Northern Virginia EMS Council
Trauma and Performance Improvement Committee
Meeting held virtually via Zoom
March 13, 2024 Meeting Minutes

Those present were (All attendees were present via Zoom):

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Dr. Babak Sarani called the Trauma and Performance Improvement Committee meeting to order at 9:03 am.

Approval of the Minutes

Minutes from the September 13, 2023, meeting were sent via email before the meeting for review.

- Motion to approve the minutes as written by Beth Adams
  - Seconded by Leddyanne Dell
  - ***The Motion was unanimously approved***

Trauma Topic – Limb Salvage

Surgical Strike Team Discussion with Dr. Babak Sarani

GWU MFA signed an MOU with DCFEMS to allow them to serve as their strike team. The mission is to assist anyone who is trapped and may need amputation before extrication, including complicated

extrications. There are considerations for other therapies and interventions they can do alongside the paramedics.

Some examples are:

1. A patient pinned under a collapsed structure and nearly amputated already needs to have their amputation completed to extricate. I.e., Collapsed parking structure. They'd come in as surgeons and complete the field amputation.
2. A semi-truck driver hauling I-beams hit an embankment, and the truck came to an immediate stop. The I-beams went through the cab and pinned him aggressively against the steering wheel, and the fire department couldn't extricate him. When they pulled I-beams back, he immediately cardiac arrested and died, likely from a crush injury.
3. About four years ago, there was a similar event when an SUV hit a woman on a scooter, and the vehicle was stuck on top of her. She was awake, anxious, and panicked. As soon as they blocked the car and tried to take the SUV off her, she also went into cardiac arrest and then died. Probably from significant potassium backwash

Don't think of them solely as an amputation-only service. Think of them as a complicated extrication service. While the paramedics can provide drugs to prevent sodium backwash, the surgeons can go beyond the dosing parameters and provide guidance for further dosage consideration before extrication. They can't ask them to do something for which they don't have protocols. Still, the dosing restrictions don't apply to them as surgeons, so they can act alongside the paramedic to prevent potassium backwash and be able to complete the extrication.

They are sensitive to the notion that they are not paramedics and that paramedics know many things they don't know. They created this process because the FD determines that they're needed/benefit, and they contact them. They have a 30-minute activation (nights, weekends, and holidays considered because the trauma center would be uncovered by staff). The backup needs to be within 30 minutes of the hospital. They send someone to pick them up (scene safety, etc.). The backup surgeon will call the in-hospital surgeon in 15 minutes. They have full PPE gear (turnout gear like FD) and train in that gear for dexterity and other things; the battalion chief or whoever they send picks them up, gets a report, and gets to the scene. The only equipment they bring is a small backpack with barebones equipment for amputation. No drugs, not even Tylenol. All drugs are provided by the FD since they are controlled substances. It's easier to be accountable, keep inventory at the FD, and not worry about the surgeons trying to transport and account for before and after. They don't take tourniquets; only a Gigli saw sutures, clamps to tie off blood vessels, and other minor things. DC FEMS will go live with whole blood on April 1, 2024. They don't bring nurses because they are not needed, and it would be complicated because the nurses at GW are hospital employees, and physicians are independent contractors. Having nurses would have brought in a 3rd party component and malpractice, etc. They also had to talk to the WC carrier for work-related events even though they were not in the hospital, malpractice carriers, indemnification between FD and his team, etc. It took over a year for the paperwork to get signed. GW Hospital allowed them to purchase PPE under them. They had one training session so far and had planned for another but had to cancel. The FD did it in two sessions to accommodate those

working. I went to the academy in DC, simulated a collapsed structure, had a manikin situated under a cinder wall, and facilitated amputation. With the help of FD, Dr. Sarani purchased an entire cow leg from a local butcher so they could practice in real-time. They saw things the FD was good at, and the hospital was terrible at, such as making sure batteries were charged. They can bring a Gigli saw, which is like an old school tree saw; if you're under a metro train, it won't be helpful due to the size and movement. It's barbed wire, so there's a safety element. They want a mechanical saw. No one has one that always works, so they got a Sawzall and used that as the training saw. It's always available for use. He went to Harbor Freight and got one. Considerations of sterility of use, whether that causes infections, etc., so they had to work through how to make that work without liability, considering the patient's condition and whether this was worth the risk. The dialogue takes time, and there is an immense amount of respect. They were supposed to do a second training, set up scenarios, and do a scenario with a metro train with a jumper in front with a person stuck under; that was supposed to be in 3 weeks, but they'll have to reschedule. This will be an exceptionally unusual event with high risk and low frequency. They need to train quarterly, but with schedules, it will be, at a minimum, twice annually so the FD can remember they're around, and the strike team needs to train so they remember the SOPs. The backpack has a checklist inside saying confirm activation, call in backup, text Dr. Sarani to notify of activation, get PPE and start putting it on, mobilize to ED, and their documentation expectations. A bag under each desk has all their turnout gear, including boots, helmets, etc. They can't cross into NOVA because they don't have an MOU, and not all are licensed in VA. Moreover, things are more complicated in VA; in DC, there is only one agency, and there are multiple just in NOVA, so how does that work? Does the Council sign an agreement, and all agencies fall under that agreement if they can make this work in our region?

Questions

- Do they have to be recognized as EMS physicians in DC? Does DCDOH care?
    - They are not recognized as EMS physicians with DC. He is not sure how much involvement there has been with DOH. They have been notified, but I'm not sure they're involved in the MOU.
    - DC Fire is a freestanding agency, different than DOH. DOH is aware of protocols but has not given "permission" per se.
- Would you consider carrying cefazolin or something for open fractures?
    - Yes, they plan to carry that with their special operations paramedics from DCFEMS. If you're setting up a team like this, you must have a significant amount of collaboration. DCFEMS will carry it for them.
- From a FD standpoint, anytime you operate on a scene, there is a higher likelihood of injury for responders. How do you address that with the hospital, FD, or government? How did you address that?
    - They strongly pushed, and the Fire Department was receptive to the idea; when the doctor gets out of the buggy on the scene, they need a paramedic buddy, and the paramedic's job is to tell us where to/not to go, and we'll not question that order. The buddy handles all radio communications to command because the surgeons don't

understand the FD language. They are the link to command. Mistakes and unintended consequences will happen; we have to have a firm agreement from the WC carrier that if he is injured, then WC will step in. They did all of that ahead of time.

Dr. Sarani advised that he has spoken with Dr. Paula Ferrada about whether the Northern Virginia folks are interested in a strike team. He'd like to expand, but this is our turf. The last thing they want to do is come into our area and look like they're taking over. Does Inova Fairfax want to spearhead it, or would he? Dr. Ferrada said she would spearhead that with NVEMSC.

Limb salvage and amputation:

EMS Agencies:

- Loudoun County Fire & Rescue
    - An adult male involved in an MVA put an arm through the windshield, resulting in partial imputation. They transported him to Reston Hospital Center due to the mechanism alone. He had a tourniquet in place.
        - The arm was able to be reimplanted or able to save the limb. Unsure where that was done, at Reston or another hospital
    - Construction accident where a male had a boulder crush his leg right at the knee. They transported him to Inova Loudoun Hospital. Before EMS arrived, this patient had a makeshift tourniquet in place by his co-workers. EMS then placed two additional tourniquets.
        - Resulted in above-the-knee amputation
    - A 40-ish-year-old male got his hand stuck in a wire spool while working off a bucket truck on the power lines. Complete amputation of index, middle, and ring fingers. He was transported to Inova Loudoun Hospital, where they believe he was transported to Union Memorial for replantation of those fingers.
- Arlington County Fire Department
    - Kate had trouble finding information because there was no primary impression for amputation.
    - Two incidents were located through a narrative search, and both were fingers
        - A 63-year-old female got a finger caught in a leash, partial index amputation
        - 1-year-old finger closed in a door, partial amputation, wrapped and transported to the trauma center
    - Dr. Sarani asked when you take to Union directly or the local trauma center.
        - Kate advised that Union Memorial said they don't want direct admits from EMS. They want them taken to a local hospital and then transfer
            - Loudoun is the same way
            - GW is the same way
- Alexandria Fire Department had none in the timeframe listed
- The City of Fairfax Fire Department advised they had nothing
- Fairfax County Fire & Rescue

- Also had to do a narrative search and found 165 that contained the word amputation
- After reviewing them all, they only had 21 that met the criteria: limb, hand/foot, thumb, or more than one finger.
- Two female, 19 male
- Ages less than 14 to 89
- Bulk of those were hands and multiple fingers
- One lower leg and ankle
- Mechanism of injury
    - Doors – car, garage, house
    - MVA
    - Lawnmowers
    - Saw in a workshop
    - Air conditioning unit
    - HVAC system
    - Folding furniture
    - Restaurant accidents with knives or deli slicers
    - Machinery
    - Scissors
    - Water can
- Transport Destination
    - 12 went to Inova Fairfax
    - 1 to Inova Fair Oaks because the patient refused to go elsewhere
    - 1 to Mount Vernon
    - 7 to Reston Hospital
- They recently added Ancef recently for use by EMS specialists
    - Will soon be carrying whole blood
    - NAEMSP is reviewing standards and practices for carrying antibiotics on ambulances. The target timeframe for review is over the summer

- Physicians Transport Service/GMR
    - Ten patients to Union Memorial Hospital
        - Five involved amputations, including the VHC dog leash patient
        - Two circular saw injuries and hedge clippers were their next most significant MOI
- Prince William County Fire & Rescue
    - Three cases total
        - All were males
        - Ages 19, 29, and 79
        - Two were table saw injuries of the tip of the finger or tip of the thumb and went to Fairfax
        - Firework injury - this patient was flow directly to Union Memorial
            - Extensive damage to left hand from a firework

- Hospitals

- GWU Hospital –
  - Two patients
    - 53-year-old male, pinned between a dump truck and jersey wall with amputation to the right leg and a tourniquet applied prehospitally
      - Scene time of 10 minutes
      - Trauma Activation Yellow
      - Injuries identified were a partial amputation of RLE, minor superficial nonbleeding laceration to the left medial knee, and significant 50-60% circumferential deep laceration to the medial aspect just below the right knee. no exsanguination before/after the tourniquet was removed, sensation above knees bilaterally, no sensation below the right laceration, no DP/PT in RLE, palpable femoral pulse
      - MTP activated before arrival, 1 unit of whole blood, two units FFP, and two packed RBCs
      - Vascular and ortho urgently consulted and planned for emergent OR
      - In the OR – the intraoperative ortho placed a multi-planar spanning external fixator, irrigated femur fracture, wound VAC applied, closure of three lacerations. Vascular performed open thrombectomy of the tibial and popliteal arteries, RLE angiogram, placement of self-expanding stent in the right SFA, fasciotomy of the anterior, lateral, and deep and superficial compartments of RLE
      - Findings: thrombus removed from tibial vessels. Angio showed ATA and SP open, thrombus removed from popliteal artery, angio showed focal dissection of above-knee popliteal artery, and the hunter's canal level. The patient admitted to ICU
      - The patient then went back and forth to the OR for nine surgeries, and they started the conversation about amputation, but the patient adamantly refused.
      - Eventually, the leg was so skeletonized due to tissue and muscle infection that he underwent an above-knee amputation
      - Outcome: Traumatic right leg injury with nerve, bone, and vascular injury with significant soft tissue defect. The aggressive attempt at limb salvage failed, and the patient had AKA
      - Discharged to Acute Rehab Unit
      - This case prompted them to do a study that has not yet been published and is still being written. It was taken to TQUIP and tried to do a study to look at everyone with a crushed leg. Isolated those in the database and then divided into two groups for those who did and did not get an amputation

        - They created a scoring method to say if you have the following score, you'll ultimately need an amputation, and we shouldn't be taking a patient to the OR 9 times, putting you under anesthesia nine times, prolonging the hospital stay, etc. We should get ready and start amputating.
        - Unfortunately, the data are not good enough to predict, and the model they developed cannot predict who will get an amputation; it can only predict who will get an amputation.
            - The positive predictive value is ~30% (who will get an amputation) but the negative predictive value is upwards of 95% (who won't get an amputation)
            - You can use the scoring system to identify who should go to the OR 9-10 times because there is a good chance that person won't get amputated, and the effort is worth it. You can't use it the other way around; just because the score is positive doesn't mean they won't get amputated. It's a negative score, not a positive score.
    - 65 year-old-male, lawnmower accident
        - Transferred from another facility
        - Injuries identified were a partial right middle finger amputation and avulsion to the right ring finger
        - Right hand was wrapped, and bleeding was controlled
        - Findings were an amputation of the right 3rd distal phalanx and laceration of the 4th distal phalanx
        - Ortho consult
        - Intervention: The wound was irrigated with betadine and saline. The wound was not reimplanted; it was just closed with a 5.0 Chromic gut suture. The patient's digit was dressed, and the ED repaired the 4th digit laceration
        - Discharged home
    -
- Inova Loudoun Hospital
    - During the reporting period, they had 2175 total patient volume, 1443 total trauma activations, and 1675 total EMS patients, or 77% of all trauma patients
    - Six traumatic amputations in total
        - four by EMS, 2 POV
            - EMS brought fingers appropriately packed when possible
        - All Male
        - Mechanism of Injury
            - Machine-related crush injuries

  - Industrial fan
  - Rope roller
  - Welding machine
  - A child struck a chair, resulting in a finger being avulsed and amputated
- Activation level
  - 2 Full
  - 4 Modified
  - 1 None
    - Amputation proximal to the wrist and/or ankle is an automatic full activation
- All were fingers
  - All six sustained one or more of the following
    - Complete and/or partial traumatic metacarpophalangeal amputation of the finger
    - Complete and/or partial traumatic transphalangeal amputation of the finger
  - Associated injuries were displaced fracture of distal phalanx of finger, nondisplaced closed fracture of distal/middle phalanx of finger, nondisplaced open fracture of the distal phalanx of finger, laceration without foreign body of index finger
- The full trauma activation case was a 33 year-old-male brought to the ED by EMS along with amputated fingers in gauze in a plastic bag in a cooler of ice
  - The patient worked as a lineman and got his fingers caught between a rope and the roller
  - Full amputation of 2-4th digits near mc/phalangeal joints in addition to partial 5th digit tip amputation noted
  - Plastics and reconstructive surgery were consulted and recommended transfer to the hand center at Union Memorial in Baltimore, MD
    - While they did reimplant his fingers, they did not take, and the patient ultimately lost those fingers.
- Interventions and Outcomes
  - All patients were seen by both trauma and plastics/reconstructive surgery in the ILH ED
  - Three patients underwent operative procedures performed by a PRS surgeon
    - Two discharged home from PACU and one pediatric admission
  - Two patients were seen and recommended outpatient follow-up
    - Discharged home from ED

    - One patient transferred to Union Memorial
- Sentara Northern Virginia
    - 46-year-old-male arrived by EMS in full arrest from MVA with multi-system trauma
        - Great toe amputation in his injuries
        - Expired in the ED from other injuries
    - 55-year-old-female with a table saw injury to distal right middle and ring fingers
        - Arrived with fingers appropriately prepared and ultimately transferred to Union Memorial
        - Both fingers were successfully reimplanted

June 2024 Topic Suggestions

- 2024 considerations
    - When to activate RHCC?
        - Fairfax County FRD had an incident in February with seven patients, with multiple reds and one traumatic arrest. Upon arrival at Fairfax Hospital, they learned there was another significant incident, and those units were bringing four reds at the same time
            - While this doesn't fall inside the MCI Manual guidelines of 10+ patients, those two incidents quickly overwhelmed Fairfax Hospital
            - Fairfax is considering adding to its process the notification of RHCC when five or more patients need to go to trauma centers from the MPI category, simply to say, "Take them where you want," or to give us better guidance.
            - Dr. Sarani added that DC DOH is undergoing personnel changes, the doctor overseeing HEPRA is retiring, and there will be a new medical director for HEPRA soon. One of these months, we should discuss the alignment between DC and NOVA for mass casualty events. It may look good on paper, but does it work operationally?
                - At the COT meeting, they refer to a vast topic: regional medical consortia. The two biggest pushes are regional medical consortia. Maybe in the next six months or so, we can put it on the agenda to talk about it. He will look at DC, and someone here can look at Virginia, and we'll see if we can align on both sides of the Potomac
    - Electrocutions
        - Alexandria had a single incident recently with four patients electrocuted
        - Protocols for referring to a burn center instead of a regular hospital or trauma center

- Data – look at January 1, 2023 – March 31, 2024, or any cases pertinent to the topic

The 2024 Regional Trauma/PI meetings are scheduled for

- Wednesday, June 12, 2024
- Wednesday, September 11, 2024
- Wednesday, December 11, 2024

The meeting was adjourned at 10:21 a.m.

CERTIFICATION OF PERFORMANCE IMPROVEMENT AND TRAUMA MEETING

Northern Virginia EMS Council
7250 Heritage Village Plaza, Ste. 102
Gainesville, VA 20155

I, Laura Vandegrift, Interim Executive Director of the Northern Virginia EMS Council, certify that the above minutes are a true and correct transcript of the Performance Improvement and Trauma Meeting of the Northern Virginia EMS Council on March 13, 2024. The minutes were officially approved on June 12, 2024, at the Committee meeting.

Laura Vandegrift 6/12/2024

Laura Vandegrift
Northern Virginia EMS Council

Date