...the obverse of the inverse...

Eric Beck, DO, NREMT-P
Associate Medical Director, Chicago EMS
Out-of-Hospital Medicine Scholar, University of Chicago

ob·verse

facing or turned toward the observer

CHICAGO 2012
The Global Crossroads

G8
2012 CHICAGO

NATO
OTAN

CHICAGO
SUMMIT • **20-21.V.2012** • SOMMET

CHICAGO 2012
The Global Crossroads

G8
2012 CHICAGO

NATO
OTAN

CHICAGO
SUMMIT • **20-21.V.2012** • SOMMET

CHICAGO 2012
The Global Crossroads

G8
2012 CHICAGO

NATO
OTAN

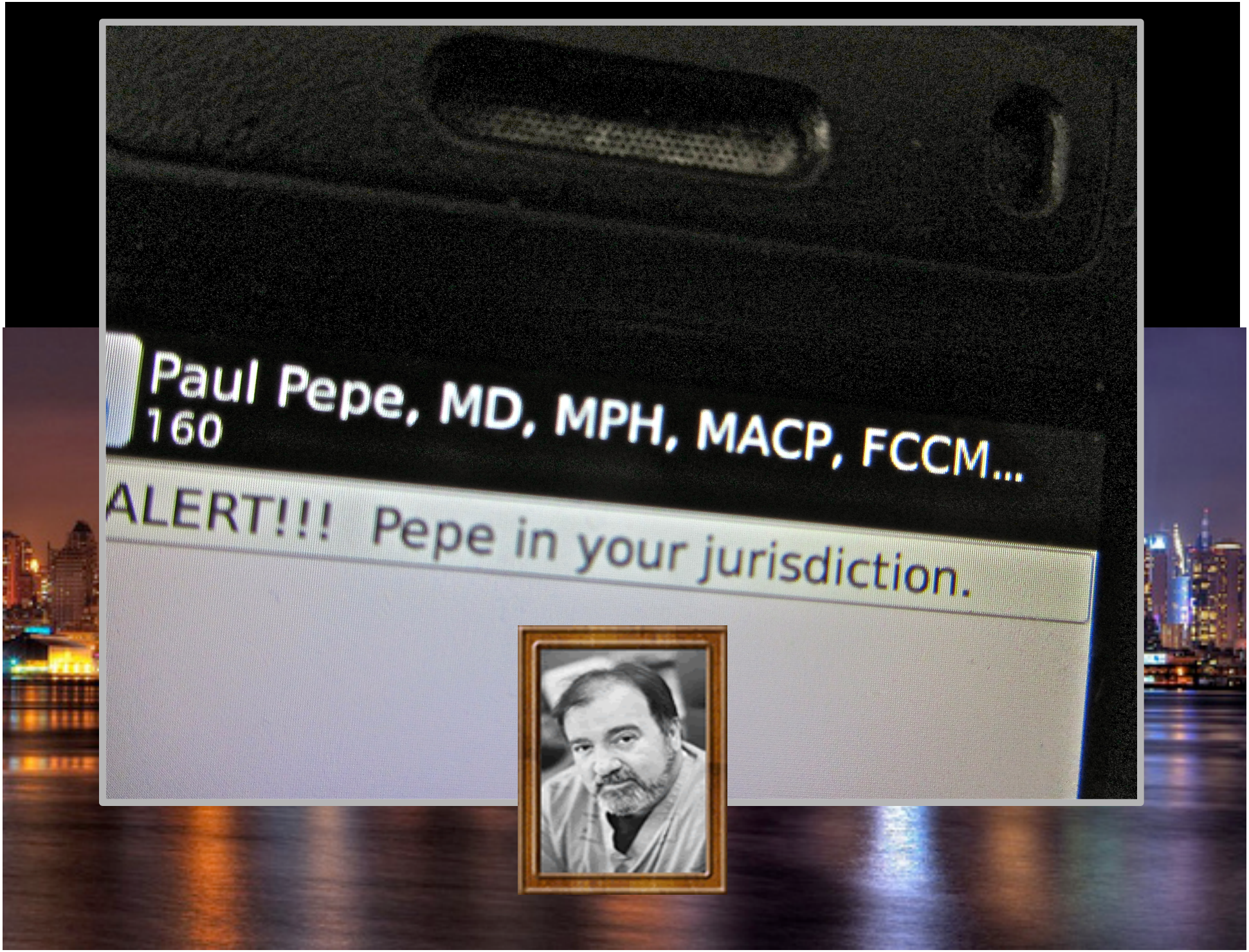
CHICAGO
SUMMIT • **20-21.V.2012** • SOMMET

CHICAGO 2012
The Global Crossroads

G8
2012 CHICAGO

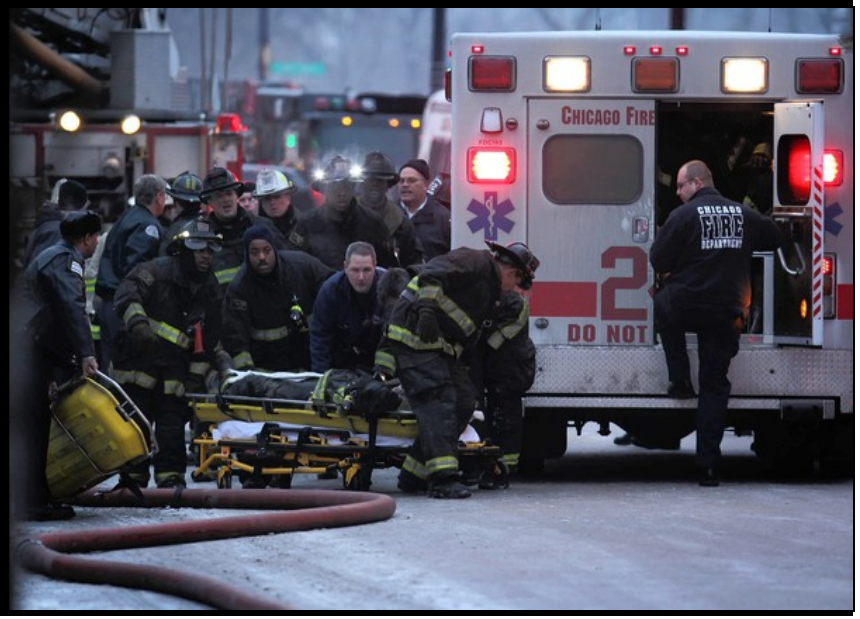
NATO
OTAN

CHICAGO
SUMMIT • **20-21.V.2012** • SOMMET


Paul Pepe, MD, MPH, MACP, FCCM...
160
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

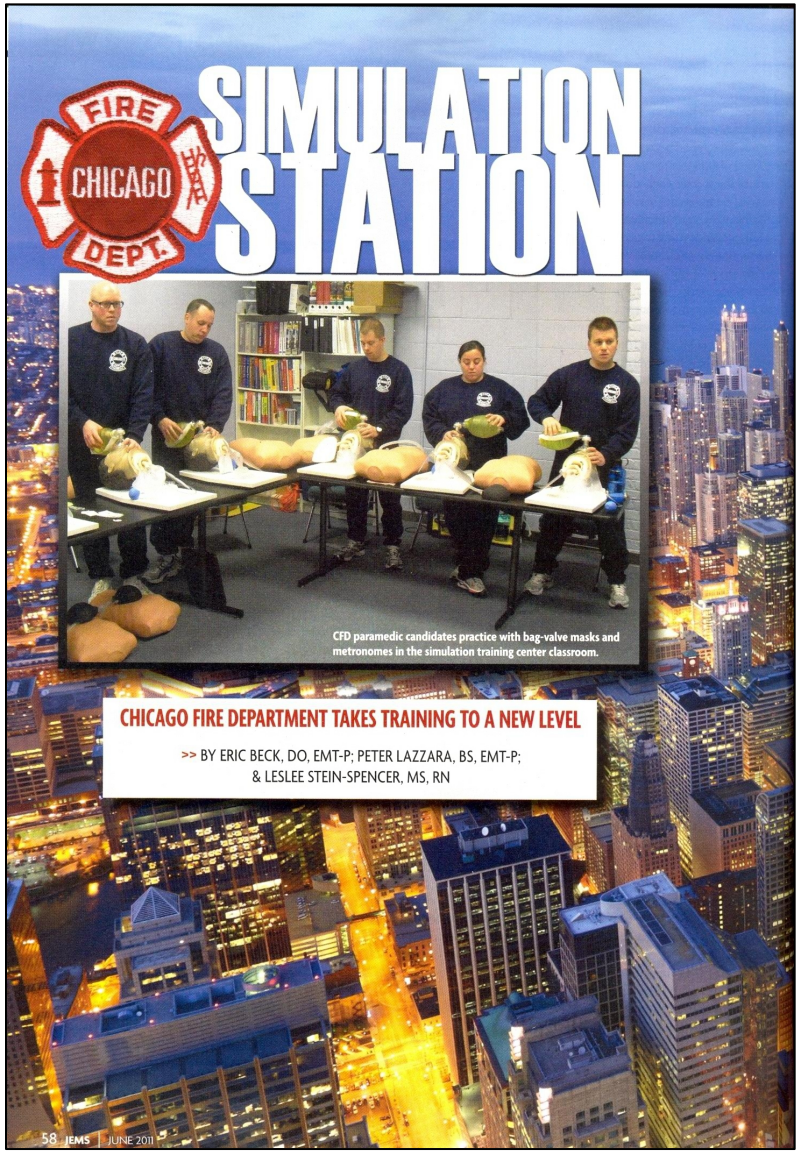
1.5 hour simulation

Chicago Paramedic Airway Study CQI

IRB-exempt,

airway registry

New protocols & devices



Quality Improvement

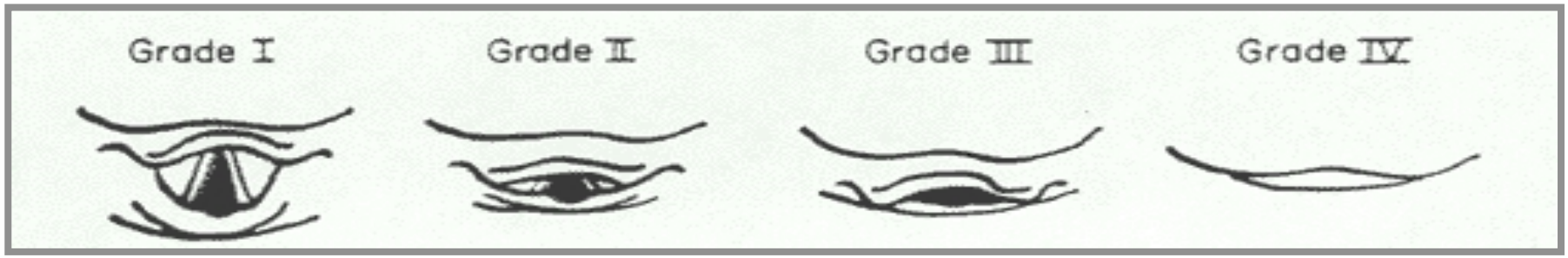
Chicago Paramedic Airway Study CQI

6 month registry

200 intubations/month

Post intubation questionnaire:

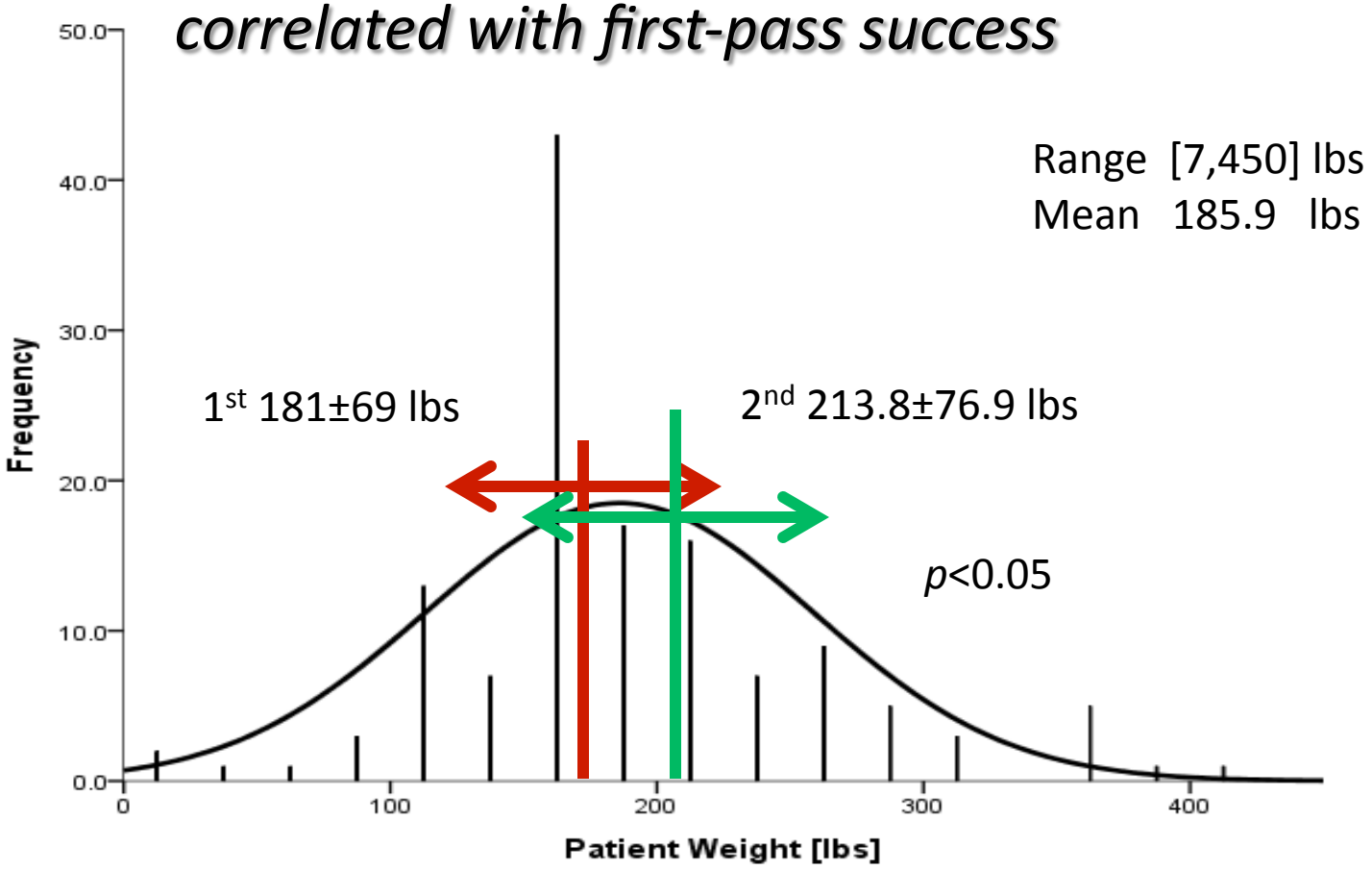
Demographics (Age, Ht, Wt)
Indication, Location, Time of day
Technique, C-L Grade of View
Cricoid, BURP, Bimanual
Reason for failure
Repeat attempt data
Combitube, BVM use
EMS & ED Confirmation



Cormack – Lehane Grading of View

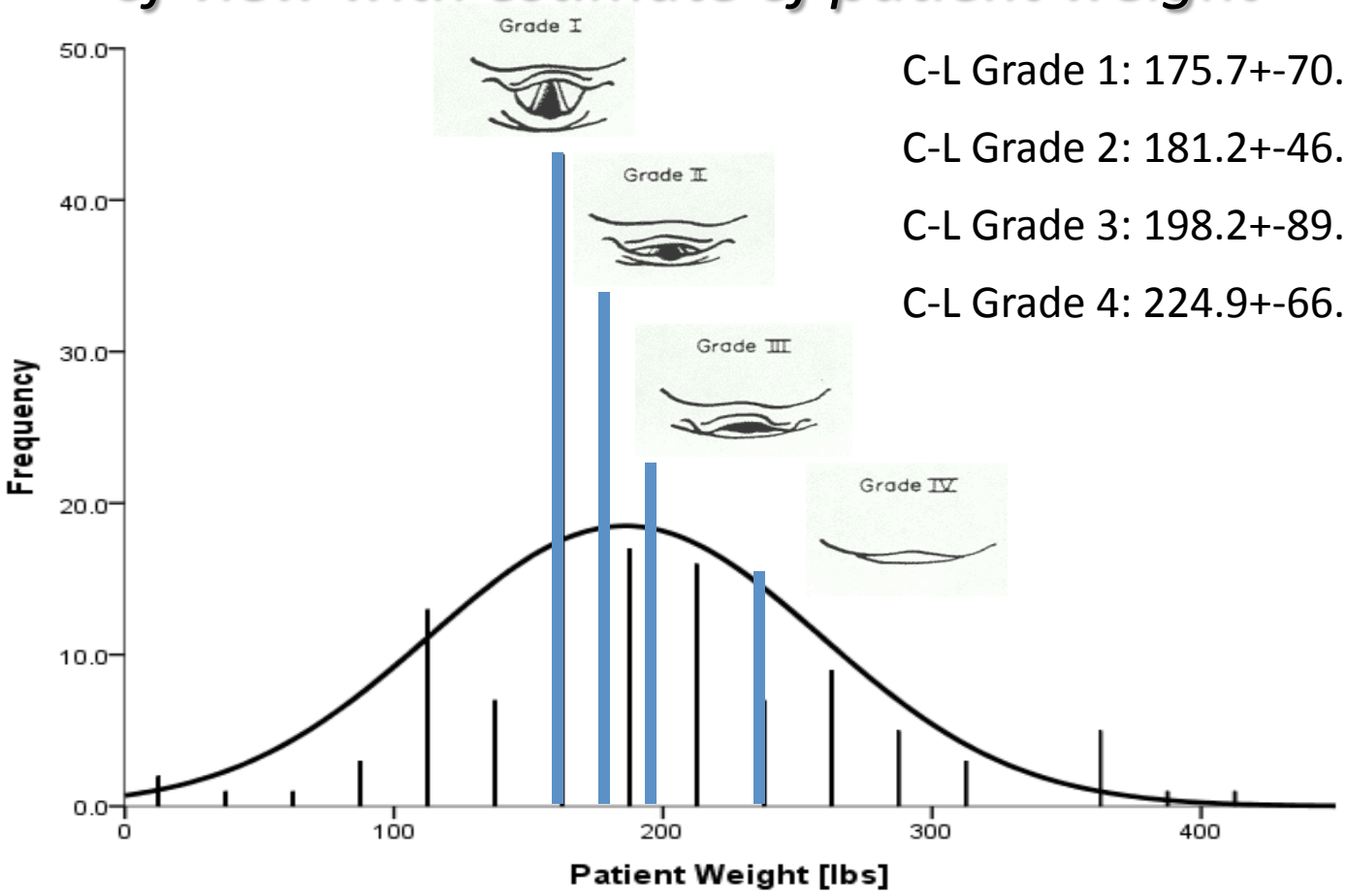
CPAS Results

Providers' estimation of patient weight correlated with first-pass success



CPAS Results

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



C-L Grade 1: 175.7+-70.7

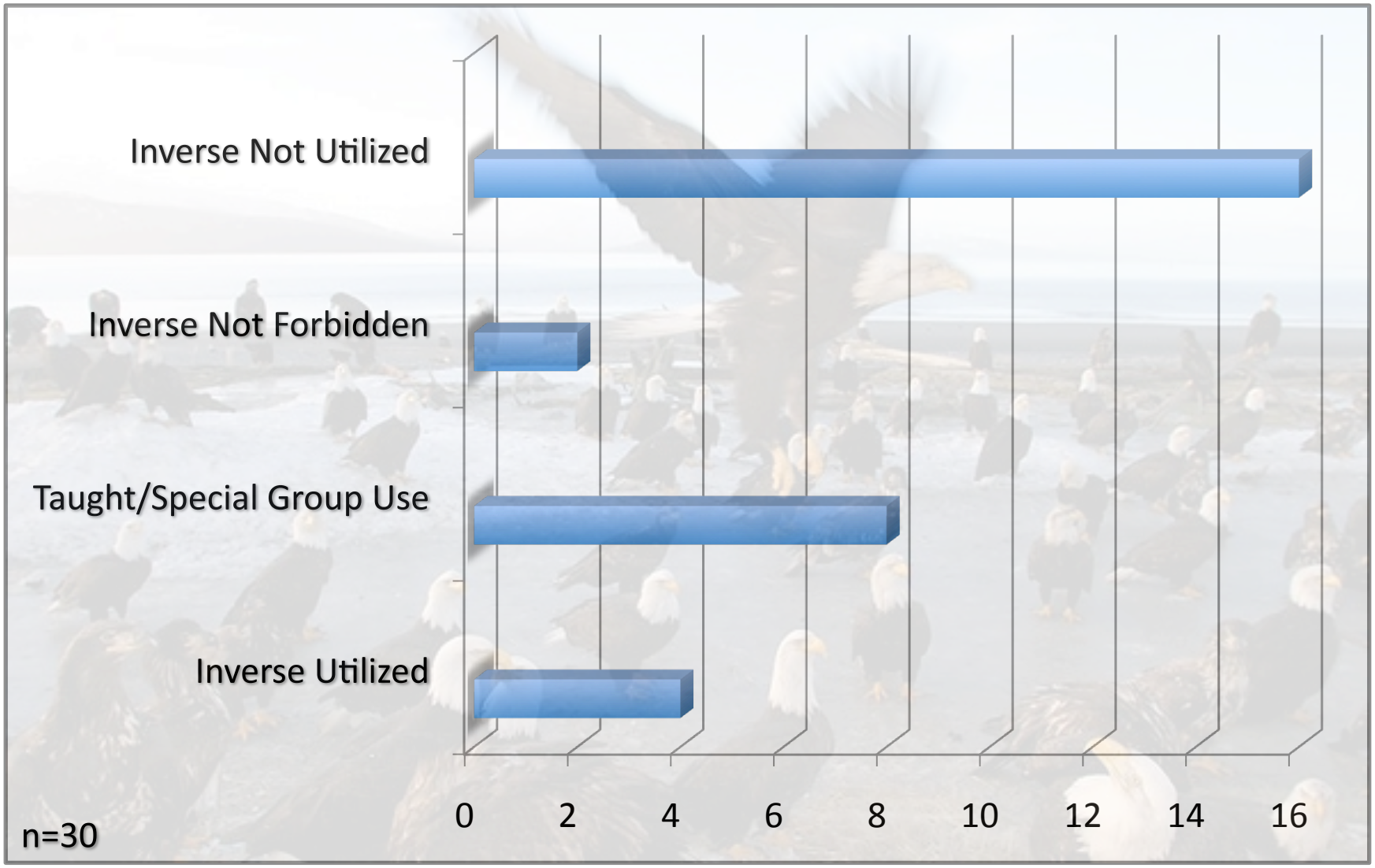
C-L Grade 2: 181.2+-46.2

C-L Grade 3: 198.2+-89.2

C-L Grade 4: 224.9+-66.6

Inverse Intubation

Eagles Inverse Utilization



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 rescuer is lifting with both hands giving better lifting strength, the other rescuer 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

J Trauma. 2002;52:1005–1007.

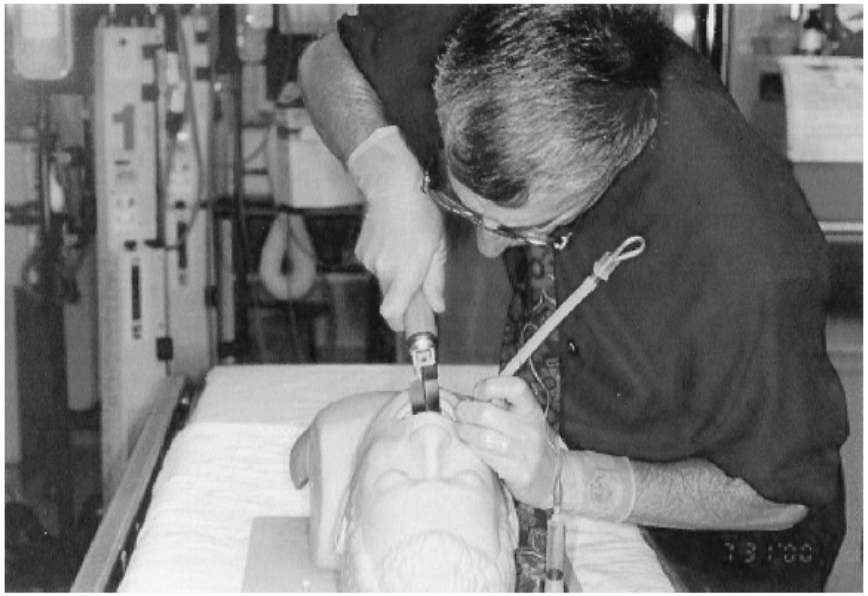


Fig. 1. *Inverse intubation from the patient's side. The laryngoscopist is positioned to the right of the supine patient's torso, facing the head.*

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

Inverse Intubation in Air Medical Transport

Kenneth Robinson, MD,[1,2] Kevin Donaghy, MD,[2] and Robert Katz, MD[1,2]

January-February 2004 **Air Medical Journal 23:1**

Figure 4. Intubation step 3, alternate view

Photos by Scott Palmer

Figure 6. Two-person Intubation Technique, alternate view

n=21, speed and accuracy

A Randomized Comparison of Rescuer Positions for Intubation on the Ground

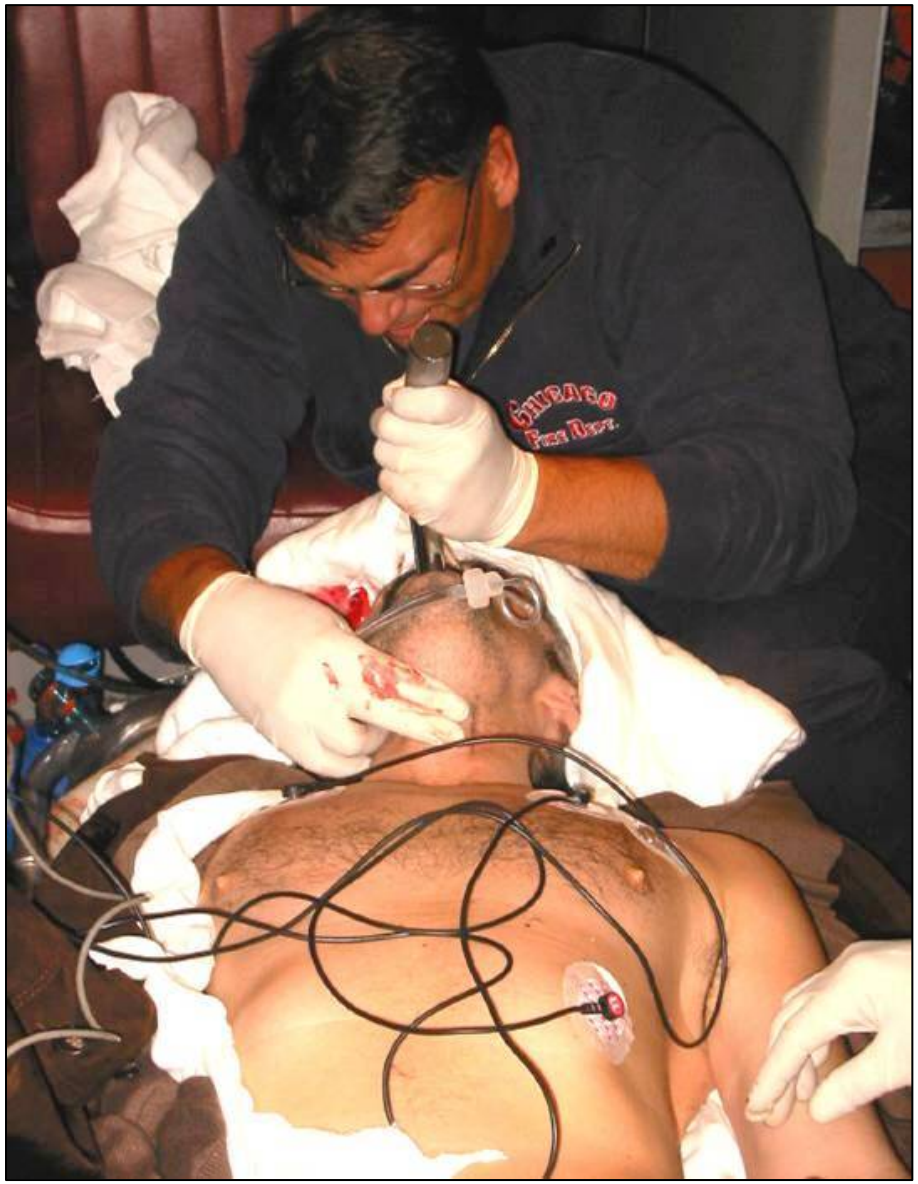
Katharina P. Koetter, MD, Tatjana Hilker, EMT-I, Harald V. Genzwuerker, EMT-I, Martina Lenz, EMT-P, Wolfgang H. Maleck, ARZT, Georg A. Petroianu, MD, Joseph A. Fisher, MD

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

Data Overview

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

Inverse Data

29 total patients who received inverse technique
(includes one-person and two-person)

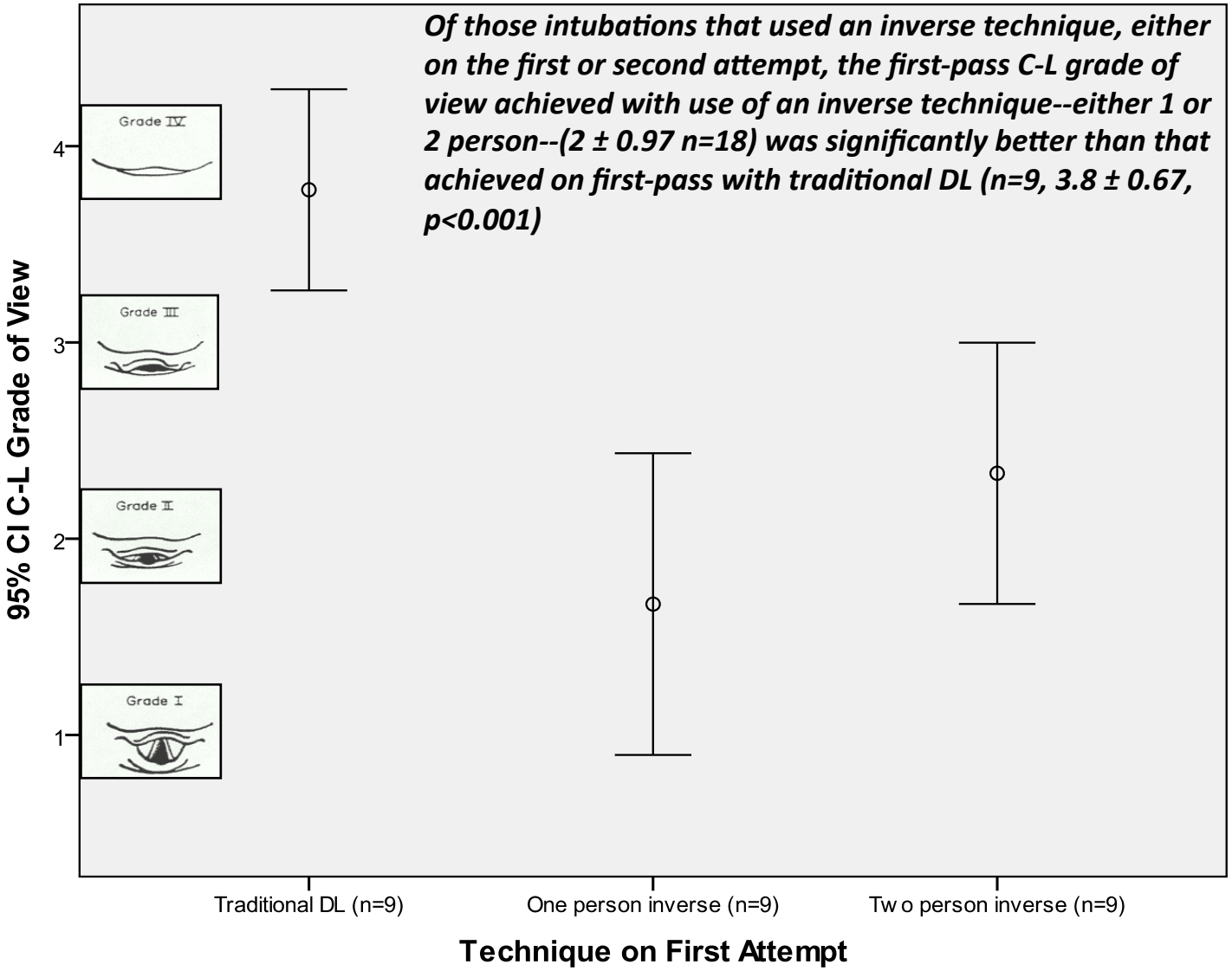
2 patients has inverse technique performed for foreign body airway obstruction removal

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

Inverse & C-L View



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.**


ebeck@uchicago.edu