NETEC COVID-19 Webinar Series:
The Use of Proning: Implications for Your Patients and Your Team
Welcome

Alex Isakov, MD, MPH, FACEP, FAEMS
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Proning: Deeper Dive During COVID-19: Radu Postelnicu, MD

Creating a Team in a Crisis: Trish Tennill, RN, BSN

EMS: Transporting Prone: Alex Isakov, MD, MPH, FACEP, FAEMS

Proning in the ED and Out-of-Hospital: Susan Wilcox, MD, FACEP, FCCM, FAAEM

NETEC Resources: Alex Isakov, MD, MPH, FACEP, FAEMS

Questions and Answers with NETEC
Welcome

National Emerging Special Pathogens Training and Education Center

Mission Statement

To increase the capability of the United States public health and health care systems to safely and effectively manage individuals with suspected and confirmed special pathogens

For more information

Please visit us at www.netec.org
or email us at info@netec.org
NETEC Overview

**Assessment**
- Empower hospitals to gauge their readiness using **Self-Assessment**
- Measure facility and healthcare worker readiness using **Metrics**
- Provide direct feedback to hospitals via **On-Site Assessment**

**Education**
- Provide self-paced education through **Online Trainings**
- Deliver didactic and hands-on simulation training via **In-Person Courses**
- COVID-19 focused **Webinars**

**Technical Assistance**
- **Onsite & Remote Guidance**
- Compile **Online Repository** of tools and resources
- Develop customizable **Exercise Templates** based on the HSEEP model
- Provide **Emergency On-Call Mobilization**

**Research Network**
- **Online Repository** Built for rapid implementation of clinical research protocols
- Develop Policies, Procedures and Data Capture Tools to facilitate research
- Create infrastructure for a **Specimen Biorepository**

**Cross-Cutting, Supportive Activities**
Proning: Deeper Dive During COVID-19

Radu Postelniciu, MD
Optimize oxygenation in mechanically ventilated patients with severe hypoxic respiratory failure

Credit: NIAID-RML: This scanning electron microscope image shows SARS-CoV-2 (round gold objects) emerging from the surface of cells cultured in the lab. SARS-CoV-2. The virus shown was isolated from a patient in the U.S.
Physiology

I. Isolated Lung Affected by Gravity (Neglecting the Chest Wall)

<table>
<thead>
<tr>
<th>Supine Chest</th>
<th>Ventral</th>
<th>Gravity</th>
<th>Dorsal Gravimetric Compression</th>
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II. Lung Expansion Constrained by the Chest Wall.

<table>
<thead>
<tr>
<th>Ventral Expansion</th>
<th>Dorsal Expansion</th>
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III. Proning Homogenizes Pulmonary Aeration

<table>
<thead>
<tr>
<th>Ventral</th>
<th>Dorsal</th>
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Gattinoni et al. AJRCCM. 2013.
Physiology

Proning: Deeper Dive During COVID-19

Rationale

PROSERVA

• Multi-center Un-blinded RCT
• 474 patients with severe ARDS (P/F<150, fio2 >0.6, PEEP >5, 6cc/kg Vt)
• Prone 16h vs LPV

Guérin, et al. PROSERVA. NEJM. 2013.
Rationale

- 28-day mortality 16% in prone group vs. 32.8% in supine group (p<0.001)
- Unadjusted 90-day mortality 23.6% in prone group vs 41.0% in supine group with HR 0.44
- Increased Vent-free days

### Protocol

**Lung Protective Ventilation**
- Vt 4-6mL/kg
- Pplat <30
- Driving pressure (Pplat – PEEP) <15
- PEEP
- Target Sa02 90-96%

**Conservative Fluid Strategy**
- Diuresis as tolerated by hemodynamics/Cr

**PEEP Titration**
- ARDSnet

**Prone**
- Early if cont hypoxemia (P:F <150)
- Prone qPM, supine qAM

**Additional therapies**
- Paralytics, iNO, ECMO
Creating a Team in a Crisis

Trish Tennill, RN, BSN
Creating a Team in a Crisis

Look at All Your Options

- Literature
- Staff resources
- Protocols
- Equipment needs
- PPE resources
Create a Protocol

Proning to be initiated today

Date: __________

• 2:30 PM/9:30 AM Increase FIO2 to 100% (FIO2 is to be returned to original setting 30” after positioning)
• 2:30 PM/9:30 AM Hold Tube feedings (resume after positioning)
• 3:00 PM/10:00AM Have equipment gathered and pre-work completed
• Tube feeding to be resumed after proning/supining
• Swimmers Position to be changed Q4 hours throughout the night with micro turns of the head when in the room (RT, MD, or RNs). Last turn patient should be facing the vent.

** Supining will be done at 10:00 AM each morning
Creating a Team in a Crisis

Practice at least once
Creating a Team in a Crisis

Equipment

Equipment on the go

Make it mobile

Make sure you have enough

Keep equipment cart outside the patient room in order to prevent contamination
Creating a Team in a Crisis

- PPE Implications
  - Team size
  - Conservation methods

- Role of a Spotter
Creating a Team in a Crisis

Sustainability
Creating a Team in a Crisis

Teamwork
EMS: Transporting Prone

Alex Isakov, MD, MPH, FACEP, FAEMS
Case series – 7 patients transported prone – 6 by helicopter
- FiO2 100% with median PEEP 16 (range 14-20)
- Weight range 58-131 kg
- Median transport time 36 minutes
- No deaths or major incidents

Operations
- Medical control consult on each transport
- Brief trial to ensure patient can tolerate
- All transported in CMV mode
- All with sedation and NMB
Observations

• Nasal pressure ulceration
• Facial and periorbital edema
• Secretions draining from ETT

Outcomes

• No deaths, no episodes of hypotension, no ETT or line dislodgement
• 2 patients required frequent change of CO2 capnography lines
Cited complications of proning
- Pressure ulcerations
- Neurovascular compression
- Ocular injuries
- Displacement of the ETT

Cardiac arrest
- CPR in prone position
- Defibrillation with pads in A-P or A-L position

Need for extensive simulation-based training sessions

Case Report: Transport of a Prone Position Acute Respiratory Distress Syndrome Patient
David Hersey, BA, BScN, RN, Tobias Witter, MD, George Kovacs, MD, MHPE, FRCP(C)
EMS: Transporting Prone

ARDS with Severe Hypoxia – Aeromedical Transportation During Prone Ventilation

Anaesth Intensive Care 2003; 31: 675-678

Safe long-distance interhospital ground transfer of critically ill patients with acute severe unstable respiratory and circulatory failure


Edelson et al.: Interim Guidance for Life Support for COVID-19

10.1161/CIRCULATIONAHA.120.047463

- Effectiveness of prone CPR not known
- Recommended to avoid dislodgement of airway and equipment disconnection
- Hands in standard position over the T7/10 vertebral bodies
Proning in the ED and Out-of-Hospital

Susan Wilcox, MD, FACEP, FCCM, FAAEM
50 adult patients presented to ED with hypoxia (SpO2 <90%) without resolution (SpO2 >93%) despite O2 supplemental oxygen, capable of self-proning

- Without O2 - SpO2 75% (IQR 62 to 82)
- With O2 – SpO2 82% (IQR 72 to 85)
- Overall, median SpO2 at triage 80% (IQR 69 to 85)
- Improved to 84% (IQR 75 to 90) with O2
5 minutes of proning - median SpO2 94% (IQR 90 to 95, P=0.001)

13 pts (24%, 95% CI 14.6 to 40.3%) intubated within 24 hours
- 4 intubated within 30 min
- 3 between 30 and 60 min
- 6 60 min - 24 hours

5 subsequently were intubated
- 3 between 24 and 48 hours
- 2 after 72 hours

Proning in the ED and Out-of-Hospital

Self-pronning in the ED

- Moderate hypoxemia, SpO2 < 95% on supplemental O2 or < 90% with exertion
- Tachypnea or mild-moderate dyspnea with supplemental O2
- Rescue therapy

Contraindications:
- Delirium, confusion, or inability to follow staff instructions when given proper interpretive services
- Inability to independently change position
- Recent nausea or vomiting
- Hemodynamic lability, including but not limited to, heart rate > 120 or MAP < 65
- Need for immediate intubation
Self-pronking in the ED
Self-pronning in the ED
Out-of-Hospital Proning

Benefits
- Avoid intubation*

Risks
- Difficulty accessing patient in transit
- Loss of airway
- Decompensation
- Safety – security
Do not initiate prone positioning for non-intubated patients.
Concern for delayed recognition need to intubate, risk of worse hypoxia
Patients will not be proned specifically for transport
Should be managed proned by the sending facility
Suitability for prone transport:
   a) Minimal dyspnea (work-of-breathing)
   b) No hypercapnia
   c) Normal mental status
   d) No predictors for difficult intubation
Specifically discuss the potentially fatal risks of prone transport
- Sufficient number of assistants, usually five
- Invasive lines are sutured, ETT secured with commercial device
- Suction mouth, endotracheal tube, and stomach
- Lines are positioned to avoid traction during moves and turns
- Assure optimal sedatiogesia then administer NMBA
- Using the slide board and the bedsheet, move the patient as a unit to the edge of the bed and STOP. Assure no tension on any line, device, or monitor
- Padding and body position are important. Support the face and shoulders appropriately, avoiding any contact of the supporting padding with the orbits or the eyes

Proning in the ED and Out-of-Hospital

Intubated versus Non-intubated
Proning in the ED and Out-of-Hospital

**Prone position**
Potential pressure areas shown

- Cheek and ear
- Breasts (females)
- Genitalia (males)
- Patella
- Toes
Emergent Return to Supine Position for Prone Position Patient

1. Use the full sheet under the patient to turn the patient
2. Cover the patient fully with the sheet, bringing together the edges on the side toward you
3. Pull out the slack in the sheets
4. Rapidly assure there is sufficient slack in remaining lines and tubes for the patient movement
5. Rotate the patient toward the ceiling and then supine
Emergent Return to Supine Position for Prone Position Patient

THE FLIP

THE FLIP
NETEC Resources

Alex Isakov, MD, MPH, FACEP, FAEMS
NETEC will continue to build resources, develop online education, and deliver technical training to meet the needs of our partners.

**NETEC is Here to Help**

**Ask for help!**

Send questions to info@netec.org - they will be answered by NETEC SMEs

Submit a Technical Assistance request at NETEC.org
Questions and Answers
**Contact**

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<td>youtube.com/thenetec</td>
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