...the obverse of the inverse...

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ob·verse

facing or turned toward the observer
Paul Pepe, MD, MPH, MACP, FCCM...

ALERT!!! Pepe in your jurisdiction.
Chicago EMS

- Illinois EMS Region XI (Chicago)
- 4 Resource Hospitals (UCMC, NMH, AIMMC, Stroger)
- EMS Medical Directors Consortium
- 33 acute care participating hospitals
- Chicago population of 2.8 million
- 75 Ambulances (60 ALS, 15 BLS)
- 71 ALS & 76 BLS fire apparatus
- 1400 vehicle responses daily
- 900 transports daily
Quality Improvement

Airway Didactic
  1.5 hour didactic
Simulation Training
  1.5 hour simulation
Chicago Paramedic
Airway Study CQI
  IRB-exempt,
  airway registry
New protocols & devices
Chicago Paramedic Airway Study CQI

6 month registry

200 intubations/month

Post intubation questionnaire:
Demographics (Age, Ht, Wt)
Indication, Location, Time of day
Technique, C-L Grade of View
Cricoid, BURP, Bimanual
Reason for failure
Repeat attempt data
Combitube, BVM use
EMS & ED Confirmation

Cormack – Lehane Grading of View
Providers’ estimation of patient weight correlated with first-pass success

1\textsuperscript{st} 181±69 lbs

2\textsuperscript{nd} 213.8±76.9 lbs

Range [7,450] lbs
Mean 185.9 lbs

$\ p<0.05 $
CPAS Results

Stepwise progression in laryngoscopic grade of view with estimate of patient weight

C-L Grade 1: 175.7±70.7
C-L Grade 2: 181.2±46.2
C-L Grade 3: 198.2±89.2
C-L Grade 4: 224.9±66.6
Inverse Intubation
INVERSE INTUBATION:
AN IMPORTANT ALTERNATIVE FOR INTUBATION IN THE STREETS

Tatjana Hilker, MD, EMT-I, Harald V. Genzwuerker, MD, EMT-I
PREHOSPITAL EMERGENCY CARE 1999;3:74–76

Figure 1. Inverse intubation in a small bathroom with limited access at the patient’s head. The laryngoscope is held in the right hand, the endotracheal tube in the left hand.

Figure 2. Inverse intubation by two rescuers: One resuer is lifting with both hands giving better lifting strength, the other resuer introduces the endotracheal tube.

confined space, mechanical advantage, teaching, no additional equipment needed
Inverse Intubation: Potential for Complications

Alan Jon Smally, MD, FACEP, Susan Dufel, MD, FACEP, Jerry Beckham, MD, and Vicente Cortes, MD, FACS


Fig. 1. Inverse intubation from the patient’s side. The laryngoscopist is positioned to the right of the supine patient’s torso, facing the head.

Fig. 3. Inverse intubation, straddling position, two-person method. The laryngoscopist straddles the patient and the assistant passes the tube.

57 M highway MVC, prolonged extrication, 2-person inverse, hypopharyngeal laceration
In conclusion, the study involving *n=21* patients demonstrated improved speed and accuracy in intubation technique through the inverse intubation method. Further research is recommended to validate these findings in a broader context.
A Randomized Comparison of Rescuer Positions for Intubation on the Ground

PREHOSPITAL EMERGENCY CARE 1997;1:96–99

Comparative Study of Airway Management Techniques with Restricted Access to Patient Airway

John D. Hoyle, Jr., MD, Jeffrey S. Jones, MD, Matthew Deibel, MD, David T. Lock, MD, Diann Reischman, PhD
PREHOSPITAL EMERGENCY CARE 2007;11:330–336
Data Overview

**Inverse Uses** \( n=29 \)
**Age** \([0,104]\), mean 59.2
**Weight** \([7,230]\), mean 97 kg
46% female; 54% male

**Indication**
- 77.6% cardiac arrest
- 5.1% apenic
- 10.9% respiratory distress
- 3.8% decreased MS
- 1% airway obstruction
3.2% pediatric intubation

5.1% spinal immobilization

71.2% supine, 10.3% sitting, 3.8% confined space

**Location**
51.9% indoors on scene
40.7% in ambulance
3.7% in an automobile
Operator Data

18.375 [6,30] average number of years of paramedic Experience

10.8 [2,31] average number of successful intubations performed by paramedic on real patient in past 12 months

Note: All paramedics performed 36 simulator intubations during Advanced Airway Module
29 total patients who received inverse technique
(includes one-person and two-person)

2 patients has inverse technique performed for foreign body airway obstruction removal

27 patients received inverse technique for intubation

5 patients (18.5%) ultimately required supraglottic airway for ventilation (combitube) – reasons included obesity, secretions, trauma, spinal immobilization

22 patients (81.5%) were successfully intubated either on first or second attempted using an inverse technique – these tubes were confirmed/maintained by ED physician
Of those intubations that used an inverse technique, either on the first or second attempt, the first-pass C-L grade of view achieved with use of an inverse technique--either 1 or 2 person--(2 ± 0.97 n=18) was significantly better than that achieved on first-pass with traditional DL (n=9, 3.8 ± 0.67, p<0.001)
Conclusions

• Inverse intubation is an important skill in the pre-hospital airway toolkit.

• Inverse techniques may be valuable for confined spaces and poor laryngeal view.

• Avoid blind insertion of laryngoscope with inverse intubation techniques.

• Inverse intubation is not a substitute for BVM or supraglottic airways.