

EMS and Data Management

An Evolving Standard

**The Fire Service has
had a standardized data set
for a generation**

The National EMS Information System

"No local, state, or federal databases were suitable for use due to inconsistent data definitions, inconsistent data formatting, and variation in inclusion criteria."

- 2003: The EMS Outcomes
Evaluation Project (Page 8)



The National EMS Information System

Development partners:

NHTSA

HRSA

CDC

University of Utah

University of North Carolina

The National EMS Information System

*A Standardized Dataset
of over 400 data elements*



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20-Sep-2007

Dataset Dictionaries

NHTSA Version 2.2.1 Data Dictionary

The NEMSIS NHTSA Version 2.2.1 DataDictionary provides **over 400 definitions** that can be implemented by an EMS system.

National data elements are defined that should be collected for the National EMS Database, but additional data elements should be considered for use at the state and local levels depending on each state or local EMS system's need.



- [NEMESIS Data Dictionary v2.2.1.pdf](#) (pdf)
- [NEMESIS Data Dictionary v2.2.1.doc](#) (doc)
- [NEMESIS Data Elements and Values v2.2.1.xls](#) (xls)
- [NEMESIS Data Elements Definitions v2.2.1.xls](#) (xls)
- [NEMESIS Data Elements Definitions v2.2.1.xls](#) (xls) **contains National Elements Only**

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CARDIAC ARREST

E11_01

Data [combo] single-choice

National Element

Definition

Indication of the presence of a cardiac arrest at any time associated with the EMS event.

XSD Data Type *xs:integer*

XSD Domain (Simple Type) *CardiacArrest*

Multiple Entry Configuration No

Accepts Null Values Yes

Required in XSD Yes

Field Values

-25 Not Applicable

-20 Not Recorded

-15 Not Reporting

-10 Not Known

-5 Not Available

0 No

2240 Yes, Prior to EMS Arrival

2245 Yes, After EMS Arrival

Additional Information

- If answered YES, all other data points in the Situation/CPR should be addressed

Uses

- A component of the EMS Medical Record: Patient Care Report
- Allows data to be sorted based on the occurrence of a cardiac arrest
- Allows data to describe the number of cardiac arrests within the EMS patient population

Data Collector

- EMS personnel

Other Associated Elements

E00 Common Null Values

E01_01 Patient Care Report Number

References to Other Databases

- NFIRS 5.0 EMS Module; Title: Cardiac Arrest; Pick-List: Pre-Arrival Arrest = 1, Post-Arrival Arrest = 2
- UTSTEIN Title: Confirmed Cardiac Arrests Considered for Resuscitation

PROCEDURES

D04_04

Data [combo] multiple-choice

Definition

A list of all procedures that the agency has implemented and available for use.

XSD Data Type	<i>xs:decimal</i>	XSD Domain (Simple Type)	<i>DemographicProcedure</i>
Multiple Entry Configuration	Yes, via structure	Accepts Null Values	No
Required in XSD	No	Minimum Constraint	0
		Maximum Constraint	1,000

XSD Structure: D04_04 and D04_05 are members of D04_04_0 Demographic Procedure Structure

Field Values

89.820	12 Lead ECG	93.930	Airway-Bagged
93.931	Airway-BVM	97.230	Airway-Change Tracheostomy Tube
98.130	Airway-Cleared	96.051	Airway-Combitube
93.900	Airway-CPAP	96.030	Airway-EOA/EGTA
96.991	Airway-Intubation Confirm CO2	96.992	Airway-Intubation Confirm Esophageal Bulb
96.052	Airway-Laryngeal Mask	96.010	Airway-Nasal
96.041	Airway-Nasotracheal Intubation	93.940	Airway-Nebulizer Treatment
31.110	Airway-Needle Cricothyrotomy	96.020	Airway-Oral
96.040	Airway-Orotracheal Intubation	96.790	Airway-PEEP
96.042	Airway-Rapid Sequence Induction	93.910	Airway-Respirator Operation (BLS)
98.150	Airway-Suctioning	31.120	Airway-Surgical Cricothyrotomy
96.700	Airway-Ventilator Operation	96.701	Airway-Ventilator with PEEP
38.910	Arterial Access-Blood Draw	89.610	Arterial Line Maintenance
89.700	Assessment-Adult	89.701	Assessment-Pediatric
38.995	Blood Glucose Analysis	89.391	Capnography
89.510	Cardiac Monitor	99.624	Cardiac Pacing-External
99.626	Cardiac Pacing-Transvenous	99.623	Cardioversion
99.640	Carotid Massage	34.041	Chest Decompression
34.042	Chest Tube Placement	73.590	Childbirth
1.181	CNS Catheter-Epidural Maintenance	1.182	CNS Catheter-Intraventricular Maintenance
99.600	CPR	99.601	CPR by External Automated Device
86.280	Decontamination	99.621	Defibrillation-Automated (AED)
99.622	Defibrillation-Manual	99.625	Defibrillation-Placement for Monitoring/Analysis
100.200	Extrication	99.290	Injections-SQ/IM
37.611	Intra-Aortic Balloon Pump	93.580	MAST
96.070	Nasogastric Tube Insertion	89.590	Orthostatic Blood Pressure Measurement
89.702	Pain Measurement	89.392	Pulse Oximetry
100.100	Rescue	99.841	Restraints-Pharmacological
99.842	Restraints-Physical	93.591	Spinal Immobilization
93.540	Splinting-Basic	93.450	Splinting-Traction
89.703	Temperature Measurement	89.704	Thrombolytic Screen
57.940	Urinary Catheterization	38.990	Venous Access-Blood Draw
89.620	Venous Access-Central Line Maintenance	39.997	Venous Access-Discontinue
38.991	Venous Access-Existing Catheter	38.993	Venous Access-External Jugular Line
38.992	Venous Access-Extremity	38.994	Venous Access-Femoral Line
39.995	Venous Access-Internal Jugular Line	41.920	Venous Access-Intraosseous Adult

PROTOCOL

D04_08

Data [text] multiple-entry

Definition

A list of all of the medical treatment protocols that the agency has in place and available for use. Specific Adult or Pediatric Protocols should be mapped to one of these topics if possible.

XSD Data Type	<i>xs:string</i>	XSD Domain (Simple Type)	<i>DemographicProtocolsUsed</i>		
Multiple Entry Configuration	Yes, via structure	Accepts Null Values	No		
Required in XSD	No	Minimum Constraint	2	Maximum Constraint	30

XSD Structure: D04_08 and D04_09 are members of D04_08_0 Demographic Protocol Structure
XSD Attributes: Status (Active or In-active) and Date are included as attributes

Field Values

6720 Abdominal Pain	6730 Airway
6740 Airway-Failed	6760 Airway-RSI
6770 Allergic Reaction/Anaphylaxis	6780 Altered Mental Status
6785 AltitudeSickness	6790 Asystole
6791 Atrial Fibrillation	6800 Back Pain
6810 Behavioral	6820 Bites and Envenomations
6830 Bradycardia	6840 Burns
6850 Cardiac Arrest	6860 Cardiac Chest Pain
6870 Childbirth/Labor	6875 Cold Exposure
6880 Dental Problems	6881 Device Malfunction
6885 Diarrhea	6890 Drowning/Near Drowning
6892 Diving Emergencies	6900 Electrical Injuries
6910 Epistaxis	6911 Exposure-Airway Irritants
6912 Exposure-Biological/Infectious	6913 Exposure-Blistering Agents
6914 Exposure-Cyanide	6915 Exposure-Nerve Agents
6916 Exposure-Radiologic Agents	6917 Exposure-Riot Control Agents
6920 Extremity Trauma	6925 Eye Trauma
6930 Fever	6935 Gynecologic Emergencies
6940 Head Trauma	6945 Hyperglycemia
6950 Hypertension	6960 Hyperthermia
6965 Hypoglycemia	6970 Hypotension/Shock (Non-Trauma)
6980 Hypothermia	6990 IV Access
7000 Trauma-Multisystem	7010 Newly Born
7020 Obstetrical Emergencies	7030 Overdose/Toxic Ingestion
7040 Pain Control	7130 Post Resuscitation
7140 Pulmonary Edema	7150 Pulseless Electrical Activity
7160 Respiratory Distress	7170 Seizure
7175 Spinal Cord Trauma	7180 Spinal Immobilization
7190 Supraventricular Tachycardia	7200 Stroke/TIA
7210 Syncope	7214 Trauma-Arrest
7215 Trauma-Amputation	7220 Universal Patient Care
7230 Ventricular Fibrillation	7232 Ventricular Ectopy
7240 Ventricular Tachycardia	7251 Vomiting

Additional Information

- Can be used as a qualifying measure to compare care provided to protocol guidance

Section D04 Agency Configuration Information

2008 NHTSA Uniform PreHospital Dataset V.2.2.1



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Software Developers

This section is geared towards vendors and software developers who are looking at ways to become NEMSiS compliant.

National Element

XSD Domain (Simple Type) *FirstName* E00
 D01_13 T **Field Values** Population E23_06
 D01_15 EMS -25 Not Applicable per Year
 D01_17 EMS -5 Not Available Volume per Year

Definition 1 Yes
 The First Name of the Agency's Medical Director

Data Collector **Required in XSD**
 • EMS personnel

xs:string Data Format

In This Section

[Dataset Components & Requirements](#)

An overview of the components and requirements of the NEMSiS data collection system.

[Becoming Compliant](#)

The how-to-source for becoming NEMSiS compliant, including:

- The [Compliance Policy](#)
- The [Compliance Process](#)
- The [Compliance Testing Schedule](#)
- [Compliance Testing Software](#)

[Downloads](#)

Download the following tools and helps:

- [Dataset Dictionaries](#)
- [Demographic Dataset Schemas](#) (XSDs)
- [EMS Dataset Schemas](#) (XSDs)
- [Database Scripts](#)
- [Test Cases & XML Samples](#)
- [Archive of Past Releases](#)



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Gold Compliant

01-Oct-2007

The National EMS Information System Technical Assistance Center is please to announce that the EMS Software Packages listed below, have achieved **NEMSiS Gold Compliance!** It is important to acknowledge the significant effort required to **obtain NEMSiS Compliance.**

What Does Gold Compliant Software Mean to Me as a Potential Customer?

Please remember as a potential customer that this list is just one of many tools you should use to evaluate the **total package** being offered to your organization. Any software package should be evaluated on its overall fit into your organization's needs. The vendor's web page may be accessed by simply clicking on the vendor name. For **sales information**, click on the following **link**.



Gold Compliant Software

Listed in Alphabetical Order



Gold Compliant Software

Listed in Alphabetical Order

[AccuMed Billing](#)

AccuMedWeb, Version 3.7, Microsoft Windows, Web-Based

[ACS-Firehouse](#)

Firehouse Software, Version 7.0, Microsoft Windows

[BIO-Key](#)

FireRMS, Version 4.3, Microsoft Windows

[Colleton Software](#)

MICS, Version 1.0.5, Microsoft Windows

[Digital Innovations](#)

Collector EMS Server, Version 4.1, Microsoft Windows, Web-Based

[emsCharts](#)

emsCharts, *emsCharts Pocket*, *emsCharts Mobile*, Version 2.2, Microsoft Windows, Web-Based, or PocketPC

[Grayco Systems](#)

EMSIS Rover, *Provider*, & *Server Version 2.1.0 (Rover)*, *2.7.0 (Provider)*, & *2.1.0 (Server)*, Microsoft Windows

[Iatroware](#)

IatroChart EMS, Version 1.01, Microsoft Windows, Mac, PC

[ImageTrend](#)

EMS State Bridge, Version 3.0, Web-Based

[IMC, Inc.](#)

EMS Transport, Version 4.6, Microsoft Windows

[Ortivus](#)

Sweet Billing & Field Data with NEMSiS Export Module, Version 5.3, Microsoft Windows

[Med Media](#)

EMStat WebCUR Gold, Version 1.0, Microsoft Windows, Pocket PC, Palm OS, and Web-Based

[RAM Software Systems, Inc.](#)

AIM Billing & ePCR with NEMSiS Export Module, Version 4.1, Microsoft Windows, Web-Based

[Sansio \(Formerly ScanHealth\)](#)

HealthEMS™, Version 4.1, Web-Based

[Vital Data Technology](#)

NEMSiS PCR Bridge, Version 1.0, Microsoft Windows, Web-Based



Silver Compliant Software

Listed in Alphabetical Order

[Allegheny R & D](#)

EMMA, Version 6.0, Microsoft Windows, Palm OS

[Click here to see compliant elements](#)

[American Ambulance](#)

Simon, Version 11.0, Microsoft Windows

[Click here to see compliant elements](#)

[Business Micro Resource Corp](#)

FireTools EMS, Version 9.00, Microsoft Windows

[Click here to see compliant elements](#)

[Corporate Technologies LLC](#)

ESS/Ambulance, Version 3.0, Microsoft Windows

[Click here to see compliant elements](#)

[Documed Systems Intl. Inc.](#)

Emergency-Pro, Version 4.0, Microsoft Windows, Web-Based

[Click here to see compliant elements](#)

[Emergency Reporting](#)

ERS, Version 4.0, Web-Based

[Click here to see compliant elements](#)

[Emergency Technologies, Inc.](#)

Visual EMS, Version 5.3, Microsoft Windows

[Click here to see compliant elements](#)

[EmergiData](#)

RescueMedic, Version 1.5, Web-Based, Microsoft Windows

[Click here to see compliant elements](#)

[EMS Consultants](#)

Automated Run Tracking (ART), Version 6.2, Microsoft Windows

[Click here to see compliant elements](#)

[EMS Data Systems](#)

EMScan, RMP-2.x, AR-2.x, Microsoft Windows, DOS

[Click here to see RMP-2.x compliant elements](#)

[Click here to see AR-2.x compliant elements](#)

[ESO Solutions](#)

ESO Pro, Version 1.2, Web-Based, [Click here to see compliant elements](#)

[FATPOT Technologies](#)

Enfuego, Version 1.4.8, Microsoft Windows

[Click here to see compliant elements](#)

[Healthware Solutions](#)

EMS Solution Suite, Version 5.7 with the NEMSiS Export Module, Microsoft Windows

[Click here to see compliant elements](#)

[Intermedix](#)

EMS 2006, Version 1.0, Web-Based

[Click here to see compliant elements](#)

[Medical Claims Assistance, Inc.](#)

EPIC, Version 1.0.0.0, Microsoft Windows

[Click here to see compliant elements](#)

[Medusa Medical Technologies, Inc.](#)

Siren ePCR, Version 2.xx and 3.xx, Microsoft Windows, Web-Based

[Click here to see 2.xx compliant elements](#)

[Click here to see 3.xx compliant elements](#)

[OPEN Incorporated](#)

SafetyPAD, Version 2.7, Microsoft Windows

[Click here to see compliant elements](#)

[PeopleForce](#)

NJSFACTs, Version 2.0, Web-Based

[Click here to see compliant elements](#)

[Purvis Systems](#)

FDManager, Version 3.2, Microsoft Windows

[Click here to see compliant elements](#)

[Vital Data Technology](#)

WebPCR, Version 2.0, Web-Based

[Click here to see compliant elements](#)

[Zoll Data Systems](#)

RescueNet TabletPCR, Version 4.0.2.81, Microsoft Windows

[Click here to see compliant elements](#)

The Advent of the Electronic Medical Record

- Standard data fields
- Data goes directly into the organization's data server
- Allows for report generation
- Ease of billing operations
- Other computer assists



Electronic Medical Records

- **Many agencies have improved billing success dramatically**
- **Drastically improved legibility**
- **Quality report left at the hospital**
- **State reporting requirements easily met**
- **Standard reports often very useful**

The shortest book ever written

Promises
Kept
by
Software
Vendors



Examples

“Oh, we’re going to add that report right away”

“We’ll have those reports sent to you by email whenever you want them”

The “20+ Issues”

- What kind of laptop?
- Who will service/repair them?
- Wireless communication? \$\$\$
- Will you include the ECG file?
- Do you want 12 lead transmission?
- Where will you print?
- Will you FAX back?
- Who will buy and maintain
- the printer(s)?
- Who will provide IT support?
- What reports do you want?
- Are reports included in the purchase?
- Is there an “ad hoc” reporting tool?



All that being said...

Reports can be wonderful

“List incident numbers for all chest pains 40 or above that did not receive NTG and ASA”

“...or monitor and oxygen...”

“...or (GASP) were non-transported”

**...and even more
being said...**

More wonderful reports...

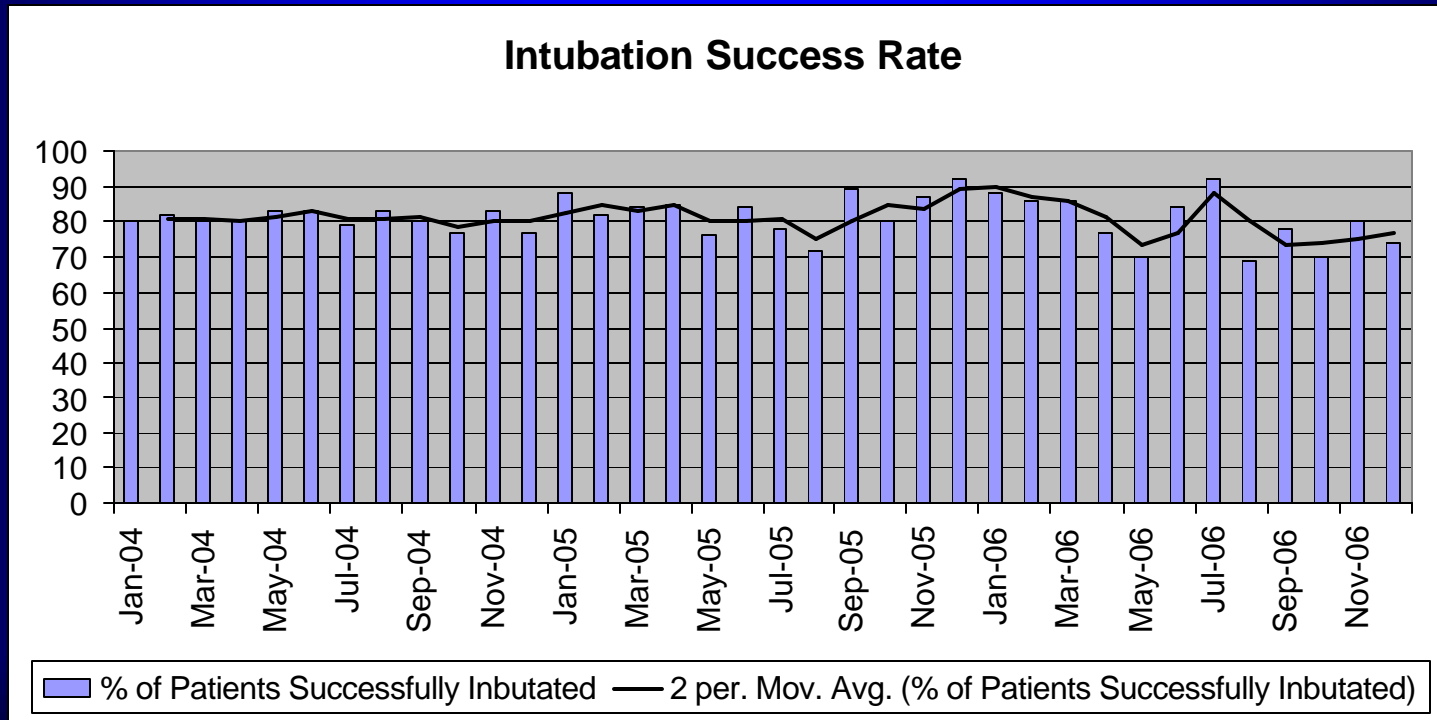
**“List all ET attempts for
capnography not used”**

**“List incident numbers for patients
meeting Level 1 trauma criteria
by destination”**

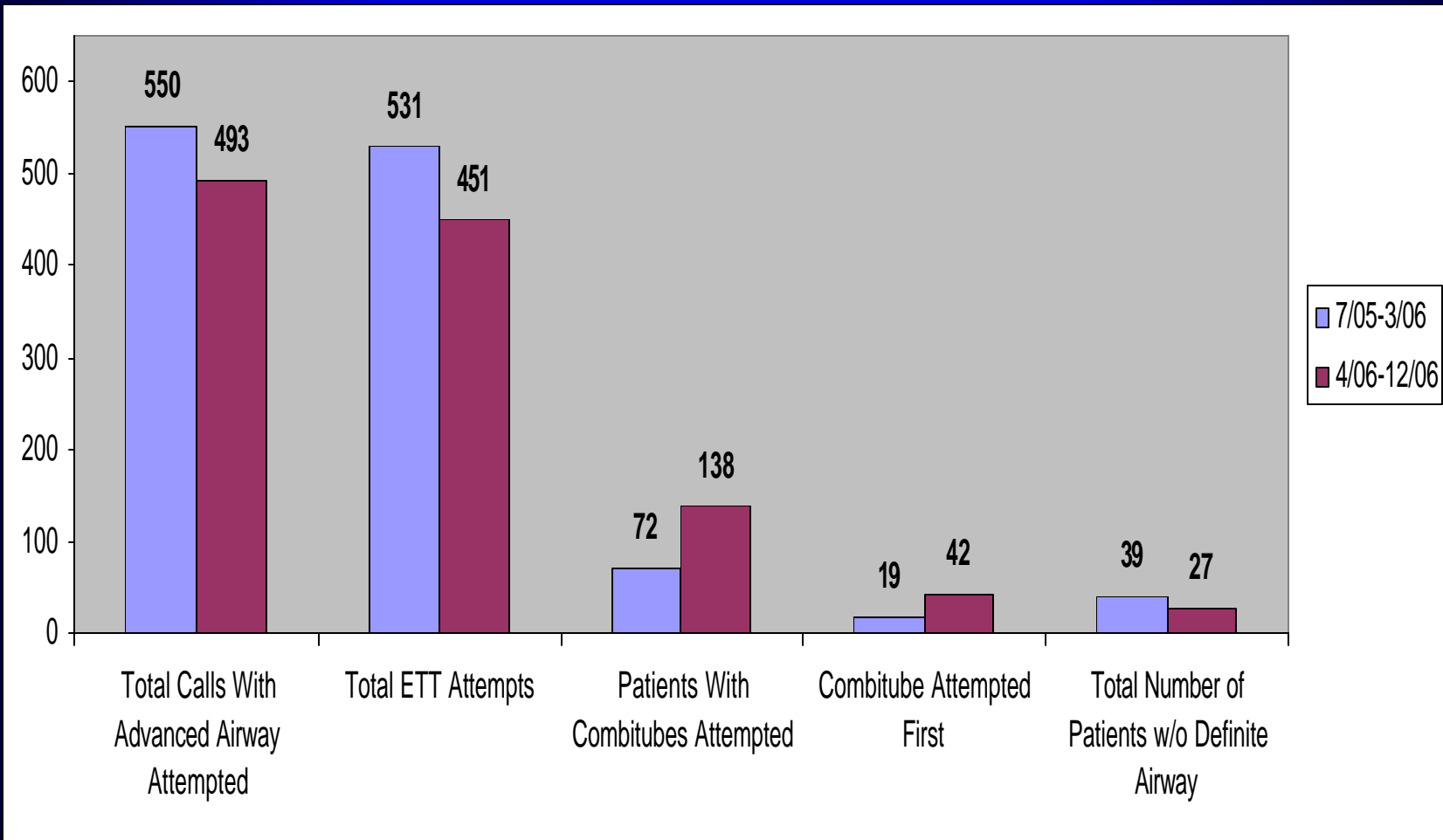
MedStar

ET Intubation Success Rates

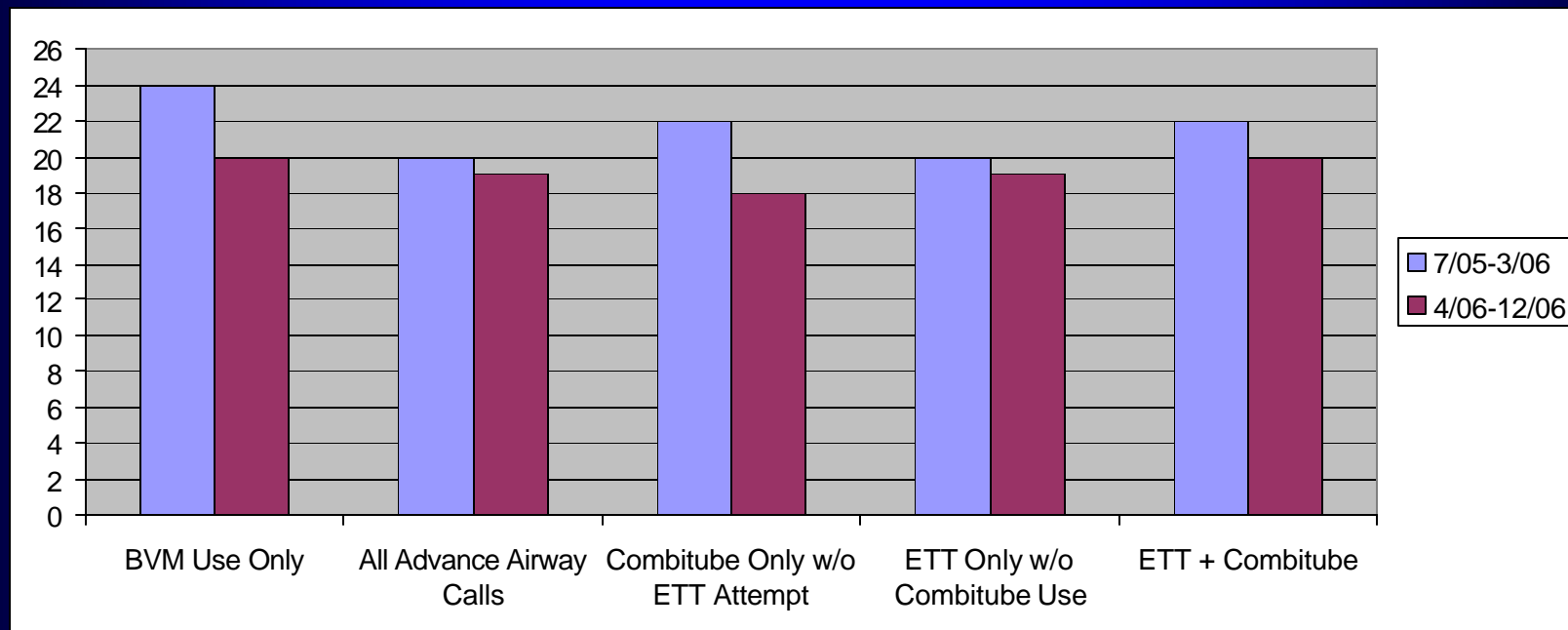
2004 - 2006



Advanced Airway Attempts July 2005 – December 2006



Scene Times vs. Types of Airway Used



Summary Thoughts

Choose your software very carefully

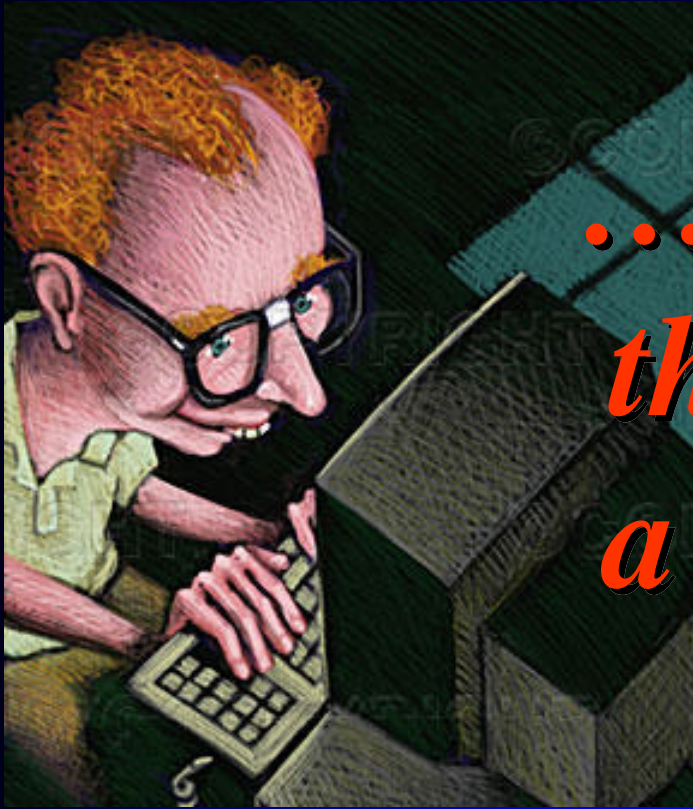
Know your IT support going in

**See the hardware and software work
before you buy it**

Think about the hardware thoroughly

...and above all...

**Steal good ideas freely from
people who have already
figured things out and
have it working**



*...among us geeks,
the word “geek” is
a high compliment*

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