The Facts

- Injury is a major global public health problem
  - Leading cause of death for ages 1-44 years
  - About 6 million deaths, worldwide
  - Leading cause of loss of productivity
  - Enormous economic burden
- Despite the obvious magnitude, there is little public focus
  - Stark contrast with other disease processes
Challenges

- The general public is insensitive to and unaware of the magnitude of the problem
- Millions lack training in basic first aid
- Political authorities have been challenged with their responsibility to provide services
- Medical organizations have failed to educate the public and inform elected officials
- Resource constraints to support systems development
Despite magnitude of the public health burden and numerous high level calls for action, progress in trauma systems development slow
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<th>5-9</th>
<th>10-14</th>
<th>15-24</th>
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Produced By: National Center for Injury Prevention and Control, Centers for Disease Control and Prevention

Data Source: National Center for Health Statistics (NCHS), National Vital Statistics System
2008-2014, United States
Smoothed Age-adjusted Death Rates per 100,000 Population
All Injury, All Intents, All Races, All Ethnicities, Both Sexes, All Ages
Annualized Age-adjusted Rate for United States: 58.16

Reports for All Ages include those of unknown age.
*Rates based on 20 or fewer deaths may be unstable. These rates are suppressed for counties (see legend above); such rates in the title have an asterisk. The standard population for age-adjustment represents the year 2000, all races, both sexes. Rates appearing in this map have been geospatially smoothed.

Produced by: the Statistics, Programming & Economics Branch, National Center for Injury Prevention & Control, CDC
Data Sources: NCES National Vital Statistics System for numbers of deaths; US Census Bureau for population estimates.
2008-2014, California
Death Rates per 100,000 Population
All Injury, All Intents, All Races, All Ethnicities, Both Sexes, All Ages
Annualized Crude Rate for California: 46.05

Reports for All Ages include those of unknown age.
* Rates based on 20 or fewer deaths may be unstable. These rates are suppressed for counties (see legend above); such rates in the title have an asterisk.

Produced by: the Statistics, Programming & Economics Branch, National Center for Injury Prevention & Control, CDC
Data Sources: NCHS National Vital Statistics System for numbers of deaths; US Census Bureau for population estimates.
Orange County Trauma System

- Trauma System established in 1980
- Orange County EMS (OCEMS) lead agency established by California statute
System Resources

- 190,000 + 9-1-1 EMS Responses Annually
- 12 Fire Agencies
- 20 Ground Ambulance Companies (454 ambulances) & 1 Air Ambulance Provider
- 25 Emergency Receiving Centers (ERCs designated by OCEMS)
  - 7 Base Hospitals (On/offline medical control/QI/Education)
  - 4 OC Trauma Centers + Long Beach Memorial
  - 2 Burn Centers
  - 13 Cardiovascular Receiving Centers (STEMI)
  - 9 Stroke Neurology Receiving Centers (SNRCs)
  - 2 Comprehensive Children’s Emergency Receiving Centers
Orange County

3rd most densely populated county in CA
More populous than 21 states
Population: 3,172,532 (est.)
Area… ~ 799 square miles

40 miles of coastline
Home to Mickey Mouse
Shooting location for Gilligan’s Island, The OC, Beaches
Headquarters for many fortune 500 companies
The Model

Inclusive Trauma System
Figure 1. The Inclusive Trauma System

- Fatal injuries
- Injuries resulting in hospitalizations
- Injuries resulting in visits to emergency departments
- Injuries resulting in visits to primary care facilities
- Injuries treated outside the health system, not treated, or not reported

INJURY SEVERITY

Numbers of Patients:
- Minor injuries: Other acute care facilities that are part of trauma system
- Minor and moderate injuries: Level III and IV centers
- Moderate and severe injuries: Level I centers
- Most severe injuries: Level I centers
The Concept of an Inclusive System

- All hospitals will see injured patients
  - Must know who to treat and who to transfer
- Hospital level should be determined by:
  - Resource availability and capability
  - System need
- Guidelines for patient destination should be uniform
The Concept of an Inclusive System

- System oversight necessary
  - Periodic re-evaluation of need
  - Enforcement of regulations
- Robust lead agency engagement necessary
  - Difficult decisions around hospital designation
  - Difficult decisions around triage / EMS destination
Lessons Learned

- Trauma systems are inherently political
- Trauma is not an innate priority for government or the public
- Competing priorities for resources
- Progress requires:
  - Active engagement of the public
  - Active engagement of political leaders
Orange County Trauma System

American College of Surgeons Committee on Trauma
Trauma System Consultation
Advantages and Assets

Injury Epidemiology

- Robust Public Health Services Agency within HCA

Indicators for System Assessment

- All trauma centers participate in TQIP for benchmarking
- EMS participates in NEMSIS

Statutory Authority and Administrative Rules

- County has the authority to designate and provide oversight to trauma system
- County has some policies in place (e.g. policy revision)
Advantages and Assets

System Leadership
- System leaders with significant knowledge and experience – depth
- Strong trauma center engagement

Coalition Building and Community Support
- EMCC- includes broad group of stakeholders
- TPM and IPC groups are reaching out to other stakeholders
- Collaborative Stop the Bleed efforts

Lead Agency and Human Resources within the Lead Agency
- Some allotted FTE (.20)
- Lead agency provides support to RTOC
- Information Systems Chief is an asset
Advantages and Assets

Trauma System Plan
- Elements of a trauma system plan are in place

System Integration
- Good integration between the lead agency and trauma centers

Financing
- There is a funding stream for participating trauma centers

Prevention and Outreach
- Committed group of IPC’s from trauma centers working together with community stakeholders
Advantages and Assets

Emergency Medical Services

- EMS personnel are required to be nationally registered and to attend an accredited training program
- Universal 911 access
- EMS patient care reports are NEMSIS compliant and agencies report to CEMSIS
- Base hospital (BH) oversight model is robust
- County-wide EMS protocols in place
- 800 mega hertz system wide
Advantages and Assets

Definitive Care Facilities

- Good geographic coverage of the county by trauma centers
- Inclusion of Long Beach Trauma Center in neighboring LA County
- High level of collaboration between trauma centers
- CHOC has been elevated to a Level II Pediatric trauma center
- All trauma centers are ACS verified
Advantages and Assets

System Coordination and Patient Flow

- Regional triage protocols based on CDC guidelines
- Few trauma patients transferred out of county
- Orange County supports adjoining county with resources
- Air medical evacuation is well codified
- Established criteria for inter-facility transfer
- Trauma centers accept all patients
- Specialty services available (burns, pediatrics, reimplants)
- Base hospital system
- 911 inter-facility transfers are 100% reviewed
Advantages and Assets

Rehabilitation
- Community resource to assist with underfunded and homeless rehab care

Disaster
- Interaction of trauma centers and preparedness system
- Understanding of vulnerabilities
- Drills based on risks
- Proactive about identifying opportunities for improvement and development of remediation strategies
- Preparedness system integrated into state incident command system
- Capacity to do regional bed tracking (ReddiNet)
Advantages and Assets

System-wide Evaluation & Quality Assurance
- Defined measures for EMS
- RTOC’s subcommittee for data
- TPM’s data review including TQIP reports and own indicators

Trauma MIS
- Unified prehospital PCR
- Collect a large amount of data
- Trauma centers seem willing to share their data, amongst themselves
- Formation of data subcommittee through RTOC and TPM’s
Advantages and Assets

Research
- Independent healthcare regulatory process
- Academic Level 1 conducts robust research to support system development
Challenges and Vulnerabilities

Injury Epidemiology
- Minimal interaction between epidemiology resources and trauma system
- Injury data not used to inform system activities
- No standard epidemiology reports
- Lack of human resource support for preparation and interpretation of data

Indicators for System Assessment
- No system benchmarking tools related to trauma outcomes
Challenges and Vulnerabilities

Statutory Authority and Administrative Rules
- Policies are not reviewed on a scheduled basis
- Lack enforcement capabilities except de-designation
- Policy to support a trauma system is not fully developed

Coalition Building and Community Support
- Limited involvement of external stakeholders (e.g. school system, entertainment industry, transportation, elected officials, rehab, home health, burns)
Challenges and Vulnerabilities

System Leadership

- System leadership responsibilities are largely delegated
- RTOC membership is very exclusive
- Stakeholders group interactions not codified at system level
- System promulgation efforts limited to trauma center level
- Lead agency under resourced to drive system development, and no staff has primary responsibility to the trauma system
- Non-trauma center stakeholders have no voice in the system
- Insufficient trauma system subject matter expertise within HCA
- Lead agency focused on EMS and other conditions (e.g. stroke)
Challenges and Vulnerabilities

Lead Agency and Human Resources within the Lead Agency

- Under resourced
- No staff dedicated to the trauma system
- Lead agency lacks ability to lead system in development and collaboration
- Focused in regulating EMS providers and ERCs
- Lacks Trauma Program Manager, dedicated Trauma Data Analyst

Trauma System Plan

- Do not have an actual strategic, comprehensive Trauma System Plan
- Lack of stakeholder participation
Challenges and Vulnerabilities

System Integration
- Limited or lack of integration between lead agency and other entities including: ERCs, trauma centers, public health, emergency preparedness, behavioral health, and other constituent groups
- Myopic view of trauma system

Financing
- Unclear how trauma system infrastructure is funded
- No stakeholder involvement – checks and balances

Prevention and Outreach
- No consistent system-wide data to inform prevention initiatives
- Minimal involvement in system initiatives with the exception of drowning
Challenges and Vulnerabilities

Emergency Medical Services
- Have not done a workforce assessment
- Do not require trauma education with recertification of providers
- Not required to maintain national registry

Definitive Care Facilities
- Volume concerns
- Exclusive model of trauma care—ERCs not involved in formal system activities
- Absence of data regarding patients treated at ERCs (non trauma centers)
Challenges and Vulnerabilities

System Coordination and Patient Flow
- Under/over triage not evaluated (EMS, IFT)
- Data dearth

Rehabilitation
- Rehab not part of RTOC
- No outcomes data from rehab

Disaster Preparedness
- Lack of oversight of hospital preparedness program (HPP) and trauma system integration efforts
- Minimal non-trauma center engagement in system response
- Limited surge capacity within system
- Limited collaboration with military
Challenges and Vulnerabilities

System-wide Evaluation & Quality Assurance

- No system Performance Improvement (PI) plan
- Lack of:
  - Data to support PI Plan
  - An inclusive system review
  - Ability to define outcomes and cost
  - PI personnel at the county level
Challenges and Vulnerabilities

Trauma Management Information Systems (MIS)
- Don’t use the data to inform system-level decision making
- No system data audit
- No consequence for not submitting Hospital Discharge Dataset
- No way to track patient across the system

Research
- Not using data use agreements to advantage
- Capacity to do research limited by data integrity and access issues
- Untapped potential research partnerships within the community
Trauma Centers are ONE component of the Trauma System
Other Themes

- Non-trauma centers not included in the system
- Not using system data to inform decision making
- Lack of understanding of the continuity of care— from prevention through rehab and repatriation
- Lead agency under-resourced, underfunded and trauma appears to be a low priority
Priority Recommendations
Priority Recommendation

Injury Epidemiology

- Dedicate epidemiologic support to the Trauma System to inform system priorities, benchmark system performance, and develop public policy.
Priority Recommendations

System Leadership

- Develop a shared vision and mission for an inclusive Orange County Trauma System.

- Support inclusion and integration of trauma care elements from prehospital through rehabilitation.

- Prioritize leadership commitment to Trauma System development by the Orange County EMS Agency, focusing upon optimizing operational components, data collection and analysis, and quality assurance functions.

- Refine and expand the organizational structure, functions and expectations for the Regional Trauma Operations Committee with broadened stakeholder engagement to advance system development.
Priority Recommendations

Coalition Building and Community Support

- Identify and engage a more broadly based group of stakeholders for the County Trauma System to include consumers, media and elected officials.

Lead Agency and Human Resources within the Lead Agency

- Dedicate full time equivalent positions within the OC EMS Agency to operationalize, manage, and provide technical assistance to the trauma system. These positions include at a minimum:
  - Trauma Program Manager
  - Trauma Data Analyst
Priority Recommendations

Trauma System Plan
- Develop a Trauma System Plan to identify discrete operational objectives, completion timelines, and accountable stakeholders.

System Integration
- Partner with other areas within HCA to leverage activities involving mental health, social services, and child protection.
Priority Recommendations

Financing
- Dedicate stable and sustainable funding to trauma system planning, oversight, and evaluation.

Prevention and Outreach
- Produce routine injury surveillance reports to inform prevention priorities and evaluate effectiveness of programs.

Definitive Care Facilities
- Establish a clear and transparent process, utilizing data from EMS, trauma centers, and ERCs, to ensure the trauma system meets the needs of all injured patients according to locally accepted standards.
Priority Recommendations

Disaster Preparedness
- Ensure that all acute care facilities, as participants in the inclusive trauma system, have appropriate resources and training to care for the injured patient in the event of a disaster or mass casualty event.

System-wide Evaluation and Quality Assurance
- Develop, implement, and monitor a trauma system performance improvement plan.
Priority Recommendations

Trauma Management Information Systems (MIS)

- Validate the quality of registry data and implement solutions for improvement.
- Mandate submission of a minimal data set to the trauma registry for all hospitals caring for injured patients.
Observations

- This is a process of maturation; from centers to **SYSTEM**.
- This is a consultative process.
  - The recommendations offered are based on broad general principles and experiences in other regions.
  - Solutions will be unique and specific to Orange County.
- Progress will require negotiation, commitment, and collaboration from **all** stakeholders and the lead agency.
- The solutions will be created by **YOU**.
- Do not be held back by dogma or *perceived* barriers.
ACS Review Team Orange County 2019

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Thank You!!