# 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.


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.}

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


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](https://doi.org/10.1097/ALN.0000000000002454)


# 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.”

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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.

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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.


# 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.


# 347 Paediatric Fractures

In caring for injured children, one is mindful that ‘orthopaedic’ 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.


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


