Essential Elements

of EMS Systems

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This is not just
a course for a few days…

…this is a relationship…

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Objectives for this Talk

- The Medical Director – who s/he is
- Levels of Technicians
- Protocols and standing orders
- Ambulance Equipment
- Risk Management Devices

The Dallas-Fort Worth Numbers

- 1500+ Fire and Municipal Medics with Central On-line Medical Command in Dallas
- 18 Cities
- 350,000 +/- Responses
- 150,000 + transports
- 120,000 + non-transports
- 3,000+ Cardiac arrests
- And…we are AWASH in BLS calls!!!

My Job

- Policies, procedures, protocols
- Handle problems
- Interview new hires
- Oversee education, especially CE and remediation including Web-based
- Set up and manage IT systems
- Budgeting and finance
- Manage infrastructure for EMS research

The Advent of a New Era

- Capnography and alternative airways
- Real-time Telemetry projects
- Compressions only CPR or “CPR first”
- Decreasing Assisted Ventilation Rates and Tidal Volumes for Patients in Circulatory Collapse
- Adult Tibial Intraosseus
- Electronic PCR’s & the opportunities!!

The Evolving Scope of EMS

- They used to call us for a ride
- Now they're calling us for an exam, to get checked out, to receive some services, and they'll decide if they want further evaluation and care or not
- How do we deal with this evolution?

Rationale

- The EMS Medical Director must become familiar with the individual physical elements of EMS systems

- ***Establish protocols and parameters***
- ***Focus on the specifics***
- ***Constantly look and evaluate***

The Medical Director

- Little formal training is generally available for the EMS physician to gain this knowledge:

Medical Director Course and Practicum 1989

The EMS Medical Director

- Comes from all walks of medicine (EP, FP, GP, IM, Surgery, Peds, etc.)
- Formal training in many residency programs and fellowships
- Almost all EMS-P's learn by OJT
- "Would you mind being the *"medical director"*?

The EMS Medical Director

- Authorizes Technician Practice
- Responsible for medical policy and procedure
- Authorizes Protocols and Standing Orders
- Authorizes the drug box
- Consultative
- Quality Assurance and Risk Manager
- Medicolegal Consultant
- ??? Work comp physician?

The Medical Director

- Responsible for examining the practice of EMS in the locale, state, nation, and elsewhere
- Responsible for relating the care available elsewhere to the local system as is applicable and feasible
- ***Alabama Example***: Equipment, training, protocol, hospitals

The EMS Medical Director

- Does NOT give approval to the budget in most circumstances
- Does NOT dictate care nor actually provide the clinical practice, except in certain on-scene incidents or in some countries

The EMS Medical Director

- Must be VERY CAREFUL if a decision is made to limit the practice of a professional

The EMS Medical Director

- Manages by love and persuasion
- Leads by example, including hard work
- Speaks softly and carries a well-padded hammer, helps to soothe conflict
- Earns authority, and only after years
- Does NOT walk in to the EMS environment and have instant credibility

The EMS Medical Director

- Does NOT walk in to the EMS environment and have instant credibility

The Medical Director

- What IS the EMSP's "hammer"?

PATIENT WELFARE

Whining does NOT work!

The EMS Medical Director

- Question: Do medics function as an extension of the license of the medical director?
- Converse question: Are medics independent practitioners who contract out to a medical director to meet state licensing requirements and for quality assurance purposes?

The Medical Director

- Basic Life Support: "Prehospital care that doesn't need a doctor's order"
  - Suction?
  - CPR?
  - Patient assessment?
  - AED's?
- Does this MEAN though that BLS doesn't require physician oversight?

The EMS Medical Director

- Does this MEAN though that BLS doesn't require physician oversight?
- Does this MEAN that BLS doesn't have to take CE and periodic review?

Remember the Hammer: Patient welfare!

The EMS Medical Director

- Advanced Life Support: Medical care requiring physician orders and physician oversight
  - IV fluids?
  - ACLS drugs?
  - Other drugs?
  - Intubation, especially rapid sequence

The EMS Medical Director

- The Protocol Set is Key
- Recreating the wheel
- Assessing the standard

www.biotel.ws
www.atcomd.org/cogs.htm

History

- The Experience from war

Special Contributions

Historical Background to *Accidental Death and Disability: The Neglected Disease of Modern Society*

John M. Howard, MD

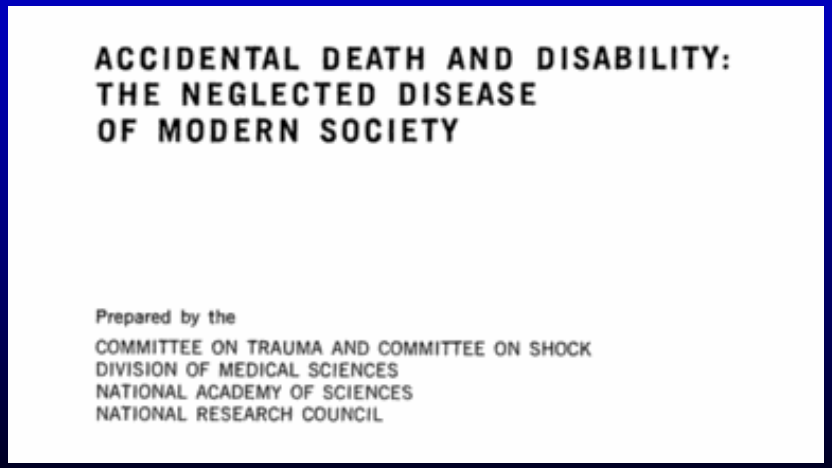
History

- Evolving strategies for severe trauma

History

- National Academy of Sciences Study
- Publication in 1966 of

"Accidental Death and Disability: The Neglected Disease of Modern Society"


ACCIDENTAL DEATH AND DISABILITY:
THE NEGLECTED DISEASE
OF MODERN SOCIETY

Prepared by the

COMMITTEE ON TRAUMA AND COMMITTEE ON SHOCK
DIVISION OF MEDICAL SCIENCES
NATIONAL ACADEMY OF SCIENCES
NATIONAL RESEARCH COUNCIL

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  C...
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- E...

History

- Manpower
- Training
- Communications
- Transportation
- Facilities
- Critical care units
- Public safety agencies

History

- Consumer participation
- Access to care
- Patient transfer
- Coordinated patient record keeping
- Public information and education
- Review and evaluation
- Disaster plan
- Mutual aid

History

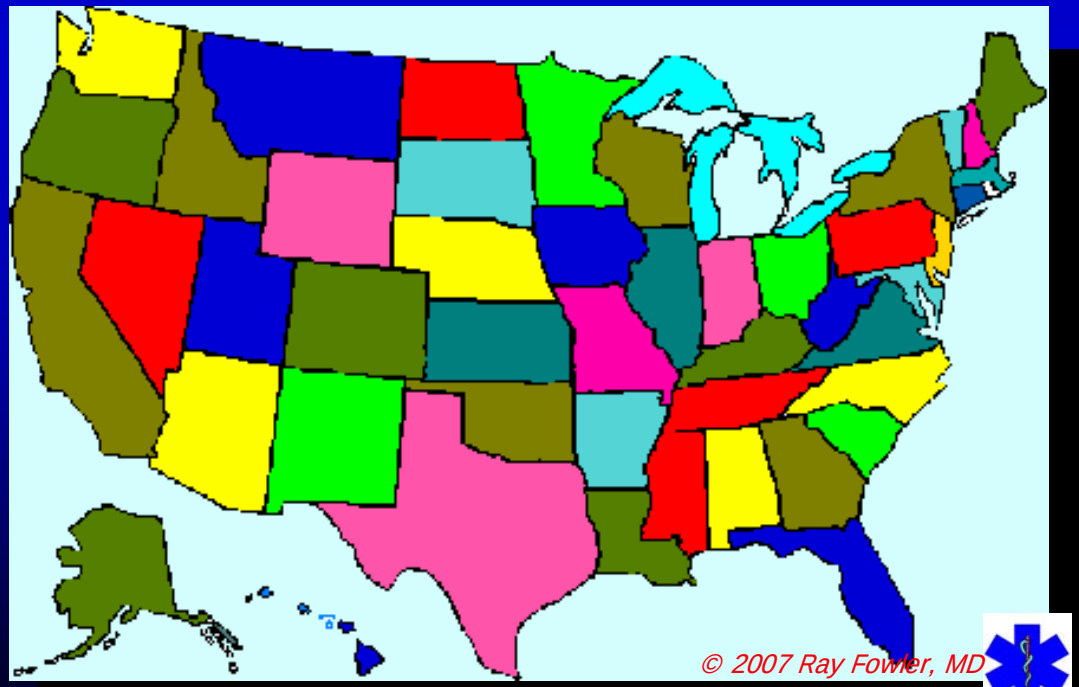
- 1200 Series of Grants
- Federal entitlements to build EMS systems all across the country
- Hundreds of millions of dollars
- What was the result?

EMS Agenda for the Future 1996

- *Emergency Medical Services (EMS) of the future will be community-based health management that is fully integrated with the overall health care system.*
- *It will have the ability to identify and modify illness and injury risks, provide acute illness and injury care and follow-up, and contribute to treatment of chronic conditions and community health monitoring.*
- *This new entity will be developed from redistribution of existing health care resources and it will be integrated with other health care providers and public health and safety agencies.*
- *It will improve community health and result in a more appropriate use of acute health care resources.*
- *EMS will remain the public's emergency medical safety net.*

Training

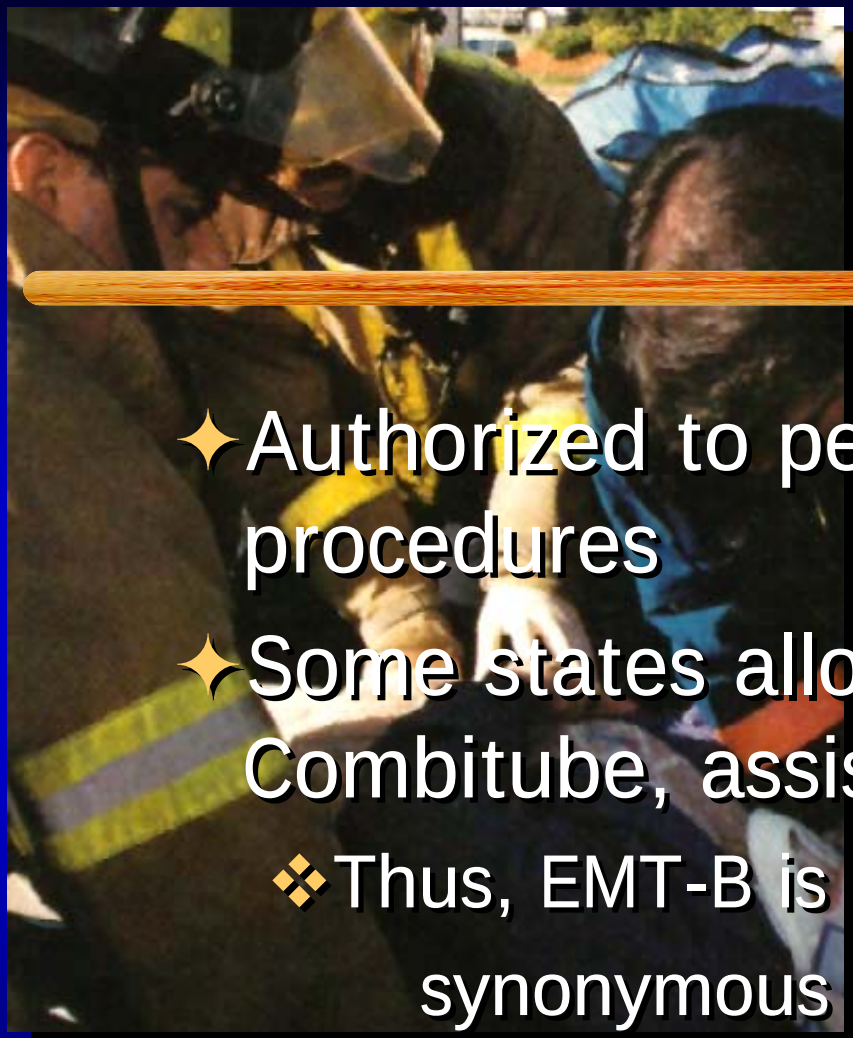
- EMT-B, or "Basic EMT"
- EMT-P, or "Paramedic"



EMT-B

- "Certified" as opposed to "Licensed"
- Basic life support (BLS) without physician orders

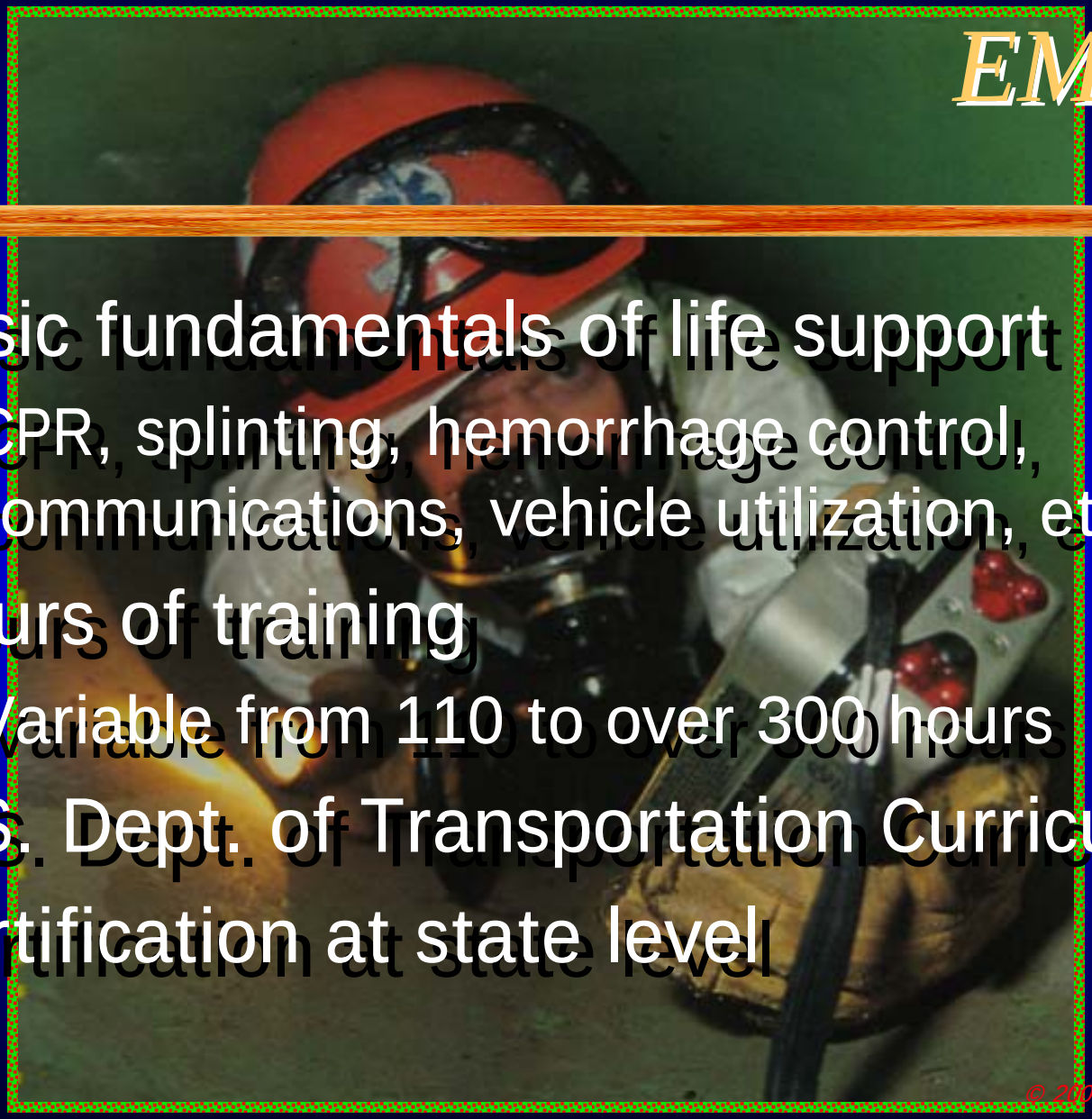
(Advanced life support (ALS) procedures require physician orders)



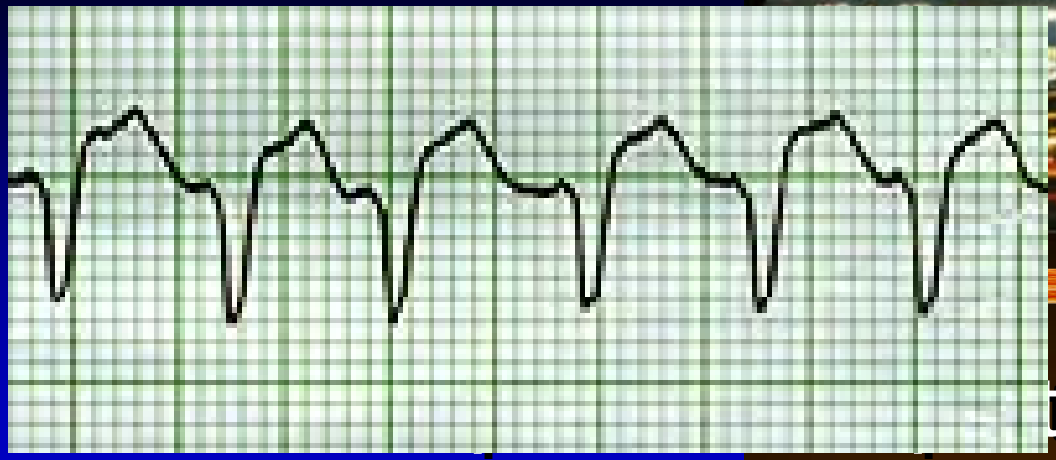
EMT-B

- Authorized to perform BLS level procedures
- Some states allow EMT-B to use IVs, Combitube, assist with meds
  - Thus, EMT-B is not necessarily synonymous with BLS
  - Tiered systems? How to do it?

EMT-B



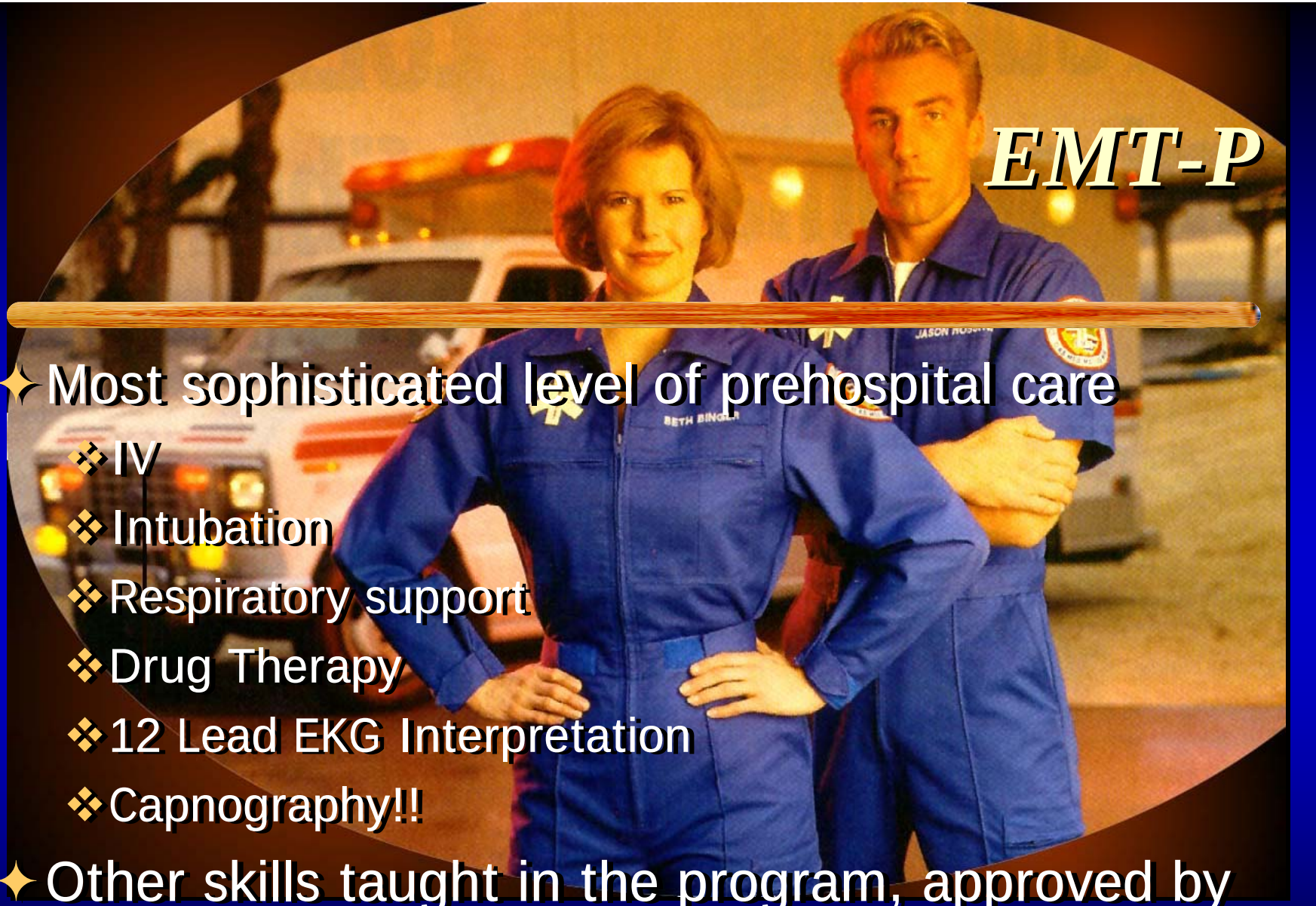
- Basic fundamentals of life support
  - CPR, splinting, hemorrhage control, communications, vehicle utilization, etc.
- Hours of training
  - Variable from 110 to over 300 hours
- U.S. Dept. of Transportation Curriculum
- Certification at state level



EMT-P

tation Curriculum

- States must establish this curriculum as their own by legislative or regulatory



EMT-P

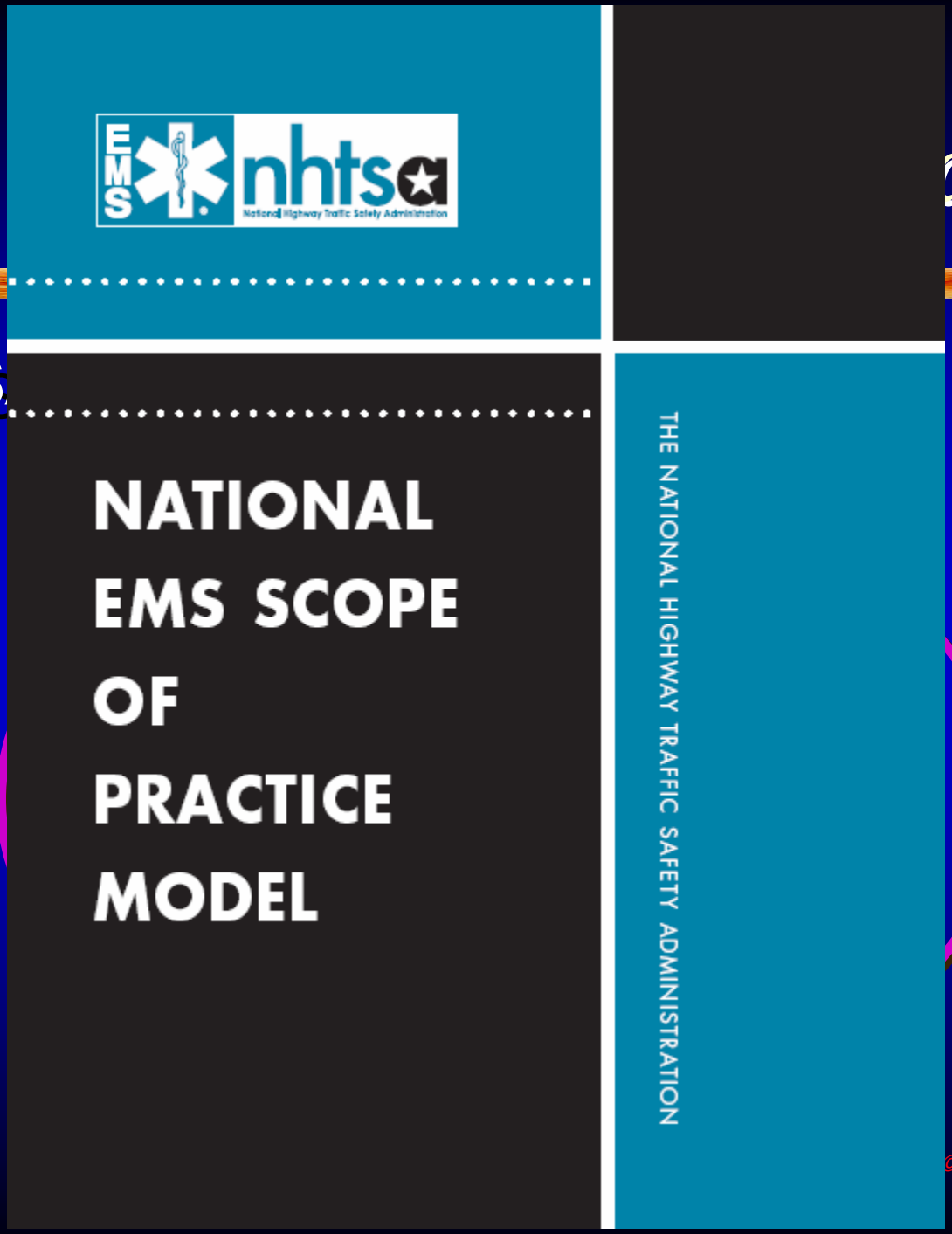
- Most sophisticated level of prehospital care
  - IV
  - Intubation
  - Respiratory support
  - Drug Therapy
  - 12 Lead EKG Interpretation
  - Capnography!!
- Other skills taught in the program, approved by state, and authorized by the Medical Director

Other EMT Levels

- First Responder
- EMT-D (Manual)
- EMT-AED
- EMT-I
- EMT-IV
- EMT-CT
- EMT-CC
- “Mobile Intensive Care Specialist”

The ...actice

- NHTS



Traini

- Initial
- Field Orientation
- Monthly/Quarterly
- Review for Cause
- Annual Skills Revi

ANNUAL SKILLS EVALUATION

SKILL	DATE	INSTRUCTOR	RESULT
Patient Assessment Primary Secondary Third			
Cardiopulmonary Resuscitation			
Airway Management Jaw Thrust Head Tilt/Chin Lift Suctioning Oral Airway Nasal Airway BVM Use Combitube ET Intubation Cricothyrotomy 02 Delivery			
IV Therapy INT Intraosseous			
Defibrillation			
ALL ACLS Algorithms and EKG Strip Interpretation			
Backboard Use			
Splints			
MAST Application			
Signs and Symptoms of Shock and Vital Signs By Age			
Signs and Symptoms of Tension Pneumothorax, Cardiac Tamponade and CHF			
Signature of Employee:			
Signature of Instructor:			

Training and Retraining

- What procedures should be covered in periodic retraining when?
- Established schedule
- Focus on Higher risk / lower frequency
- Results of the QA plan

Training and Retraining

- How often to reverify ET tube technique?
- Rapid Sequence Intubation retraining
- How about cricothyrotomy?
- Intraosseous?
- Splinting?

Training and Retraining

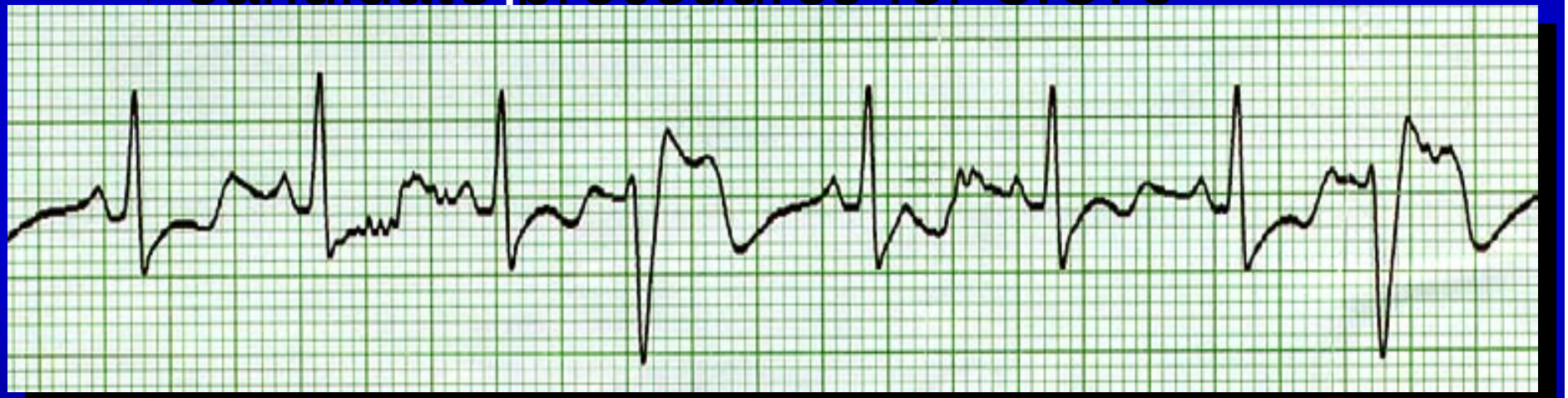
- And…how much training is enough for a new-hire?
- None?
- A week?
- Two weeks?
- 13 weeks?
- *Medstar in Fort Worth and Austin-Travis County*

Standing Orders

- Authorized by the medical director
- Provides protocols by which medics can recognize various emergencies and treat them, including certain ALS procedures
- Obviates the need to call in for permission for a select group of invasive procedures

Standing Orders

- Candidate procedures for S.O.'s



  - D-50 for hypoglycemia
  - Certain ACLS algorithms including drugs

Standing Orders

- What about RSI?
- Do you have RSI in your system?
- If so, have you compared your results to those of Dunford et al in San Diego?
- What are the minimum standards for training, retraining, and monitoring?
- Is it a standing order?

Standing Orders

- The authorization of standing orders by the Medical Director

  ...BUT the failure of Medical Director to exercise due diligence in the monitoring of the application of these Standing Orders by the medics...

IS NEGLIGENCE!

Standing Orders

- Can you turn a system loose with RSI without applying the same analysis criteria of its utilization that San Diego did? *(which, by the way, caused them to remove RSI from their system…prolonged time to intubation increasing mortality)*

On-Line Medical Control

- Has been shown to change hospital outcome very little in some studies

Davidson, et al, 1987

Disaster Management

- **What is the right way to do the triage exam?**

Disaster Management

- Business as Usual!!!

S.T.A.R.T. Method

B (rate) – No – Reposition = No - Black

Breathing fast or slow- Red

↓

THEN, if breathing OK

C (rate and CRT)

Absent pulse – Red

Delayed CRT - Red

↓

Mental – Good = yellow Bad = Red

BDLS/ADLS MASS Triage

Green Screen

↓

Yellow Filter

↓

Red Surveys

Ambulatory Patient

Someone able to walk out may indeed be an "IMMEDIATE"

Bad = Red

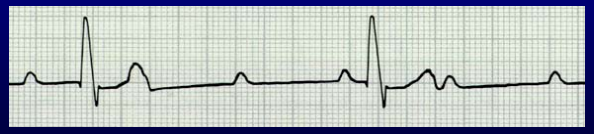
None reposition
(if none = BLACK)

Mental

Breathing

Circulation

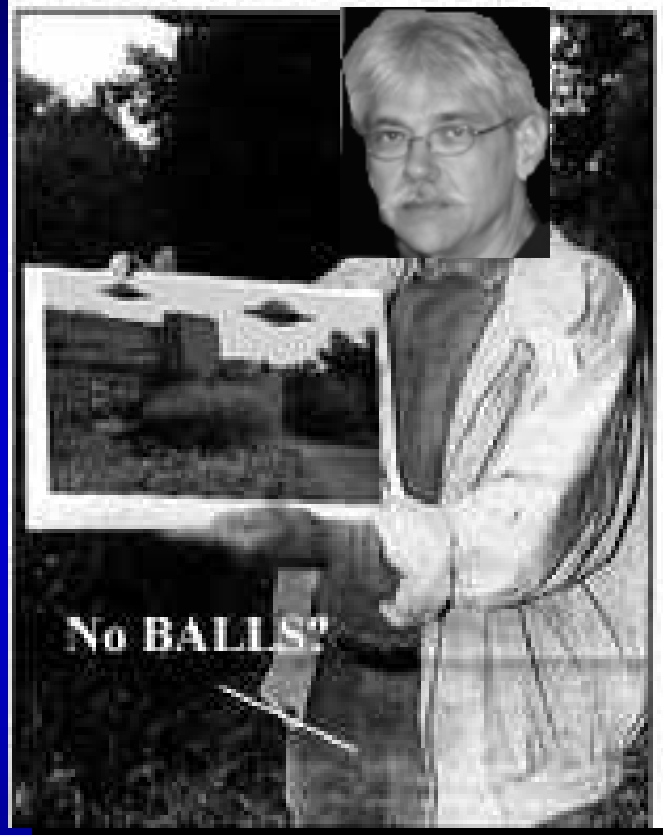
Bad or Absent = Red



Questions?
Comments?
Bowel Gas?

Ate my Balls News

HIS BALLS WERE EATEN BY ALIENS!



They just wanted my balls!

and John S. Ballgone to Ate my Balls News

. . . *you think you got problems, huh?*

Communications

- The initial focus of organized EMS was toward the provision of communication between the patient and public responders as well as between the field and the hospital
  - -> EMS Systems Act 1973

Communications Needs

- Consumer request for assistance
- Dispatch
- Medic to supervisor
- Medic to direct medical control
- Networking, including interagency coordination

Communications Methods

- Radio frequencies
- Conventional telephone
- Cellular telephone
- Satellite
- Mail sent by courier

VHF Low Band

- 32-50 MHz
  - Long range, low penetration, skip and noise
- Few channels
- No telemetry
- No duplex

VHF High Band

- 150-174 MHz
  - Good range, low penetration, less skip and noise, smaller antenna
- The "Hear System"
- Crowded, gets "walked on"
- Few channels
- No telemetry
- No duplex ("shut up already")

UHF Band

- 450-470 MHz
  - "Med" frequency, shorter range, good penetration, little interference, small antenna
- Many channels
- Telemetry available
- Duplex available

800, 900 Trunking Systems

- 800 or 900 MHz FM
  - Very short range, excellent penetration, little interference, small antenna, repeaters needed
- Many channels (can be shared)
- Data transmission / computer interface available, including FAX
- Expensive, usually major municipal purchase

Microwave

- Straight line communications from remote radios
- Multiple transmitters required

Cellular

- Mobile telephones - flexibility
- Little distortion
- Needs presence of "cells" to work
- Non-dedicated frequencies
- Cheap
- Problematic use in disaster

Blackberry

- Seem durable in disasters
- Very fast, as fast as cyberspace
- A record of communications
- Keeps a group informed

Direct Telephone Communication

- Most common method of calling for help by:
  - Patients
  - Other agencies

Enhanced 911 System

- Central answering agency (rapid access)
- Provides automatic caller location and phone number identification
- Usually dispatches directly (not always)
- May control multiple agencies

Dispatch

- Ring down, land line, radio and alphanumeric beeper use common
- Pre-arrival instructions:
  - *"The Standard of care"*
  - Emergency Medical Dispatcher (EMD)

Medical Control

- VHF high band, UHF, or 800 trunking
- Cellular becoming more common though often problematic

Does On-Line Medical Control Make a Difference?

- *"Critical Care Consult"*
- *Real-time QA*
- *Destination*
- *Protocol expansion*
- *No Loads*
- *Homeland Security Issues*
- *"Resource alert"*

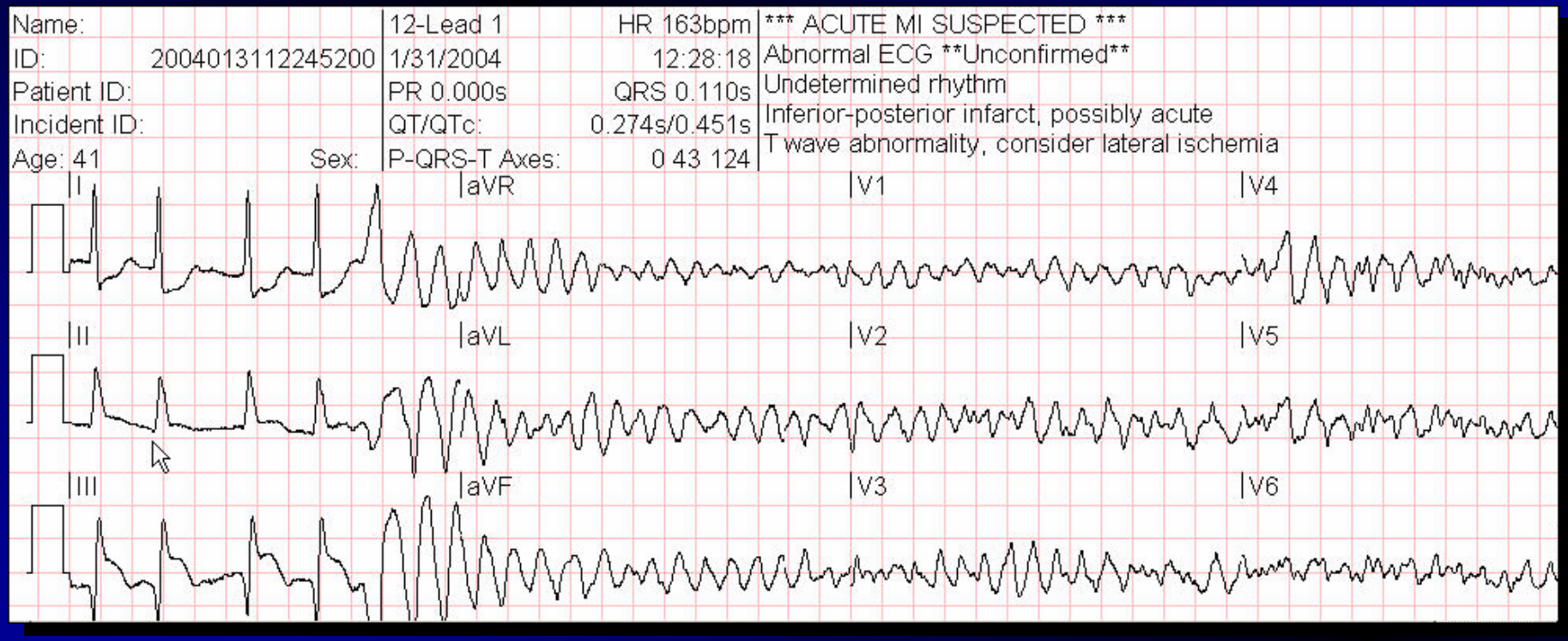
Could On-Line Medical Control Make MORE of a Difference?

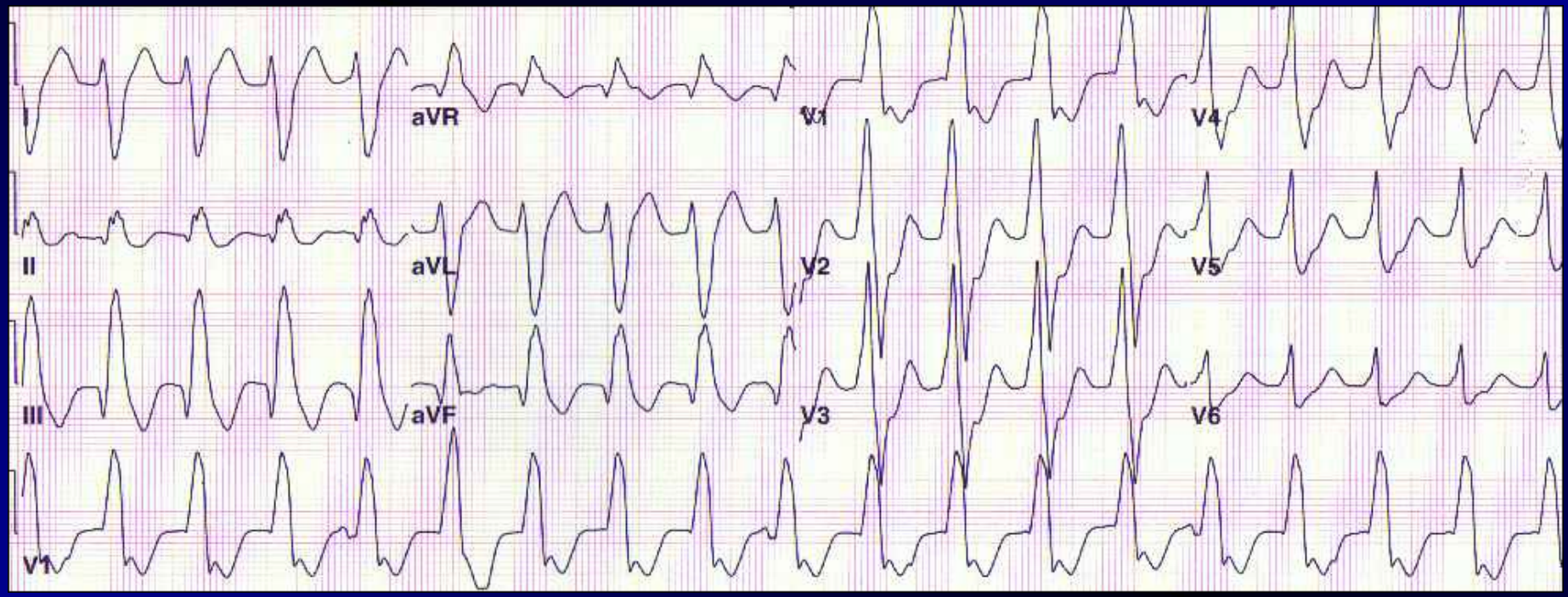
The Real-time Evaluation and Management of Critically Ill Patients, especially long transport times

For What?

- Complex Clinical Scenarios
- Difficult ECG Rhythms
- Assistance in Patient Monitoring
- Destination Decisions
- Assistance with Non-Transports

…and, to bring a reality check





Interoperability and Open Architecture

Allows others to work with your hardware and software

(Windows and the PC)

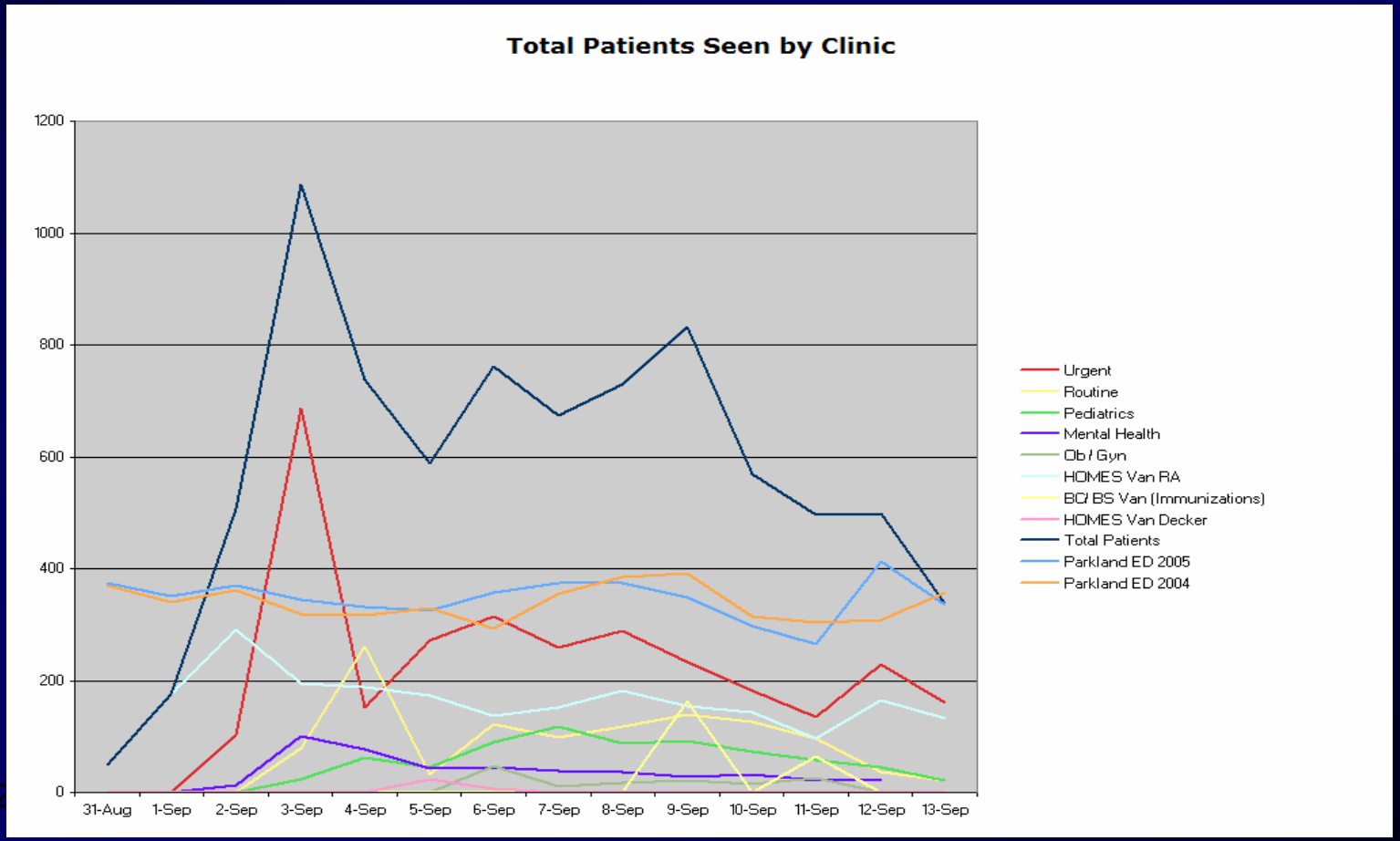
Disaster

- Must be multiple methods
  - Reduce chance of communications system failure
- Non-essential utilization must be suppressed

Transportation Sector

13. *January 4, USA Today* – (National) **Passenger jets get anti-missile devices.** Tens of thousands of airline passengers will soon be flying on jets outfitted with anti-missile systems as part of a new government test aimed at thwarting terrorists armed with shoulder-fired projectiles. Three American Airlines Boeing 767-200s that fly daily

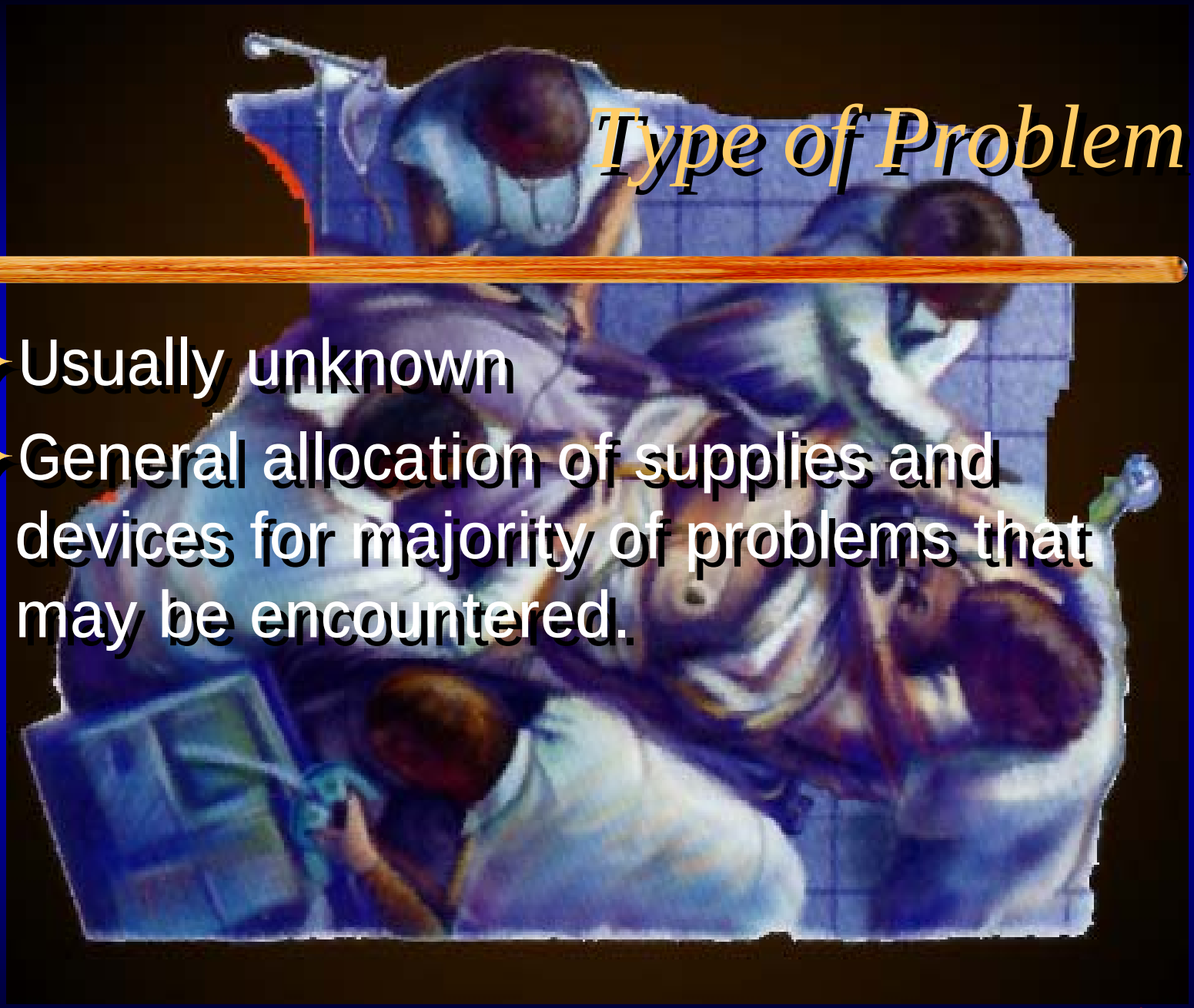
~40,000 service population
~10,000 patients in 4 weeks
~250 admitted to hospital



Ambulance Equipment

The ambulance is a mobile medical care facility which must be broadly equipped with devices and supplies to be used in the evaluation and management of patients.

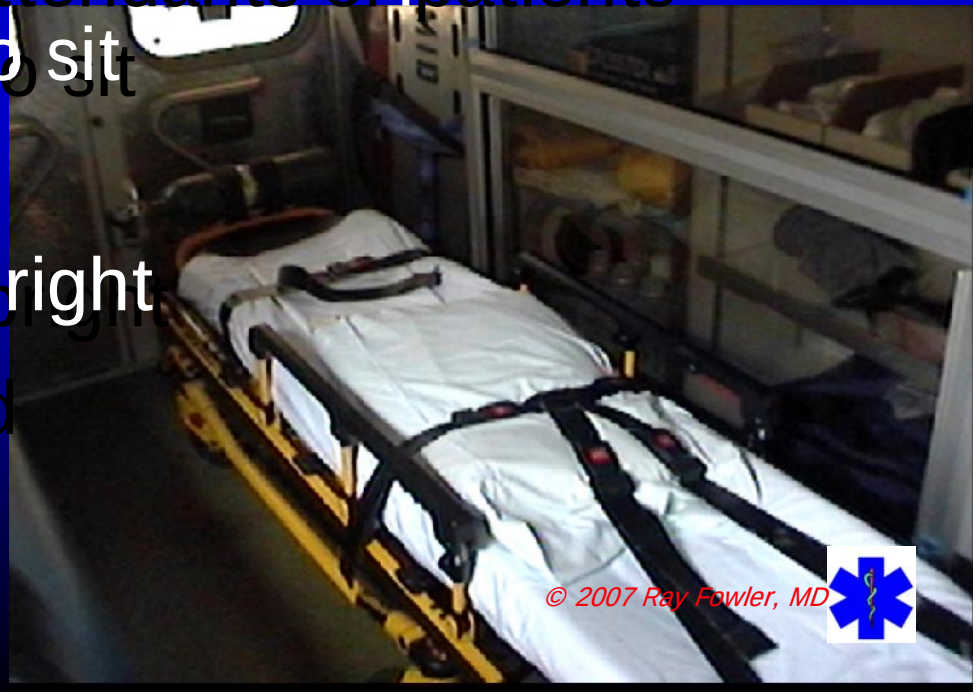
Type of Problem



- Usually unknown
- General allocation of supplies and devices for majority of problems that may be encountered.

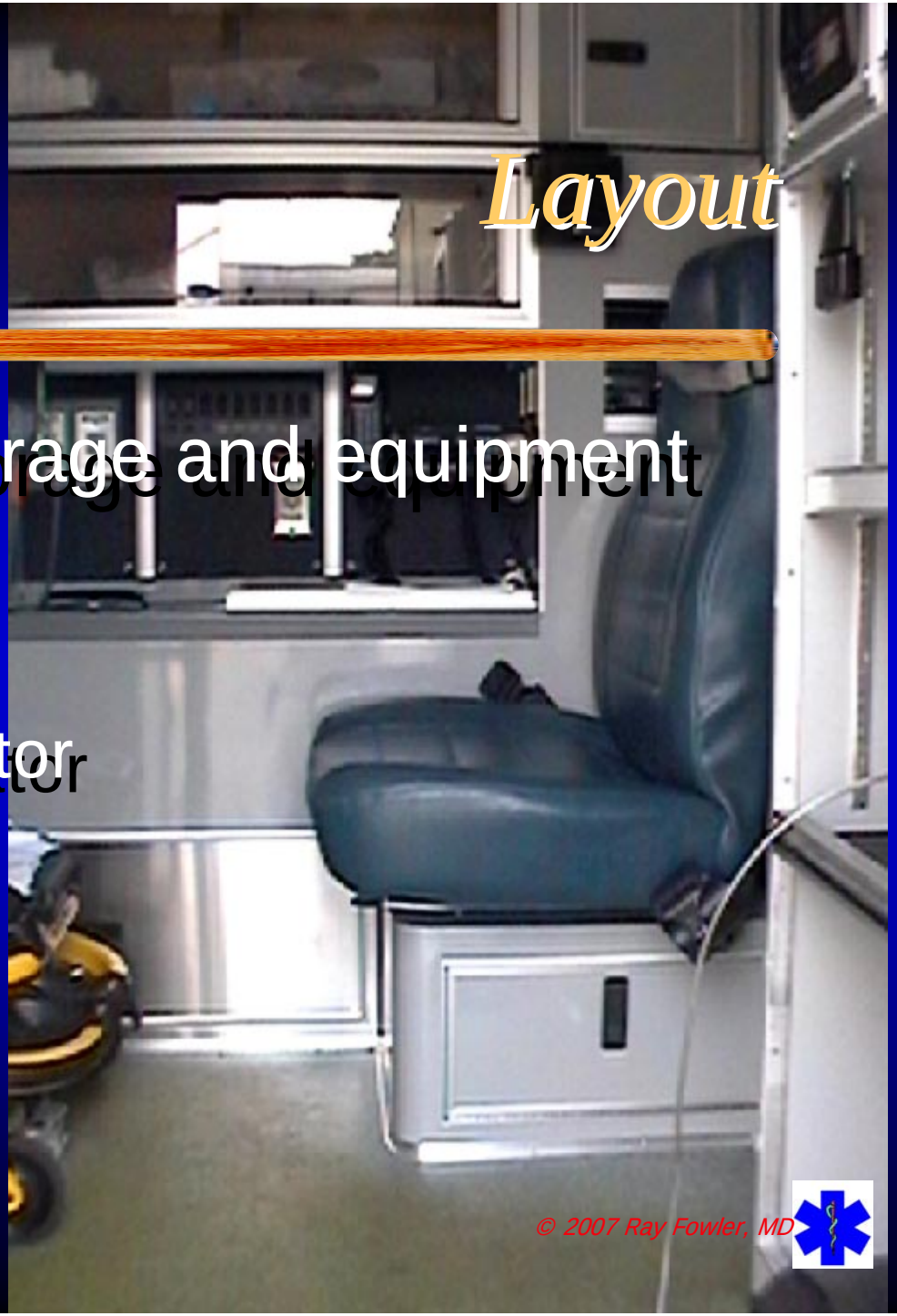
Layout

- Cushioned seat against wall at patient's left
  - Permits multiple attendants or patients' significant others to sit
- Headroom
  - May stand semi-upright
  - CPR is one-handed



Layout

- Wall mounted storage and equipment
  - General supplies
  - O_2
  - Monitor-Defibrillator
  - Radio(s)



Layout

- Accessory Cabinets
  - Spine boards
  - Splints
  - Rescue materials and devices

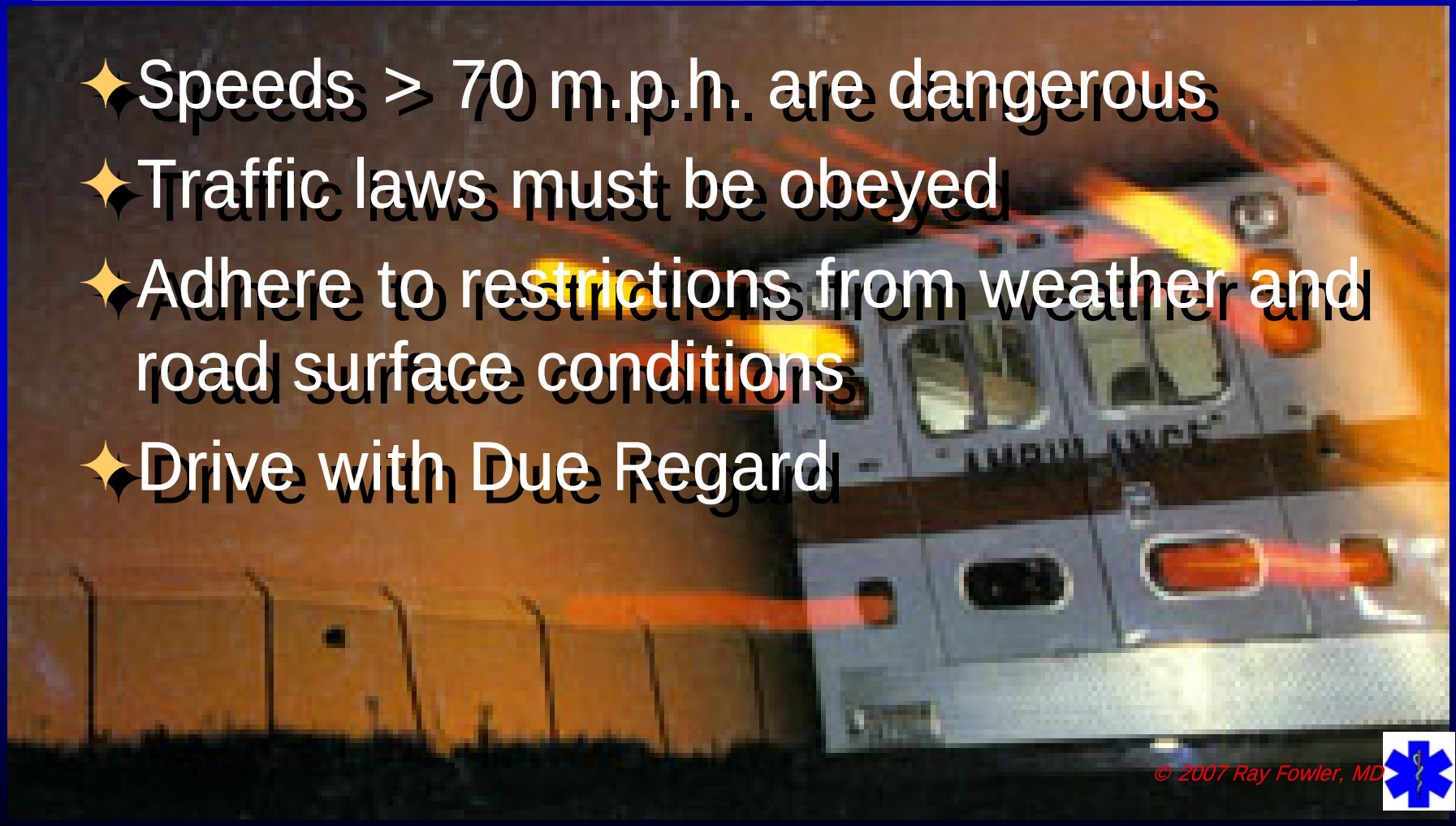
Layout Variations

- Hearse
- Type I Modular Truck (no walk-thru)
- Type II Modular Van
- Type III Modular Van (with walk-thru)
- Multi-passenger bus
- Specialty interhospital transport units

Performance

The ambulance is a truck, not a high speed vehicle

Truck Concept



- Speeds > 70 m.p.h. are dangerous
- Traffic laws must be obeyed
- Adhere to restrictions from weather and road surface conditions
- Drive with Due Regard

Truck Concept

- Accelerate and decelerate gently
- NO tight turns
- Fatigue on engines and chassis can be decreased
  - Miles driven under aggressive conditions
  - Rough handling (acceleration, deceleration, tight turns)
- "Pinging" by GPS for speed and location

DEFENSIVE DRIVING IS ESSENTIAL

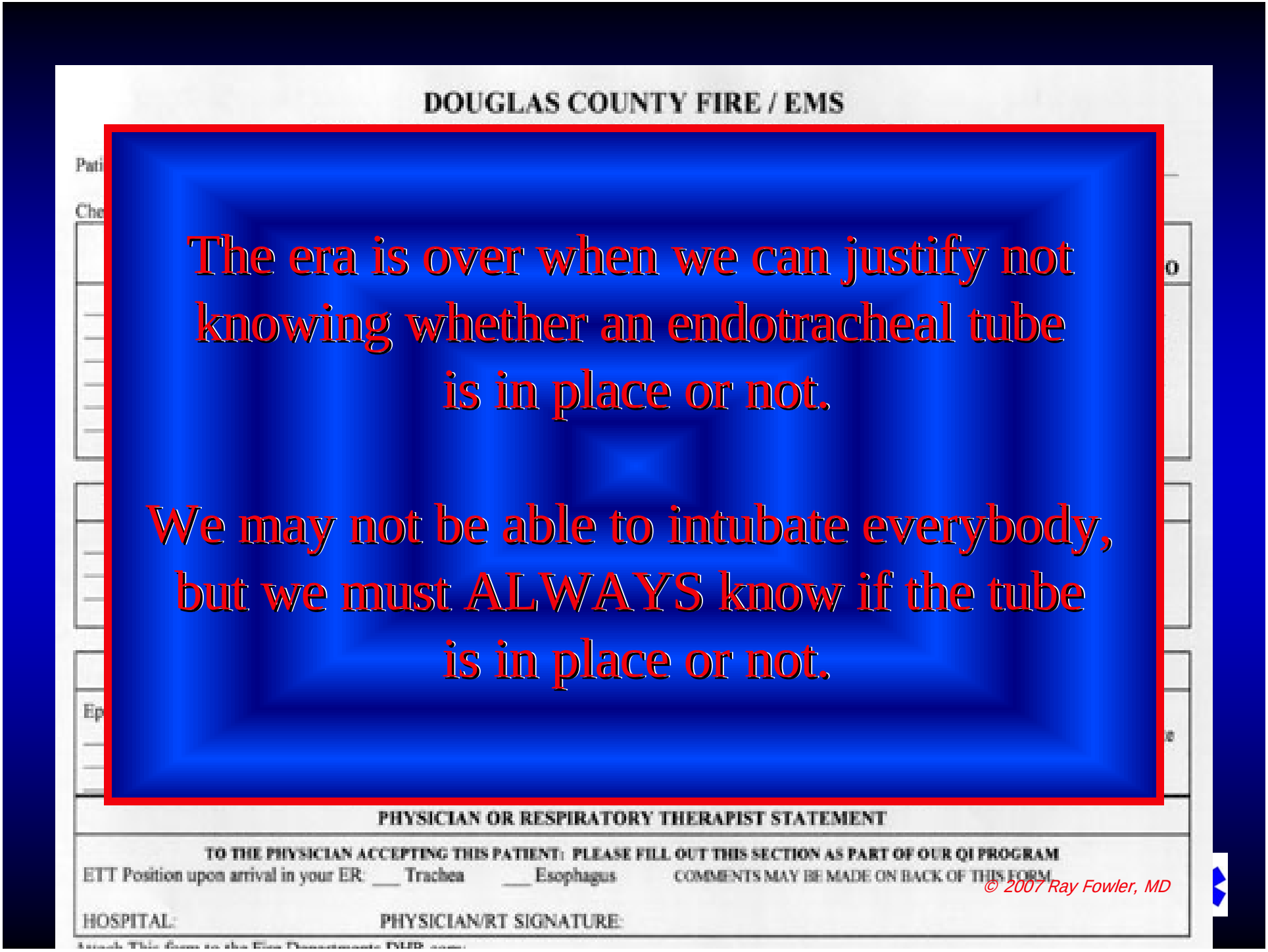
EVO Course highly recommended! ! !

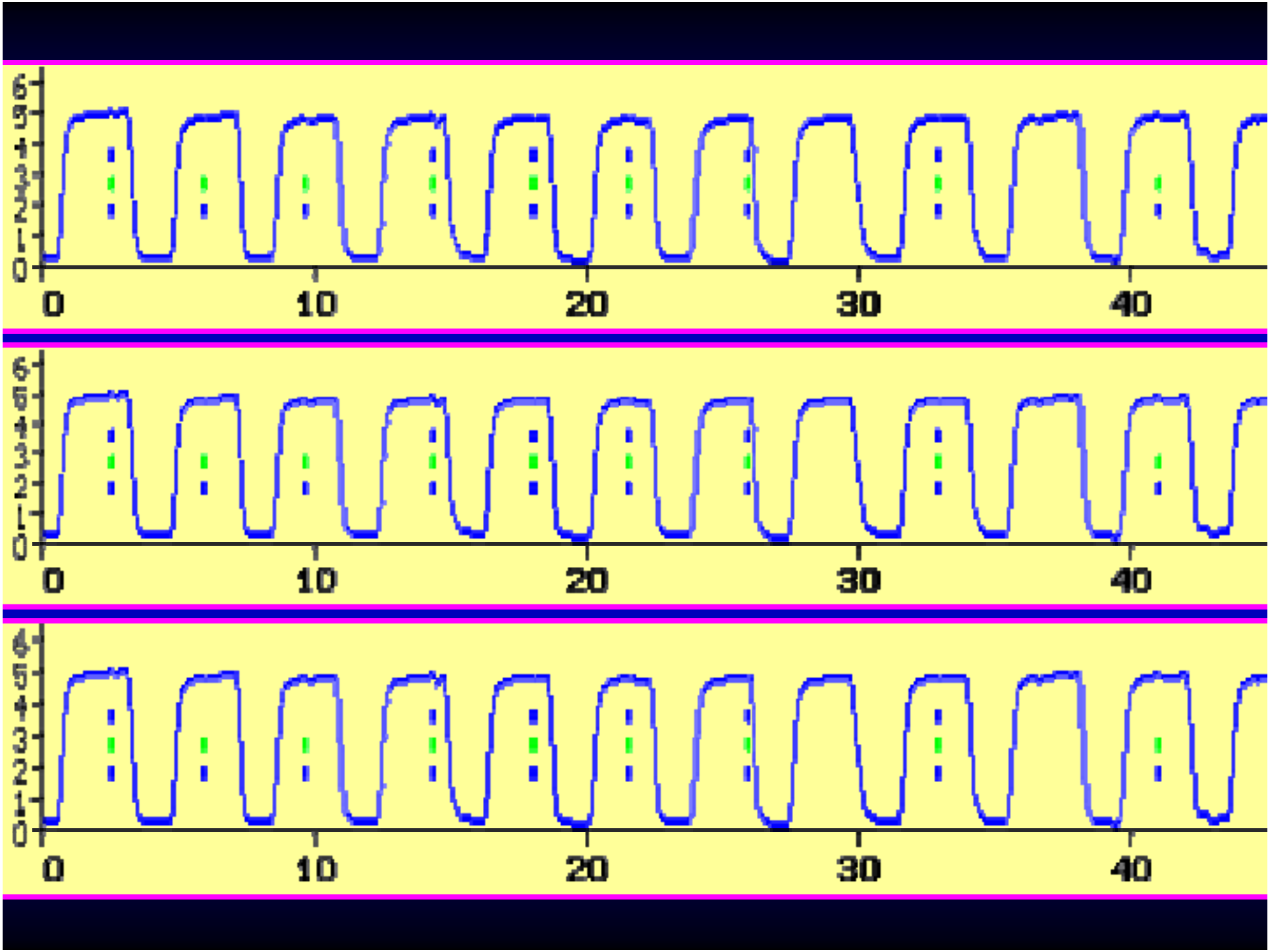
Respiratory Equipment

- Oral and nasal airways
- Esophageal airways
- NG tubes
- Bite sticks, tongue depressors

Respiratory Equipment

- Oxygen: Both on-board and portable
- O2 delivery devices
  - Nasal cannula
  - Simple face mask
  - Venturi (24-50%)
  - Partial and Non-rebreather masks

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1
2
3
4
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6
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10
20
30
40

Which alternative airway?

Respiratory Equipment

- Aerosol devices
- Humidity devices
- Pocket mask
- Bag-valve-mask
- O2 powered ventilatory assist device: CPAP or BIPAP?

Respiratory Equipment

Circulatory

- IV catheters
  - Conventional and Seldinger
- Monitor / Defibrillator
  - Automatic external defib (many BLS, first responder, police, and other units)
  - External pacers
  - Synchronized cardioversion capability
  - 12 Lead Capability? Transmit 12 leads?
  - Biphasic or Monophasic?

Circulatory

- IV fluids
  - D5W??
  - Saline
  - LR?
  - Colloids??
  - Future: HBOC and Hypertonic Saline???

Circulatory

- Pressure infusion pump
- Controlled rate/volume infusion device
- Automatic ventilation/ compression device
- *Is the Autopulse proved yet?*


SINGLE USE

Orthopedic

- Cervical immobilization devices
- Short board / KED / Reeve sleeve
- Long board
- Scoop

General

- Drug box
  - Antiarrhythmics: Amiodarone - $4.00
  - Nitroglycerin
  - Vasopressors
  - Seizure control
  - Pain control / sedation
  - Inhaled analgesia
  - Nebulized bronchodilator

General

- OB kit
- Blood sugar measurement
- Poison antidote kit? Charcoal?
- Snake bite kit

General

WT

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MAD® Nasal

Nasal Drug Delivery Device

Fast and effective
for heroin overdoses, seizures and sedation

Reduces pain and bleeding
associated with nasal and oral instrumentation and nasogastric tube placement

Controlled delivery

Specifications

Typical partical size	30 microns
System dead space	0.09 mL
Tip diameter	0.17 inches (4.3 mm)
Applicator length	1.75 inches (4.5 cm)

Ordering Information

Reliable atomization of topical solution across the nasal and oropharyngeal mucous membranes.

No needles
- No needlestick risk
- Less frightening for children
- Disposable

Complete control - You choose
- Medication
- Exact dosage
- Exact volume
- Delivery target

Consistent, reliable spray every time!
- Fine mist-like spray
- Targets desired mucosal region

Works in any position
- Semipermeable soft plug absorbs runoff
- Contoured tip designed for adult and childs nose

All MAD® products are:
- With luer lock connection
- Individually packaged clean
- Available with or without 3 mL syringe
- Latex-free

How do we ADD New Stuff???

- Check it out…
- Check it out…
- Check it out…
- Look for data…
- Make it make sense to you and all of the players
- Try “Pilot Projects” with CAREFUL monitoring

Computers

- The computerization of medicine has provided unprecedented assistance in areas such as:
  - Information resources
  - Data tracking
  - Communications

Dispatch

- Computer-Aided Dispatch (CAD)
  - Emergency Medical Dispatch!!
  - The standard of care!!

Medical Control and PCR's

- Computer data entry of patient care reports (PCR)
- Analysis of PCR
- Analysis and critique of EMS practice
- Direct feedback to the Continuing Education Program

Records

- Electronic PCR's are changing life as we know it in EMS Medical Direction –
  - *"every no-load by A shift from last Thursday for chest pain above the age of 35 that didn't get a 12-lead ECG with no call to online medical control"*

Ambulance Run Sheet

Incident Location:_____ Reason for Call:_____ Date: ____/___/____ Incident #:_____-_____

Patient Name:_____ Address:_____ DOB:_____/_____/_____ Sex:____ Race:_____

***Subjective Hx*:**_____

_____

_____

***Objective* - *Primary Survey Findings*:**

Scene survey: initially safe unsafe Hazards:_____ # of patients:____ Injury mechanism:_____ LOC: A V P U

Pulse ox attached: Y N Airway (w/c-spine control): Open Maneuver Suction Respiratory rate:_____ normal shallow labored Carotid pulse: Y N

Radial pulse: Y N rate:____ rhythm:_____ quality:_____ CRT: normal delayed absent Skin color:_____ temp:_____

moisture:_____

Pulse ox reading before & after O2 admin:_____/_____ Exsanguinating hemorrhage: Present Absent Neck: bruising Y N swelling: Y N retracting: Y N

JVD: absent present Tracheal deviation: midline deviated R L Chest for CLAPPD: unremarkable

remarkable_____

_____

Breath sounds: present absent bilateral R _____ L _____ MAST exam/back: unremarkable remarkable_____

_____ Load and Go: Y N Total Scene minutes:_____

***Secondary Survey Findings*:**

Measured pulse:_____ Resp rate:_____ BP:_____/_____ Glucose level:_____mg% Peak flow:_____:_____ EKG:_____

Pupils: size, reactivity R_____ L_____ Head: unremarkable _____ Airway: unremarkable_____

Breathing: unremarkable_____ Circulation: unremarkable_____ Neck: unremarkable_____

Chest: unremarkable_____ Upper extremities: unremarkable_____

Abdomen: unremarkable_____ Pelvis: unremarkable_____ Lower extremities: unremarkable_____

GCS: Eyes spontaneous 4 Verbal oriented 5 Motor obedient 6

Allergies:_____

to voice 3 confused 4 localizes 5

Medications:_____

to pain 2 inappropriate 3 withdrawal 4 **P**ertinent past medical

hx:_____

none 1 incomprehensible 2 flexion 3 **L**ast meal

at:_____

none 1 extension 2 **E**vents prior to EMS

call:_____

none 1 Total GCS = _____

_____

***Third Survey Findings*:**

LOC: A V P U Airway: open compromised Breathing: adequate assisted labored Pulses: present absent unchanged JVD: absent present

Tracheal deviation: midline deviated R L Breath sounds: unchanged changed _____

***Assessment*:**_____

***Plan*: Tx/Procedure Dose/Rate/Route Time (all are estimated) Medic # If invasive, success Y or N & # attempts, response to therapy**

_____:_____

_____:_____

_____:_____

_____:_____

_____:_____

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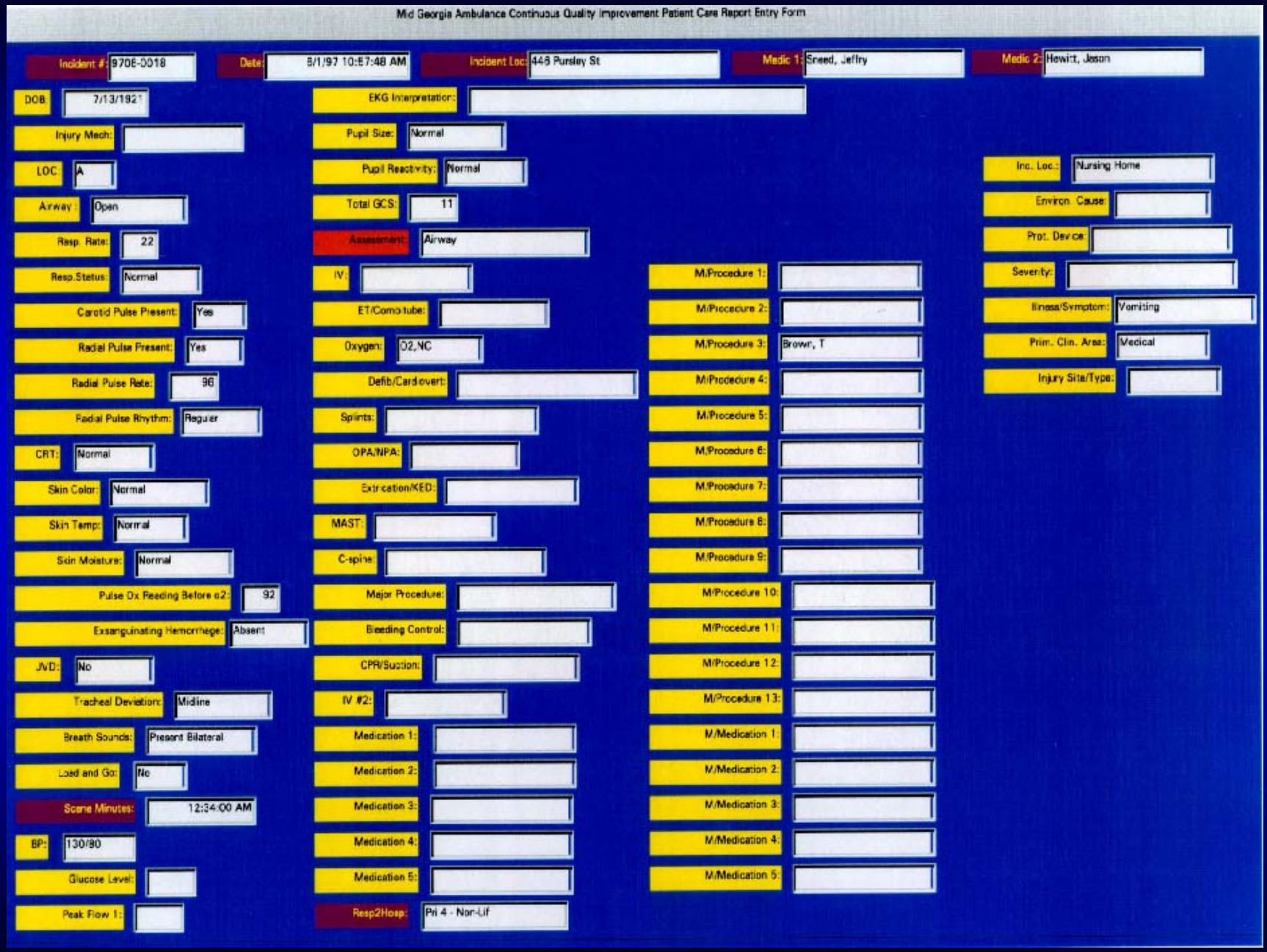
Orders: Requested Denied Standing Order Physician signature _____


Mid Georgia Ambulance Continuous Quality Improvement Patient Care Report Entry Form
Incident #: 9706-0018
Date: 8/1/97 10:57:48 AM
Incident Loc: 446 Pursley St
Medic 1: Sneed, Jeffry
Medic 2: Hewitt, Jason
DOB: 7/13/1921
Injury Mech:
LOC: A
Airway: Open
Resp. Rate: 22
Resp.Status: Normal
Carotid Pulse Present: Yes
Radial Pulse Present: Yes
Radial Pulse Rate: 96
Radial Pulse Rhythm: Regular
CRT: Normal
Skin Color: Normal
Skin Temp: Normal
Skin Moisture: Normal
Pulse Ox Reading Before o2: 92
Exsanguinating Hemorrhage: Absent
JVD: No
Tracheal Deviation: Midline
Breath Sounds: Present Bilateral
Load and Go: No
Scene Minutes: 12:34:00 AM
BP: 130/80
Glucose Level:
Peak Flow 1:
EKG Interpretation:
Pupil Size: Normal
Pupil Reactivity: Normal
Total GCS: 11
Assessment: Airway
IV:
ET/Combitube:
Oxygen: O2,NC
Defib/Cardiovert:
Splints:
OPA/NPA:
Extrication/KED:
MAST:
C-spine:
Major Procedure:
Bleeding Control:
CPR/Suction:
IV #2:
Medication 1:
Medication 2:
Medication 3:
Medication 4:
Medication 5:
Resp2Hosp: Pri 4 - Non-Lif
M/Procedure 1:
M/Procedure 2:
M/Procedure 3: Brown, T
M/Procedure 4:
M/Procedure 5:
M/Procedure 6:
M/Procedure 7:
M/Procedure 8:
M/Procedure 9:
M/Procedure 10:
M/Procedure 11:
M/Procedure 12:
M/Procedure 13:
M/Medication 1:
M/Medication 2:
M/Medication 3:
M/Medication 4:
M/Medication 5:
Inc. Loc.: Nursing Home
Environ. Cause:
Prot. Device:
Severity:
Illness/Symptom: Vomiting
Prim. Clin. Area: Vecical
Injury Site/Type:

Search on tachypnea, shock, altered LOC, and **no oxygen given**

Resp_Nm	Resp_Date	Birth_Dat	Total	Resp	Radia	Assessment	IV	ET/C	Oxyger
0007-10	7/14/2000	7/14/2000	3	50	140	Breathing			
0011-17	/2000 1:09:2(	11/13/2000	8	58	180	Other			
0102-07	2001 10:58:3!	10/13/1999	11	48	174	Convulsions			
0105-03	5/5/2001	11/3/1998	14	44	160	Other			
0106-03	6/8/2001	6/7/2001	10	66	149	Other			
9708-09	/1997 8:46:0!	4/22/1926	5	54	108	Other			
9710-14	10/21/1997	10/21/1997	8	80	110	Other			
9711-06	/1997 2:26:4:	2/1/1997	13	42	160				
9801-13	1/20/1998	1/20/1998	10	50	154	Other			
9803-19	3/26/1998	3/23/1933	11	45	134	Other			
9804-10	/1998 4:03:0(	11/25/1997	11	56	120	Pediatric Care			
9806-19	6/23/1998	6/15/1998	11	56	130	Other			
9808-08	8/13/1998	8/13/1998	10	80	160	Other			
9810-13	10/20/1998	10/20/1998	10	60	120	Other			
9811-01	11/3/1998	11/3/1998	9	80	160	Other			
9811-03	11/5/1998	11/5/1998	9	60	139	Other			
9906-10	1999 10:14:1!	12/29/1998	13	60	140	Pediatric Care			
9907-20	1999 12:59:0(	1/12/1999	11	50	130	Other			
9911-20	/1999 4:39:2:	10/23/1996	14	44	140	seizure			
9912-07	/1999 7:54:0:	4/9/1999	11	42	148	fever			
9912-25	1999 11:10:0!	7/18/1999	11	56	180	HIGH TEMP			

Runs	No-loads	False Alarms	Pt.-Refuse	FD-Refuse	FDRef/NL%	PtRef/NL%	No Load %	False/NL%
156596	94994	23395	39558	8212	8.64	41.64	60.66	24.63
5138	2870	1052	841	251	8.75	29.30	55.86	36.66
1692	892	205	317	112	12.56	35.54	52.72	22.98
1672	930	199	380	93	10.00	40.86	55.62	21.40
1774	1048	648	144	46	4.39	13.74	59.08	61.83
1957	1350	232	726	107	7.93	53.78	68.98	17.19
651	458	80	238	28	6.11	51.97	70.35	17.47
635	420	54	252	34	8.10	60.00	66.14	12.86
671	472	98	236	45	9.53	50.00	70.34	20.76
5080	3269	684	1429	563	17.22	43.71	[illegible]	20.92
1673	1019	185	469	172	16.88	46.03	60.91	18.16
1785	1328	291	519	294	22.14	39.08	74.40	21.91
1622	922	208	441	97	10.52	47.83	56.84	22.56
3113	1910	356	795	151	7.91	41.62	61.36	18.64
1093	654	113	262	35	5.35	40.06	59.84	17.28
1024	638	51	331	41	6.43	51.88	62.30	7.99
996	618	192	202	75	12.14	32.69	62.05	31.07
2088	1271	385	459	104	8.18	36.11	60.87	30.29

Available Software Approaches

- MEDUSA/Lifenet EMS/Siren from Medtronic
- RescueNet/Tablet PC from Zoll
- ESO Solutions
- ROAM – IT
- Image Trend
- Intermedix
- Safety Pad
- Rescue Medic

Patient Care Report

Dallas Fire-Rescue Department
Emergency Medical Service

Incident Number:
Date of Service: 12/08/2007 01:11:02
Chief Complaint: Cardiac

Report: ROC Study

RescueMedic
emergi+data

Report Date: 1/7/2008 11:46:34 AM

Start Date: 12/31/2007
End Date: 1/7/2008

ROC Summary

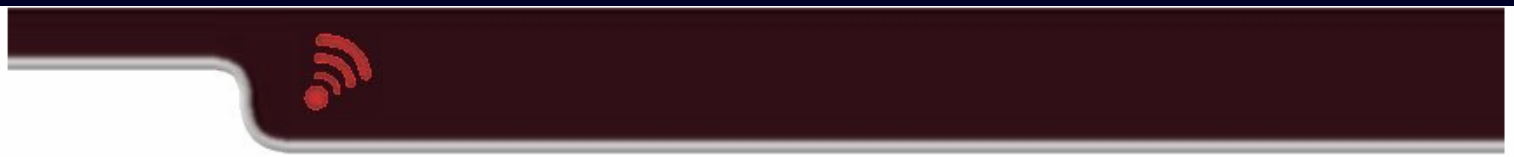
Total ROC Runs for 12/31/2007 - 1/7/2008: 64 Details

City Runs (64) | Details

Incident ID: 2007171226	**Ticket DOS:** 2007-12-31T02:05:05	**Ticket Description:** CPR, DOE 32 M	**Chief Comp:**
Incident ID: 2007171226	**Ticket DOS:** 2007-12-31T02:05:05	**Ticket Description:** MVC / MVA, bell 27 M	**Chief Comp:** MVC / MVA
Incident ID: 2007171279	**Ticket DOS:** 2007-12-31T05:53:43	[redacted]: Cardiac Arrest (Medical),	**Chief Comp:** Cardiac Arrest (Medical)
Incident ID: 2007171312	**Ticket DOS:** 2007-12-31T08:04:17	**Ticket Description:** Signal 27 - Rigor Mortis, [redacted]	**Chief Comp:**
Incident ID: 2007171317	**Ticket DOS:** 2007-12-31T08:12:40	**Ticket Description:** OD/ ETOH [redacted]	**Chief Comp:** OD/ ETOH Abuse
Incident ID: 2007171410	**Ticket DOS:** 2007-12-31T12:35:36	[redacted] Cardiac Arrest (Medical),	**Chief Comp:** Cardiac Arrest (Medical)
Incident ID: 2007171449	**Ticket DOS:** 2007-12-31T13:54:18	**Ticket Description:** Fa[redacted]	**Chief Comp:** Fall
Incident ID: 2007171491	**Ticket DOS:** 2007-12-31T15:09:30	**Ticket Description:** MVC / [redacted]	**Chief Comp:** MVC / MVA
Incident ID: 2007171683	**Ticket DOS:** 2007-12-31T20:09:48	**Ticket Description:** Unconsc[redacted]	**Chief Comp:** Unconscious

Signatures

Fowler, MD



CLOSE

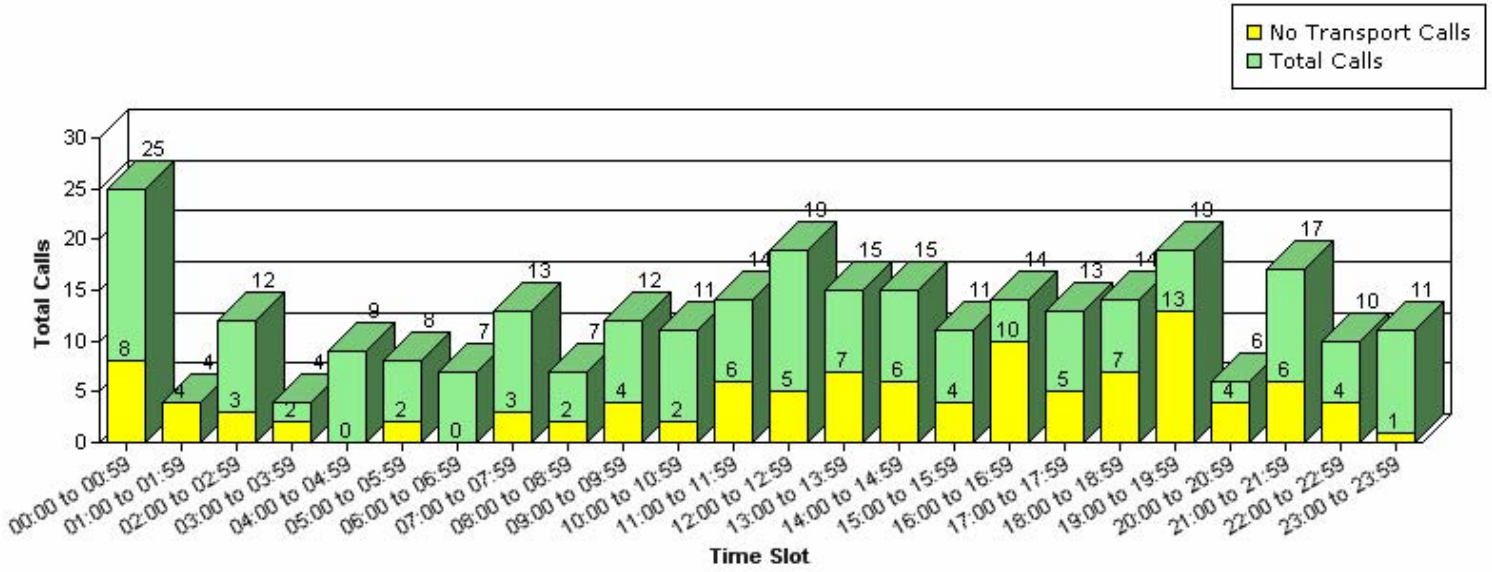
The following list of PCR's belong to Record Auditor - New Groups with Batch Numbers: 200607-03.

Previous | 1 2 3 4 5 6 7 8 9 10 | Next Showing Records From 1 - 25 of 470 (Page 1 of 19)

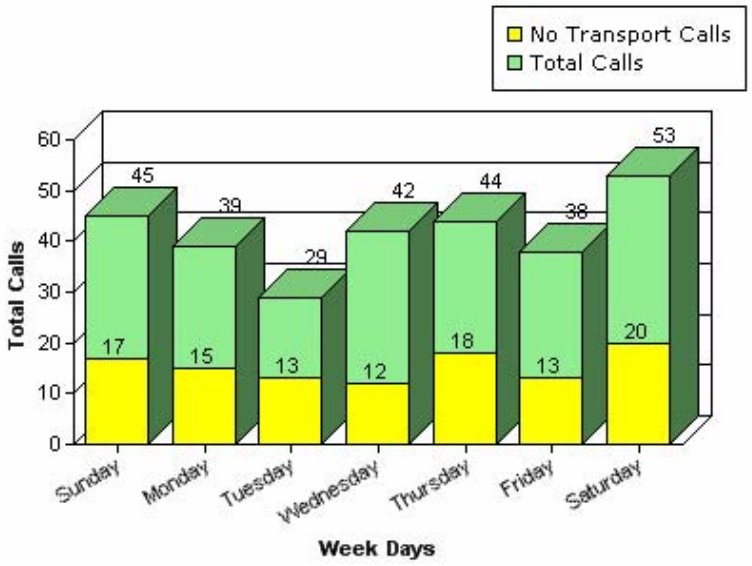
Total PCRs Selected: None Multi-PCR Actions:

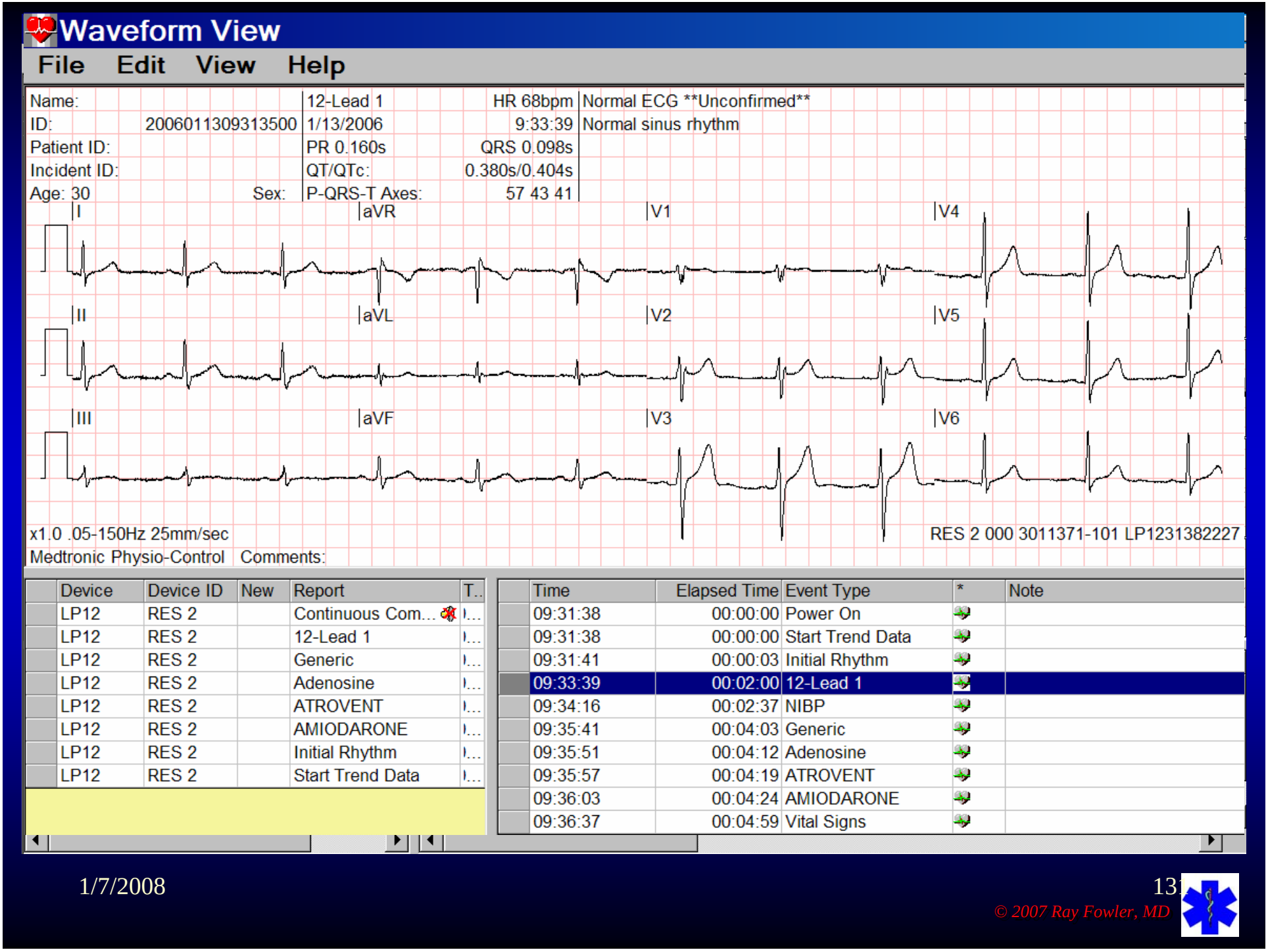
Response #	Name	Type	Chief Complaint	Age	Create Time	Assign Time	Unit #	Batch #	Group	State	Trans-ported	Actions
83[redacted]	[redacted]	PCR			7/3/2006 00:00	7/3/2006 00:01	AM707	200607-03	Record Auditor	New	No	
83[redacted]		PCR	nose bleed	5 Years	7/3/2006 00:02	7/3/2006 00:19	AM753	200607-03	Record Auditor	New	No	
83[redacted]		PCR			7/3/2006 08:53	7/3/2006 09:05	AM722**OVERLOAD**	200607-03	Record Auditor	New	No	
83[redacted]		PCR			7/3/2006 08:53	7/3/2006 10:13	AM725**OVERLOAD**	200607-03	Record Auditor	New	No	
83[redacted]		PCR	transfer from greenoaks	47 Years	7/3/2006 08:54	7/3/2006 09:40	AM728**OVERLOAD**	200607-03	Record Auditor	New	Yes	
83[redacted]		PCR	Breathing Difficulty (Medical)	50 Years	7/3/2006 09:04	7/3/2006 10:19	AM734**OVERLOAD**	200607-03	Record Auditor	New	Yes	
83[redacted]		PCR	Breathing Difficulty (Medical)	53 Years	7/3/2006 09:14	7/3/2006 13:04	AM751	200607-03	Record Auditor	New	No	
83[redacted]		PCR	bp check	25 Years	7/3/2006 00:45	7/4/2006 07:56	AM737	200607-03	Record Auditor	New	No	
83[redacted]		PCR			7/3/2006 01:21	7/4/2006 07:56	AM737	200607-03	Record Auditor	New	No	
83[redacted]		PCR			7/3/2006 02:04	7/4/2006 07:56	AM737	200607-03	Record Auditor	New	No	
83[redacted]		PCR			7/3/2006 02:39	7/4/2006 07:56	AM737	200607-03	Record Auditor	New	No	

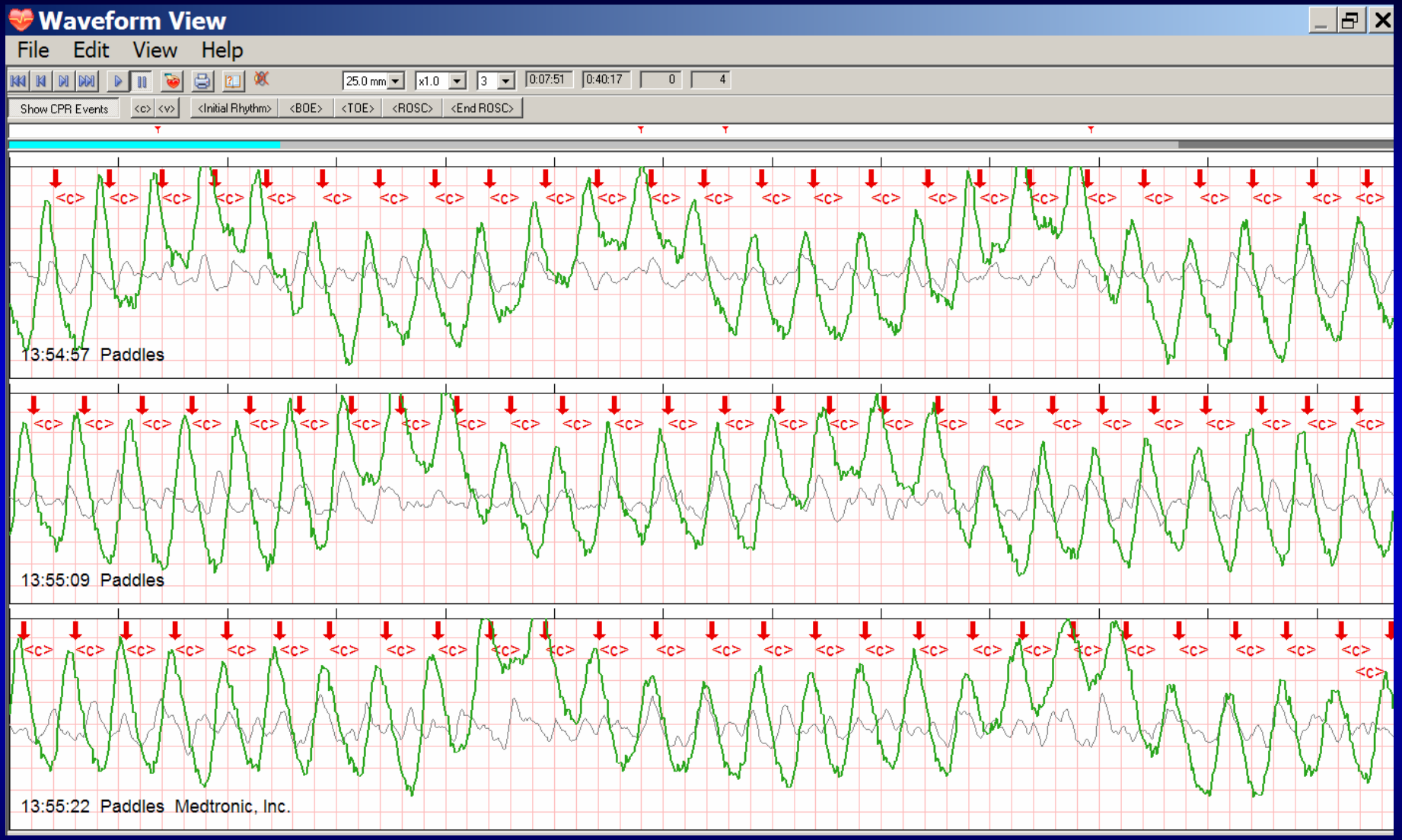
No Transport by Time of Day

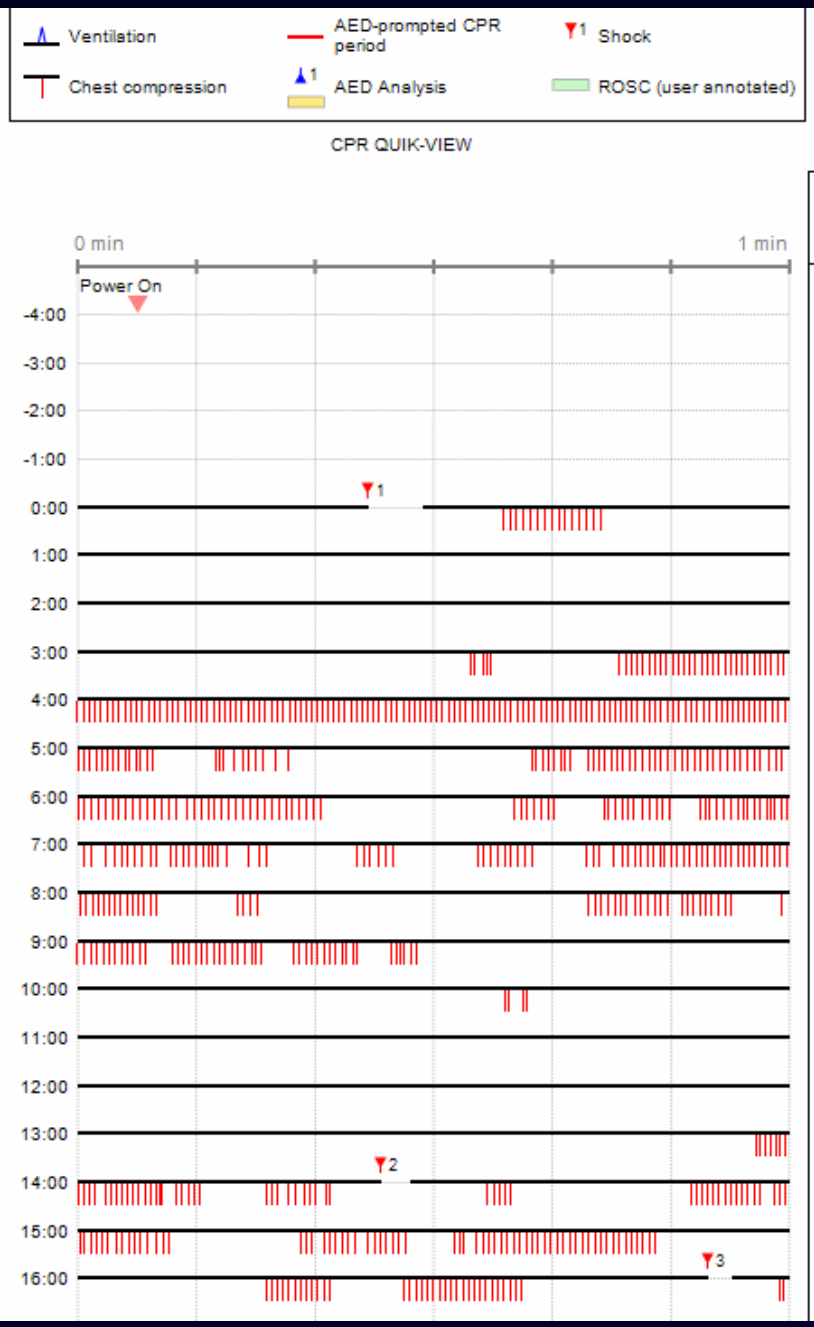


No Transport by Day of Week









Interval Statistics

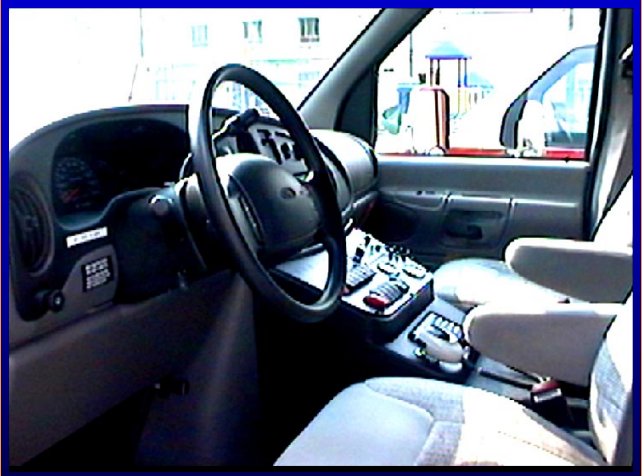
CPR Ratio, %	Prompt. CPR Ratio, %	Compr. Ratio, %	Prompt. Compr. Ratio, %	Compr. Rate	Compr. /min
--	--	--	--	--	--
--	--	--	--	--	--
--	--	--	--	--	--
--	--	--	--	--	--
17	--	17	--	102	16
--	--	--	--	--	--
--	--	--	--	--	--
29	--	29	--	122	34
100	--	100	--	124	123
67	--	60	--	113	63
75	--	69	--	103	69
100	--	73	--	109	70
55	--	40	--	116	42
49	--	49	--	117	45
5	--	5	--	--	4
--	--	--	--	--	--
--	--	--	--	--	--
5	--	5	--	148	7
58	--	50	--	123	54
66	--	61	--	116	64
40	--	31	--	123	36

How do you do that?

- Incorporate the monitor file directly into the ePCR (many vendors, requires a software development kit)
- Download the file in the station to a PC
- Download the file to a laptop in the rig and stream it wirelessly to a server, matching the file up with the PCR file later (cellular card, station router, municipal router

Ambulances

- Computers are commonly prevalent in driver compartments for mapping and mobile data terminals
- Real-time telemetry pilot project in Dallas, Texas



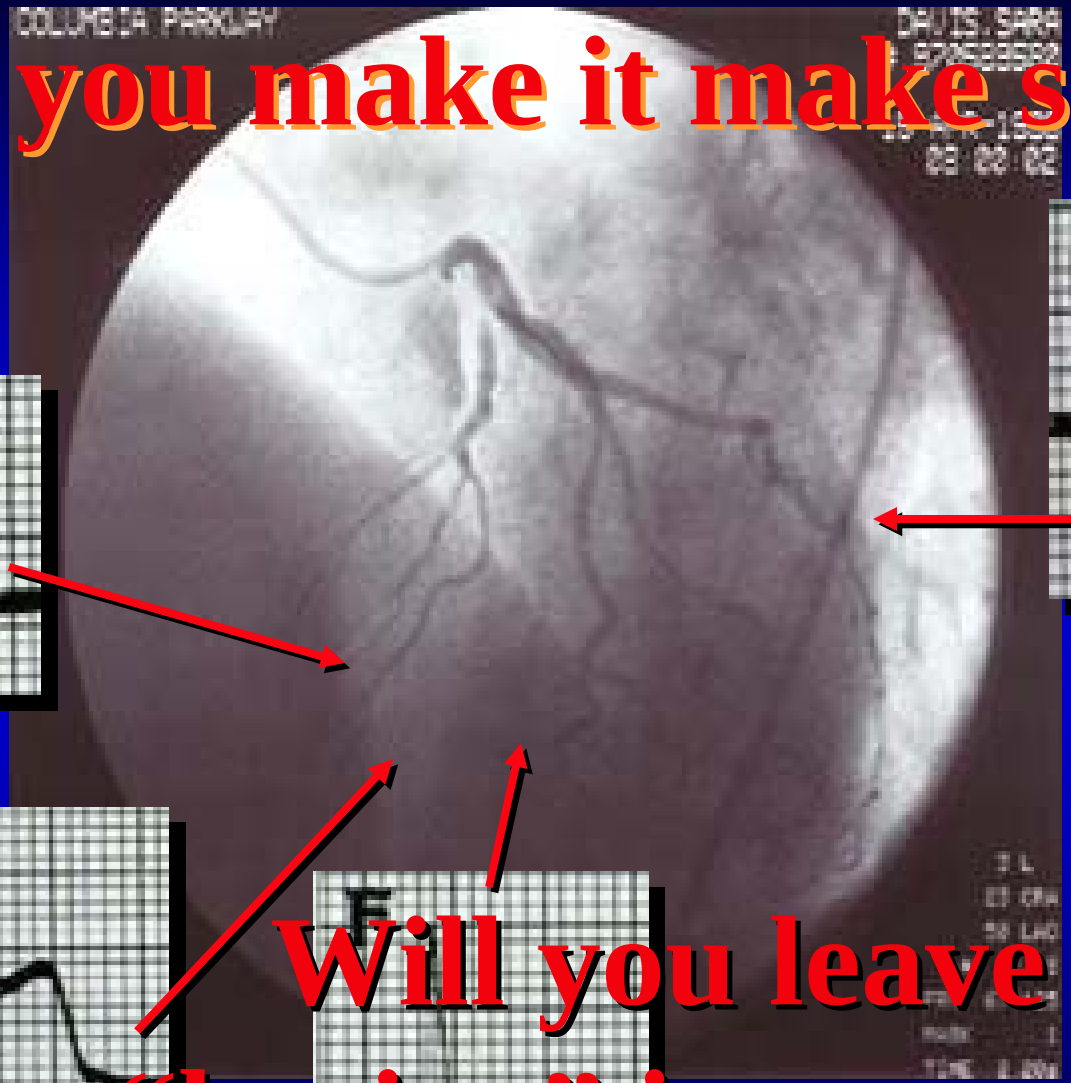
Initial and Continuing Education

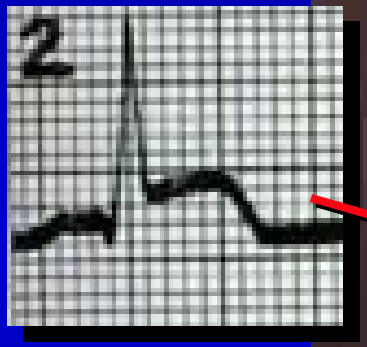
- The quality of education is undergoing a HUGE boost due to such resources
  - www.utsw.ws
    streaming **Flash**® lectures
  - www.emergencymedicine.ws
    library of material

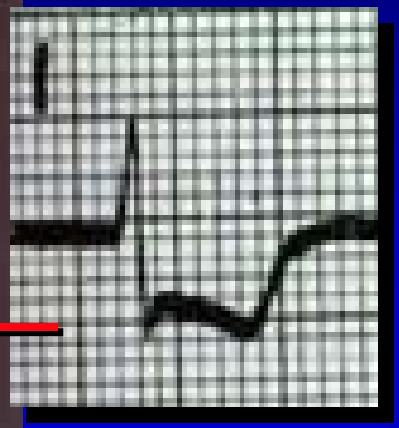

a little closer.... closer...

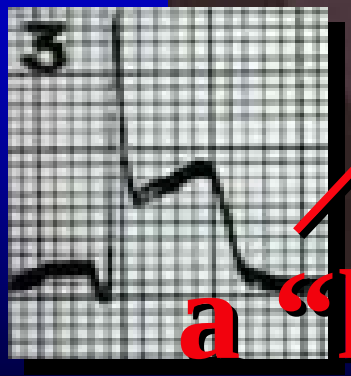
Summary Thoughts

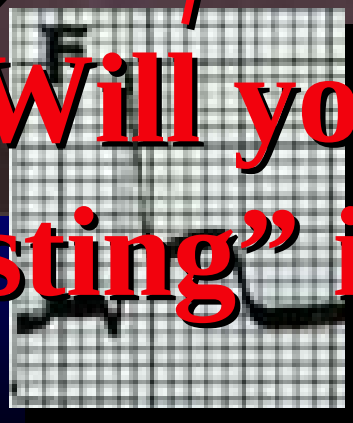
Can you make it make sense?







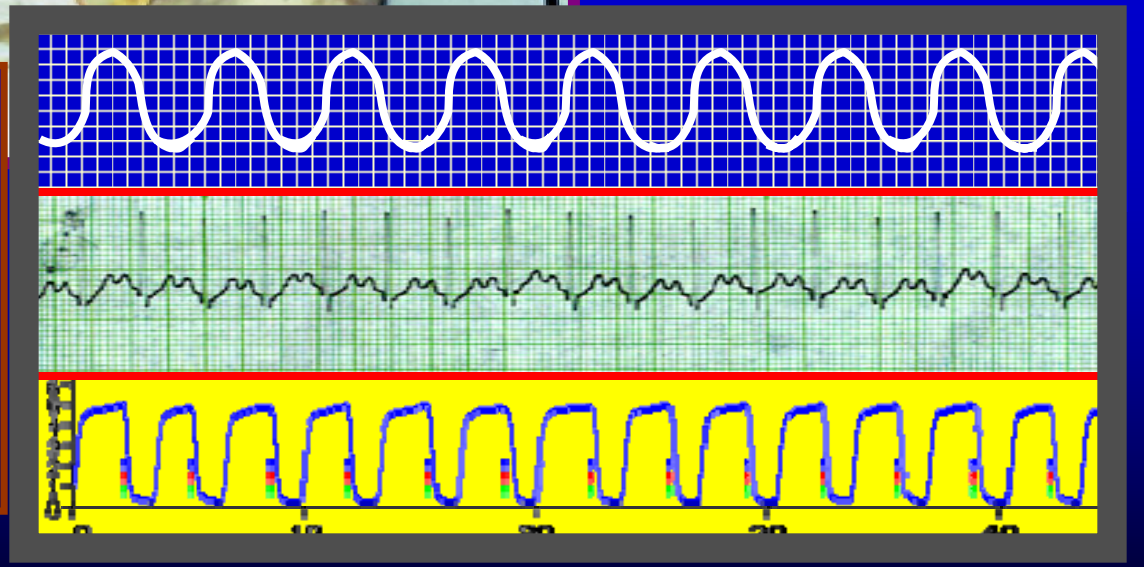




Will you leave a "lasting" impression?

BP = 88/55
P = 160
Resp = 36
TV = 800
Glu = 425
Hgb = 9

The Medics of the Near Future will be "Out of Hospital Intensivists"



Summary Thoughts

- Framework
  - Personnel
  - Ambulances
  - Communications
  - Computers

Summary Thoughts

- Using such a framework, the EMS physician can most accurately establish and maintain the practice of EMS medicine in the best interests of the patients and of the providers

Again, this is not just

a course for a few days…

…this is a relationship…

"drray@doctorfowler.com"

www.rayfowler.com