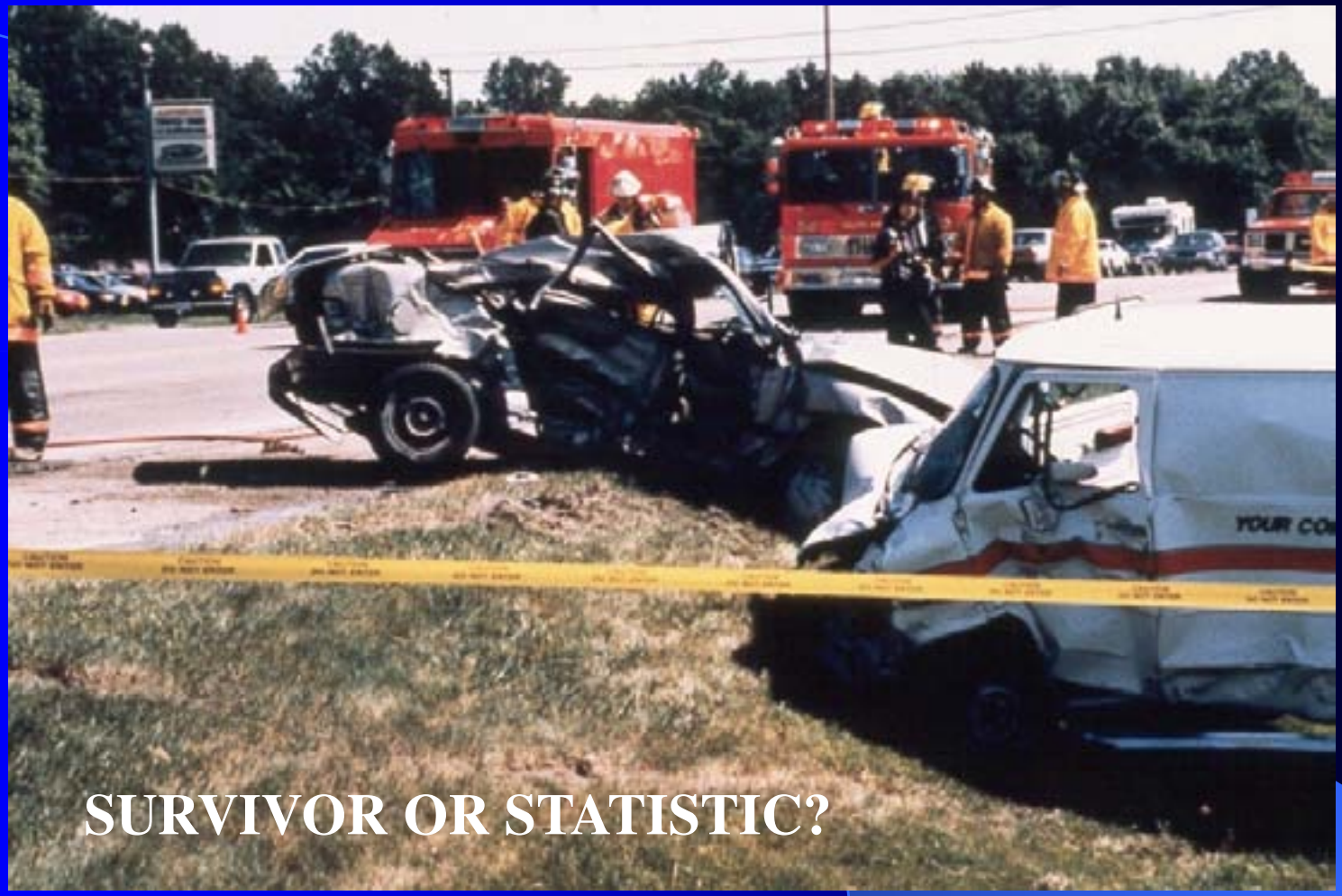
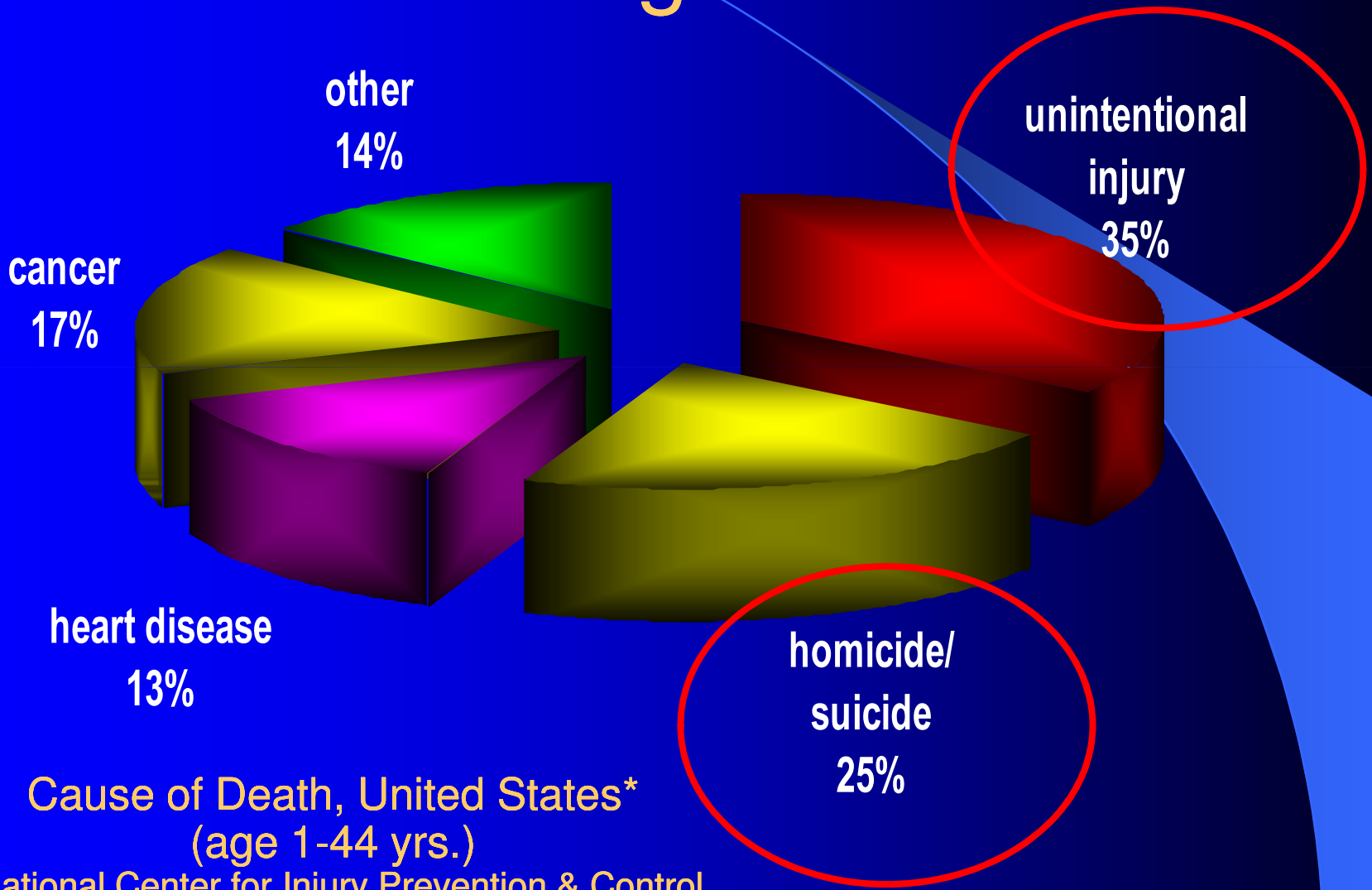
A System Saving Lives



Incidence of Trauma

- Leading cause of death in U.S. in patients less than 45 years old (CDC 2004)
  - 60 million injured
    - **160,000 die – (56 per 100,000) and the rate is going up**
    - **9 million disabled - 300,000 permanently**
- Trauma is more commonly a disease of the young (15-34) thus has a far greater economic impact
- Most costly U.S. health problem
  - Cost of medical care for trauma doubled between 1996 and 2003 (to 71 Billion) making it higher than the cost of heart disease
  - Does not take into account lost wages and long term care

In case we forget…



Cause of Death, United States*
(age 1-44 yrs.)

* National Center for Injury Prevention & Control, CDC

Why do Trauma Patients Die?

- They are killed immediately from massive injuries (can't help these except by prevention)
- They lose their airway and die from lack of oxygen (only have minutes to save these)
- They bleed to death
  - **Usually internal bleeding where only surgery can stop**
  - **Often quietly while waiting for transfer to a trauma hospital**
- Some die later of complications (organ failure or sepsis)
  - **Often related to how soon the bleeding was stopped and blood volume restored**

Trauma Survival is Time Dependent

- **Time-dependent means the earlier treatment is begun, the better the chance of a good outcome**
- **Time-dependent diseases are best treated with a planned, organized (System) approach in order to save time and lives**

The Golden Hour

- Patients have the best chance for survival if definitive care is available within an hour after injury
- For victims of life-threatening trauma, frequently stabilization occurs only in the operating room where the internal bleeding is stopped and blood volume is restored

Trauma Center

Trauma centers are selected hospitals that provide a full range of care for severely injured patients 24 hours a day, seven days a week. The trauma care includes ready-to-go teams that perform immediate surgery and other necessary procedures for people with life-threatening injuries.

Trauma System

A trauma system involves trauma centers working together with 9-1-1, EMTs, ambulances, helicopters, and other health care resources in a coordinated and preplanned way. **This network of care is designed to get seriously injured people to the place with the right resources as quickly as possible**

Why Do We Need One?

- THEY SAVE LIVES!
  - Voluntary trauma system started in seven counties around Birmingham in 1996
  - Between 1996 and 2005 there were over 23,000 patients treated for major trauma
  - There was a 12% decrease in the death rate from trauma in this area during this time
    - There was no change for the rest of the state

Who is a “Trauma System” Patient?

- A “trauma” patient is any patient who is injured
- Most injuries are minor and should be treated at a local community hospital
- Less than 10% of patients with injuries need to go to a trauma center. These are Trauma System patients.
- A “Trauma System” patient has life-threatening injuries that require rapid, specialized care. Protocol 8.5 defines the Trauma System Patient

Protocol for Which Patient is Entered into the Trauma System

- Can be for any of 4 reasons
  - Physiologic
  - Anatomic
  - Mechanism of injury
  - EMT discretion
- Of all of the reasons to be entered into the trauma system, which one has the worst prognosis?

Physiologic Criteria

Generally Triaged to Level I Trauma Center

- A systolic BP < 90 mm/Hg in an adult or child 6 years or older

  < 80 mm/Hg in a child five or younger.

  Died 0%, OR 27%, ICU 32%, ATTF22%
  Home from ED 19%

Physiologic Criteria

Generally Triaged to Level I Trauma Center

- Respiratory distress - rate < 10 or >29 in adults, **or**

  < 20 or > 60 in a newborn

  < 20 or > 40 in a child three years or younger

  < 12 or > 29 in a child 4 years or older.

  Died 11%, OR 11%, ICU 47%, ATTF23%
  Home from ED 8%

Physiologic Criteria

Generally Triaged to Level I Trauma Center if <9

- Altered mental status as evidenced by GCS of 13 or less

  Died 6%, OR 11%, ICU 36%, ATTF45%
  Home from ED 6%

Anatomic Criteria

Generally Triaged to Level I or II Trauma Center

- Flail chest.
  - **Died 25%, OR 0%, ICU 50%, ATTF25% Home from ED 0%**
- Two or more obvious proximal long bone fractures (humerus, femur).
  - **Died 0%, OR 28%, ICU 8%, ATTF64% Home from ED 0%**
- Penetrating injury of the head, neck, torso, or groin, associated with an energy transfer.
  - **Died 1%, OR 29%, ICU 15%, ATTF17% Home from ED 10%**

Anatomic Criteria

Generally Triaged to Level I or II Trauma Center

- Has in the same body area a combination of trauma and burns (partial and full thickness) of fifteen percent or greater.
  - **Died 0%, OR 0%, ICU 18%, ATTF82% Home from ED 0%**
- Amputation proximal to the wrist or ankle.
  - **Died 0%, OR 100%, ICU 0%, ATTF0% Home from ED 0%**
- One or more limbs which are paralyzed.
  - **Died 0%, OR 35%, ICU 20%, ATTF35% Home from ED 10%**
- Unstable pelvic fracture, as evidenced by a positive "pelvic movement" exam.
  - **Died 0%, OR 15%, ICU 23%, ATTF54% Home from ED 8%**

Mechanism of Injury Criteria

- A patient with the same method of restraint and in the same seating area as a dead victim.
  - **Died 0%, OR 5%, ICU 21%, ATTF63% Home from ED 10%**
- Ejection of the patient from an enclosed vehicle.
  - **Died 1%, OR 11%, ICU 34%, ATTF43% Home from ED 11%**
- Motorcycle/bicycle crash with the patient being thrown at least ten feet from the motorcycle/bicycle.
  - **Died 5%, OR 22%, ICU 46%, ATTF16% Home from ED 11%**

Mechanism of Injury Criteria

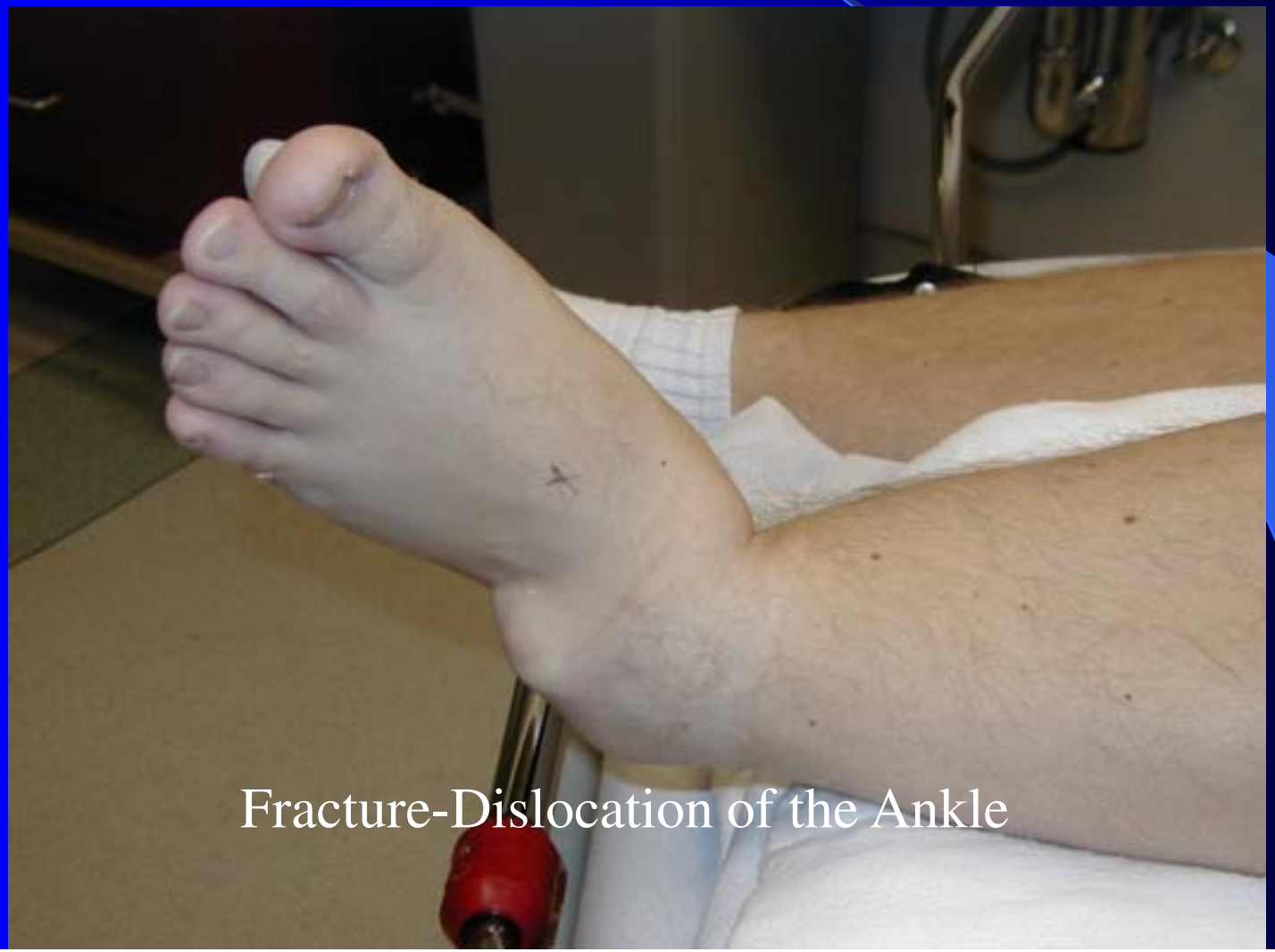
- Auto versus pedestrian with significant impact with the patient thrown, or run over by a vehicle.
  - **Died 1%, OR 24%, ICU 34%, ATTF36% Home from ED 5%**
- An unbroken fall of twenty feet or more onto a hard surface.
  - **Died 6%, OR 10%, ICU 17%, ATTF47% Home from ED 17%**

EMT Discretion Criteria

Died 0%, OR 6%, ICU 16%, ATTF47% Home from ED 31%

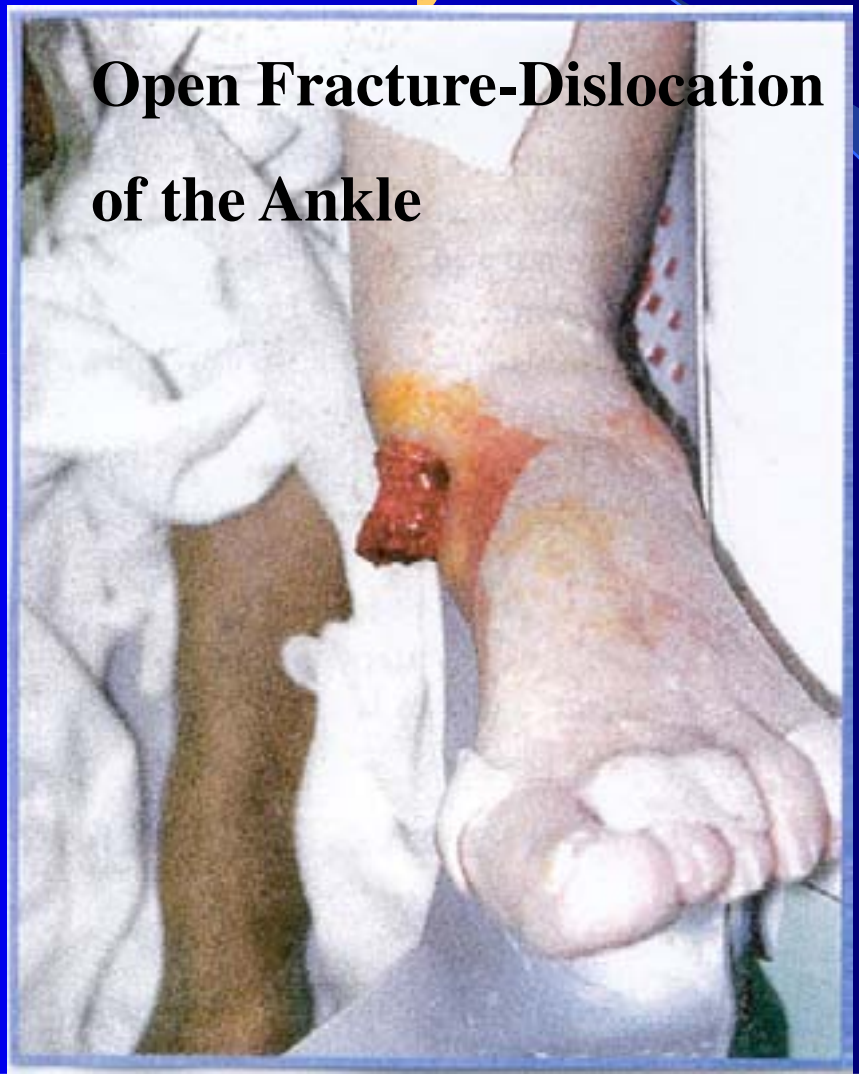
- If the EMT is convinced the patient could have a severe injury that is not yet obvious, the patient should be entered into the trauma system.
- The EMTs suspicion of severity of trauma/injury may be raised by the following factors:
  - Age > 55
  - Age < five
  - Environment (hot/cold)
  - Patient's previous medical history
    - Insulin dependent diabetes
    - Cardiac condition
    - Immunodeficiency disorder
    - Bleeding disorder
  - Pregnancy
  - Extrication time > 20 minutes with heavy tools utilized
  - Motorcycle crash
  - Altered mental status or history of more than momentary unconsciousness

This is an Trauma Patient but not a Trauma System Patient

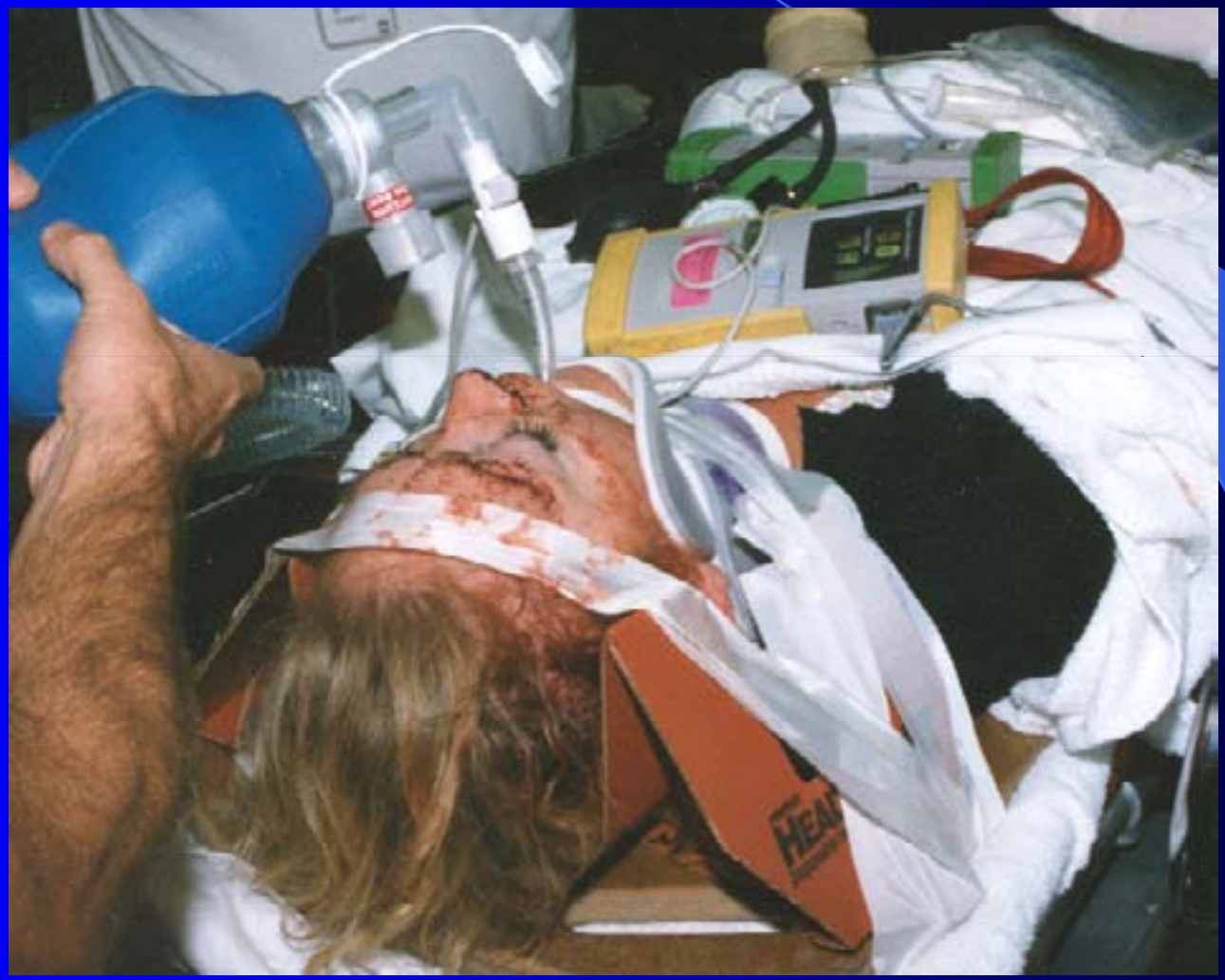


Fracture-Dislocation of the Ankle

This is a Trauma Patient but not a Trauma System Patient



This is a Trauma System Patient



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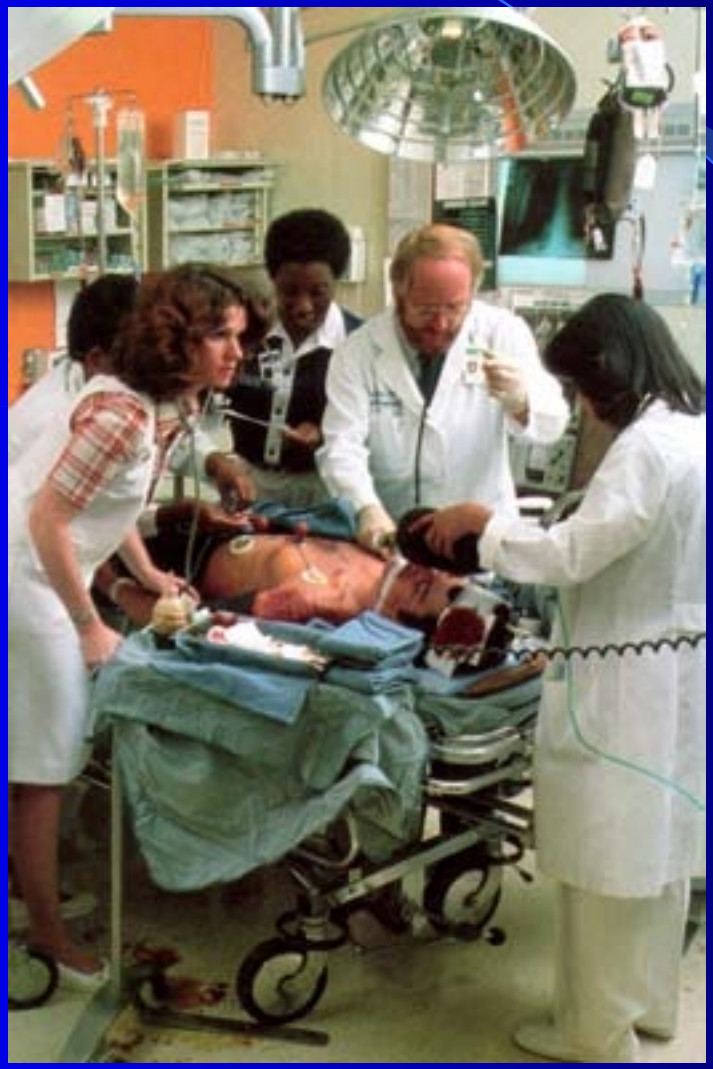


Alabama Trauma

- 4TH Highest per capita highway trauma death rate in the U.S.
- 80% of trauma is blunt (motor vehicle crashes or falls)
- 20% of trauma is due to penetrating injuries (gunshot, stabbing)
- **Before trauma system in place 60% of trauma patients initially went to hospitals that lacked the resources to treat them**

Alabama Trauma

- A review of motor vehicle trauma in Alabama in 2005 found:
  - 1,134 people killed
    - **28% of accidents in rural areas but accounted for 69% of deaths**
    - **72% of accidents in urban areas but only 31% of deaths**
    - DEATH RATE TWICE AS HIGH (1.78% VS. 0.9%) IN RURAL AREAS
  - A 12% decrease in deaths would have saved 136 lives

Rural Trauma

- Challenges in rural trauma care
  - **Paramedics are often not available to provide Prehospital care**
  - **Emergency Medicine Physicians may not be experienced in treating seriously injured patients**
  - **Most hospitals do not have the resources (surgical specialties) to provide definitive trauma care**
  - **Without the trauma system, arranging transfer to definitive care often takes hours**

What are the Qualities of a Good Trauma System?

- Network of hospitals with the commitment and the resources to care for trauma system patients
- Organized plan to route critical patients to the right hospital that is ready to care for them
- Constant monitoring of the system to correct problems, improve the system, and validate the quality of care provided

Alabama Trauma Plan

- Voluntary participation by hospitals
  - **Hospitals are inspected and designated for the level of services they can provide**
- System built around high-tech communication center that coordinates patient transport from the scene to the appropriate hospital the first time
  - **Done with computer intranet system and 24/7 staff that maintain up-to-the-minute status of all hospitals and resources**
  - **This allows hospitals to always be in control of when they are available to accept a new patient**
- Everything is monitored by Quality-Improvement process

Trauma System Patient Routing

- Each participating hospital will be connected to the statewide Alabama Trauma Communications Center (ATCC) so that there is a constant monitoring of the status of all hospitals
- When a patient needs the trauma system the EMT on scene will call the ATCC who will route the patient to the correct ready hospital depending on the patient's injuries
- If the scene EMT needs to call for helicopter transport the call to the helicopter should be placed first then call the ATCC and place the patient in the system and decide on a destination. Then notify the helicopter of the destination
- ATCC will fax a report to the receiving hospital
- Within 48 hours hospital will return report with outcome/evaluation
- Transfer of patients from local hospitals to the correct trauma center can be coordinated by the ATCC

Patient Report

TraumaNet

Patient PCR: 2029418
Report Date: 04/16/1999
Report Time: 19:07:12

Hospital: Carraway
TC Level: 1
System: Birmingham, Alabama

Date/Time Logged:	/ / : :	**Transport Mode:**	Ground
User Id:	gsp	**Est. Departure Time:**	01:23
Provider:	Vaughan Chilton Med. Ctr. EMS	**Est. Arrival Time:**	01:25
Initial Contact Date/Time:	07/27/1998 01:18:24	**Transfer Time:**	2
Age:	17	**Selected Hospital's Status:**	green
Gender:	Female	**Override:**	No
Contact Method:	Phone	**Hospital Selected by:**	TCC
Location:	Chilton County Hwy 45		

Physiological Info:

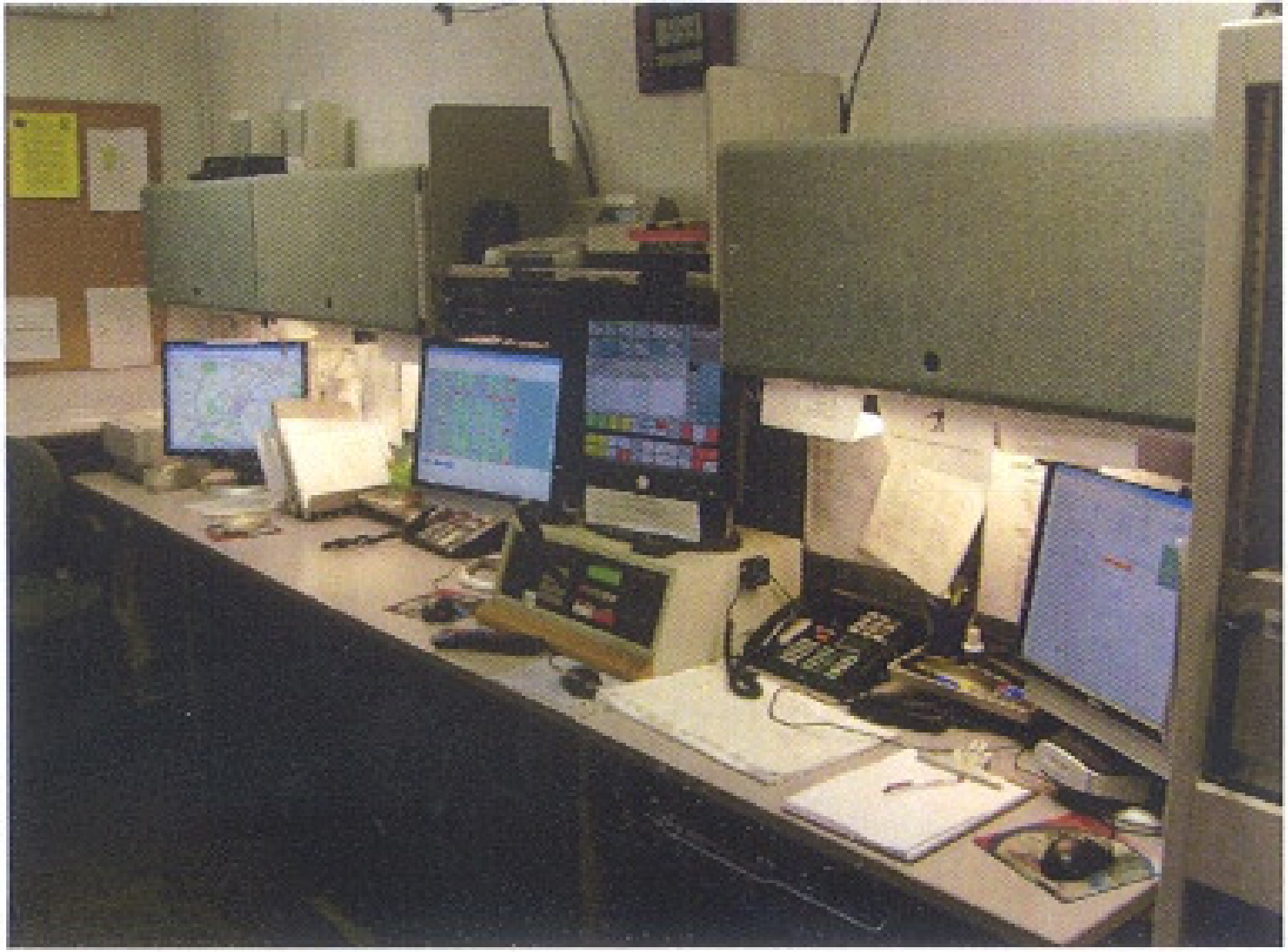
Blood Pressure Systolic:	80 to 89
Respiratory Rate:	30
Level Of Consciousness:	Alert

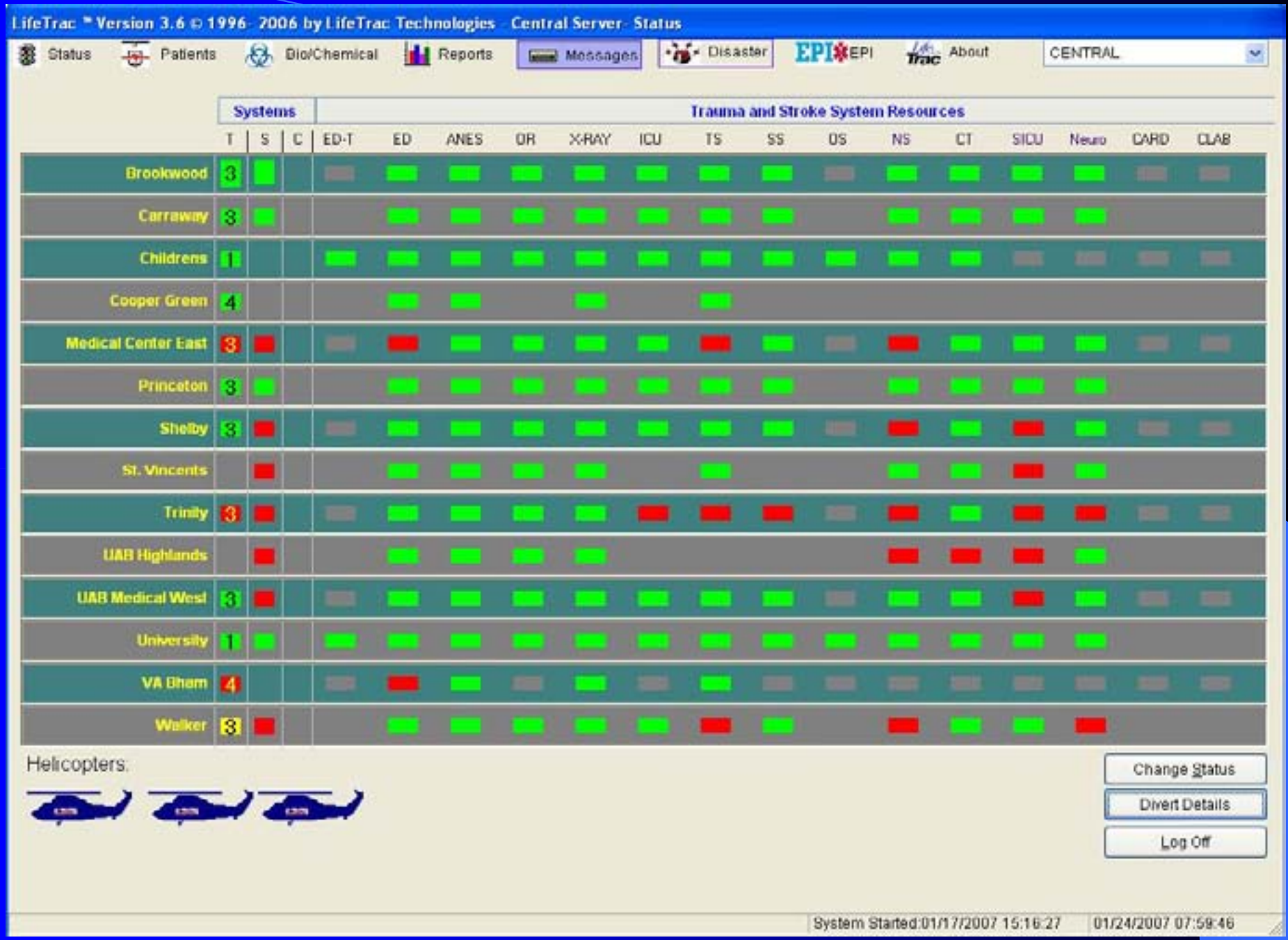
Mechanism of Injury: Auto/Pedestrian

Anatomical Criteria: None

Co-Morbid Factors: None

Co-Morbid Notes: B/P LESS THAN 90 NO RADIAL PULSE

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CLAB
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Carraway 3
Childrens 1
Cooper Green 4
Medical Center East 3
Princeton 3
Shelby 3
St. Vincents
Trinity 3
UAB Highlands
UAB Medical West 3
University 1
VA Bham 4
Walker 3
Helicopters:
Change Status
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How does the System Save Lives?

- It correctly identifies the patients who need trauma care
- Anticipates the resources needed to treat the patients
- Locates the available needed resources
- Routes the patient “right” the first time to reduce time to appropriate care
- Arranges interfacility transfers if needed to reduce time to appropriate care
- Improves care by the QI process

How does this System Compare to Other State's Trauma Systems?

- **ALABAMA WILL BE THE ONLY STATE IN THE U.S. WITH THE CAPABILITY TO CONSTANTLY MONITOR THE STATUS OF EVERY TRAUMA HOSPITAL AND ROUTE THE TRAUMA PATIENT TO THE RIGHT HOSPITAL EVERY TIME**
- **THIS SYSTEM WILL BE THE MODEL FOR THE REST OF THE NATION**


QUESTIONS?