F. J., Alberca-Páramo, A., & Martín-Fernández, J. (2015). [Abdominal compartment syndrome by tension pneumoperitoneum secondary to barotrauma. Presentation case](#). *Cirugía y Cirujanos (English Edition)*, 83(5), 429-432. [PDF]

Kaafarani, H. M. (2015). (Images in Clinical Medicine) [Tension pneumoperitoneum](#). {Includes link for 22" video of [Decompressive Laparotomy for Pneumoperitoneum](#).} *New England Journal of Medicine*, 373(21), e24. [PDF]

Kolinsky, D. PGY-2. [Needle that belly! Everyday E\(B\)M](#). Washington University EM Residency Blog. April 8, 2015. [Ed. Note]**Excellent concise overview.

Carvalho M, Godinho P, Moura A, Silva C, Tourais I, et al. (2016) [Gastric Rupture after Bag Mask Ventilation: A Review Under a Case Report](#). *J Anesth Clin Res* 7:617. doi:10.4172/2155-6148.1000617. [PDF]

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Sharma, Rohit, Dr. & Jones, Jeremy, Dr., et al. [Pneumoperitoneum](#). [Radiopaedia.org](#). (Blog). No Date. Accessed 04/02/2018. "Revision [1](#) created almost 9 years ago by [Dr Jeremy Jones](#)." "Current revision created 5 days ago by [Dr Rohit Sharma](#)."

252 'Tactical Tampons'

For some two or more decades, there have been unverifiable assertions that ordinary vaginal tampons have utility as 'wound plugs' for gunshot wounds, for epistaxis, that frequent use has been for such by military medics, and thus is a bona fide recommendation for those who prepare for such emergencies. I have always considered such comments as 'not proven', unlikely, unverifiable without documentary evidence or testimony, and likely not an official policy.

A Canadian web blog on tactical medicine includes it in its list of "[Myths of Tactical Medicine](#)" (its most popular download). Many tactical medicine writers support an evidence based medicine approach, using military "lessons learned", and keeping care relevant in reality – rather than uncritical acceptance of past dogma.

Modern terror attacks increase the likelihood of life-threatening bleeding, and strong efforts are being made to update the civilian approach to stopping bleeding. Tampons are not effective, and, despite the attractive novelty imputed, should not be used. They are not perfect in their original purpose.

Major bleeding must be dealt with first, fast, and effectively. Pressure must be applied to the source of bleeding. Shutting off flow proximally may be needed. The bleeding point should be accessed, and wound packing with pressure, until definitive control and repair is done.

Unlike a tampon, the dressing in shape should resemble a champagne cork with its base at the bleeding point, complete filling of the wound, and a 'mushroom cap' on top to allow circumferential bandage pressure. Hemostatic agents may be used, but gauze works as well if correctly used.

Official responders need to be well-trained and equipped. Hospital workers need, likewise, to be prepared for a disaster that comes to them, or occurs within. Exsanguination is rapid. Without blood, life will not be supported. Death by every drop.

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253 Penetrating Trauma ... That Sucks!

A gunshot victim suddenly arrives “**WBEMS**” (Without Benefit of EMS {Emergency Medical Services), at your ‘quiet’ Emergency Department. Looks awful. Pale. Gasping. Funny asymmetric chest movement. Not much blood. As you lift the shirt, a pencil-sized wound is revealed. What to do? Immediately, you apply (gloved) hand pressure to the wound. You’re “not a trauma center” so chest tubes and seals are in another room.

What now? Your hand must stay there until the wound is sealed. Scan the room. “*Of course!*” “*Give me the Defibrillator Pads!*” *Eh, voila!* Nice sticky defibrillator pads to cover the wound, and a companion wound, say, an exit, if there is one.

As your institution is “*not* a trauma center”, you usually ‘expect’ cardiac, so the pads are there. If the chest is bloody, grab one of the intubation towels and wipe the chest to improve adhesion.

ATLS no longer specifies a “three-sided occlusive dressing” for which evidence is lacking. However, whichever dressing you use, it is vital to monitor the chest for progressive pneumothorax which might achieve a ‘tension’. Survival is a balance between air (or ventilator breaths) coming in vs the rate of escape, if any. Tissue may interpose a barrier to escape of what otherwise would be an ‘open’ pneumothorax, or ‘minute volume’ of ventilations may exceed ‘minute volume’ of escape. In the ventilated patient, pneumothorax is more likely to achieve tension and to shift the mediastinum impairing cardiac output, whereas the spontaneously breathing patient is less likely to have a ‘shift’. Leigh-Smith, S., & Harris, T.

If there is great trauma, it may be wiser to do a ‘finger thoracostomy which would be more effective, especially if there is hemopneumothorax; bilateral ‘finger thoracostomies’ can be converted to a ‘clamshell thoracotomy,’ if need be.

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254 Odd rashes, itching, scratching

Don't forget a very useful ED tool is the (typically) illuminating magnifying glass with a Wood's (long-wave ultraviolet A) Lamp. There's usually one, sometimes in a supply room, or in a pediatric room.

Frequently used to check for ringworm (tinea capitis), with the UV lamp, or for sexual assault exams (wounds & fluorescence of semen; however, more specific light frequencies and filters are now recommended), it's useful to detect Ethylene Glycol ("anti-freeze intoxication) in urine by its fluorescence.

The unexplained 'fingernail cellulitis' from scratching the itch may be explained by finding the bites that caused it. Using magnification with good light, or UV when indicated, makes inspection easier and more detailed.

Patients with "invisible" bites and lesions ("*Don't you see them? They're going in and out of my skin.*") can be assured of your carefulness by a conspicuous exam with the lighted magnifier and Wood's Lamp. ("*No, I can't see them, even with this special light, but I do believe that what you're feeling is bothering you. I'd like you to follow up with someone who can help more.*")

Dogs, cats, and birds have long been pets. More exotic pets (reptiles, rodents) are joined now by increasing numbers 'backyard chickens' and other animals who share

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their owners' lives as pets, more than livestock. Infestations of mites and other 'critters', now enter the differential of bites, skin irritations, or worse, lung infections from avian dander, and allergens that exacerbate asthma, and other less urban substances. Remember to ask about 'other' animals, as a generic 'pets' question may only elicit the household animals.

Worms in some animals, can be acquired by humans also, and should be sought where indicated. Modern suburban practice is truly a blend of urban and semi-rural concerns.

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255 Shoulder Reduction

Dislocated shoulders are painful. Reduction of it is painful, too; Prompt reduction is beneficial.

A quick, but careful, neurovascular exam, followed by point of care ultrasound may eliminate some of the slow-downs if X-ray is swamped.

Technics are numerous; some require sedation and recovery; some can be done with intraarticular anesthesia; some with talking (or hypnosis) and manipulation only. Learn several methods and become adept at those which work best for you and are simplest, if possible.

The more 'fresh' the injury, generally, the reduction is easier due to less spasm. It's useful to keep talking with the patient to distract his attention away from the injury. Your best cheerful, confident, and engaging 'bedside manner' will lesson anxiety, tension, and therefore, pain. If you are able to achieve sedation-free reduction, the burden on the department is less and discharge can be done without 'recovery'.

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256 Does 'Altered Mental Status' alter our own?

Dr. Natalie May (UK) presents an interesting review of two American [papers questioning 'presumed' alcohol intoxication](#) and the physical clustering of those patients raising diagnostic challenges of overcoming biases, anchoring, and triggers for further workup.

Of “29,322 patients with presumed alcohol intoxication – 1,875 had negative breath alcohol and were included in their analysis. That’s 6.39% of patients presumed to be intoxicated with alcohol who weren’t {Note: My emphasis} – around 1 in 16 patients”. 10% were admitted, with 1% to the ICU. This was a large center that uses breath alcohol screening. Dr. May notes that this is uncommon testing in the UK.

Do you have a standard screen or track for poor trajectory of clinical progress? How suspicious are you in seeking other problems, when alcohol is ‘presumed’ to be the main problem? Blood alcohol testing that I’ve seen was to *exclude* the diagnosis, confirm toxic (very-high) levels, check proportionality to the level of consciousness seen, or to check for *other alcohols* if that was an important possibility. Check glucose always. Choose other tests based on possible confounding, or masked, diagnoses. Are there targets for open-minded re-exam? Failure to progress, or “reattendance” argue for more aggressive diagnosis.

An example used in first aid classes was that of a man found unconscious on the ground near his ladder. His breath is boozy. What happened?

- Drunken fall from the ladder?
- Fall from standing height?
- Drank his lunch and fell asleep?
- Felt unwell and took a drink?

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- Never got on the ladder; had a stroke?

Be careful with assumptions. Quiz EMS about scene observations. Thorough exam and testing. Review/Reexamine hourly or with any change.

May, Dr. Natalie. [St. Emlyn's Emergency Medicine Journal Club: One too many? StEmlynsBlog.org](#). May 4th, 2018. "The Intoxication Area", its biases and flaws. Safer care of 'Altered Mental Status.'

257 Caring for VIPs; VIP Syndrome; Ethics

As with other patients, caring for VIPs can be satisfying or frustrating. Further, there is some hazard that care given may, by distraction or influence, vary from best and prudent care.

- Registration may be by pseudonym, address may be corporate rather than personal.
- Prompt privacy needed to avoid attracting stares and overhearing.
- The entourage may be helpful, or not; their loyalty is to the boss.
- Many celebrities can be 'ordinary folks', some will have special requests, or want to leave for the air flight.
- As the Joan Rivers case showed, VIPs may suffer from the wrong care and attention due to deference, ga-ga silliness from professionals, and specious reasoning in care or crisis. VIP Syndrome occurs when the patient is harmed by the consideration of status.
- Stick to standard care and unaltered procedures, focusing on the patient and disease. Maintain good communication and teamwork. Beware of concessions and compromise.
- Administrators, Chairpersons, Consultants, may want to pay courtesy calls or take part in the care, or request privileges for the VIP.
- VIP or preferential treatment arouses some ethical questions as to motivation and whether it interferes with the needs of others.

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258 Is that pelvis broken?

A nice tip originates from a large Australian centre ([The Alfred Hospital](#), Melbourne, Victoria) in a small study.

Patients were prospectively screened with a test of straight leg raise eliciting pain and then X-rayed to determine if the pelvis was fractured. From the cohort of 328 patients, 35 patients had proven fracture. 32 alert patients (GCS=15) could not straight leg raise or did so only with pain. "Sensitivity of 91.43% (95% CI: 76.94–98.2%) and a negative predictive value of 98.57% (95% CI: 95.88–99.70%)" was claimed. The other 3 patients with fracture could lift without pain; these patients had GCS<15. For the sub-group who were alert, there was 100% sensitivity and 100% specificity in the test.

Older methods of examination by 'spreading' and 'squeezing' the Iliac Crests and pressing upon the Symphysis Pubis have been criticized as increasing injury dangerously leading to increased concealed internal hemorrhage which can be fatal.

As always, be cautious in eliciting subjective symptoms in patients who are impaired.

This report is gaining traction among various emergency professionals with presently 127 retweets.

Bolt, C., O'Keeffe, F., Finnegan, P., Dickson, K., Fitzgerald, M. C., & Mitra, B. (2017). [Straight leg elevation to rule out pelvic injury](#). *Injury*. {Abstract & Paywall} [\[PDF\]](#)
DOI: <https://doi.org/10.1016/j.injury.2017.10.009>. [PubMed: 29132904](#).

259 Several Simple Things to Ease Intubation

When setting up for imminent endotracheal intubation, several simple tips make things vastly easier; the neglect of which is a sign of a heedless cowboy trusting to luck.

1. Firstly, have a 'bougie'! Just having it, puts you ahead to rescue a bad situation (poor jaw opening; Cormack & Lehane view ≥ 3 ; awkward tube passage; tactile confirmation needed).

The bougie's diameter, less than that of the tube, improves visualization and allows for a low approach out of the direct line of vision. It can lift or manipulate the epiglottis or pass just above the arytenoid notch when the cords are not easily seen. $\geq 90\%$ of the time, one can feel clicks of the bougie on tracheal rings; 'hold up' of the bougie in the Right Mainstem Bronchus occurs after 30-40 centimeters have been passed. (Don't press harder --to prevent injury.)

Best is to have the ETT preloaded with the bougie (especially if help is limited) to find and navigate through the glottis and pass one's own tube. Second best is solo use of the bougie, with a helper to 'railroad' the ETT over it.

2. **Lubrication.** ED intubations are more likely to have a wet field vs. an OR intubation due to premedication, but not necessarily. Prehospital and ED ventilation or preoxygenation, certain toxidromes, and smoke inhalation, may cause dryness of the membranes.

Slim to modest lubing of the tube tip helps you to slip it into where you want it to go; also do the cuff (helps tube delivery or glide across tissues, better cuff seal against aspiration); the stylet or bougie within the tube (helps with delivery, or rotation to clear the arytenoids; avoids being 'stuck' or needing a forceful pull).

3. **Collapse the cuff against the tube** after test inflation. [Leave the cuff interior at sub-atmospheric pressure.] The syringe should remain attached to the inflation line, ready to inflate. Having the cuff tight gives a better view around the tube to know where it goes. (*c.f.*, linked image below) If the cuff is 'nicked' against the teeth or fragments, loss of tightness reveals the fault.

As the cuff volume {adults} is often greater than the 10 ml delivered by the usual syringe, it is less likely to be initially over-pressured; however, *always*, check intracuff pressure as soon as possible to a minimal occlusive pressure to avoid mucosal injury. Continuing attention is needed if transport includes barometric change at altitude, or if there is airway swelling.

[Yen Chow, @TBayEDguy, Tweet on VL exposure](#). Note images 4,5,6, how 'fluffy' ETT cuff (not collapsed against tube) obscures vision. [Detail view](#).

260 Have you thought of Clysis?

Same situation as at other times. It's getting late. Despite an antiemetic, the child is still too fussy and cranky to accept oral rehydration. The veins are not promising, yet this doesn't require an IO insertion. If rehydrated, the child could go home and follow up closely with the PMD. Are there options other than failed cajolery or multiple needles?

Dr. Horeczko reminds us of new updates to old practice. Hypodermoclysis, or modernly, subcutaneous rehydration is easy to do, reliable, less traumatizing, and effective. It is also vein-sparing for kids who have had too many in their short lives. It also avoids having to insert a nasogastric tube. His [PEM Playbook](#) article, and podcast, will give you all the history and information that you'll need. It even works on adults.

Widely-used in the days of straight metal needles, he recommends some anesthetic cream, 24-gauge catheter, in-between the scapulæ, a little padding, a membrane dressing, and pump infusion, with 150 units of recombinant Hyaluronidase added for more rapid absorption. Remember, that the parents may already have done this for an aging pet, or their elders may have received end-of-life care.

This is 'another' way, that can give you safe and effective alternative access that is simple to do.

"thoreczko" Tim Horeczko, MD, MSCR, FACEP, FAAP. [Subcutaneous Rehydration. PEMPlaybook.com](#). Updated on August 1, 2016.

261 Secure Intraosseous line.

Intraosseous line insertion can give quick and reliable access for infusion and drugs in critical situations. Then you need to move that patient without losing that line to a sudden tug or getting caught in a narrow space (ambulance, helicopter, MR or CT scanners). The world-class website, "[ALiEM](#)" — *Academic Life in Emergency Medicine*, has a simple and quick solution for this problem with a readily available component. The result is displayed in a nine second video on YouTube: [Trick of the Trade: Securing IO Line with Padded Mask](#). It should guard and shield the IO device, but be sure to 'stress-tape' the infusion tubing in case it is snagged. Michelle Lin, MD, describes it at: <https://www.aliem.com/2016/05/trick-securing-intraosseous-needle/>.

The discussion, and the lower limb, are extended in [Trick of the Trade: Tibial Intraosseous Line Stabilization in an Agitated Patient](#) by Eric Shappell, MD, Seth Trueger, MD MPH and Nurse Mark Samora.

Michelle Lin, MD. [Trick of the Trade Securing the intraosseous needle. ALiEM](#). May 3rd, 2016.

Eric Shappell, MD, Seth Trueger, MD MPH, and Nurse Mark Samora. [Trick of the Trade: Tibial Intraosseous Line Stabilization in an Agitated Patient. ALiEM](#). July 20th, 2016.

262 Upper Extremity Injuries

Most of everything that we do is with our hands. Naturally, the unarmored tissues are easily injured. When we have repaired the injury for best healing, it is *not enough* to grandly say to the patient, if in presence of a spouse, “Keep it dry. You are excused from doing the dishes!”

Realistically, household roles don't switch very much, yet income must be earned, food prepared, and the dishes washed, children cared for, personal bathing must be done, the house kept, *etc.* “Time off work” may be used up, unavailable, or non-existent. Exigencies and practicality may intrude upon ‘wound rest’.

Ask about patient responsibilities for others or work. Is task modification even possible? Is there a risk of immersing the injury dressings? Do the dressings put them at risk for being caught in machinery?

If there's considerable pain, consider lidocaine patches for opioid-sparing.

Before leaving the ED, provide some gloves until the patient can get them from a store or online. Consider waterproof dressings, membrane dressings, or wound sealants that may be applicable.

If casted with plaster or fiberglass, provide a sling for rest and encourage elevation. Having nurses or PT/OT available may enhance the teaching. “Shower sleeves” should be available to protect during bathing. Remind about the awkwardness of being off-balance with risk of falls or dropping kids and packages. Provide an estimate of weight restriction in lifting or carrying. Rotational tasks (keys in doorknob) may be awkward, too. Driving may be impaired also. Added caution in circumstances of potential danger (parking lots, shopping zones) is needed: those who are injured or encumbered are especially targeted by criminals for robbery or assault.

263 Where's that vein?

There are now several technologies which have been adapted to the eternal pursuit for a usable vein. When available, they can not only find a vein, but evaluate it also. They encourage the clinician and lessen the fear of the patient. However, ... we must deal with the emergency as and when it occurs; —such technology may not be with us.

Cold or Warm? If the patient is cold, he must be made warm. Local warmth may suffice. Moist heat is believed to ‘penetrate’ better. Traditionally, hot towels have been used. Check that it is not so hot as to likely scald. Forced air warmers work well and are comforting. Immersing the hand or foot in a basin of warm water is effective. Are your hands cold?

Vasodilators: If hemodynamically stable, the brief use of nitroglycerin ointment or spray over the vein may enlarge it sufficiently. Remove when through. Covering with a warm moist washcloth may hasten the effect. As examples of the principle, a patient who is already on Flolan®, will have dilated vessels. In the pediatric O.R., it is common to induce with Sevoflurane and place the IV when the vessels are dilated.

Tourniquets: The common elastic tourniquet is often not tight enough to dam the flow and create a reservoir of blood, particularly with obese arms. There is fear of ‘pinching’

the skin. A manual sphygmomanometer is ideal as it is wide, soft, and compresses efficiently and comfortably; pressure can be accurately controlled. *Invert* the cuff so that its tubings run upwards and away, leaving the entire area from the fossa to the fingertips for use.

Gravity: Often forgotten, lowering the intended IV site below the body or table increases filling behind the tourniquet. (Don't wait until the patient is arranged on the MRI gantry to start the IV; it may not be possible to lower the arm.) Sit or kneel below the patient and dangle his limb, a usable vein may now appear.

Stability: Don't handicap yourself; if you're going to do precision work, give yourself the advantage of stable seating and good lighting. Standing, swaying over the patient, perhaps even too low for your back (because it's a kid) doesn't work well. Restless and agitated patients can be sedated or immobilized before the stick. You may even splint the arm before the start. Ideal prep = ideal start.

Activity: Have the patient exercise his tourniquetted arm to increase blood flow and filling. (Doing so overly long may hemolyze a blood sample.) IV drug addicts have offered to have a very tight tourniquet and then do push-ups to raise a vein!

People use simple patterns to wipe the veins with alcohol or other disinfectant. Instead of back'n'forth or circles, I suggest the only reasonable way is to stroke distal-to-proximal and repeat; push distal blood past the valves to create a greater pull below the tourniquet.

Uncommon Sites: It may be necessary to use a less-desirable and relatively non-standard IV site (e.g., ventral wrist, as veins may be curvy or any leakage may cause a compartment syndrome). Any non-standard IV site requires additional surveillance to monitor for leaks or other adverse consequences. Such sites should be removed when a standard site becomes available as rehydration 'fills the tank'.

Infusion Augmentation: When little is available, use the little. Scorn not the vessel that seems only 'baby-sized'. Use a 24-gauge cannula or a 25-gauge winged-needle to infuse a quantity of IV fluid with tourniquet still in place. This will cause other vessels to appear. (This is similar to a Bier's Block for regional IV anesthesia.) Do not use any of this diluted blood for testing.

Also, if it may be difficult to navigate the cannula within the vein, have ready an extension set with a syringe of fluid attached. When the cannula tip is within the vein, steady the cannula, you or a helper can then connect the extension to the hub and carefully infuse fluid while progressively inserting the cannula as the fluid expands the vessel and centers the tip within the lumen, thus you may 'float it in'. Be sure to remove the tourniquet before starting the regular infusion.

Use of Vessel Dilators: With a suitable vein, it may be possible to gain access with a Seldinger technique, so that the initial cannula is replaced, after mechanical vessel dilation, with a larger cannula for the desired flow rates. The Arrow RIC (Rapid Infusion Catheter) is a commercial example of a kit for this purpose. If a single lumen is not enough, a multi-lumen catheter may enhance infusion capabilities.

Tricks may satisfy one's pride, in starting a line, but if perceived difficult, it's wise to use available technology to minimize complications. If a substandard vein may be worked beyond its likely capabilities, keep a close eye on the site and the line for problems. If the patient is increasingly unstable, go for an intraosseous and plan for a central line. One, or more of these techniques used together, may help you through a difficult access situation. Use skill, have good luck, and know your available resources in personnel, technologies, and organizational capabilities.

Trimble, Tom, RN CEN. [I.V. Starts . . . Improving your odds!](#) [Emergency Nursing World!](#) © 1996-2015.

264 When the cuffed airway leaks from the device

A [Twitter link](#) reminds of an airway (or human) equipment failure that can happen in mid-resuscitation; it is not infrequent, --you will encounter it several times.

A damaged 'pilot tube' inflation line to the cuffed endotracheal tube leaks air or is severed (beware of scissors); the cuff will not inflate and seal to minimize aspiration. What to do?

1. First, clamp the tube to retain any residual air. Clamp is a cautious term, as unless you have provided for toothless clamps that do not further damage the tubing (good idea); the handiest will be a toothed hemostat.
2. The traditional step would be a 'blunt needle' that won't pierce the line or prick any fingers. These are uncommonly stocked, and confusion may reign. The modern answer is a 29-gauge IV cannula fitted snugly within the inflation line. This can be capped with a needleless-valve injection cap.
3. Inflate with syringe and re-clamp only if you must. The technically-minded often add a 3-way stopcock, but weight, bulk (the syringe), and complexity lend problems of their own.
4. Stop. Check that all is working well.
5. Sometimes the automatic valve may not work (either stuck closed or stuck open). For which the cure is to amputate the part and do the repair just described.
6. A yank at the junction where the pilot tube 'goes inside' mandates replacement.
7. The cuff itself may be perforated by a snaggletooth, tooth fragment, or glass in the airway. Iatrogenic damage is less likely if the lubed cuff is snugged firmly against the tube by sucking with the syringe *before insertion*, using a bougie to increase viewing area and guide the tube, and watching the cuff as it transits teeth and mouth.

Cuff Pressure Manometers *are your friend* in not only minimizing mucosal pressure damage (worse in aircraft) but in tracking cuff efficiency and leakage.

8. If the tube was reliably placed in the trachea, and it is irreparably damaged, OPTIMIZE the patient if distressed.

If not feasible with the tube *in situ*, **change to a Gen 2 SGA**. to recover, and perhaps to be a conduit for a new ETT.

If holding ok, then exchange the tube over an airway exchange catheter (longer and more convenient than some bougies and may be hollow for oxygen insufflation or CO₂ detection. These can be valuable, even life-saving, in difficult airways.).

9. The 15mm ETT connector is easily lost, as it is packed loose, or if it is manipulated. They usually bounce onto the floor and under a cabinet. Have spares. If no spares, a smaller ETT can intubate the lumen of the patient's tube, until suitable correction is made.
10. Obviously *inspect* and *function-check* all planned equipment *before use* to detect faults in manufacture or handling. Anticipate common problems and have 'materiel' on hand. Be "the *Cool* kid" who know what to do, quickly, when crisis occurs. Gracefully, accept high-fives afterwards.

265 "**Hocus ... POCUS !!**"

The first widely accepted usage of Point of Care Ultrasound in Emergency Departments (by emergency providers rather than radiologists) was FAST: "Focused Abdominal Sonography for Trauma."

Which of the following are accepted usages?

- Measure the diameter of the optic nerve sheath to estimate ICP.
- View the heart and IVC to sort out undifferentiated shock.
- Examine the the eye for ruptured globe.
- Examine vasculature while starting central lines.
- In phlebopenia to find usable peripheral veins.
- Look for "sliding lung sign" to assess pneumothorax.
- Find the Cricothyroid Membrane when palpable signs are lacking (short thick neck).
- Confirm intubation of the trachea and depth of tube.
- Find evidence of ectopic pregnancy and bleeding vs intrauterine pregnancy.
- Estimate bladder filling, urinary retention, anuria, atony.

Collected Clinical Tips from Advanced Emergency Nursing Journal, by The Editors.

- Evaluate abscesses and cysts.
- Check location for regional blocks, or for 'difficult' lumbar punctures.
- Assessment of DVT/PE.
- Assess effusions and presence of tamponade physiology.

How many checkmarks did you place in the list? I hope that you did so for each and that you feel comfortable in performing those procedures. Isn't it remarkable how the number of indications has grown, and continues doing so?

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266 O₂ NOT good?

Recent research has been building a conclusion that administering oxygen is not *always* a 'good thing'. Patients getting too much oxygen may have worse recovery, more deficit, and more deaths than studied groups who are normoxic during their period of care. During hyperoxia, the complex metabolism and usage of oxygen may create "reactive species" which alter cellular functioning.

Traditionally, oxygen was a 'good thing' to be given freely and generously for many problems; and a student's safe answer to questions. Faith, trust, and medical dogma encouraged a provider's self-comfort and a feeling of 'doing something'. Previously, it was difficult to study deleterious effects in so many different arenas of care, with disparate personnel, environments, philosophy, and needs. These are now being looked at more closely.

It now appears that it's safer to be more frugal with oxygenation. Hypoxemia can be treated with oxygen to a normoxic level, provided there is no hypercarbia (which is treated with ventilation). The patient should be watched for the need for increased effort or distress in maintaining a satisfactory level.

The patient who remains oxygen dependent should have it efficiently delivered, rather than by leaky masks and cannulae that do not provide enough volume for needs at a controlled O₂ concentration.

As always, manual ventilation with a bag by a person not keeping track of rates, volumes, and pressures, may create adverse hemodynamic changes within the chest that may prevent resuscitation and survival. Automatic transport ventilators may be the preferred device.

Watch the patient. Treat *the patient!* Be alert to change.

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267 Slick Airway Tricks for the Right-at-Hand Assistant

It is often thought that the assistant near the airway is there to provide “cricoid pressure”; hand over the tube; or it the senior observer ---to take over the tube from the intern. There is so much more that a qualified person can do.

1. ‘Cricoid Pressure’ is not often done now, as controversy has diminished the role. It was often ill-applied, can worsen view and obstruct the trachea. Prevention of aspiration is done with a *smooth* RSI in either ‘Head of Bed Up’ position, or in Reverse Trendelenburg’s position for airway drainage.
2. Have suction(s), Magill’s Forceps, BMV, ETT Introducer (bougie) & ETT with syringe, and securing device, ready to go.
3. Verbalize observations from the side and front as to airway ramping, motions of the chest, neck, and upper airway.
4. In risky situations, have the cricothyroid membrane identified, marked, perhaps even prepped with kit at hand.
5. In DL of an ‘anterior’ larynx, may need to assist with the weight of the head when Head Elevated Laryngoscopy Posture is used to align the axes.
6. If C-Spine precautions are needed, assists with manual stabilization of the neck and collar.
7. Can provide External Laryngeal Manipulation to give and hold a better view for the intubator.
8. While stabilizing the larynx, can trail the little finger caudally to feel the tube passage or even check a pulse in the suprasternal notch.
9. Can ‘railroad’ the ETT over a flexible scope, bougie, if the intubator is not using a one-man D-Grip bougie hold.
10. Assist with concurrent suctioning.
11. Apply a flashlight at the cricothyroid membrane for a retrograde light guided intubation; lighting up the glottal aperture; “find the hole.”
12. If laryngoscopy space is tight and difficult, can hook the jaw lifting anteriorly. Elevating the jaw from the posterior mandibular rami by anterior lifting. (Either

may improve view grade by \geq one or more grades.)

13. Help view, and tube delivery, by pulling the cheek down and out for more space.
14. Call for needed reoxygenation, or moving to next plan, if tube doesn't timely pass. Oxygenation is the primary goal; not tube placement. There's always another way.
15. Assist with two-person manual ventilation until the mechanical ventilator is ready.

268 'The Wee Hours' of Pedi Evaluation

Clinically, I think that we've all noticed that an infant is more likely to empty the bladder during the stimulus of cleansing the genitalia or not-quite-having-fully-inserted-the-catheter ... and not quite ready to catch the dribble from the air.

"Be Prepared" measures include having an open sterile cup (and a ready hand) to receive the rain, or having a 10 ml syringe on the catheter to aspirate what one can. Certainly, it's hard to persuade an anxious parent to accept a 'needling' of the bladder for a supra-pubic aspiration (yet we often accept this by veterinarians for our pets). Some studies have been done. Possibly, the results may be of use to you.

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269 Terrifying Tracheal Tubes – Bad Positions

- A. "Tracheal Vomiting Syndrome" The knowledgeable reader will grit his/her teeth reading this med-humor algorithm; those who have witnessed these 'kills' will relive rage that swears "never again ... " Clearly, projectile vomiting from a tracheal tube is coming from a tube that is **NOT** in the trachea! ^{GomerBlog}

- B. This also serves to highlight, and give our support to, Dr. Tim Cook's campaign for the Royal College of Anesthetists: **"No Trace = Wrong Place."** In life, and even somewhat after, CO₂ is exhaled from the lungs; during Cardiac Arrest & CPR, the capnograph tracing is *attenuated, but not absent*; flat-line capnograph occurs from esophageal placement, not from the arrest. **"No Trace = Wrong Place."** Cook 1; Cook 2
- C. There are legitimate reasons to *deliberately* intubate the esophagus to further protect the trachea from massive bleeding or soiling while gaining control to intubate the trachea safely^{DuCanto}, or to facilitate passage of tubes, *etc.* towards the stomach^{Willette}. Failure to discover, and correct, an accidental esophageal intubation is **deadly** and inexcusable.
- D. *"The intubated patient is talking!"* Rising of the ETT tube cuff above the vocal cords can occur when a patient who has not been recently or sufficiently sedated *"tongue-ulates"* the ETT and with head/neck movements. Fortunately, this patient was also breathing spontaneously "around the tube" with his bypassed native airway. However, tubes that are shallowly inserted, inadequately secured, or that have reflected during insertion can also be aimed 'backwards.' Be sure of the location and depth of placement, security of fastening, and *adequate sedation*.
- E. Remember that slightly malpositioned tubes may leak air during ventilation because of poor cuff fit. The natural reaction is to put more air in the cuff: this can further push the cuff up or down; cause laryngeal damage to the cords, cartilages, and innervation; cause soft tissue pressure injury to mucosa; or potentially rupture the structures.

If any initial corrective measure doesn't fix things, INSPECT with laryngoscopy, video or direct, and with optical stylet or flexible scope. Ultrasound may give you a rapid answer, while waiting for X-Ray. If the patient 'can't wait' for any of these then extubate and reintubate; preferably over a scope, or with an airway exchange catheter. Reconfirm placement, and check for injury, as if someone's life depended on it.

"Doktor Schnabel" [Updated 2015 Trauma Airway Algorithm](#). [GomerBlog](#). ©2014.

¹Dr. Tim Cook; (for) Royal College of Anaesthetists. [Capnography: No Trace = Wrong Place](#). Video, 7:41 mins. [YouTube](#). July 24th, 2018.

²Dr. Tim Cook; (for) Royal College of Anaesthetists. [Capnography: No Trace = Wrong Place](#). Twitter feed; July 31st, 2018. [Condensed version of essential points by screenshots. Has link to above video, also.]

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270 Tongues: 'The Good, The Bad, and The Ugly!'

Just as a trauma specialist is noted for feeling the patient's foot upon entry of the room to judge perfusion and circulation, so, too, should seriously ill patients have their tongue and oropharynx inspected.

The Good: Normal findings include: normal color indicates lack of cyanosis, anemia, hemoglobinopathies affecting oxygen transport; fullness and moisture indicating hydration; absence of hematomata or wounds; structural integrity of jaws and TMJ function; normal size & Mallampatti (modified) suggest ability to do laryngoscopy r/t size of tongue base, etc.

Finding of 'abnormals' is good to aid diagnosis and begin planning: ecchymoses and hematomata indicate trauma, seizure, coagulopathy; firmness may be due to infection [Ludwig's Angina], amyloidosis, tumor, angioedema; coating or candidiasis due to infection or immune status; loose dentition may be infectious, traumatic, but certainly, like piercings, can be concerning in intubation.

The Bad: Signs & Symptoms of cancer surgery or irradiation, which can greatly hamper intubation. Enlarged & firm native tissues (tongue, laryngeal tonsillar hypertrophy {not easily seen on usual examination}, mandibular floor, neck) that become space-occupying lesions that obstruct airway management; bleeding, exudates, vomiting, that put at risk for aspiration.

Incidentals such as odors of halitosis (infection, general health), congeners of alcoholic beverages, toxins e.g. ethylene glycol, oil of wintergreen, 'bitter almonds' of cyanide {not always detectable, nor smelled by everyone^{CDC} (genetic)}; tobacco smells, stains, or oral residues may indicate cardiovascular risks or cancer risk.

The Ugly:

- Signs of oronasotracheal thermal inhalation injury: e.g., blebs, burns, swelling, singeing, sooty deposits or sputum. Prepare for prompt intubation. ^{Levitan}
- Blood and other effluents from mouth/nose; tongue lacerations; dental debris; mandibular or craniomaxillofacial trauma "mid-facial mash" i.e., LeForte Fxs II & III.
- Penetrating trauma of those structures, especially threatening the airway, GSWs, impalement. Secure airway before imaging, if possible, (Imaging may help complicated cases.) Attempt to localize any retained projectile, as wound channel may not be linear.
- Angioedema is not predictable in its course. Prophylactic intubation if airway threatened (80% may not need it) ^{Walls}. Nasal route may be easier. Flexible scope ideal for assessment and intubation. Consider ketamine for comfort and prevention of agitation. Avoid Rapid Sequence Intubation unless fully prepared (double setup for cricothyrotomy) and committed to control the airway. If not flexible scope, consider 'Bougie' or airway exchange catheter to railroad tube into place due to smaller diameter than tube increases ability to manipulate tube (or if hollow, give oxygenation).

Tips:

- Macroglossia (e.g., Beckwith-Wiedemann syndrome): temporize with nasopharyngeal airways or glossopexy.
- Procedural tongue control: Glossal traction with atraumatic tongue clamp, open end of suction tubing to tongue (may cause ecchymosis if sustained), or manual (rewrap an unfolded gauze square over the tongue tip to pull). Consider glycopyrrolate or atropine to dry mucosal secretions. Further control of the tongue can be done with a silk traction suture through the tongue, or a surgical towel clip.
- Difficult mask ventilation or laryngoscopy: when structural support is poor, or scant airway space is available, an assistant providing two-handed jaw thrust behind the rami of the mandible (in addition to the airway manager's efforts) can make the difference. A "skyhook" upward jaw lift of the mandible from its center may also help. Turning the patient or his head to the left will use gravity for drainage and to pull the tongue downwards and open space laterally to the right for visualization or tube manipulation; again, jaw thrust is useful. ^{Hagberg}
- *In extremis*, absent an IV line or Intraosseus access, epinephrine, or a neuromuscular blocker (*versus* laryngospasm) can be rapidly absorbed from an intraglossal injection with a small-bore needle.
- Remember to always have two strong wide-bore suctions available for emergencies of the tongue and upper airway. One can be held in the left hand laterally and simultaneously with the laryngoscope blade as a pharyngeal sump.

Yen Chow

Let's hail the useful and important tongue and all that it normally does. Likewise, the epiglottis, the other guardian of the airway.

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Yen Chow, MD. [@TbayEDguy](#) & James DuCanto, MD. [@jducanto](#). <https://twitter.com/TBayEDguy/status/1007102692227887109>

271 Should we put the BVM in the 'spares' bag?

I deplore unreal depictions and dramatic license taken of emergency care. Whether it's the yelling to and slapping of cardiac arrest patients; the flailed-elbows of fake-CPR; a CPR resuscitation success rate >reality; absence of gas flow to refill NRB or BVM reservoirs; the poor mask technique that artfully shows the victim's face for the camera; I think that we all must wince.

One thing done for "screen-time" and dramatic time compression that is often close to reality is the rapid squeezing of the BVM. In real life, this has been called "Adrenalations": *i.e.*, the *too-fast* bagging rate by rescuers responding to their own sympathetic nervous system. We know, too, that are serious, even lethal, real-life consequences for hyperbagging.

Why do we do this? Sometimes, we need external order imposed: watching the sweep-second hand on the clock; a metronome for compression rate. Our pride can 'goeth' before the patient's fall; some do not perceive their own errors. As in driving, we all think that we bag better than anyone else.

Why do we insist upon a BVM? 1) standards & tradition 2) simple 3) portable 4) cheap; can afford multiples 5) can be line-item charge, or part of a bundle.

There is only **one** compelling reason for a self-refilling BVM. If oxygen supply defaults; it will operate on room air. It does, however, require the continuous attention of one or two people.

At the first opportunity, the cardiac arrest patient should be placed on an automatic transport ventilator (ATV), or use the mechanical ventilator in the resuscitation area. A few simple settings, and it will do its job consistently and indefatigably; far better for the patient; and organizes things for the team.

With quick-connects, it can be transferred from the wall source to portable tanks. Mobility is preserved at the cost of thinking ahead of how many tanks are needed, and a spare BVM; just in case. There will be no awkwardness at doors or elevators; no tugging at that precious ETT; less chance of accidental extubation; and it will be a smoother transport.

Scott Weingart. [Podcast 127 – The Oxylator with Jim DuCanto](#). *EMCrit Blog*.

Published on June 29, 2014. Accessed on August 20th 2018. Available at

[\[https://emcrit.org/emcrit/oxylator/\]](https://emcrit.org/emcrit/oxylator/).

{N.B. This demonstrates a particular brand, is pressure-cycled in controlled circumstances, and is for respiratory support rather than with CPR.}

Scott Weingart. EMCrit [Podcast 172c – Vent as Bag & VAPOX](#). *EMCrit Blog*.

Published on April 17, 2016. Accessed on August 20th 2018. Available at

[\[https://emcrit.org/emcrit/emcrit-wee-vapox/\]](https://emcrit.org/emcrit/emcrit-wee-vapox/).

Tips # 272 Airway Tray, Useful Odds & Ends

There are useful tools to be kept on or near the airway tray/car for ready access, or objects from other trays normally kept nearby that have airway utility.

- Knitted Gauze Rolls: Can be quickly placed to fill out the cheeks for mask ventilation of the edentulous; or to control and stop bleeding from damaged cheeks; bite blocks (less likely to damage teeth) to protect ETT. LEAVE ONE TAIL PROTRUDING FROM MOUTH, for safety and count.
- Stacked loose 4"X4" gauze squares: For traction in grasping tongue; swab dry intraoral area; grasping loose dentures; hemostasis or filling cheeks; drying tissue for better absorption of local anesthetic.
- Long Vaginal Swabs: to clean or dry lower pharyngeal areas without forceps, apply local anesthetic.
- Long Sponge Stick, straight or curved: apply swabs; retrieve foreign bodies {I've retrieved the pharyngotracheal mold of clotted blood confirming cause of death}.
- Tenaculum: May be useful in retrieving large particles of meat, or plastic into which the teeth may take a grasp.
- Cyanoacrylic glue: On the end of an applicator stick may help retrieve smooth plastic foreign objects.
- LED Flashlight: Useful in soiled airways or when the laryngoscope light suddenly fails, the light can transilluminate the skin at the cricothyroid membrane, and the operator can aim for the light; be careful of light temperature.
- Lighted Stylet: Used within the ETT and transilluminates the trachea from within so the ETT may be guided correctly; outside observers or trainer can see progress. An Optical Stylet may be able to do the same, plus viewing through the stylet towards the glottis.
- Meconium Aspirator: This allows ready conversion of an ETT to wide-bore suction catheter with thumb control; when combined with a bronchoscopy swivel adaptor, allows ventilation or use of a fiberoptic or optical stylet to guide passage.
- Bronchoscopy Swivel Adaptor: As above.
- Large Membrane Dressing, or Plastic food wrap: When a large bushy beard is present, a better seal with the BVM mask is made, "plastic-to-plastic, by covering the oronasal facies or enwrapping the head, and making an opening at the mouth for air/oxygen.
- Modified Nasopharyngeal Airway: Versatile for airway support; Preoxygenation/Apneic Oxygenation; oxygenation during awake fiberoptic intubation.
- Sheath Introducers, Large (shorter) central catheters, etc.: can be used for preemptive cricothyroid jet ventilation during other airway maneuvers. Maintain maximal triple/quadruple airway maneuver to enhance retrograde passive

exhalation.

- Forceps: Magill's; Boedeker or other curved forceps to use with hyperangulated laryngoscopes; Tylke for nasotracheal intubation.
- Skin Marker: Mark the cricothyroid membrane space before beginning difficult airway procedure.
- Large-bore suction devices, e.g., DuCanto catheter; rather than Yankauer.
- Mouth Gags: hold the mouth open for other procedures; e.g., Boyle-Davis, oropharyngeal-tonsillar repair; Olympus, endoscopy or orogastric tube; Oberto, seizures or electroconvulsive therapy. Bite-Sticks and padded tongue blades may briefly prevent dental damage (or cause it, if used forcefully), but are not suitable for procedures on anesthetized patients.
- Cricothyrotomy Kit: Don't forget. #10 Blade; Bougie; 6.0 mm tube.
- Personal Protective Equipment; surgical gloves.

273 Sweaty Skin and Shock States

It's not just Global Warming and higher local temperatures. Some of our sickest patients are very diaphoretic from their prior exertions or as shock increases. And the *electrodes* won't stay on! Watch the team member's reactions: often the first electrodes are lightly and hesitantly applied while fighting the "Oooh, icky!" sensation. Perhaps, management bought a cheaper brand of electrodes. How can they stay on well when applied to a sea of fluids, skin oils, dead cells, and other substances? How can one make good clinical decisions when there is so much artifact and unreliable signal?

Seize control now. Scrub the skin vigorously with alcohol-soaked gauze pads (the rough kind, not soft 'wipes'). One needs to clean, defat, and exfoliate the skin until it's fresh and a little raw. Then dry it with dry gauze: no interfering moisture. Apply a fresh electrode firmly with thumb pressure over the contact-gel cup and rub the adhesive on centrifugally for best contact and adhesion. Connect to the monitor. Enjoy the signal.

Always, the prime importance is the surface preparation and good application of the electrode. Remove frustration and save labor by doing it well once. Even in near-code situations with few resources (two-person crew), the good fix -once- is not a waste of time; it's an investment in good signal.

Spray antiperspirant has been used to lessen further diaphoresis. (Don't spray to wetness.) Adhesion has been helped with 'tackifiers' such as compound tincture of benzoin, surgical adhesive, povidone, *etc.*, but only under the adhesive, not under the contact.

The same preparation is good for IVs. A securement device helps. Wound closure strips work well as pre-cut tapes, especially with benzoin or Mastisol to intact skin.

Bandaging a line *in situ* can help immediately but IV dressing should be done properly when the patient settles. Lines can according to need be held with wound glue, suture, or staple.

274 #NOF It's not *Just* the bone!

Fractures of the surgical neck of the femur are so common as to be “bread and butter” for the Emergency Department. Generally easy and familiar to assess, consult, and admit. The EMS slang is a ‘hip trip’. There are pitfalls. Remember, that even in the early 20th century, a broken hip was a mortal diagnosis from acute injury or surviving that then likely six months of splinted bed rest and its attendant risks to life. Older patients may remember this and be frightened.

Immediate attention is to neurovascular status and general condition, with prompt investigation of events antecedent to the fall. Hold on to useful witnesses. Question the first responders as to scene indicators, reported mechanism of injury congruent with evidence at scene, any confusion, delirium, waxing/waning of consciousness, medications ± alcohol. Has the victim confabulated a putative MOI: “*I must have tripped on the carpet.*” Was the fall due to cardiac or vasomotor syncope, pulmonary embolism, or primary neurological event? Any need for social work or Adult Protective Service intervention due to unmet needs, lack of supervision, or possible abuse? Poor footwear, or diabetic peripheral neuropathy, poorly-controlled diabetes, or change in vision, may be factors.

Once clear on these matters, you can prioritize any imaging other than purely orthopedic. Has the victim acquired a subdural or epidural hematoma as a consequence of injury? As most victims are elders, review for osteopenia or pathologic fracture. Review/reconcile medications (all providers, all sources), including ‘herbals’ and ‘naturals’ for potential side-effects, interactions, duplications. Question family or caregivers for how actually taken, or if skipping doses to save money, *etc.*

Prompt interventions include:

- Vascular access; labs & studies needed for admission, preoperative evaluation;
- Maintenance fluid ± volume replacement (pt on floor for long time);
- Analgesia or regional block anesthesia (avoid clouding mental status);
- Foley Catheter for perioperative period;
- Minimize pain with position of rest, stabilize injury with pillows or sandbags, Buck’s extension traction, body-splinting with bandages;
- Lifting sheet or other minimal lift equipment for x-rays and transports lessens pain for patient, and strain for staff.

- Coordinate institution of prophylaxis *versus* deep vein thrombosis, e.g., pneumatic “squeezy-boots.”
- Be mindful that altered level of consciousness from fat emboli from fractured long bones may occur.
- Continued expansion of the extremity’s diameter represents concealed internal hemorrhage of life-threatening potential.
- Expansion of hematoma or edema within unyielding fascia can cause compartment syndrome that increases pain, devitalizes tissue, and can obliterate the pulse. Regularly check pulses, doppler, and compartment pressure if needed.
- Give assurances that prompt operative repair and mobilization should prevent complications.
- Ascertain other family responsible in decision-making or who bears Durable Power of Attorney for Health Care Decisions.

Wheless, Clifford R. III, MD. [Fractures of the Femoral Neck. Wheless' Textbook of Orthopaedics, Presented by Duke Orthopaedics.](#) Last updated: September 13, 2012.

275 Horrendous in the Grass

It’s one of those nights when the department is packed overcrowded and patient flow is obstipated. You’re at Triage, trying to hasten assessments and begin initial measures without being tied up with direct patient care: yeah, right!

A very uncomfortable 35-year-old man complains of left ear pain since romping with his dog and rolling in dried grass. The “foxtail” that he thinks he has in his ear can be readily seen. He agrees to letting you remove it.

You fetch a wide metal ear speculum, Hartman’s (Alligator) Forceps, and some 10% topical lidocaine spray. Warning him of the sensation of warmth, you gently spritz the anesthetic into the canal (tympanic membrane is intact). In seconds, he is delighted to be free of pain. There’s no ENT chair, so he agrees to steady his head with his hand and that elbow with the other hand. Although the widest parts of the foxtail face you and are likely to dig in, you’re able to carefully remove the foxtail and verify no scratches to the irritation.

You give him some cautions: don’t dig at it with his finger; return if worse, any change in hearing, or ear discharge; don’t immerse ear until well; avoid foxtails in future. You sign him out with essential documentation. Having spared the treatment area from a “minor” patient and long wait, you feel internal satisfaction and move onto the next arriving patient.

Collected Clinical Tips from Advanced Emergency Nursing Journal, by The Editors.

Dance, D., & Ludemann, J. P. (2009). [Removal of ear canal foreign bodies in children: What can go wrong and when to refer.](#) *BCMJ*, 51(1), 20-24. [PDF]

Davies, P. H., & Benger, J. R. (2000). [Foreign bodies in the nose and ear: a review of techniques for removal in the emergency department.](#) *Emergency Medicine Journal*, 17(2), 91-94. [PDF]

Michelle Lin, MD. [Trick of the Trade: A mini-suction device.](#) *ALiEM: Academic Life in Emergency Medicine*. June 29th, 2011.

Mitchell Li, MD. [Trick of the Trade: Insect removal from the ear.](#) *ALiEM: Academic Life in Emergency Medicine*. October 2nd, 2014.

Adedeji, T. O., Sogebi, O. A., & Bande, S. (2016). [Clinical spectrum of ear, nose and throat foreign bodies in North Western Nigeria.](#) *African health sciences*, 16(1), 292-297. [PDF]

doi: [10.4314/ahs.v16i1.38](#) PMID: [27358644](#) PMCID: PMC4915433

Robin Mantooth, MD, FACEP. [Ear Foreign Body Removal in Emergency Medicine.](#) *emedicinemedscape.com*. Updated: May 16th, 2017.

276 To the Heart of the Matter, and the Matter of the Heart.

I can report to you anecdotally, from personal contacts and Internet comments, that many prehospital providers, if not constrained by protocols, will in cardiac arrest cases and 'crashing' patients *preferentially* insert an intraosseous infusion access rather than fuss with the delay of finding peripheral veins for conventional IV access. This may well be no surprise to you. IO has proven itself and is relied upon.

A "Hat Tip" of Thanks to Australian [Dr. Tim Leeuwenburg](#) from Kangaroo Island and the Twitterverse, for retweeting [@Resuscitology](#)'s citation:

"During CPR, drugs are likely to reach the heart significantly faster when delivered through a humeral intraosseous than through a brachial vein <https://www.ncbi.nlm.nih.gov/pubmed/29928956>."

Cho, Y., You, Y., Park, J. S., Min, J. H., Yoo, I., Jeong, W., ... & Oh, S. K. (2018). [Comparison of right and left ventricular enhancement times using a microbubble contrast agent between proximal humeral intraosseous access and brachial intravenous access during cardiopulmonary resuscitation in adults.](#) *Resuscitation*. August 2018 Volume 129, Pages 90–93. {Abstract & Paywall} [PDF] <https://doi.org/10.1016/j.resuscitation.2018.06.014>

This is a small study (10 cases) comparing transit time of infusion *via* brachial IV & proximal Humerus IO microbubble contrast to the heart and enhancement of right and left ventricle activity *during* adult human CPR. Each measurement was faster with HIO access.

Ergo, there are not only presumptive time benefits in HIO access during CPR *vis a vis* possibly difficult venous cannulation during cardiac arrest, but flow of drug therapy is measurably faster than conventional peripheral IV.

Consider, then, using HIO as initial means of vascular access in resuscitation of patients without existing lines. Faster to insert. Faster flow to the heart (and presumably other tissues). More than just time may be saved.

277 Something's NOT lining up here!

Paramedics are in the field, calling in to you, reporting a previously healthy 40 y.o. woman collapsed on a jogging trail with BP of 60-70 *torr* and dopamine infusion running. Mentation is good, appearance seems good, no change with dopamine infusion. HR is normal. Something is odd, to your mind.

You request checking the opposite arm. BP is normotensive to mildly hypertensive with the infusion running. Signs of perfusion in either arm appear equal and normal. You order to continue monitoring the BP in the "good" arm. You further order to decrementally reduce the infusion rate while monitoring general condition.

Upon examining the patient, yourself, you find that she has equal perfusion on each side, is in good condition, with a benign and self-limiting etiology for her problem. Further discussion discloses that the unequal blood pressures, previously investigated, are her known variant. Disposition is unremarkable.

You use the occasion as a "teachable moment" with the medics. (It may be *for* them, but it's not *to* them; *i.e.*, no 'put down' or patronizing, but a shared expansion of knowledge, wisdom, and outlook.

1. Variants exist, and it's good to be aware of the possibility of a 'red herring' that can confuse them.
2. Beware of focusing overmuch on a single sign if there are not correlating signs consistent with the pathology.
3. Check for contralateral findings; and recheck when things don't add up.
4. Talk with the patient as to any history of variants, or unequal findings.
5. When bilateral checks confirm inequality, look for further signs and symptoms consistent with potential pathophysiology, *e.g.*, aortic dissection disrupting distal distribution.
6. When unusual and significant signs are found and reported, *regardless of outcome*, provide useful commentary and praise for picking up things not usually found.

278 The Tube's In; How to keep it there

The endotracheal tube is in, it's working, and it's being held tight. How to keep it there? Taping is common. Commercial securing devices are recommended by resuscitation courses but may not be available or appropriate.

Common 'taping' may not adhere with bushy beards; messy faces; lack of structure from missing teeth, facial injuries, burns, or sensitive skin.

One widely used alternative is to use a 'string-tie' surgical face mask as a harness. The opened mask should be slipped under the occiput; the ability to conform to the face as a mask should help it to cradle the shape of the head lessening slippage. The four ties can now be tied snugly to the tube to prevent migration and center the tube.

If strength is needed, or the face is sloppy with bodily or other fluids, plastic oxygen tubing can be used, if you're good with knots. Any 'slobber' on the tube can be cleaned away to dry with alcohol wipes. Use 'Clove Hitches' or put a 'Larks Head knot' or 'Girth Hitch' in the middle of the tubing, then separate the ends (passing around the head in opposite directions) to be tied in place. The friction of plastic-upon-plastic will prevent slipping. Google for images and descriptions for tying the knots.

279 *Un femme d'un certain age ...*

A middle-aged English-speaking foreign visitor is brought in by EMS with C.C. of lower abdominal pain, N/V, and mild hypotension that corrected with a 500 ml bolus of IV saline. She appears to be stable, slightly pale, and tired-looking. She replies to questions of an Internal Medicine Resident who is doing a Review of Systems and Family History.

Labs are drawn with a second IV. "*Hmm, how could a healthy woman become ill so quickly? I What's the worst thing that this could be?*" She was, as the French say, a *woman of a certain age*: middle-aged but difficult to estimate her years, not yet very old. Was she fertile and still capable of an ectopic pregnancy? "*What is the shortest way to ask? Do you still have periods?*" "Why, yes, I do." "*When was the first day of your last period?*" "Six weeks ago." At this point, the Resident caught the drift and inquired "Is there a possibility that you could be pregnant?" To which the patient demurely replied "Well, I *am married*, you know."

Next task was a catheter urine specimen and point-of-care testing for Hcg. In five minutes, the positive urine result was shown to the Resident: "*She's pregnant. She needs an ultrasound NOW.*" The Attending Physician is shown the tell-tale test. Again, "*She's pregnant. She needs an ultrasound NOW.*"

POCUS showed a lake of free blood in her abdominal gutters that was visibly increasing. Two units of Type O Negative blood were transfused immediately. Emergency surgery began within the hour of arrival. Three more units were given during the successful surgery. Six days later, the patient was seen for an unrelated

minor complaint prior to return to her own country. She was forty-six years old.

Lessons learned:

- Trust your instincts; especially if you think that something could go wrong.
- Start with a “worst possible case differential diagnostic scheme. What is the worst that this could be? What could go wrong here? What needs to be done next?”
- Do not slavishly follow a formal exam process. Be capable of Skip-Branch thinking; moving laterally or changing aspects of your internal algorithm as data presents.
- Be aggressive in diagnosing and treating the marginally unstable until the situation is clear. Marshal your resources early. Each clinical step prepares for the next possibility.

280 Is your patient carrying a weapon?

Persons entering an emergency facility while carrying weapons are of three types:

1. Officers armed and on duty.
2. Citizens, lawfully armed, or workers with ‘tools’
3. Criminals, illicitly armed, who try to hide their weapons.

All have probably entered unintentionally with an unanticipated problem. The former two will be open and cooperative, if somewhat embarrassed. The last, does not wish to be ‘caught’ and will try to hide it, or shift it to a companion.

- Be alert to behavioral clues or signs of affiliation. Vocabulary or speech patterns may be typical to the various professions of arms, even if ‘off-duty’.
- Concealed undressing, furtive talk with or handing things to a friend.
- ‘Clunk’ sounds, or heavy objects, may be weapons, especially if in pockets, sleeves, waistbands, ankle/foot areas, necklines, within hoods or hair, or drawstrings into such areas.
- Weapons may not be simply a gun or knife; familiar objects, e.g., Phillips Head Screwdrivers, box-cutters, rat-tailed comb or hair pick, broken toothbrush (prison ‘shank’), heavy keys, weighted fob or ball on cord, padlocks, wrenches, heavy key-chains, safety-toe boots, even clothing, can be lethal in hands that intend so.
- Be especially alert if potential targets of reprisal (gang members, victims, officers) are in the department.
- Officers and lawfully armed citizens will tell you, and yield to another officer, or locked storage container. Criminals will conceal or try to persuade you that covert weapons or non-significant objects. Workers legitimately carrying tools may not

have thought of them as weapons but should be cooperative.

- Apart from any intended violence, innocent arms carriers in the medical environment may present risk such as some Peace Officers and others, inadequately screened, who have been *inside* the MRI magnet safety zone and the firearm was drawn from the holster or hand into the magnet with accidental discharge of a round from impact. Some metal pistols have been magnetized. All polymer-framed pistols have metal parts and ammunition but might be thought of as 'plastic' rather than metal. "*Do you have any metal on you?*" is not a sufficient question.
- Follow your organization's security policies regarding confrontation, search, safekeeping, or seizure.

Beitia, A. O., Meyers, S. P., Kanal, E., & Bartell, W. (2002). [Spontaneous discharge of a firearm in an MR imaging environment.](#) *American Journal of Roentgenology*, 178(5), 1092-1094.

Smollins, Mike. [Lynbrook police: Man injured, arrested after gun goes off in MRI machine.](#) LIHerald.com. (Long Island, NY) Posted June 20, 2018.

PoliceOne.com. [Officer Safety Alert: MRI Unit Causes Malfunction of Officer's Issue Firearm.](#) April 26, 2003. *Source: Sing, Lieutenant Douglas K. Manheim Township (Lancaster County, Pennsylvania) Police Department Revised March 2002.*

Tim Evans. tim.evans@indystar.com. [Gun discharges in MRI at Indianapolis Veterans Affairs hospital.](#) "IndyStar" Published 5:19 p.m. ET Dec. 31, 2015.
[Andy Geller. DISARMING MACHINE: COP LOSES GUN IN MRI.](#) *New York Post*. September 16, 2000.

281 The 'Quick-Change' Code Room

Simulations and drills are often done on 'Training Days'. Yet, an essential task not often practiced needs to be done in the workplace in real time. The 'next' or '*more* critical' patient may arrive right after the leaving of the first, or while the first must be 'yanked out' and displaced. How quickly, and with what level of confusion, can this be done? Just as navies must practice "Battle Stations", so too, your emergency facility should practice *rapidly removing* the prior patient, *rapidly cleaning*, *rapid replacement* of essential equipment, and *rapid reception* of the next patient.

Of course, it's not as easy as that; there must be a safe hand-over or transport! Usually the scribe nurse or a main nurse who has been tracking details scoops up records and 'goes with' to report off. All stretchers should be fitted for transport, with full oxygen tanks, *etc.*, for quick transition.

The room must be stripped of debris, mopped of biohazards, and personal belongings left behind (a collapsible hamper works well). Hopefully, there is a redundancy of consumable supplies in the room, Additional *replacement* trays and carts of major equipment, airway, electronics, should be on hand ready to go into the room. A fresh bed goes in next with the new patient following.

Work out the steps and sequence, practice it as choreography or a martial-arts '*kata*' so that the flow is smooth and quick, with all *performers* gracefully working together. The smaller and more awkward your rooms, or lack of spare equipment, the more important it is to be practiced and to know where replacements are. It is very difficult during critical treatment to have to go to another department to fetch wanted items.