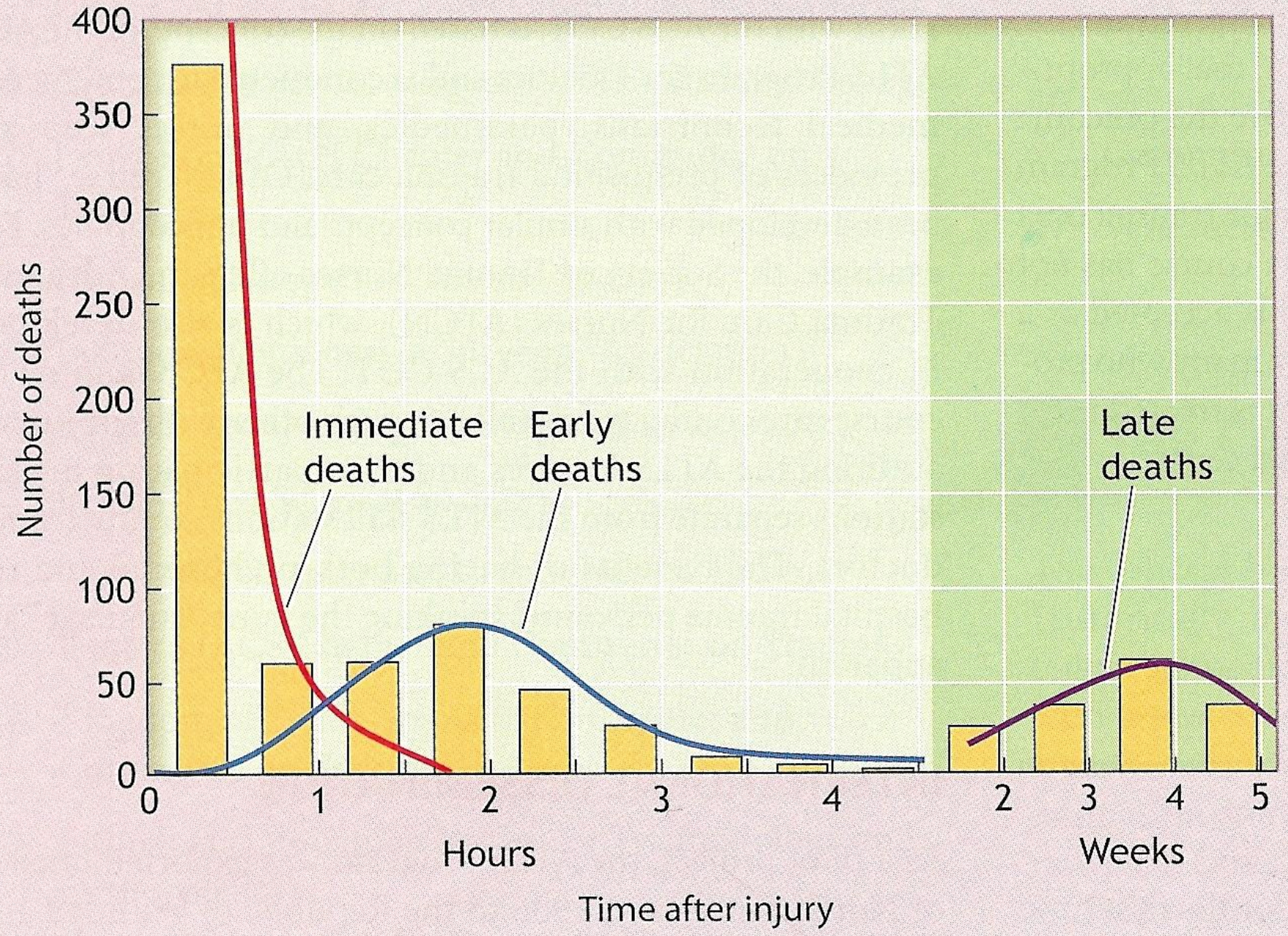
STATE WIDE TRAUMA SYSTEMS

Dr. Brian O’Byrne

- First trauma centers in the US established in 1966 in Chicago and San Francisco- decreased preventable deaths from 33% to 0%.
- Trimodal distribution of death from trauma outlined by Trunkey.
- In rural America, patients have more than a 25% reduced chance of survival compared with their urban counterparts.


400
350
300
250
200
150
100
50
0
Number of deaths
Immediate deaths
Early deaths
Late deaths
0
1
2
3
4
2
3
4
5
Hours
Weeks
Time after injury


vidman.ca

THE PROBLEM

- Nearly 50% of major trauma cases go to smaller volume hospitals that deal with less than 100 cases of major trauma a year.
- 2001 Idaho Senate Bill 1145-Established a Committee to investigate forming a Trauma System-none has yet been formed.
- "Trauma care in the US is fragmented, overwhelmed and underfunded. It must change to be coordinated, regionalized and accountable." Brent Eastman, MD 2009 ACS Scudder Oration in Trauma

TRAUMA CENTER LEVELS OF CARE

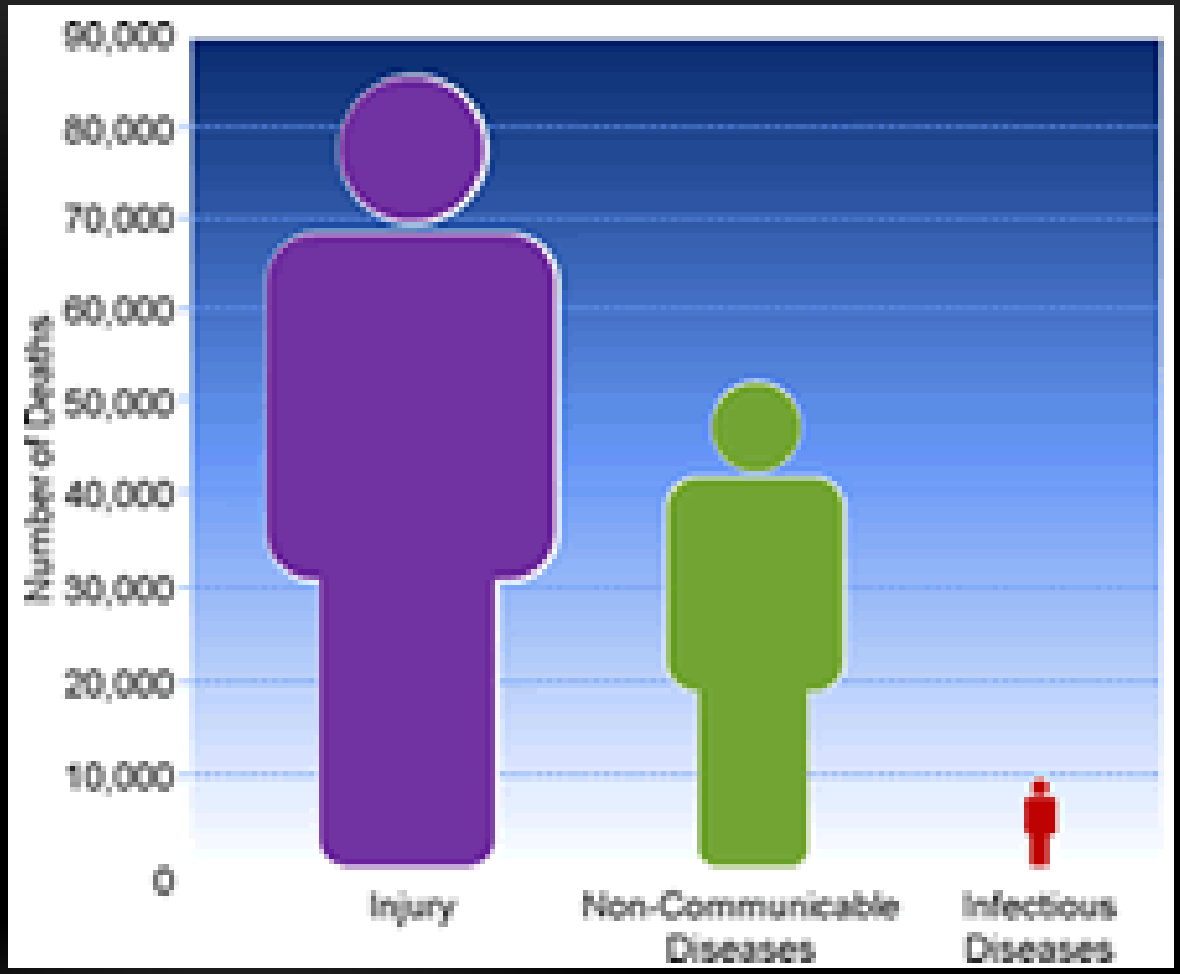
- Level I
  - Regional trauma center
  - Provides leadership and able to provide care to every aspect of injury from prevention to rehabilitation
  - Leader in education, research and system planning
  - Surgical Residency and Trauma research
- Level II
  - Tertiary care center, although may not have the same comprehensive services as a Level I
  - Often provides system support and educational leadership when a Level I is not geographically close
  - Often the regional trauma center in isolated regions (Idaho)
- Level III
  - Provides service to communities that do not have immediate access to a Level I or II
  - Provides patient assessment, resuscitation, emergency operations and stabilization
  - May provide some definitive care depending on level and type of injury
- Level IV
  - Generally located in rural settings
  - Stabilizes and transfers to higher level, usually a Level I or II

PUBLIC HEALTH ISSUE TRAUMA

- **Epidemiology:**
  - Trauma is the number 1 cause of death between the ages of 1-44 (American College of Surgeons Committee on Trauma [ACS], 2006)
  - Mortality rate within this age group greater than all other causes combined
  - Trauma is the greatest cause of disability in the country (ACS)
  - Motor vehicle collisions cause one million deaths and an estimated 20-30 million significant injuries annually (ACS)
  - 90% of all crashes occur in developed countries

Injury: The Leading Cause of Death Among Persons 1-44

Injury Deaths Compared to Other Leading Causes of Death for Persons Ages 1-44, United States, 2007*




ADEATER

IDAHO EPIDEMIOLOGY

- Trauma is the #1 cause of death in the age group 1-44 (2009 Idaho vital Statistic Report)
- In 2009 in Idaho there were **665** lives lost to trauma (2009 Idaho Vital Statistic Report)
- Average number of productive life years lost per patient in Idaho is 32.7 years
  - Similar statistics are seen at the National level for loss of productive years in these patients
  - Idaho has a higher death rate for trauma than the national average
    - 43% versus 41% (2009 Idaho Vital Statistic Report)

- Falls are the leading mechanism (37%) of trauma with MVC (car crashes) a close second (31%)
  - Blunt trauma accounts for 98% of trauma within the state
  - Many MVC's are associated with reckless driving behaviors, distracted driving or DUI

PROJECTED LIVES SAVED

- In 2009 in Idaho there were **665** lives lost to trauma
- Projected possible lives saved are **99.75** (15% of 665)
  - 15% mortality decrease is the most commonly cited survival percentage for blunt trauma
- Average number of productive life years lost in Idaho is 32.7 years
- 3261.8 years of productive life lost (99.75 X 32.7)
- $36,319 per life year or $790,931 per life are some cost estimates cited (Mackenzie, et al)
- *$118 million could have been saved based on 99.75 lives*
- *3.6 million could have been saved per productive life-year*

TRAUMA SYSTEMS

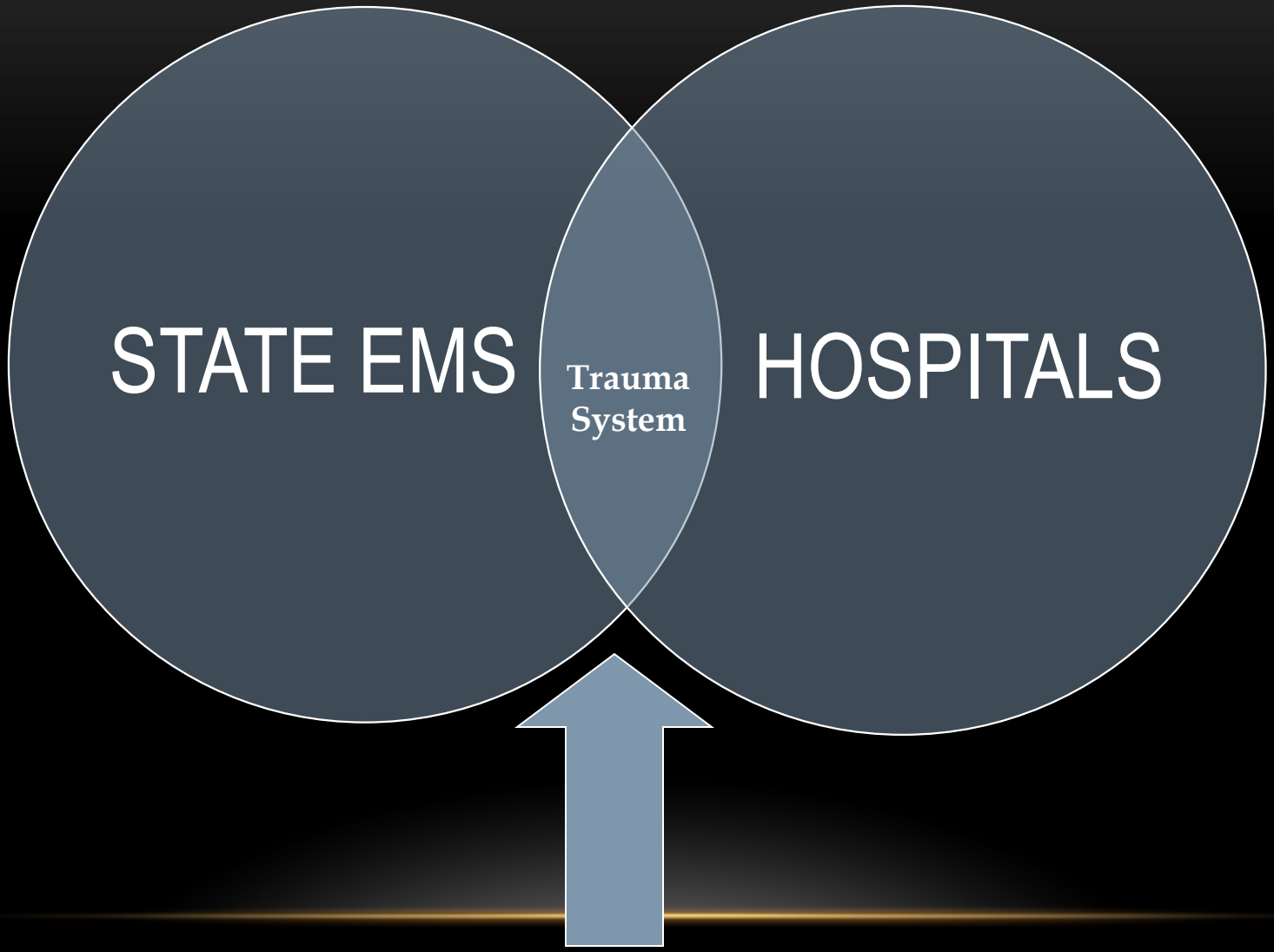
- A trauma system allows for a regional coordination of often scarce resources
- Defined by Health Resources and Services Administration (HRSA) as a 'Preplanned, comprehensive and coordinated statewide and local injury response network that includes all facilities with the capability of care for the injured' (HRSA, 2002)
- A trauma system involves a combination of pre-hospital and hospital resources
- Trauma systems allow for dissemination of information from primary prevention through rehabilitation and play an integral role in mass casualty incidents response
- Trauma systems, both state and regional, provide a way to optimize trauma care by providing continuing medical education, prevention outreach, research, and quality assurance standardization to ensure the system provides the best services available (ACS, 2006)
- Critical access hospitals and tertiary trauma centers are equally important to an effective system (Utter et. al., 2006)

HEALTH QUALITY PLANNING COMMISION

- Task given to the team November 2011
  - Trauma Centers
  - State EMS Agency
  - IHA
  - Department of Health
  - To collaborate on developing a comprehensive Trauma System incorporating the ideas from the two presentations given to the HQPC
    - Trauma Centers
    - EMS Agency
  - Asked to develop a system that addressed concerns raised by the OPE as well as incorporating a system for hospital designation

PROGRESS

- Three meetings held:
  - December 22, February 1, and April 16
  - Developed a vision, mission and position statement
  - As the discussions progressed, it became clear the hospitals and the EMS had different needs and timelines for a trauma system
  - Both sides agreed they would continue to support each other as the system progresses


STATE EMS
Trauma System
HOSPITALS

TRAUMA SYSTEM DEVELOPMENT

- Comprehensive Statewide Trauma System
  - Step 1
    - Hospital Designation
      - Voluntary
      - Support Facility Review Process
      - Develop State Multidisciplinary Trauma Committee
      - Develop Support Relationship with Local EMS and Voluntary Transport Agencies
      - Implement Appropriate Activation Criteria and Billing once Designated
  - Step 2
    - Statewide EMS system enhancements

ADVANTAGES

- Every hospital could become a trauma center regardless of size
  - Voluntary
  - Participation and Trauma Level designation would depend on the ability to which the hospital's resources would allow
- Improved hospital length of stay
- Overall improvement in quality of patient care
- Disaster preparedness
- Regional designation standards
- Proven improved contribution margin (income) for hospitals that become trauma centers (Maggio, Brunage, Hernandez-Boussard, Spain, 2009)

ADVANTAGES CONT.

- Only designated/verified hospitals may be reimbursed by payers for trauma response fees and trauma critical care
  - Revenue code 68x can only be used by trauma centers/hospitals if licensed or designated by the authorized state or local government division or, if verified by the American College of Surgeons
  - Payment for trauma response fees would help hospitals recover trauma program costs
  - Improved support for transfer facilities

HOSPITAL REQUIREMENTS

- Trauma program infrastructure
  - Internal trauma staff such as a Trauma Coordinator and Trauma Medical Director
    - FTE needs based on volume
  - Education of staff-key piece necessary for a Trauma Center to function
    - Advanced Trauma Life Support (ATLS) for physicians
    - Trauma Nurse Core Curriculum (TNCC) for nursing staff
    - Ongoing continuing trauma education
    - Ongoing education of the local EMS providers

MONTANA TRAUMA SYSTEM EXAMPLE

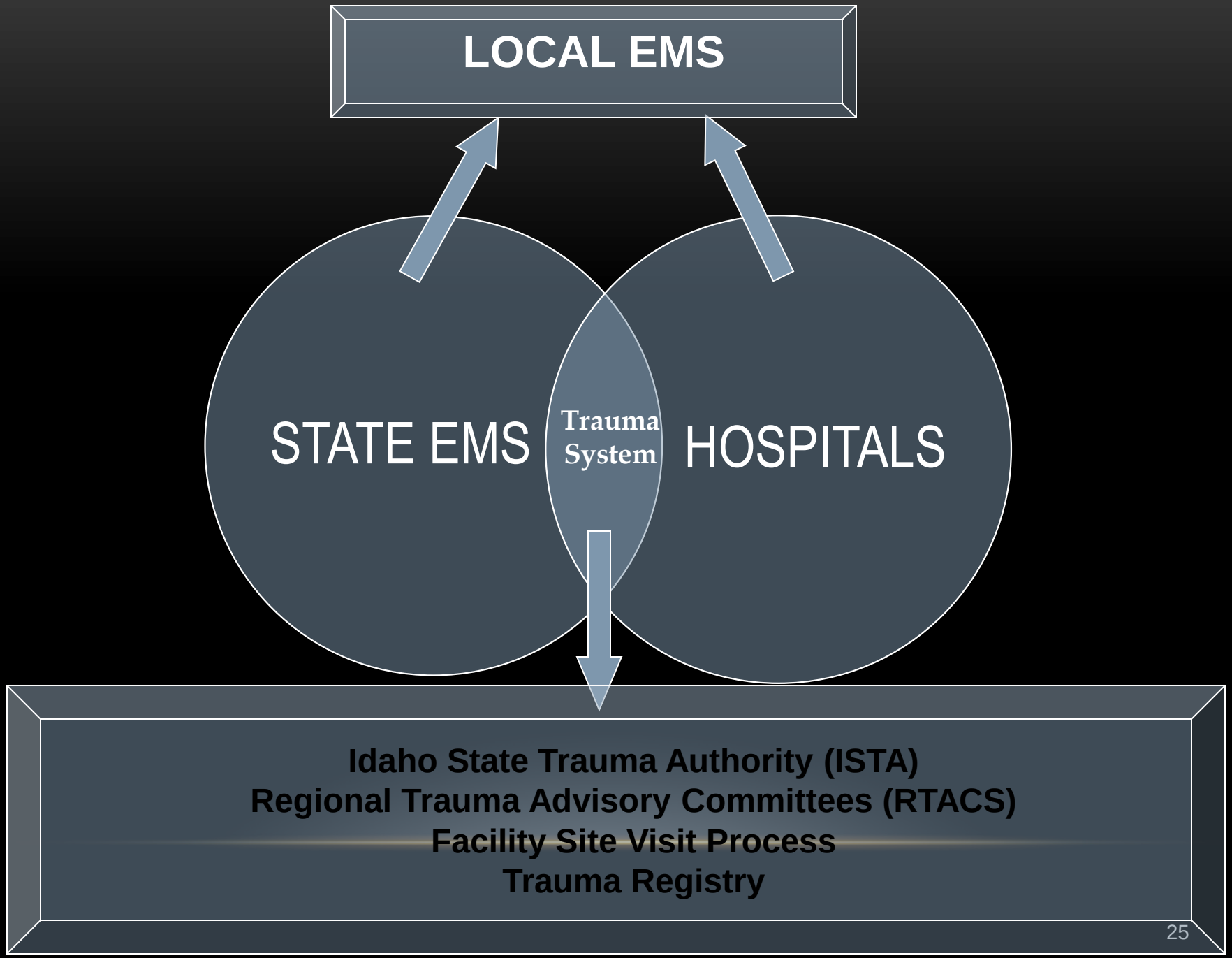
- Montana
  - Montana began their trauma system in 2006
    - Initial funding from grants
  - 39 facilities are currently designated
    - Number is increasing yearly
  - Main function of the trauma system is to provide a mechanism for hospital designation and support of the regional boards
  - Current budget is $157,000/year mainly related to the salary costs
    - General funds

IDAHO TRAUMA SYSTEM GOALS AND OBJECTIVES

- The primary objective of an inclusive trauma care system is to assure efficient, effective, and timely care of injured persons.
- The injured person must receive rapid and appropriate care at the scene from law enforcement and emergency medical services personnel
- Receive rapid, definitive and, appropriate resuscitation, stabilization, and if available, medical/surgical treatment at an appropriate medical facility.
- An inclusive system of care would allow facilities to participate up to their resource capability as defined by the designation level.
    - Providing optimal care for the trauma patient
    - Preventing unnecessary death and disability from trauma and emergency illness
    - Conducting trauma prevention activities to decrease the incidence of trauma
    - Participating in local and regional disaster planning and exercises

IDAHO TRAUMA SYSTEM STRUCTURE

- The Idaho statewide trauma system will be voluntary
- Be governed by the Idaho State Trauma Authority (ISTA) and have 3 Regional Trauma Advisory Committees (RTAC)
  - Northern RTAC
  - Southwestern RTAC
  - Southeastern RTAC.
- Each RTAC will consist of representatives from each of the regions participating medical facilities and their associated EMS agencies.


LOCAL EMS
STATE EMS
Trauma System
HOSPITALS
Idaho State Trauma Authority (ISTA)
Regional Trauma Advisory Committees (RTACS)
Facility Site Visit Process
Trauma Registry

PRE-HOSPITAL

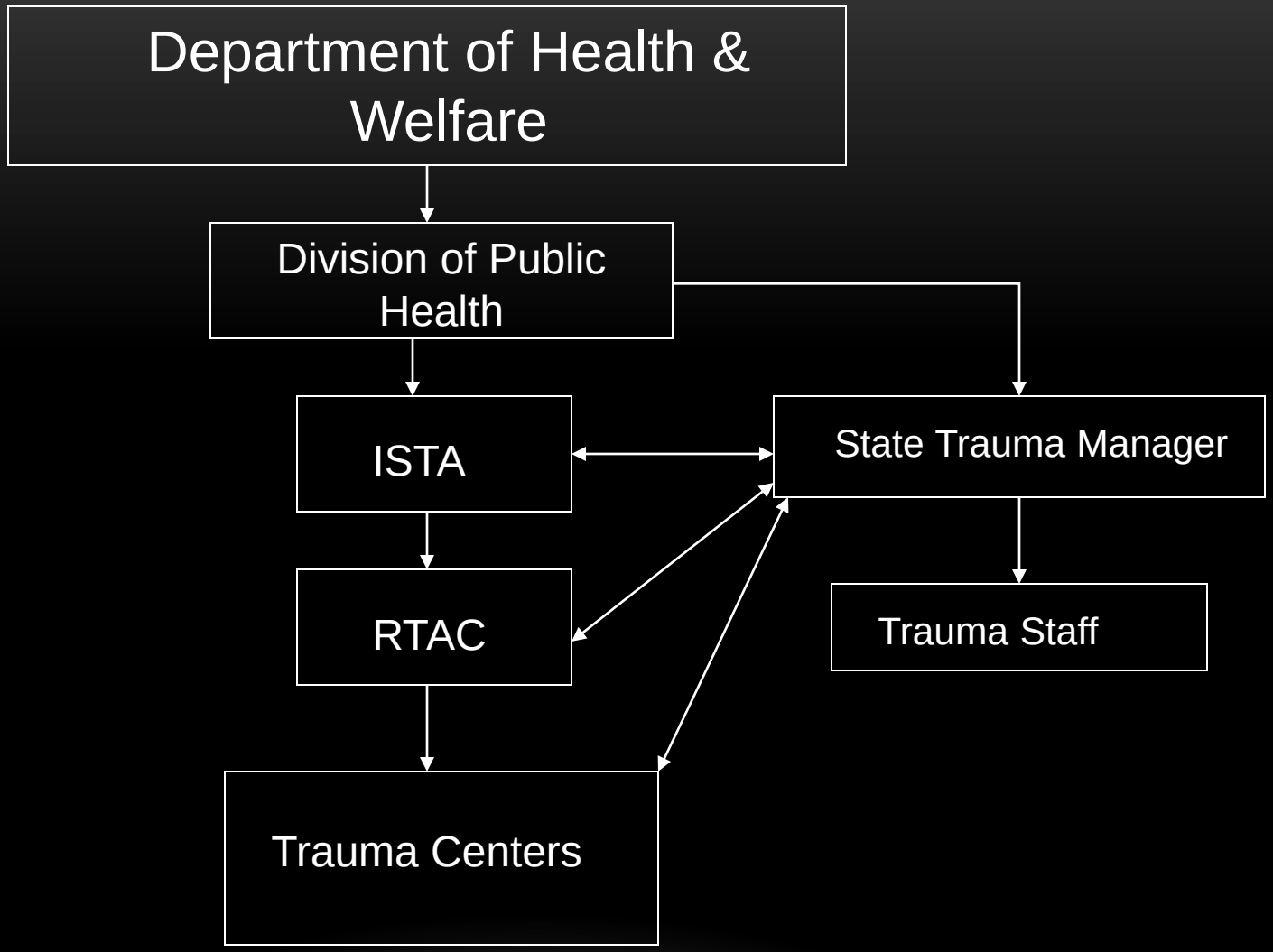
- Characteristics of optimal pre-hospital services include medical control, quality assurance protocols and a quality improvement plan that is based on:
  - Triage protocols to assure right patient - right facility
  - Training in recognition and initial management of traumatic injuries
  - Assure providers have a knowledge of trauma system operation
  - Data collection capabilities
  - Sufficient Telecommunications and on-line medical control

DATA COLLECTION

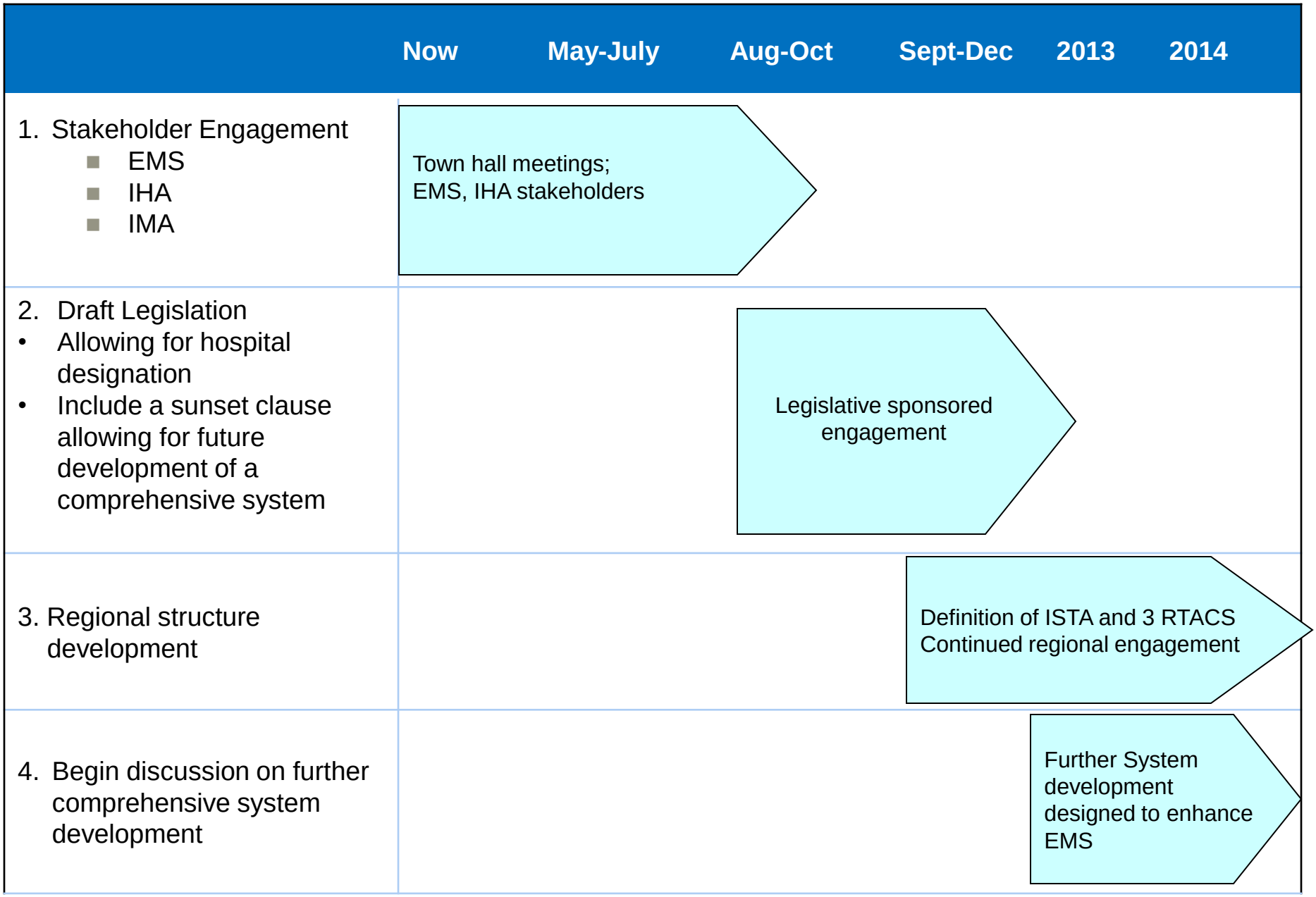
- Conducting data analysis to evaluate system performance
  - pre-hospital
  - in-hospital
- Coordinating data from:
  - public safety
  - emergency medical services
  - medical facility
  - medical examiners
- Determining problems of care at all levels, and making changes in the system

PROPOSED ORGANIZATIONAL STRUCTURE

- Oversight
  - Department of Health
- Staff
  - 1 FTE Program Manager/Nurse Coordinator
  - .5-1.0 FTE or contracted Medical Director
  - 1 FTE Trauma Registry/Data Analyst
  - Administrative support
  - Contracted Survey teams
    - Surgeon/nurse team


Department of Health & Welfare
Division of Public Health
ISTA
State Trauma Manager
RTAC
Trauma Staff
Trauma Centers

Proposed Timeline for Trauma System Implementation



IDAHO TRAUMA SYSTEM

ıa Medical Director
Regional Medical Center
uma Medical Director
egional Medical Center

rn Idaho Medical Center

JUNE 23, 2012

- 31 YO Hispanic male crushed between a front end loader and a manure hauler
- Found after he called his boss on the cell phone
- Apneic and asystolic at the scene-CPR started by first responders
- Taken to a small hospital and resuscitated sufficiently to attain a pulse
- Treated as a cardiac arrest and underwent hypothermia protocols with “ice packs in the axillae and groins”
- Transferred to Level II center as a level 1 trauma
- Coagulopathic and exsanguinated with retro-hepatic vein tear through caudate lobe
- Expired after 30 uts PRBC, 16 uts FFP, 40 uts cryoppt, 4 uts single donor platelets and an exploratory laparotomy-DIC and hypothermia persisted

TRAUMA SYSTEM FOR IDAHO

WHAT?


Brewed in the UK

- Nov 12, 1951-Train carrying surgeons from the ACS Clinical Congress in San Francisco stopped on the tracks due to fog and snow outside Evanston, Wyoming.
- 10 minutes later, a second train slammed into the back of the first with over 100 injured and 19 killed.

- Orthopedist on board started using slats from orange crates in the dining car to set fractures based on a lecture he had heard at the ACS meeting on orthopedic stabilization in trauma patients.

PUBLIC HEALTH ISSUE TRAUMA

- Epidemiology Cont.
  - Over 70% of trauma patients have been diagnosed as having post-traumatic stress disorder with a resulting significant decrease in the quality of life (Kiely, Brasel, Weidner, Guse, & Weigelt, 2006; Jackson et. al., 2007)
  - Rural residents are 50% more likely to die from trauma than their urban peers (Gonzalez, Cummings, 2006)
  - Trauma is the leading cause of lost years of life and lost productivity
    - Trauma is a disease of young, healthy productive members of society
    - Estimates are as high as 500 lost years of life per 100,000 population (Celso, Tepas, Lottenberg, 2006)
  - By 2020 it is estimated more than 1 in 10 people will die from trauma globally
  - Trauma is a disease
    - Host (the patient)
    - Vector of transmission (mechanism of injury)
- Despite the costs and preventive nature of this disease less than 4 cents on the dollar are spent on trauma research

IDAHO TRAUMA SYSTEM VISION AND MISSION

- *A statewide trauma system will:*
  - *improve cost effectiveness of trauma care delivery*
  - *reduce the incidence of inappropriate or inadequate trauma care*
  - *prevent unnecessary suffering*
  - *reduce the personal and societal burden resulting from trauma.*
  - *The system will also provide an additional framework for the state disaster preparedness and response plan by allowing for coordination of healthcare resources.*

IDAHO TRAUMA SYSTEM POSITION STATEMENT

- It is essential that an inclusive trauma system be designed to allow it to:
  - care for all injured patients
  - to provide a continuum of services including:
    - Prevention
    - pre-hospital care
    - definitive care
    - rehabilitation.
- A trauma care system that ensures a coordinated approach to the swift identification of injury victims and transport to optimal care is critical to the reduction of preventable deaths and associated losses.

IDAHO STATE TRAUMA AUTHORITY (ISTA)

- The ISTA, to be established by statute, will be broad-based and responsible for:
  - The adoption and implementation of the trauma care plan
  - Serve in an advisory capacity to the Idaho State Trauma/EMS System.
- **Trauma Care Plan**
  - The ISTA's Trauma Care Plan will:
    - Define an appropriate role for each participating hospital
    - Specify capabilities and resources of hospitals on a regional level
    - Designate and assist with training for all pre-hospital and in-hospital personnel
    - Contain a quality assurance/quality improvement component to:
      - ensure patients receive optimal treatment based on available resources
      - integrate training with quality assurance/quality improvement findings

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Episode 364

INPATIENT CARE

- ISTA will facilitate the improved care of trauma patients in all hospitals by:
  - Establishing, through self-assessment and on-site evaluation, the capabilities of each hospital to manage the various types of trauma patients
  - Participate in developing regional plans for trauma patients
  - Establish appropriate referral mechanisms and procedures for each hospital
  - Enhancing each hospital's capabilities to manage the trauma patient consistent with the trauma care plan
  - Documenting uncompensated trauma care
  - Training and educating physicians and nurses
  - Providing technical assistance to help hospitals improve their trauma care
  - Encouraging injury prevention programs
  - Improving telecommunications and on-line medical control

DATA COLLECTION

- Collecting data on trauma cases meeting Idaho Trauma Registry inclusion criteria as required in Idaho Code §57-2001 through §57-2007
- Identifying areas for improving the delivery of trauma care through quality assurance/quality improvement activities
  - trauma registry data
  - patient outcome data
- Adhering to the established trauma registry standards

TRAUMA SYSTEM LEGISLATION

- The newly created Idaho State Trauma Authority, a Division of Public Health, in conjunction with Idaho Emergency Medical Services, will be designated as the lead agency to plan, develop, and implement a state-wide trauma system and will promulgate rules that include:
  - The process for trauma center designation and classification
  - Standards for:
    - data collection
    - triage criteria
    - quality assurance/improvement activities
  - Provisions to ensure data confidentiality and protection from discovery
  - Legal protection of the quality assurance/quality improvement process per Idaho Code §57-2006 and 2007

PROJECTED COSTS SIMILAR TO MONTANA'S TRAUMA SYSTEM

- **Personnel**
  - Medical Director
    - $50-100K, depending on hours
    - Could also be a volunteer role held by current Trauma Medical Directors or the Chairman of the ACSCOT on a 2 year rotational basis
  - Program Manager
    - $80-90K
    - Usually Master's prepared nurse
  - Trauma Registrar/Data Analyst
    - $35K
  - Administrative support
    - 30K, could be part-time

PROJECTED COSTS SIMILAR TO MONTANA'S TRAUMA SYSTEM

- **Operations**
  - Survey team-contracted approx. $3,000 per site (doctor/nurse team)
    - 44K/year based on 1/3 of all Idaho hospitals surveyed yearly
  - Office overhead
- **Travel**
  - $40-$60k per year
- **Potential total yearly budget minimum $350,000/year**
  - Does not include ongoing trauma registry costs

NEXT STEPS

- Endorsement of Stakeholders
  - IHA on line town hall meeting May 1st
  - Series of town hall meetings with EMS agencies-First meeting-Aug 10 in Coeur D'alene, Boise August 16, Idaho Falls August 23
- Legislative Sponsor
  - Needed to draft legislation allowing for the designation of hospitals
  - Need to include a clause allowing for further development of the trauma system including the enhancements of EMS
  - Have spoken with several State Senators and Representatives that are interested in sponsoring the bill-discussed with the Governor last week and he is interested

NEXT STEPS

- Define regional and state structure to be outlined in the legislation
  - ISTA
  - RTACS
- Support EMS with needed enhancements


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