



*SafeTec Training Services*

# **Is Your Service Ready for RSI?**

*Tips on Implementing a Successful EMS RSI Program*

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# Objectives

- Define paralytic rapid sequence intubation (RSI), non-paralytic rapid sequence intubation (NP-RSI), and rapid sequence airway (RSA) and attempt to determine how it may fit into airway management for EMS
- Discuss important components of a successful RSI program including;
  - Initial and ongoing skill proficiency and tracking
  - Medical Direction
  - Protocol/algorithm development
  - Continuous quality improvement and assurance



# Objectives

- Review key components of NAEMSP position statements
- Discuss sample implementation procedures for a successful RSI program

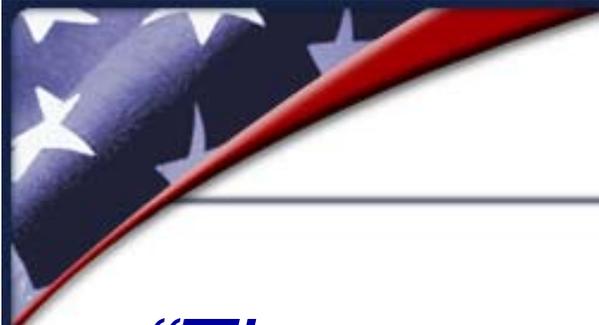


➤ EMERGENCY VIDEO HERE



*“Airway management is the foundation on which the resuscitation process rests.”*

**- Ron Walls, MD**



*“There are few more important tasks in emergency medicine than airway management. Whatever method is used must be effective, for the problem airway does not allow the luxury of waiting until the ‘physician’ arrives, or until the problem has cured itself.”*

**- Charles E. Stewart, MD, FACEP**





# RSI Definition

The virtually simultaneous administration, after preoxygenation, of a potent sedative agent and a rapidly acting neuromuscular blocking agent to induce unconsciousness and motor paralysis for tracheal intubation.



# RSI Terminology

## Also Known As

Drug-assisted Intubation (NAEMSP)

and

Medication Facilitated Intubation

and

Pharmacologically Assisted Intubation

and

Pharmacologically Facilitated Intubation

and

*The Hits Keep On Coming!*





# NP-RSI Definition

The use of a predetermined dose of an induction medication following preoxygenation to render a patient unconscious for the purpose of tracheal intubation.



# RSA Definition

The virtually simultaneous administration, after preoxygenation, of a potent sedative agent and a rapidly acting neuromuscular blocking agent to induce unconsciousness and motor paralysis for extraglottic device placement.

# Group Question 1

Your service's provider is presented with a patient with a GCS of 15 who requires intubation.

The provider has access to RSI and skillful in the procedure.

Should RSI be utilized if there are no contraindications?





**YES!!**

## Group Question 2

Your service's provider is presented with a patient with a GCS of 3 who requires intubation.

The provider has access to RSI and skillful in the procedure.

Should RSI be utilized if there are no contraindications?





**YES!!**



**“RSI is always indicated unless  
it’s contraindicated”**

*RSI should be used for management of all  
airways, regardless of GCS unless there  
is a contraindication to the procedure or  
medications utilized during the process.*

## Group Question 3

Knowing the answer from the previous two questions does this mean we need RSI?





**MAYBE!**

**MAYBE NOT!**

**RSI may be beneficial in some instances/systems**



**RSI may be detrimental in some instances/systems**





**There are many, many misconceptions as to what RSI is and when it should be used**

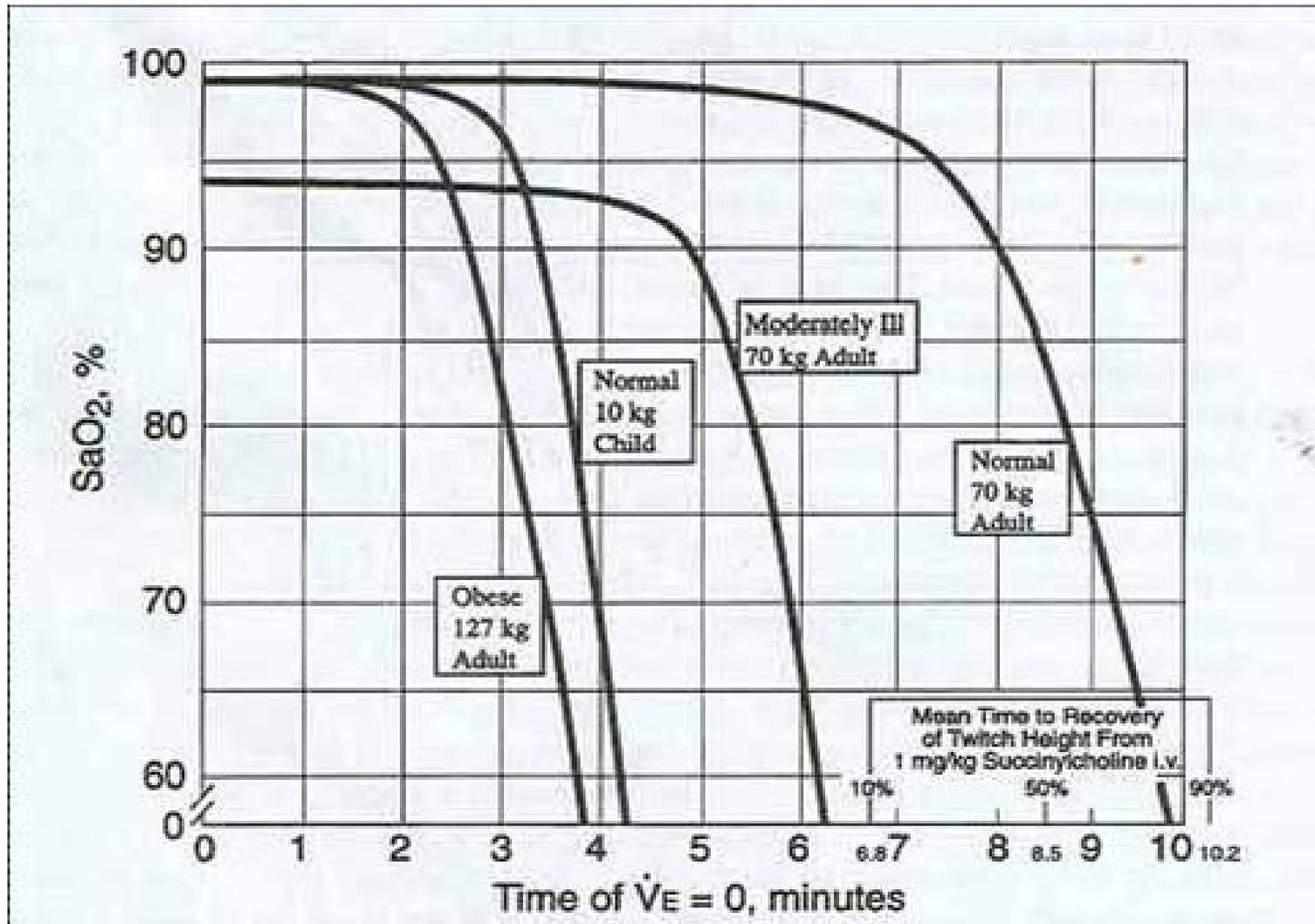
**Some of the reasons to consider RSI include the two big ones.....**

# Why Consider RSI?

## 1) It's beneficial for the patient!

- Protects against reflex sympathetic response to laryngoscopy (RSRL)
- Elimination of gag/cough reflexes
- Prevention of spikes in ICP
- Prevention of acute bronchospasm
- Reduction of “shear” pressure
- Some degree of aspiration protection is provided
- Increases “safe apnea time”

# Safe Apnea Time



# Why Consider RSI

## 2) ETI is easier than without RSI

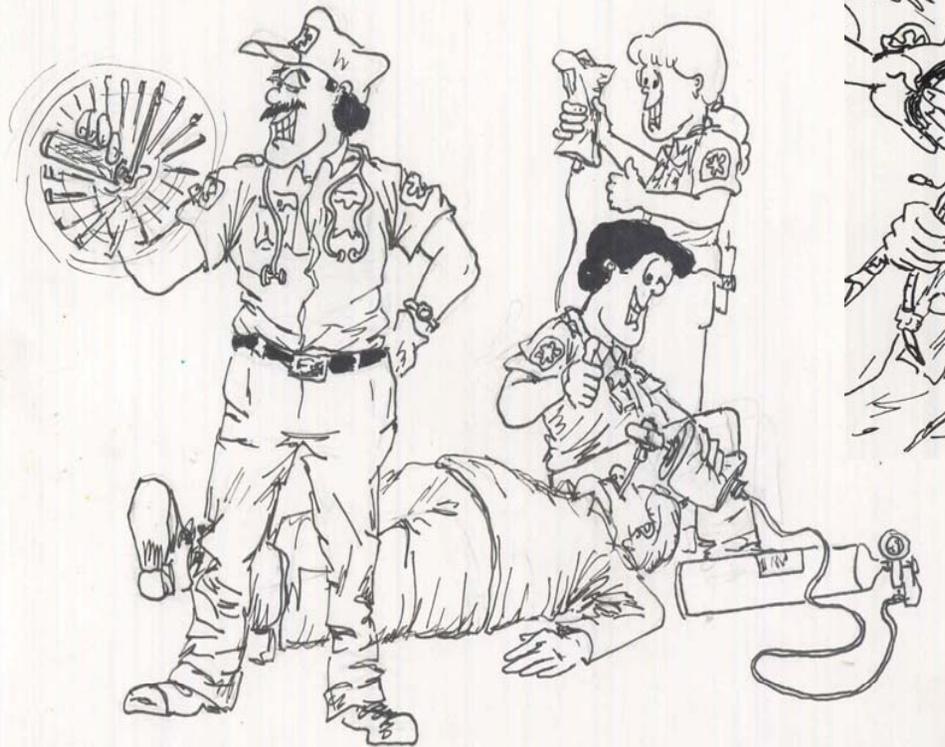
- Glottic visualization is generally better than without medications
  - Particularly with paralytic RSI over NP-RSI
  - SCh may increase visualization by one full grade
  - May actually decrease 'failed' airway attempts
- Combative patients are able to be made compliant
- Gag reflex is fully suppressed
- Trismus/masseter muscle spasm is suppressed

# Why to Not Consider RSI

- Skill set
- Unit provider makeup
- Number of available tubes
- Medical direction availability
- QA/QI concerns
- What does the evidence tell us?
- Transport time
- Training availability
- \$\$\$\$



# Is Perception Reality...?



# **IMPORTANT!**

**It is truly unclear if ETI in EMS is evidence supported, though those intimately involved in emergency medicine, anesthesia and EMS remain convinced that if ETI is good in ED's it must be good in EMS**

**Logically sensible... kind of like fibrinolysis for stroke or MI**



# RSI History

- First described by Stept and Safar as a 15 step process to rapidly induce anesthesia and prevent aspiration in patients with full stomachs
  - Emergent trauma patients
  - Pregnant patients
- Drug-Assisted Intubation (DAI) becomes popular in ED in the late 1970's/early 1980's
- Today; the gold standard for all emergency department ETI's
- Gold standard for EMS? – not so much, yet!



# RSI and EMS

- Exact date of inception is unknown
  - 1972 – Seattle, Washington??
  - 1988 – Thurston County, Washington
    - The first formal report of prehospital RSI
      - 95 RSI's performed by paramedics
- As of 1997 at least 29 states permitted use of NMB agents
  - Many more states likely to be using some form of DAI
- Anecdotally more flight services and critical care transport use RSI than true EMS





# Group Discussion

What are your concerns  
about EMS RSI?



**All concerns about  
an EMS RSI Program  
are valid!**

# Initial Provider Training

- How much is enough?
  - Live patient ETI
  - High fidelity patient simulator ETI?
  - Airway task trainer (manikin) ETI?
- Some study results
  - No difference in ETI success manikin training only vs. manikin + cadaver training
  - Fresh frozen cadavers more realistic vs. manikins
  - Use of VL to learn DL may increase success



# Initial Provider Training

- Some paramedic programs are no longer providing any live intubation training into their programs
  - Liability concerns
  - Lack of available facilities
- Traditional EMS programs often teach the technique of ETI and DAI incorrectly
  - NSC curriculum does not adequately address DAI, particularly RSI
  - Evidence curve for EMS programs is poor
  - Non expert instructional model

# Initial Provider Training

- Attendance at an accepted, peer reviewed advanced/difficult airway course may be associated with higher success rates
  - Based on current scientific evidence
  - No “I feel” or “we teach this but do x” factor from instructors
  - Provides standardized approach to airway management, regardless of where the course was taken
  - Eliminates confusion/misunderstanding about DAI and techniques
  - Reinforces algorithmic approach

# Initial Provider Training

## Known Reviewed EMS airway management courses:

- Practical Emergency Airway Management
  - 2 days in length. Delivered in Baltimore, MD only
- The Difficult Airway Course: EMS
  - 2 days in length. Delivered in all regions of the country as well as internationally
- SLAM Airway Training
  - Several length sessions available. Currently no scheduled courses according to their website





# Initial Provider Training

## National Association of EMS Physicians DAI Position Statement

“EMS providers performing DAI should possess training, knowledge, and experience in the techniques and in the use of pharmacologic agents used to perform DAI.”



# Initial Provider Training

## **Commission on Accreditation of Air Medical Transportation Systems Standards for initial airway management training**

“Since airway management is an essential life-saving measure, and endotracheal intubation is an important aspect of airway management, the initial education and training must include no less than 5 live (animal labs are also acceptable) cadaver or dynamic Human Patient Simulator (HPS) experience specific to age groups in program’s scope of care and patient population.”

Training on the use of ‘rescue’ airway devices must be included

# Initial Provider Training

- Like anything else, the more one does something the better they are at it!
  - This is also true with ETI. Studies show the provider who intubates more (12+ times/year) is more successful than the provider who does not
    - Interestingly enough, the comparison of live, cadaver, and manikin intubations are the same!
- Aggressive initial provider training is paramount
  - Initial EMS certification levels
  - Initial assignment to a program using RSI
  - Continuing education programs





# Initial Provider Training

**Minimum quarterly performance standards vary from program to program.**

**The following sample is taken from MidAtlantic MedEvac (Philadelphia, PA). This program currently has a >98% ETI success rate and 100% 'airway' rate.**

# Initial Provider Training

- No less than 5 successful adult intubations by human encounters, human patient simulator (HPS), operating room, or cadaver lab
- No less than 5 successful infant (<1yr in age) intubations by human encounters, human patient simulator (HPS), operating room, or cadaver lab





# Initial Provider Training

- Alternative airway management education (i.e.. King™, LMA™)
- Education on advanced airway management (Melker Emergency Cric Kit)
- Review RSI and airway management protocols with chairperson of RSI committee or their designee
- OR rotation



Providers who ***MEET*** the  
requirements are doing the  
***MINIMUM!***

Ongoing skill proficiency and continuing education  
are an important component of a successful RSI  
program. Providers should be held to a higher level.



# Ongoing Skill Proficiency

- Tracking considerations
  - Number of overall ETI attempts per patient
  - Number of first pass success
  - Number of successful EGD placement post failed ETI
  - Presence or absence of difficult airway indicators
  - GEB usage
  - Required documentation
  - Individual provider statistics
  - Hemodynamic response
  - Scene times





# Ongoing Skill Proficiency

## Commission on Accreditation of Air Medical Transportation Systems Standards for ongoing airway management training

“Since airway management is an essential life-saving measure, and endotracheal intubation is an important aspect of airway management, no less than 1 successful live, cadaver, HPS or mannequin intubation per quarter is required for each Critical Care or ALS Provider.”



# Ongoing Skill Proficiency

**Minimum quarterly performance standards vary from program to program.**

**The following sample is taken from MidAtlantic MedEvac (Philadelphia, PA). This program currently has a >98% ETI success rate and 100% 'airway' rate.**



# Ongoing Skill Proficiency

- Individual flight team member will achieve 3 successful adult intubations and 1 successful infant intubation per quarter. Intubations may either be live or mannequin.
  - These encounters can occur either in the field, operating room, approved airway education program, or at yearly competency
  - 4 of the 16 intubations per year must be either human encounters or completed on a HPS mannequin.
- Completion of an approved airway course every three years





# Medical Direction

RSI can be an extremely litigious procedure and fatal if not used correctly. Successful RSI programs require active, aggressive medical direction and oversight.

## Wang et al

“(medical) direction with close system-wide monitoring may be the most important ingredient of the program’s success.”





# Medical Direction

## Basic Medical Direction Concepts

- Intimate with each provider's experience and skill set
  - Knowing providers by name is probably a huge plus but, may be difficult in some EMS systems
- Takes an active roll in protocol development, based on current, sound evidence
- Frequently has face-to-face interaction with providers and does "ride-alongs" with providers
- Takes an active roll in QA/QI on all levels, not just RSI cases



# Protocol/Algorithm Development



**Far too often protocols are made for the weakest link**

# Protocol/Algorithm Development

## Sound evidence

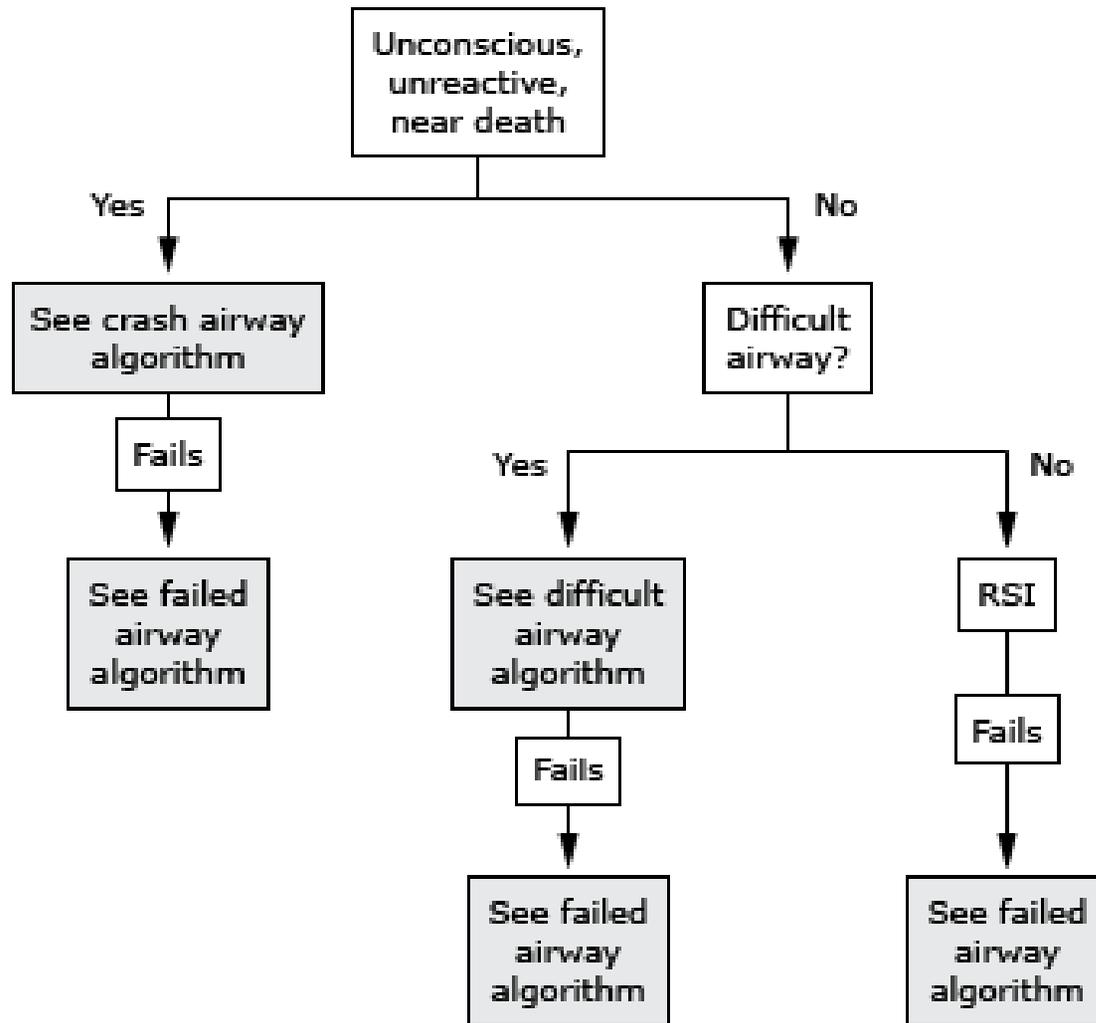
- Many protocols are “dumbed down” or not inclusive because MD/MCP does not fully understand rationale for need for RSI and/or the recommended dosages for RSI medications
  - Ex using single doses for all age/sizes of patients
- Reference/rely on the *airway experts* – ***don't reinvent the wheel!***
- Provide the provider with the most likelihood at success
  - Simply written
  - Algorithmic in design
    - Familiar territory for EMS providers



# Protocol/Algorithm Development

- Protocols/algorithms should address nearly all possibilities of potential patient encounters
  - Crash airway algorithm
    - Patients too hemodynamically unstable to benefit from the sedatives used in RSI – *nearly dead or newly dead*
  - Difficult airway algorithm
    - Based on airway assessments
  - RSI/RSA algorithm
    - Patients who are not ‘crash’ or not ‘difficult’ should be RSI/RSA
  - Failed airway algorithm
    - Must be defined

# Protocol/Algorithm Development



# CQI/QA Considerations

- Mechanisms must be in place to address quality well before an RSI program is established
- Whatever we call it, QA, QI, CQI, PI, etc. must focus on patient care and documented outcomes
- It must identify strengths and weaknesses of the program
- It should identify trends and prescribe an avenue for correction and remediation when necessary
- It should be free of punitive measures
  - This does not mean documented, repeated deficiencies cannot lead to discipline or similar procedure





# CQI/QA Considerations

Although, often not a fan favorite of providers many successful programs utilize a system of quality control that includes peer review to some extent.

- Peer review allows providers to become accountable for their actions through **constructive** critique
- Encourages open communication amongst team members
- Allows team members to learn from each other
- Predetermined QA indicators should be developed

# CQI/QA Consideration

Tiered-level CQI/QA may be the most successful method for most systems.

- Level 1 – Peer review
- Level 2 – Level 2 review group
  - Smaller, subset of staff which review charts more in depth than the peer group
- Level 3 – RSI Committee review group
  - Focuses specifically on RSI flow and issues
- Level 4 – CFN or Chief of Program
- Level 5 – Medical Director review



# CQI/QA Consideration

## Advantages of tiered-level CQI/QA

- Multiple eyes see charts and identify issues
- Trends with providers may be more apparent
- Offers 100% QA of ALL charts
- Staff held to higher standards

## Disadvantages of tiered-level CQI/QA

- Multiple eyes see charts and identify issues
- Unwillingness of providers to participate in peer review
- The “pass through” effect
- Providers may see who QA issues exist with



# NAEMSP Position Highlights

- medical direction with concurrent and retrospective oversight supervision
- proper patient selection; to include training and continuing education designed to demonstrate initial and ongoing competence in the procedure (includes supervised DAI experience)
- training in airway management of patients who cannot be intubated; as well as the availability, and competence in the use, of backup rescue airway methods in the event of failed DAI





# NAEMSP Position Highlights

- standardized DAI protocols, including the use of sedation and neuromuscular blockade
- resources for drug storage and delivery
- resources for continuous monitoring and recording of heart rate and rhythm, oxygen saturation, and end-tidal carbon dioxide, before, during, and after DAI



# NAEMSP Position Highlights

- appropriate training and equipment to confirm initial and verify ongoing tube placement
- continuing quality assurance, quality control, performance review, and when necessary, supplemental training
- research to clarify the role of DAI on improved patient outcome within EMS systems.



# NAEMSP Meeting Findings

WMO has a successful and safe prehospital RSI program because of its unique training experience and stringent attention to quality. A comprehensive didactic training program is supplemented with hands-on OR-based airway training. Whatcom adheres to strict standards for the numbers of ETI required of each paramedic. The system has invested in and requires the use of state-of-the-art continuous ETCO<sub>2</sub> monitoring, which is an important safety feature of a prehospital RSI program.

Most importantly, strong, committed medical direction with close systemwide monitoring may be the most important ingredient of the program's success.



# Sample Implementation

## 1) Identify need for RSI

- Current ETT/airway trends
  - Understand many missed or failed airways may be successful with a properly instituted RSI program

## 2) Get buy-in from stake holders

- EMS system
- Hospitals
  - Remember many MD's are wary of RSI for EMS because of documented failures
    - Use science to your advantage
    - Focus on patient safety



# Sample Implementation

## 3) Develop protocols and algorithms

- Utilize airway experts when possible
- Do not reinvent the wheel

## 4) Ensure all staff have received adequate initial education

## 5) Prove competencies

- Uncomplicated and complicated RSI scenarios
- Use real time simulation when possible

## 6) Order medications, ensure availability of all required equipment

## 7) Start program





# Summary

- RSI is NOT for every EMS system!
- A successful RSI program requires an extreme amount of oversight and attention
  - Don't just '*set it and forget it*'
- Initial training, ongoing training, and equipment can be an expensive endeavor



# Summary

- Services wishing to initiate an RSI program should assess its needs
  - Staffing
  - Number of potential RSI cases
  - Proximity to hospitals
  - Potential increased on-scene times
  - Equipment availability



# Summary

- RSI programs can be successful if properly developed
- Look to experts in the field – no need to reinvent
- Analyze, analyze, analyze!



# Thank You!



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