Advanced Emergency Nursing JOURNAL

Presents
Collected Clinical Tips©
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 # 342 What does the Department sign say?

It's a new year, so let's call this a brief "Retreat" and a Call to Remember Our Mission. Why? As an advocate, I brought a patient to the ED who was an ESI 2 febrile pneumonia patient, geriatric with at risk pulmonary pathology, hypotensive, tachycardic, and room air SPO_2 of 92%. The patient did well and was discharged with follow-up but based on initial presentation could have gone either way. The room was a high-acuity room, in which resuscitation could be done but was not a primary resuscitation area. However, examine the photo.

The photo is focused on the room's deficiencies for high-acuity patients. Neither the suction, nor the BVM are set-up and connected for *immediate use*! If there was a *sudden* crisis, realistically, how long will it take to open the packages, assemble parts, connect tubings, adjust flowmeters, make the suction work, and be able to bag the patient? That wasted time could be a critical difference. It's no fun to do mouth to mouth because someone was negligent in preparing the room.

The Boy Scouts have always said "Be Prepared." Our Coast Guard's motto is *Semper Paratus* ("always ready"). Our signs say "Emergency" and our patients "*rely*" on that. "Rely", you must remember, is a LEGAL TERM, which can be explained by the Hospital's lawyers and Risk Management people. The client has the right to a reasonable expectation and reliance upon our ability to deal with emergencies. If we fail

them in that, not only do we fail in our mission, we are liable in damages for our neglect, notwithstanding other criminal or regulatory concerns. This might seem like a 'mountain out of a molehill' but in a worse-case scenario there can be an entire range of mountains ahead.
We must ensure that all staff will put equipment in readiness whenever the need is found. No one walks out of the room until fresh supplies are readied and *tested*. If the suction cannister has been cracked or poorly connected, there will be no suction to vacuum-clean the airway.

While ENPs have the chief role of diagnosis and management of patient care, they also model excellence and leadership in nursing. ENPs should call for everyone to always be ready, and to do the preparation to be ready. Your smart-phone likely has a stop-watch function; gather a group and try a live-action test as a demonstration. Seeing, and doing, is believing.

 # 343 Identifying the Cricothyroid Membrane

Cricothyrotomy is a last-ditch life-saving airway maneuver in desperate circumstances to obtain an open airway in a CICO (Can't Intubate, Can't Oxygenate) situation, or primarily when facial and neck anatomy is so damaged or distorted that standard methods would be unlikely to succeed in safe and timely manner.

Yet in any career the opportunities to perform and gain experience in cricothyrotomy are few or *nil*. Present methods of training are largely lecture, simulation, and animal or cadaveric procedures. Several studies, either experimental or retrospective of cases, show ~30% likelihood of ***misidentifying*** the cricothyroid membrane (CTM), regardless of seniority. This is more likely in females, high Body Mass Index, thick short necks/"no neck", and distorted anatomy.

Prudently, one should find the CTM manually and with ultrasound before airway procedures or 'deep' sedation. Such practice may improve judgment. The sono machine should *'live'* (be kept) in or adjacent to the resuscitation room. Consider marking the CTM when concerned. In critical cases, consider 'double-set-up' (immediate sequencing, or simultaneous efforts at head and neck, or preemptively in circumstances necessary to buy time to tolerate other measures).

When few ever gain significant experience and the stakes are so high, one should be diligent in preparing and testing oneself before the awful day.

Campbell, M., Shanahan, H., Ash, S. *et al.* **The accuracy of locating the cricothyroid membrane by palpation – an intergender study.** *BMC Anesthesiology*. 14**,** 108 (2014) DOI: 10.1186/1471-2253-14-108

Richard M. Levitan, MD FACEP. **Tips and Tricks for Performing Cricothyrotomy.** ACEPnow.com. February 6th, 2014**.** {N.B. Levitan's tips for "*the laryngeal handshake*" to identify the laryngeal framework in difficult cases.}

M. S. Kristensen, W. H. Teoh, S. S. Rudolph, **Ultrasonographic identification of the cricothyroid membrane: best evidence, techniques, and clinical impact**. *BJA:*

British Journal of Anaesthesia, Volume 117, Issue suppl_1, September 2016. Pages i39-i48. DOI: 10.1093/bja/aew176

Naveed Siddiqui, Eugene Yu, Sherif Boulis, Kong Eric You-Ten; **Ultrasound Is Superior to Palpation in Identifying the Cricothyroid Membrane in Subjects with Poorly Defined Neck Landmarks: A Randomized Clinical Trial.** *Anesthesiology* 2018;129(6):1132-1139. {FREE} **{PDF]** DOI: https://doi.org/10.1097/ALN.0000000000002454

Jimbo, I., Uzawa, K., Tokumine, J. *et al.* **Ultrasonographic identification of the cricothyroid membrane in a patient with a difficult airway as a result of cervical hematoma caused by hemophilia: a case report.** *BMC Anesthesiology* **19,** 124 (2019) **[PDF]** DOI: 10.1186/s12871-019-0798-3

Kwon, Y. S., Lee, C. A., Park, S., Ha, S. O., Sim, Y. S., & Baek, M. S. (2019). **Incidence and outcomes of cricothyrotomy in the "cannot intubate, cannot oxygenate" situation.** *Medicine (Baltimore).* 2019 Oct; 98(42): e17713. Published online 2019 October 18. PMID: 31626153 PMCID: PMC6824795 DOI: 10.1097/MD.0000000000017713

 # 344 Adrenal Crisis

Adrenal Crisis is a sneaky one. Without emergency medical identification, history, or medical records, subtle physical signs may not be helpful. What is significant is that a stressed individual has relative or absolute hypotension persist until treated with parenteral corticosteroid after which it resolves in ~one hour, and symptoms resolve within ~2 hours. [Rushworth]

"Approximately half of patients will have no past medical history of adrenal insufficiency." [Phipps]

"*Adrenal crises arise from an absolute or a relative deficiency of cortisol, an endogenous glucocorticoid; in that circumstance, there is insufficient tissue glucocorticoid activity to maintain homeostasis.*" [Rushworth]

UMEM Educational Pearls, from University of Maryland Dept. of Emergency Medicine, on January 7th, 2020 covered Adrenal Crisis, *q.v.*, notes, as I have, "*Adequate treatment of adrenal crisis (AC) is often delayed, even when a h/o adrenal insufficiency is known.*" [Chan] (I've seen resident physicians note the hyponatremia, hyperkalemia, and treated hypoglycemia, say "Hmm, sounds like adrenal insufficiency" then work on the perfect admission note, then to be reminded to treat the adrenal insufficiency which is followed by prompt resolution of tachycardia and hypotension.} In that Pearl, Dr Chan also notes that the "*most important predictor of AC is a h/o of AC."*

Primary Adrenal Insufficiency (Addison's Disease, and other primary causes) is a less frequent diagnosis, may more frequently be in crisis, be somewhat more severe in crisis, and crises may occur in 6-8% *per annum*.

Secondary Adrenal Insufficiency is acquired when the ability to make a normal amount of cortisol is hindered by events in the HPA axis, or exogenous suppression. It's possible that this may be underestimated due to prevalence of inhaled and topical steroid treatments suppressing endogenous corticosteroid production, especially if meds are duplicated or the patient excessively self-administers.

Patients with insufficiency may go into crisis with infections, fever, fluid losses (N/V/D), trauma and shock, especially if there is failure to take an adequate replacement therapy (2 X maintenance for mild cases, 3 X maintenance with severe cases). GI problems can lessen absorption of oral hydrocortisone. Drug interactions may decrease effectiveness of oral replacements. Immunotherapy, chemotherapy, thyrotoxicosis or initiation of thyroid replacement, can precipitate a crisis.

There is sometimes a concern that treatment shouldn't begin until the problem is confirmed with an ACTH which may not be timely. There is no harm in providing a "stress dose" of corticosteroid, there may be prolonged shock or death if a stress dose is neglected.

Use an IV/IM dose of Dexamethasone (4 mg, adults) to give 24-hours coverage without affecting the test result. Do NOT delay giving a Stress Dose Steroid; give immediately when AI is first suspected. The definition for Adrenal Crisis is the patient's *improvement following the dose* when there is reason to suspect AI.

Hydrocortisone (100mg IV *stat.* followed by 50 mg Q6H [adult doses]) is the 'usual' steroid for treatment; in primary AI, if hydrocortisone =|> 50 mg day is used, mineralocorticoid (Fludrocortisone) need not be added until changing to oral hydrocortisone.

Methylprednisolone (40 mg IV *stat.*, then daily or change to hydrocortisone) may alternatively be used.

IV fluids and pressors should, of course, be given as needed. "*Persistent shock despite specific treatment for adrenal crisis suggests another cause of hypotension*." [Rushworth]

{N.B. Review the references for choosing drug, dose, and pediatric usage, as well as comprehensive understanding.}

When recovering, patients should be strenuously counseled to get effective emergency medical identification to speak for them when they cannot. An adequate supply of drug, and possibly training in initiating a stress dose self-treatment while seeking medical care for serious illnesses should be considered.

Caleb Chan, MD. **Adrenal Crisis.** UMEM Educational Pearls, University of Maryland Dept. of Emergency Medicine, January 7th, 2020.

Kevin M. Klauer, DO, EJD, FACEP. **Adrenal Crisis in Emergency Medicine.** emedicine.medscape.com. October 11th, 2018. {The comprehensive article is in multiple sub-parts with unique URLs; use the sidebar links.}

Ashley Phipps, MD. **Adrenal Crisis in the ED.** emDocs.net. May 15th, 2015.

Amrein K, Martucci G, Hahner S. **Understanding adrenal crisis.** *Intensive Care Medicine*. 2018;44(5):652-655. Published 26 October 2017. Issue Date May 2018. [Open Access] **[PDF]** DOI: 10.1007/s00134-017-4954-2

Rushworth, R. L., Torpy, D. J., & Falhammar, H. (2019). **Adrenal crisis**. *New England Journal of Medicine*, *381*(9), 852-861. [Free Limited Access available] **[PDF]** DOI: 10.1056/NEJMra1807486

 # 345 Warming Thoughts for Cold Patients

The patient must be dried, covered, and insulated, from further heat loss. Minimize exposure during any exam or treatment procedure. Fold blankets for double layering and to cover separately the upper and lower halves of the patient's body to limit what must be moved to look at something. Remember that typical hospital warmed cotton blankets cool quickly and should be replaced often. "Hood the Head & Neck" to minimize heat loss.

Check and maintain glucose levels to provide substrate for the body.

Consider important associated conditions: blood alcohol, myxedema, carbon monoxide, overdose, homelessness or marginal subsistence (tea & toast), dehydration, injuries sustained, 'down time' and pressure sores.

Warming pads can be focused on the neck, axillae, and groin, for effectiveness.

Forced-air-warming units are an effective aid in rewarming the patient. Electrical heating pads may injure the skin due to pressure and vasoconstriction; avoid.

Heated infusion units or warmed and wrapped IV fluids can be helpful.

Cardiac monitor electrodes may not stick well to cold edematous skin; needle electrodes may be needed or puncturing the gel capsule with a needle.

Rectal temperature probes, inserted 15 cm, may lag from true core temperatures, especially if adjoining cold feces.

Bladder catheter thermistor readings may be altered by cold diuresis and fluid infusions.

Esophageal temperature probes, inserted 24 cm distal to larynx, are useful to estimate cardiac temperature especially with intubated patients. If placed too proximally, near the pharynx, a false temperature may occur from heated gasses. This brings to mind that an esophageal stethoscope may be useful to hear beats of a bradycardic heart with poorly perceptible pulses. However, POCUS (Point-of-Care UltraSound) will give more information in more ways for most people.

Heated humidified respiratory gasses are useful to transfer some warmth closer to the lungs and heart and should be done as soon as possible; doing so with a CPAP unit in unintubated patients may minimize shunt physiology.

Trismus can occur with cold and very cold patients which may make things difficult or necessitate nasotracheal intubation.

Similarly, chest wall stiffness may make compressions difficult.

It has been suggested that the accuracy or pick-up of pulse oximetry finger probes may improve with a vasodilating cream applied to the finger.

Intraosseous infusion may be easier to start than a peripheral IV if considerable vasoconstriction is present.

Avoid or delay inserting a pulmonary artery catheter (for complex patients) as perforations of cold tissues may occur during the procedure.

In moderate to severe hypothermia, when the patient is intubated, a nasogastric tube is useful due to decreased motility and gastric dilation.

The use of immersion or invasive methods of active warming are not within the scope of this tip.

These tips of a practical sort were gleaned, in part, from “Chapter 5 Accidental Hypothermia” by Daniel F. Danzl, MD, in Auerbach, Paul S., MD MS FACEP, Wilderness Medicine. Fifth Edition. 2007. You should consult current references, policies, and protocols before changing practice.

 # 346 Making it warmer inside

When conventional efforts of drying the patient’s skin, heat conservation, passive and active external rewarming, heated humidified respiratory/ventilatory gasses are not going to be sufficient to rewarm your patient, you need to be aware of your resources and capabilities. Aggressive and invasive methods will be needed to rewarm the critical patient.

If one is still in the field, weather conditions, communications abilities, rescue and transport capabilities, distance and time to an advanced facility, are all powerful factors. At the medical facility, resources will be dependent on type, number, staffing and scheduling, physical location supporting the equipment, and necessary physiological support the patient needs. Additionally, the invasive measures may make it difficult to do CT/MRI concurrently. It is best to have worked out, in advance, the where done, how initiated, by whom to be done, out-of-hours arrangements, the prerequisite work (cannulation, etc.).

Warmed irrigations of stomach, bladder, and as enemas have been done but can cause fluid and electrolyte shifts with limited heat transfer. Other cavities have had rewarming

lavage: the peritoneum, the pleural spaces, the mediastinum, and the heart itself by thoracotomy.

Significant heat transfer can occur if the patient has bidirectional high-flow catheters placed, receives dialysis, continuous veno-venous rewarming (VVR), continuous arteriovenous rewarming (CAVR), ECMO/Cardiopulmonary Bypass. The complexities are obvious. The necessity of pre-planning is also obvious.
If there are more casualties than one, how many can be treated? Are there other facilities that can share the burden.

Procedural specifics are not within our scope here as such will need to be particularized to your local requirements.

Chapter 5 Accidental Hypothermia" by Daniel F. Danzl, MD, in Auerbach, Paul S., MD MS FACEP, Wilderness Medicine. Fifth Edition. 2007.
You should consult current references, policies, and protocols before changing practice.

 # 347 Pædiatric Fractures

In caring for injured children, one is mindful that 'orthopædic' means "straight child": the desired result of worried parent and caregiver alike. There are characteristics and concerns peculiar to the child and his state of growth. Fractures may be incomplete, as in 'greenstick' and 'buckle fractures' due to immaturity, and outcome may be less desirable if the break disrupts a growth plate.

Not only are kids likely to injure themselves due to impulsiveness and inability to perceive risk, they are testing themselves and the environment as they try new skills and build strength. However, it is also possible that injuries are inflicted from either schoolyard scraps, sport, or through abuse.

Children are likely to be poor at describing their symptoms or mechanism of injury. They can be restless and squirmy, and easily frightened by examination and injury. This can worsen parental anxiety. Early analgesia or an appropriate regional block, even a cold pack, can give cooperation. Sometimes, children will try to conceal their injury if fearful of being 'in trouble' from doing something forbidden.

Observation of activity, gait, usage *vs.* non-usage, appreciation of subtle swelling or contusion perhaps coupled with finding of point tenderness, are likely to be most useful in determining which areas to image. If the child can recount how it came to hurt; that's a bonus.

Kitabjian, A., & Ladores, S. (2020). **Treatment and Management of Torus Fractures in Pediatric Patients.** *The Journal for Nurse Practitioners*, *16*(1), 48-56. Published online: November 01, 2019. **[PDF]** DOI: https://doi.org/10.1016/j.nurpra.2019.08.026

Lars Grimm, MD, MHS. ***Typical Fractures Seen in Children: Slideshow*.** reference.medsape.com. {No Date, but website is Copyright © 1994-2020.}

Tim Horeczko, MD, MSCR, FACEP, FAAP. **Pediatric Sports Injuries.** [Podcast, 39 mins.] Pediatric Emergency Playbook. December 1st, 2019.

Tim Horeczko, MD, MSCR, FACEP, FAAP. **Pediatric Elbow Injuries.** [Podcast, X-rays on webpage] Pediatric Emergency Playbook. November 1st, 2016.

Tim Horeczko, MD, MSCR, FACEP, FAAP. **Please, Just STOP LIMPING!** [Podcast, Drawings on webpage] Pediatric Emergency Playbook. Updated on July 1st, 2016.

Flaherty, E. G., Perez-Rossello, J. M., Levine, M. A., Hennrikus, W. L., & American Academy of Pediatrics Committee on Child Abuse and Neglect. (2014). **Evaluating children with fractures for child physical abuse.** *Pediatrics*, *133*(2), e477-e489. DOI: https://doi.org/10.1542/peds.2013-3793

[Peer-Reviewed, Web Publication] Ko J, Lang S. (2019, Aug 19). **Can't Miss Hand and Wrist Fractures in the ED.** [NUEM Blog. Expert Commentary by Levine M]. Retrieved from http://www.nuemblog.com/blog/cant-miss-hand-and-wrist-fractures-in-the-ed/.

George, M. P., & Bixby, S. (2019). **Frequently missed fractures in pediatric trauma: a pictorial review of plain film radiography.** *Radiologic Clinics*, *57*(4), 843-855. {Preview & Paywall} DOI: https://doi.org/10.1016/j.rcl.2019.02.009

[Peer-Reviewed, Web Publication] Chodakowski J, Weygandt L. (2019, April 28). **Ultrasound in pediatric distal forearm fractures.** [NUEM Blog. Expert Commentary by Haney R. Retrieved from http://www.nuemblog.com/blog/us-for-fracture.

 # 348 I've got a Lot of Pressure

"I feel really clogged up. I'm stuffy and congested. I can't hear very well, and my ears pop. I've got a nasty headache – like a vise; it doesn't go away. I'm just not at my best with this."

"Do you get like this with hay fever or when you have a cold coming on?"

"Why, yes, I do! I hadn't thought about that… "

"I notice that you have a thick-*ish* neck and are carrying some extra weight. Do you have sleep apnea and treat it with CPAP?"

"Yes. *That's IT!* The pressure makes it hard to drain."

"I think you're right. Let me check a few things."

"Well, your ears are clean, so it's not wax. The glands in your neck aren't swollen. You have thin drainage that you say is like your allergies rather than a cold. Your nose lining looks inflamed and swollen. You're tender over the sinus in your forehead, cheek on this side, and your teeth are starting to hurt. All in all, with your nose as it is, I think that you have sinusitis from the pressure of your CPAP pushing the drainage inwards."

"You're using decongestants, already. I'm going to prescribe an antibiotic for the infection, and a short course of steroid to lessen the swelling and improve the drainage. We don't give antibiotics for a viral sinusitis, but if your tubing and mask are none too clean, you may well have a bacterial infection, plus there maybe fungi or molds in unclean equipment. Try to really clear your nose with a steamy shower and using saline nasal spray several times a day; it won't raise your blood pressure or give you rebound swelling as most decongestants do."

"Does your CPAP have a heated humidifier and tubing? It needs it, as do you; thousands of liters of cool air at night are not normal; that, too, is linked with reactive swelling. I believe everyone should have a good heated humidifier and heated tubing. I won't ask if you keep your gear clean; I will say, keep it cleaner, so that it doesn't reinfect you. Talk to your Sleep Apnea people about these things."

Obstructive Sleep Apnea patients with CPAP are at risk for pressure related problems, whether sinusitis, pulmonary colonization, dermal problems from mask contact, bags under the eyes from uplifting straps, or irritated conjunctivae from the slipstream of air from small leaks of the mask.

CPAP patients often have problems with allergic, or non-allergic, rhinitis, and the rhinorrhea of URIs. Some will try to decongest and antihistamin-ize themselves into sound sleep, or even *forego* CPAP therapy entirely, reverting to apneas-hypopneas, untreated sleep deficits, cardiovascular stress of nocturnal arousals, and dangerous microsleeps while driving.

It is wise to be aware of their special needs, and to help resolve issues promptly.

349 Be Fervid Against COVID- 19

"On February 11, 2020 the World Health Organization announced an official name for the disease that is causing the 2019 novel coronavirus outbreak, first identified in Wuhan China. The new name of this disease is coronavirus disease 2019, abbreviated as COVID- 19. In COVID- 19, 'CO' stands for 'corona,' 'VI' for 'virus,' and 'D' for disease. Formerly, this disease was referred to as "2019 novel coronavirus" or "2019-nCoV." CDC FAQ

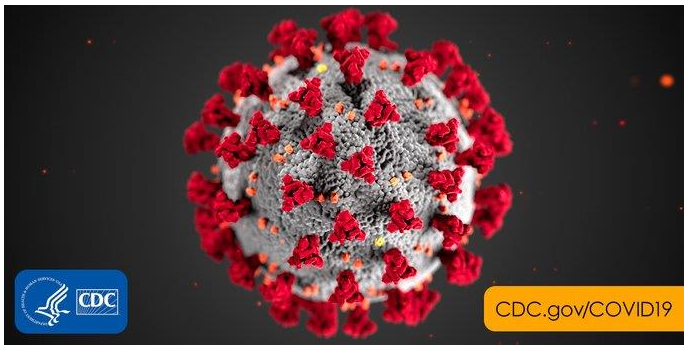
It is fair to say that the Public, in several countries, are greatly alarmed. There has been considerable disruption of travel, commerce, and navigation, with quarantines imposed, ships denied port, a growing number of cases with evidence of person-to-person transmission. Persons cleared by testing have later become positive. There are indications of, and media alarms for, the potential for the first truly global pandemic in a century. Indeed, CDC says "However, it's important to note that current global circumstances suggest it is likely that this virus will cause a pandemic. In that case, the risk assessment would be different." CDC COVID- 19 Situation Summary

So far, the traditional and effective public health measures of screening, isolation, PPE for HCP, possible cohorting of patients (with same-strain, testing) when patient-volume is high, *etc.*, are still expected to be effective.
For guidance and best practices, and current Situation Summary, visit **CDC Coronavirus 2019** for vast resources to numerous to list here.

CDC | Centers for Disease Control & Prevention; USDHHS. **Coronavirus Disease 2019 (COVID- 19).** Index to Web Section on COVID- 19. Page last reviewed: February 23rd, 2020. **Content source: National Center for Immunization and Respiratory Diseases (NCIRD), Division of Viral Diseases.** Accessed 02/23/2020.

- Coronavirus Disease 2019 (COVID-19) Situation Summary
- Strategies for Ensuring Healthcare Systems Preparedness and Optimizing N95 Supplies (Slides)
- Information for Healthcare Professionals
- Information for Laboratories
- Interim Guidance for Preventing the Spread of Coronavirus Disease 2019 (COVID-19) in Homes and Residential Communities
- Interim Guidance for Emergency Medical Services (EMS) Systems and 911 Public Safety Answering Points (PSAPs) for COVID-19 in the United States
- Frequently Asked Questions about Respirators and their Use
- Interim Guidance for Discontinuation of Transmission-Based Precautions and Disposition of Hospitalized Patients with COVID-19
- Interim Clinical Guidance for Management of Patients with Confirmed 2019 Novel Coronavirus (2019-nCoV) Infection
- Flowchart to Identify and Assess 2019 Novel Coronavirus
- FAQ for Health Care Professionals
- **LINK TO GET UPDATE BULLETINS FROM CDC**

{Some links or titles may change after applying the new COVID- 19 nomenclature (in progress).}
Randy S. Wax, MD, MEd, FRCPC, FC
CM . Michael D. Christian, MD, MSc (Public Health), FRCPC, FCCM. **Practical recommendations for critical care and anesthesiology teams caring for novel coronavirus (2019-nCoV) patients.** *Can J Anaesth.* 2020 Feb 12. [Epub ahead of print] **[PDF]** PMID: 32052373. DOI: 10.1007/s12630-020-01591-x



Picture Source: CDC.
For more information, contact CDC
1-800-CDC-INFO (232-4636)
TTY: 1-888-232-6348
https://www.cdc.gov/

 # 350 Watchful Waiting. PAPRs.

I know that you are tired of repeating yourself to folks: “I don’t know.” “We don’t have enough data yet.” “The best things to do, and have always worked, are stay away from sick people and crowds; wash your hands frequently, avoid touching your face, nose, and eyes; always cover when you sneeze or cough, and burn or discard tissues that you use.”

What inwardly worries us most is the apparent ability of **COVID-19** is the ≥ 14-day period of infection without outward signs or symptoms, but with *communicability* while feeling in good health before signs become overt. This may cause rapid spread before detection. This is a fearsome potential.

Apprehension and fear are rising. With new cases within CONUS (48 contiguous continental states of USA) without apparent source contacts from known ill or susceptible travelers, the public have bought up available face masks & N95 respirators without any foreseeable replacements. Shoppers are clearing big box stores of paper supplies, cleaning materials, and food, anticipating a potential fortnight’s home quarantine.

We are all awaiting developments. As useful information becomes available, AENJ will make it known to you.

***** PAPRs *****

If you wear eyeglasses and have facial hair or are unable to secure a *close* fit with standard facial masks and N95 masks, you will likely be required to use a Powered Air-Purifying Respirator. This is a more effective, higher-tier, higher cost, device with special considerations in the Emergency Setting.

In my institution, the ‘normal’ was to submit a requisition for an Isolation Cart (with PAPR); this is obviously suited *only for an inpatient setting with advance warning*! In order to have a unit (for me) on hand for immediate use, it was necessary to have it

issued personally to me. You will also need to arrange for spare batteries; charger; hood + spares (that fit one's own head –don't accept "that's all we have"); spare filter cartridges; storage space needs to be assigned in the ED.

The concept is a combined head cover with large viewing area (plastic, scratches) and large corrugated tubing which delivers forced air *in excess of leak* from a battery-powered air pump and filter cartridges worn behind the back on a waist belt. It's not a full helmet (usually) and the ears, back of the head, and neck are exposed, unless a gown provides some partial coverage.

SPECIAL CONSIDERATIONS for PAPR use in the ED:

1. You will need a brief time to retreat to your storage place, assemble, test, and don your PAPR before patient care. This will take longer if there are any deficiencies or missing parts.

2. The viewing part is flexible *non*-optical grade plastic, easily scratched, limiting peripheral vision, and distorting vision. It can be awkward reading monitors, making observations, or making notations. A new one is covered with paper stitched in place that must be torn away to be usable.

3. The batteries must be kept charged; it is unacceptable to have the blower fail while one is still in the hazardous environment, as there is no fallback except to hold one's breath and exit immediately!

4. Extra hoods must be available; if splashed or droplets land, it is *easy* to break technique and spread contamination. Be sure to have the right size or a tight headband can give a tight headache.

5. While the airflow can be refreshing, the hood may still feel hot. The noise of the blower interferes with hearing. The ears are exposed which allows for stethoscope use. If the hood gets hotter, airflow is slower, and it's harder to breathe, leave immediately before the battery stops.

6. Make friends with the PAPR Supply Guy in advance of urgent needs.

7. Decontaminate or dispose of hoods, and other gear, according to procedure.

8. I always found it necessary to explain gently that this was the type mask that I was required to wear. I could imagine that children might think it made me like the "Science Police" chasing "ET, the Extraterrestrial"!

9. Remember, it is a Positive-Pressure system excluding pathogens by having constant airflow from inside the hood to the outside. It is not a strong pressure, nor is there a close-fitting mask, so if knocked askew, it is possible to lose protection if the rate of leak exceeds rate of inward airflow. This also includes your responsibility to **not** use it to diffuse your *own respiratory pathogens* if you are "getting over a cold."

 # 351 The ounce of prevention …

In reading an airway article[1], I recalled several similar reports[2,3,4] which brought to mine Benjamin Franklin's adage "*An ounce of prevention is worth a pound of cure*." In instances of predicted and actual difficult airways, a transtracheal oxygen catheter was preemptively placed as prophylaxis prior to conventional or specialized airway maneuvers. The added safety permitted a stepwise approach with less stress: rescue already placed.

This thinking is useful. Not just Plan A, Plan B, *etc*., but *"if everything goes wrong, I'll have Plan D already there.*" It is the same cautionary thinking of planning for worse while proceeding carefully "without burning bridges", as anesthesiologists say.

When hypoxic patients tore off their masks, we learned with DSI that we could use ketamine or etomidate sedation to tolerate a NIPPV or CPAP, correct their pulmonary status and other physiological stress to intubate under better conditions. This morphed into using sedative **±** NMB to gain control of the airway with a 2nd generation Supraglottic airway, improving ventilation and shielding the glottis, yet with the right SGA one could intubate through it blindly or with flexible endoscope: RSA, Rapid Sequence Airway. Moving forward without burning bridges.

Blended concepts benefit patients when they advance safety as they improve the patient and control his distress.

1. Martins, M. R., Potié, A., Van Boven, M., & Momeni, M. (2019). **Prophylactic insertion of a transtracheal catheter for anticipated difficult airway management A retrospective analysis.** *European Journal of Anaesthesiology: April 2020 - Volume 37 - Issue 4 - p 332-333*. **[PDF]** {Preview & Paywall} PMID: 32132409 DOI: 10.1097/EJA.0000000000001075

2. Williams, A., Patel, A., & Ferguson, C. (2008). **High frequency jet ventilation through the laryngeal mask airway in a critically obstructed airway.** *Anaesthesia*, *63*(12), 1369-1371. PMID: 18803629 DOI: 10.1111/j.1365-2044.2008.05605.x

3. Gulleth, Y., & Spiro, J. (2005). **Percutaneous transtracheal jet ventilation in head and neck surgery**. *Archives of Otolaryngology–Head & Neck Surgery*, *131*(10), 886-890. PMID: 16230591 DOI: 10.1001/archotol.131.10.886

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 # 352 TOP CRISIS ASSISTS TO GIVE AN INTUBATOR

While the Airway Manager is principal in choosing measures and equipment, and takes responsibility for course and outcome, the Airway Assistant has key responsibilities in effectuating the actions. Ideally, this person is senior and experienced, able to foresee and prepare for the next need independently. The Intubator should be able to open his/her hand and close it, unasked, upon the needed tool.

Video Laryngoscopy, if used, makes it easy for all to observe and co-witness tube placement. However, there are more elements in assisting the Airway Manager. Nearest at hand to help, the Airway Assistant has much to do.

The Airway Assistant **constantly observes** patient status, positioning, monitors and flow gauges, that two suctions are on and working, for needed tools or tasks, and for any sudden change or misadventure.

The patient may need customized **positioning or Ramping**. Having the 'side view' here gives advantage in judging alignment and flexion or extension of various joints towards an ideal airway view.

Call Alarms: He/she should alert the Airway Manager as to vital signs, desaturations, elapsed time, equipment malfunction, *etc*.

Tilt Table: Should the patient vomit or bleed into the airway, (depending on where the bed's controls are), the Assistant should call it out and lower the head of the bed to avoid aspiration. The patient may need to be turned on his side. An endotracheal tube can be placed in the esophagus for diversion, and the pharynx suctioned and dried. It is possible to intubate in the lateral position ± head-down tilt, (left lateral preferred with standard Macintosh geometry blades for easier tongue control).

Suction: Suctions should be ready at either hand of the Airway Manager and may be needed simultaneously. One may be joined in the laryngoscope hand for constant "sump" suction.

Help Hold Laryngoscope: At times, the Airway Manager may need additional strength or steadying of the laryngoscope while another tool is used. With an overhand grasp, the

Assistant may provide this. If Inverted Intubation is used, (facing patient) the Assistant may be needed either to hold the laryngoscope or manipulate the tube according to circumstances.

Manipulate Larynx: Optimal visualization of the glottis may require manipulating the larynx externally (This is not 'Cricoid Pressure.' It is the *Thyroid* cartilage that needs moving). During this, one can trail a little finger into the suprasternal notch or infralaryngeal area to feel passage of the tube directly beneath.

Airway Lift: When the patient's head is large and heavy, or is positioned to insufficient mechanical advantage for the Intubator (who may need a stool or to stand upon the lower parts of the bed), the Assistant may need to further prognath (advance) the mandible by hooking the mandibular rami and pulling 'up and out', or by an overhead grasp of the anterior mandible and lifting 'up and out' to create additional airway space.

If the tongue is swollen, or macerated, it might be necessary to firmly grasp it with gauze, rubber-shod tongue forceps, towel clip, or suture for **anterior traction** to create airway space.

Depress Sternum; Make A Bubble: With apneic patients, the glottis may be obscured by residual fluid in the airway, especially if the substance is dark: *e.g.*. blood or charcoal. Sharply depressing the sternum may displace air from the lung and creating a bubble that shows where to go.

Transilluminate Larynx: In similar circumstances, or with a failing laryngoscope battery or bulb, transilluminating the Cricothyroid Membrane with an LED penlight or flashlight will literally show "the light at the end of the tunnel."

Railroad Tube upon Bougie or Flexible Scope: When a Bougie (Introducer) or flexible scope has been placed within the trachea (easier to see around than a large ETT), the pre-mounted tube will need to be slid down and rotated (to pass arytenoids) into the trachea *without* disturbing the Intubator's visualization and hold. The tube must then be held firmly during withdrawal of instruments and secured.

Cuff Inflation: When the tube is correctly placed, the cuff should be inflated to Minimal Occluding Pressure (no leak) and volume noted; ideally, this should be done with an inflating manometer to ~20-30 cm H_2O pressure. The easiest way is with the opened syringe pre-attached to the inflation line of the lubricated cuff and tube.

Tube Placement Confirmation: The Airway Assistant must in every way confirm and validate correct placement of the ETT into the trachea and its good function. This includes feeling the passage of the tube; viewing the waveform capnograph, auscultating breath sounds, feeling inflation of the tube cuff, use of POCUS to check placement, or calling for CXR. S/he must diligently check for clinical deterioration until intratracheal placement is definitively proved.

Retrograde Intubation: If this is attempted, help will be needed in retrieving the guide wire or catheter from the mouth or nose by fingers or Magill's Forceps.

Hyperextend neck for eFONA (emergency Front of Neck Access): If doing 'double-setup', anticipating Cricothyrotomy or Tracheotomy, placing a sandbag or towel roll

under the neck, shoulders, and interscapular area, with the head hyperextended at C1-2 (barring cervical injury) will bring the larynx and trachea anteriorly for easier exposure.

Put Scalpel in Hand: When it's time to cut (eFONA), have the knife and tools ready, this is the hardest decision and courage may be emboldened by preparedness and support. *Viz.*, the "Elaine Bromiley case." The team must clearly communicate any situation of distress.

ERRATUM: For a few hours, cuff inflation pressure was incorrectly stated as "20-25 mm H_2O pressure." It now reads "20-30 cm H_2O pressure." We apologize.

 # 353 COVID-19 PRECAUTIONS FOR INTUBATIONS

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Perioperative Considerations for the 2019 Novel Coronavirus (COVID-19). Anesthesia Patient Safety Foundation. February 12th, 2020. USA.

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 # 354 'The Spanish Flu' of 1918

In the month of greatest mortality of the Great Influenza Pandemic during The Great War, my mother's half-brother died bereaving her, their mother, and "Father, away at the War." A letter from then speaks of the heart-breaking grief and goes on to mention others who died. In that single month (October 1918) an estimated 195,000 Americans died. Father, a navy doctor, was to achieve the record of no serviceman under his care to die from 'flu on the transport ship. One man broke the rules and got sick, but none died.

Then, as now, public leaders, ignored, minimized, pooh-poohed, and covered up the developing crisis, then being concerned with morale, war funding and production, mobilization, and fighting. Indeed, the sobriquet "Spanish Flu" arose because reports from neutral and uncensored Spain were the first to indicate that something very wrong was going on.

In the USA, 675,000 perished. Deaths generally cited as 50 million (some estimates as high as 100 million) were three or more times the world's total war-caused deaths. It is thought that one third of world population was ill; 500 million, of the mere 1.6 billion on Earth. Curiously, mortality was greatest in young, healthy adults 18-35 years of age [a mortality curve by age shaped as a 'W' rather than the ordinary 'U'.]. This is thought, but not yet proven in viral genetics as due to evolution of the virus with older persons and younger persons having some immunity from exposure to prior and later variants in the years before 1918.

Things were worse, too, because 30% of physicians and many nurses were serving in the military lessening those at home. Exhaustion and close exposure dealing with overwhelming numbers of patients lowered effectiveness and some succumbed to the disease. Calls for volunteers with any nursing skills, shorter courses, new "practical nurses' helped somewhat, but reluctance to use African-American nurses was part of the times.

While influenza was a recognized entity, knowledge of viruses did not exist. *Haemophilus influenzae* was thought to be the causative bacterium; since it wasn't, treatment wasn't effective. Indeed, without antibiotics, the secondary bacterial pneumonias affecting the flu-weakened lungs and were the *modus exitus* for many, received only physical measures, if that. Death could come in mere hours for many. 72 of the 80 inhabitants of an Alaskan Inuit town died within days (but recovered lung tissue from permafrost protected corpses helped sequence the viral genome in the late 1990s.

Where truth was told, social distancing, isolation, and quarantine were used early and effectively, deaths were fewer and, in some instances, (Gunnison, Colorado), no cases occurred if there were no cases when instituted.

Good Luck and Good Health!

CDC: The 1918 Pandemic Timeline.

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 # 355 In This Time of COVID-19, What Shall I Do Now?

Not going out so much anymore? Spending what little off-work time that you have at home with the family? We can certainly understand the innate exhaustion that you may have from working with PPE, the increased stress trying not to miss anything when stakes are so high, the fatigue of longer intervals (must plan ahead) for bathroom breaks, nourishment, and to clear one's head.

We can't erase existentialist fears of bringing disease home from work or concerns that family might break 'protocol' when you're not there. Nor, make it easier to make time with family be quality time. Free time, now, isn't so free, with additional cleaning and sanitizing, laying in food stores or take-out, and organizing some homeschooling so the kids don't fall far behind.

If your circumstances allow, it's good to reach out with videocalls to distant or lonely family, friends, or school chums.

Catch up on continuing education online. Do research for your next paper. Expand horizons of your professional reading with foreign journals; subscribe to electronic tables of contents for specialties in which you're interested. Articles will be English, or translatable by browsers. Try some online foreign language learning for the common languages in your area.

Teach your family first aid and other emergency skills. There's time for practicing resuscitation, bandaging, splinting, tourniquet use. "Tales from work" can explain points and create respect for your career. "What ifs" can extend discussions. Even meal

preparation can be a cooking lesson or planning for emergency supplies and storage: useful knowledge not likely to be gotten from school.

Too serious? Intersperse lessons with Internet travel to famous locations, art galleries, museums, or episodes in history. Watching a movie? Ask what happened then, really? Learn more, while practicing critical thinking and judgment without realizing it.

Don't be too serious too often for yourself. Catch up on personal projects, games, or sports. Sleep in to lessen the sleep deficit. Read the beach novel you've put off. Lounge in the tub, instead of the shower. Watch a special movie or binge-watch old favorites. Taking care of yourself and family helps take care of everyone. *Good Luck and Good Health!* We salute you.