ACS EXIT PRESENTATION

Orange County, California Trauma System Consultation

July 18, 2019

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The Facts

- Injury is a <u>*major*</u> 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

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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

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Deaths per year (millions)

Injury — HIV/AIDS, TB and Malaria

Source: WHO Global Health Estimates, 2014

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

NATIONAL ACADEMY OF SCIENCES   NATIONAL RESEARCH COUNCIL
Washington, D. C., September, 1966

50 Years

Despite magnitude of the public health burden and numerous high level calls for action, progress in trauma systems development slow

A NATIONAL TRAUMA CARE SYSTEM

Integrating Military and Civilian Trauma Systems to Achieve ZERO Preventable DEATHS After Injury

The National Academies of
SCIENCES · ENGINEERING · MEDICINE

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10 Leading Causes of Death, United States
2017, All Races, Both Sexes

Rank	<1	1-4	5-9	10-14	15-24	25-34	35-44	45-54	55-64	65+	All Ages
1	Congenital Anomalies 4,580	Unintentional Injury 1,267	Unintentional Injury 718	Unintentional Injury 860	Unintentional Injury 13,441	Unintentional Injury 25,669	Unintentional Injury 22,828	Malignant Neoplasms 39,266	Malignant Neoplasms 114,810	Heart Disease 519,052	Heart Disease 647,457
2	Short Gestation 3,749	Anomalies 424	Neoplasms 418	Suicide 517	Suicide 6,252	Suicide 7,948	Neoplasms 10,900	Heart Disease 32,658	Heart Disease 80,102	Malignant Neoplasms 427,896	Malignant Neoplasms 599,108
3	Maternal Pregnancy Comp. 1,432	Malignant Neoplasms 325	Congenital Anomalies 188	Malignant Neoplasms 437	Homicide 4,905	Homicide 5,488	Heart Disease 10,401	Unintentional Injury 24,461	Unintentional Injury 23,408	Chronic Low. Respiratory Disease 136,139	Unintentional Injury 169,936
4	SIDS 1,363	Homicide 303	Homicide 154	Congenital Anomalies 191	Malignant Neoplasms 1,374	Heart Disease 3,681	Suicide 7,335	Suicide 8,561	Chronic Low. Respiratory Disease 18,667	Cerebro-vascular 125,653	Chronic Low. Respiratory Disease 160,201
5	Unintentional Injury 1,317	Heart Disease 127	Heart Disease 75	Homicide 178	Heart Disease 913	Malignant Neoplasms 3,616	Homicide 3,351	Liver Disease 8,312	Diabetes Mellitus 14,904	Alzheimer's Disease 120,107	Cerebro-vascular 146,383
6	Placenta Cord Membranes 843	Influenza & Pneumonia 104	Influenza & Pneumonia 62	Heart Disease 104	Congenital Anomalies 355	Liver Disease 918	Liver Disease 3,000	Diabetes Mellitus 6,409	Liver Disease 13,737	Diabetes Mellitus 59,020	Alzheimer's Disease 121,404
7	Bacterial Sepsis 592	Cerebro-vascular 66	Chronic Low. Respiratory Disease 59	Chronic Low. Respiratory Disease 75	Diabetes Mellitus 248	Diabetes Mellitus 823	Diabetes Mellitus 2,118	Cerebro-vascular 5,198	Cerebro-vascular 12,708	Unintentional Injury 55,951	Diabetes Mellitus 83,564
8	Circulatory System Disease 449	Septicemia 48	Cerebro-vascular 41	Cerebro-vascular 56	Influenza & Pneumonia 190	Cerebro-vascular 593	Cerebro-vascular 1,811	Chronic Low. Respiratory Disease 3,975	Suicide 7,982	Influenza & Pneumonia 46,862	Influenza & Pneumonia 55,672
9	Respiratory Distress 440	Benign Neoplasms 44	Septicemia 33	Influenza & Pneumonia 51	Chronic Low. Respiratory Disease 188	HIV 513	Septicemia 854	Septicemia 2,441	Septicemia 5,838	Nephritis 41,670	Nephritis 50,633
10	Neonatal Hemorrhage 379	Perinatal Period 42	Benign Neoplasms 31	Benign Neoplasms 31	Complicated Pregnancy 168	Complicated Pregnancy 512	HIV 831	Homicide 2,275	Nephritis 5,671	Parkinson's Disease 31,177	Suicide 47,173

WISQARS™ 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
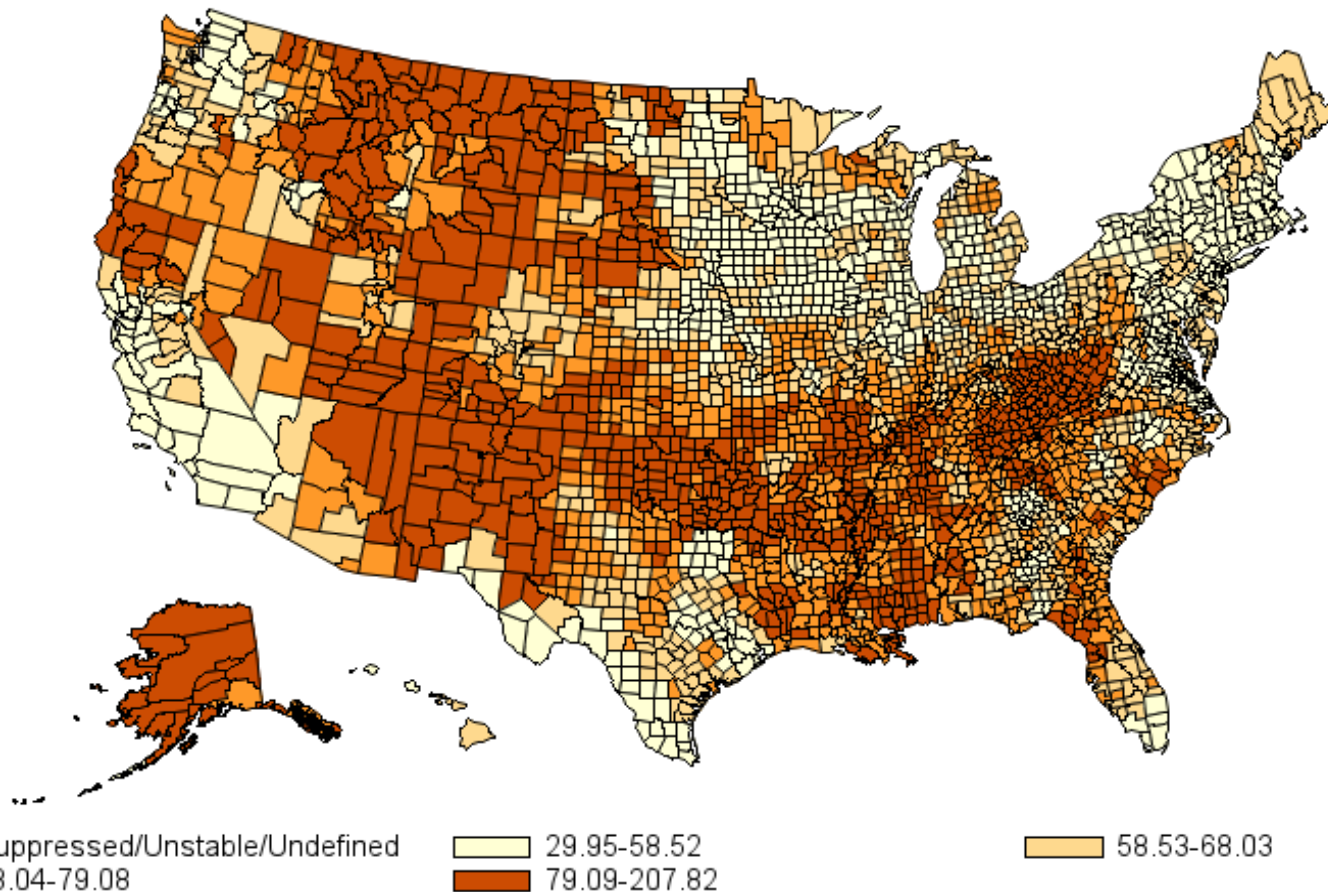
Legend:
- Suppressed/Unstable/Undefined
- 29.95-58.52
- 58.53-68.03
- 68.04-79.08
- 79.09-207.82

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.
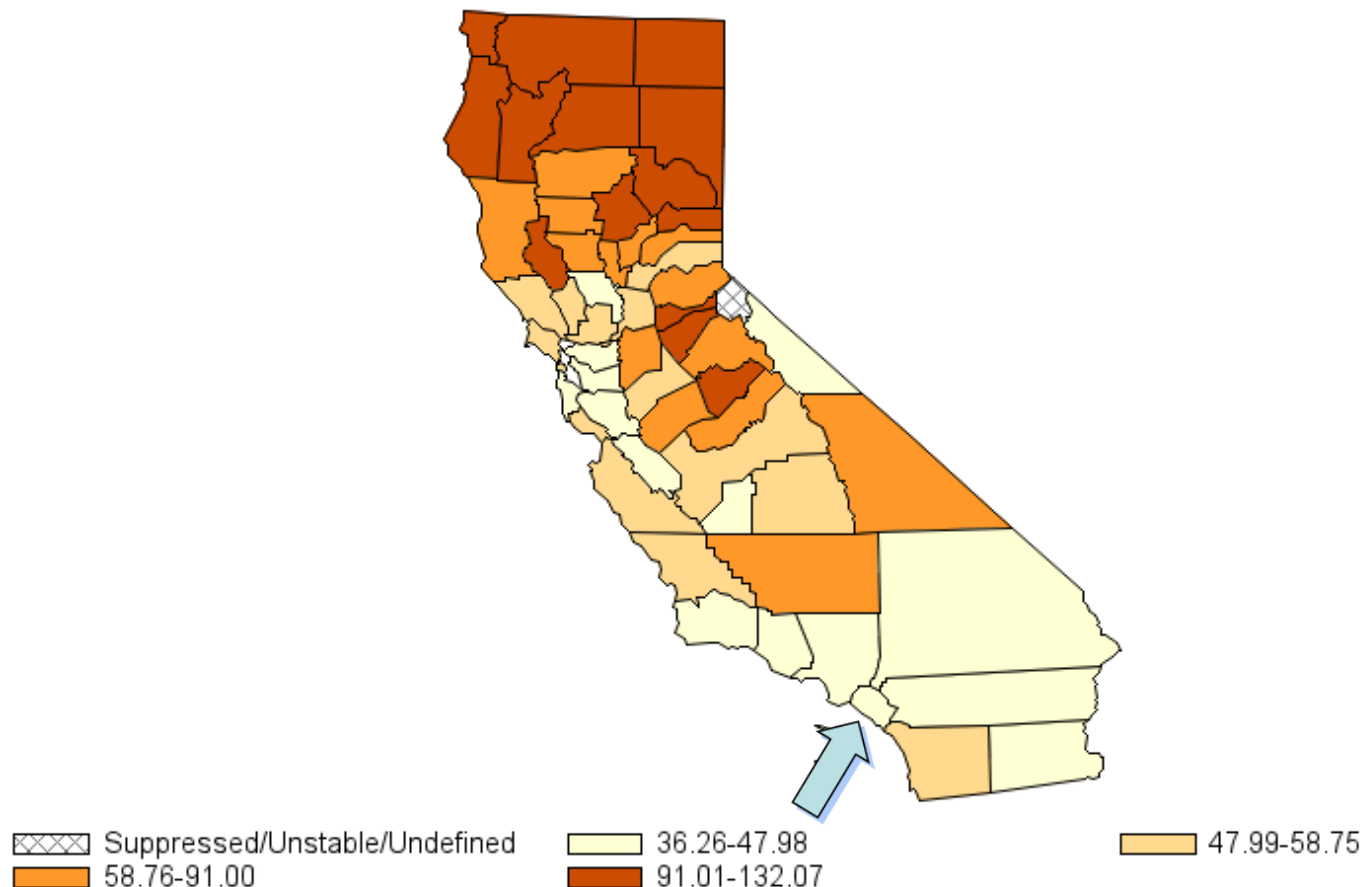The standard population for age-adjustment represents the year 2000, all races, both sexes.
Rates appearing in this map have been geospatially smoothed.

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

Legend:
- Suppressed/Unstable/Undefined
- 36.26-47.98
- 47.99-58.75
- 58.76-91.00
- 91.01-132.07

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.

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
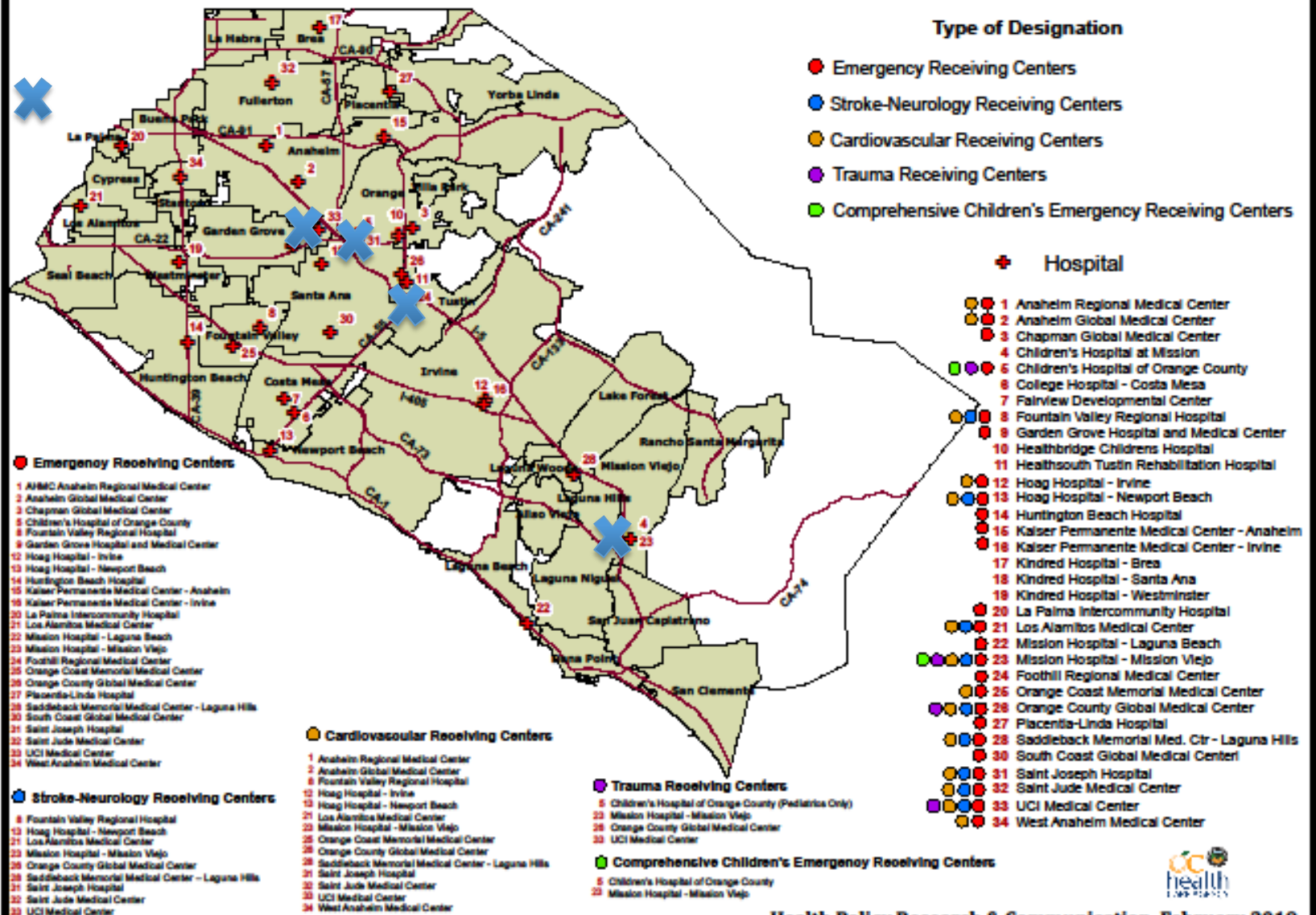
AMERICAN COLLEGE OF SURGEONS
Inspiring Quality:
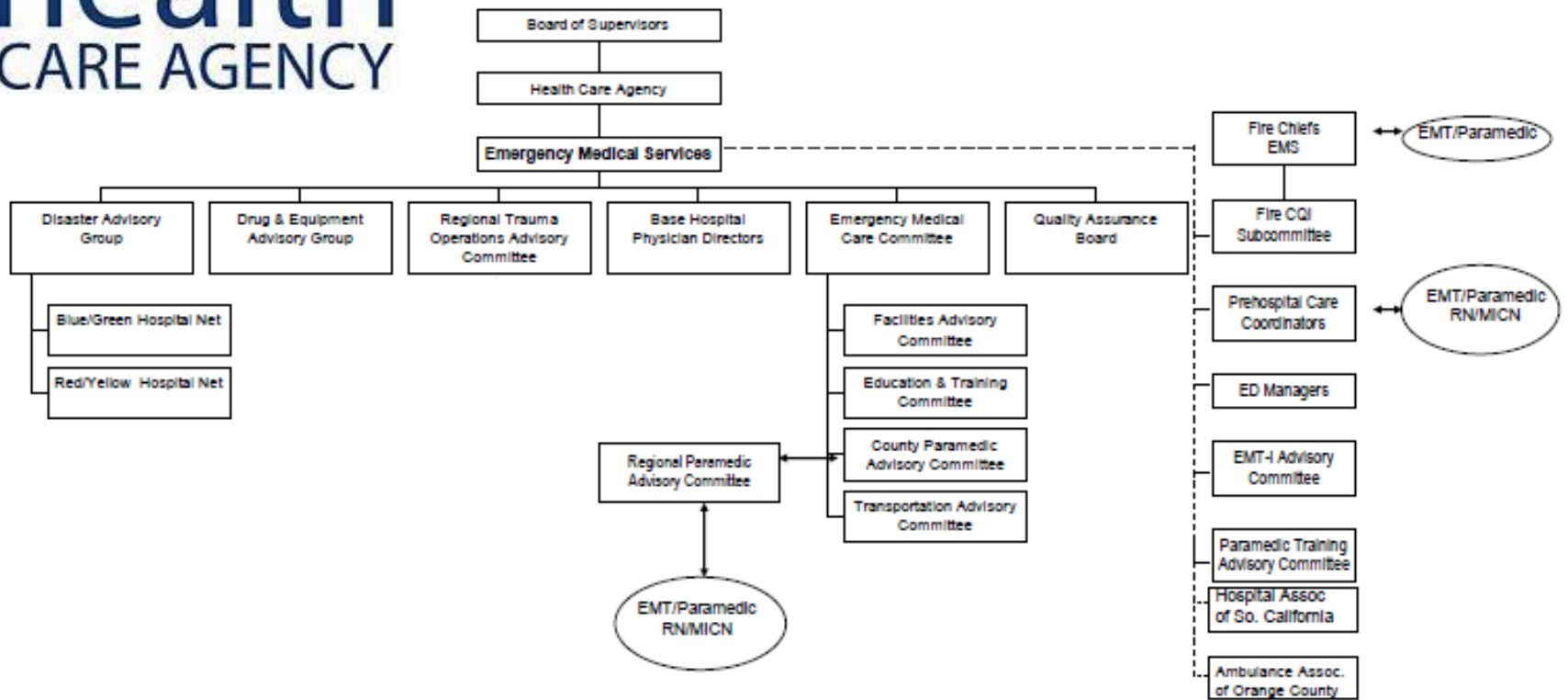Highest Standards, Better Outcomes

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Acute Care Hospitals by Type of Designation
Orange County, California

Type of Designation

- 🔴 Emergency Receiving Centers
- 🔵 Stroke-Neurology Receiving Centers
- 🟠 Cardiovascular Receiving Centers
- 🟣 Trauma Receiving Centers
- 🟢 Comprehensive Children's Emergency Receiving Centers

✚ Hospital

#	Hospital
1	Anaheim Regional Medical Center
2	Anaheim Global Medical Center
3	Chapman Global Medical Center
4	Children's Hospital at Mission
5	Children's Hospital of Orange County
6	College Hospital - Costa Mesa
7	Fairview Developmental Center
8	Fountain Valley Regional Hospital
9	Garden Grove Hospital and Medical Center
10	Healthbridge Childrens Hospital
11	Healthsouth Tustin Rehabilitation Hospital
12	Hoag Hospital - Irvine
13	Hoag Hospital - Newport Beach
14	Huntington Beach Hospital
15	Kaiser Permanente Medical Center - Anaheim
16	Kaiser Permanente Medical Center - Irvine
17	Kindred Hospital - Brea
18	Kindred Hospital - Santa Ana
19	Kindred Hospital - Westminster
20	La Palma Intercommunity Hospital
21	Los Alamitos Medical Center
22	Mission Hospital - Laguna Beach
23	Mission Hospital - Mission Viejo
24	Foothill Regional Medical Center
25	Orange Coast Memorial Medical Center
26	Orange County Global Medical Center
27	Placentia-Linda Hospital
28	Saddleback Memorial Med. Ctr - Laguna Hills
30	South Coast Global Medical Center
31	Saint Joseph Hospital
32	Saint Jude Medical Center
33	UCI Medical Center
34	West Anaheim Medical Center

🔴 Emergency Receiving Centers

1. AHMC Anaheim Regional Medical Center
2. Anaheim Global Medical Center
3. Chapman Global Medical Center
4. Children's Hospital of Orange County
8. Fountain Valley Regional Hospital
9. Garden Grove Hospital and Medical Center
12. Hoag Hospital - Irvine
13. Hoag Hospital - Newport Beach
14. Huntington Beach Hospital
15. Kaiser Permanente Medical Center – Anaheim
16. Kaiser Permanente Medical Center - Irvine
20. La Palma Intercommunity Hospital
21. Los Alamitos Medical Center
22. Mission Hospital - Laguna Beach
23. Mission Hospital - Mission Viejo
24. Foothill Regional Medical Center
25. Orange Coast Memorial Medical Center
26. Orange County Global Medical Center
27. Placentia-Linda Hospital
28. Saddleback Memorial Medical Center - Laguna Hills
30. South Coast Global Medical Center
31. Saint Joseph Hospital
32. Saint Jude Medical Center
33. UCI Medical Center
34. West Anaheim Medical Center

🔵 Stroke-Neurology Receiving Centers

8. Fountain Valley Regional Hospital
13. Hoag Hospital - Newport Beach
21. Los Alamitos Medical Center
23. Mission Hospital - Mission Viejo
26. Orange County Global Medical Center
28. Saddleback Memorial Medical Center – Laguna Hills
31. Saint Joseph Hospital
32. Saint Jude Medical Center
33. UCI Medical Center

🟠 Cardiovascular Receiving Centers

1. Anaheim Regional Medical Center
2. Anaheim Global Medical Center
8. Fountain Valley Regional Hospital
12. Hoag Hospital - Irvine
13. Hoag Hospital - Newport Beach
21. Los Alamitos Medical Center
23. Mission Hospital - Mission Viejo
25. Orange Coast Memorial Medical Center
26. Orange County Global Medical Center
28. Saddleback Memorial Medical Center - Laguna Hills
31. Saint Joseph Hospital
32. Saint Jude Medical Center
33. UCI Medical Center
34. West Anaheim Medical Center

🟣 Trauma Receiving Centers

5. Children's Hospital of Orange County (Pediatrics Only)
23. Mission Hospital - Mission Viejo
26. Orange County Global Medical Center
33. UCI Medical Center

🟢 Comprehensive Children's Emergency Receiving Centers

5. Children's Hospital of Orange County
23. Mission Hospital - Mission Viejo

Health Policy Research & Communication, February 2019

EMS SYSTEM INFORMATION FLOW CHART

Board of Supervisors

Health Care Agency

Emergency Medical Services

Fire Chiefs EMS — EMT/Paramedic

Fire CQI Subcommittee

- Disaster Advisory Group
- Drug & Equipment Advisory Group
- Regional Trauma Operations Advisory Committee
- Base Hospital Physician Directors
- Emergency Medical Care Committee
- Quality Assurance Board

Blue/Green Hospital Net

Red/Yellow Hospital Net

Facilities Advisory Committee

Education & Training Committee

County Paramedic Advisory Committee

Transportation Advisory Committee

Regional Paramedic Advisory Committee

EMT/Paramedic RN/MICN

Prehospital Care Coordinators — EMT/Paramedic RN/MICN

ED Managers

EMT-I Advisory Committee

Paramedic Training Advisory Committee

Hospital Assoc of So. California

Ambulance Assoc. of Orange County

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

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Figure 1. The Inclusive Trauma System
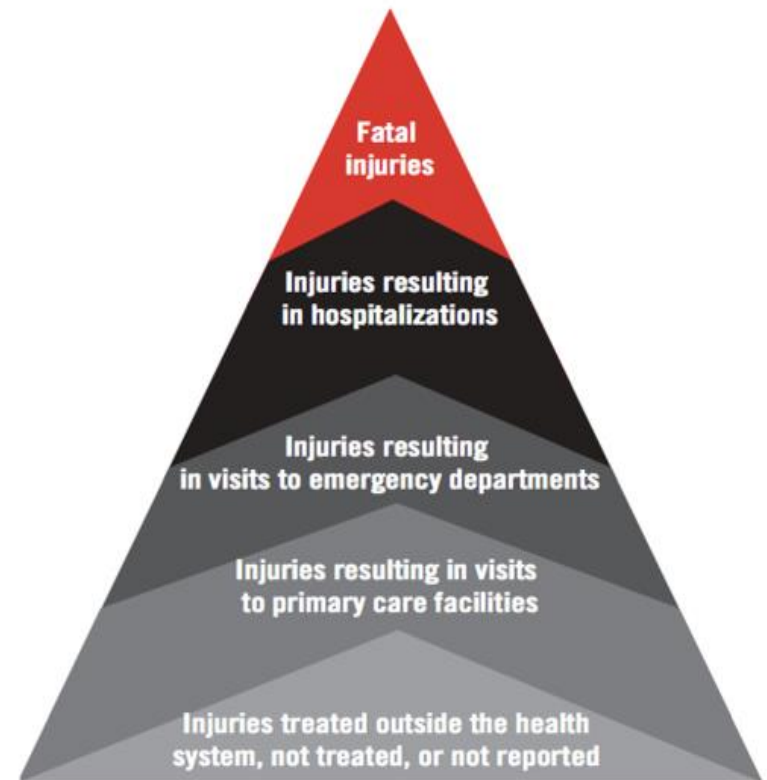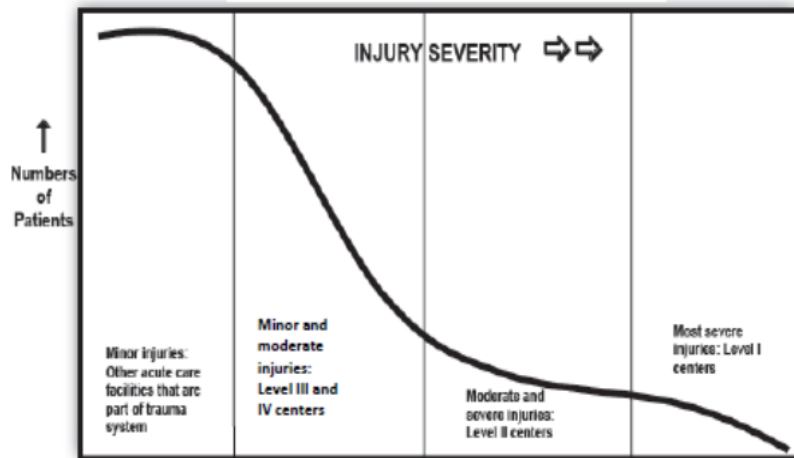
The Concept of an Inclusive System

- 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

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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

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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

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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

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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

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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

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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

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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, peds, 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)

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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

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Advantages and Assets

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

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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

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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

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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

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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)

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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

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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

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Major Theme

FIGURE 4. Core Functions, Essential Services, and Trauma System Benchmarks
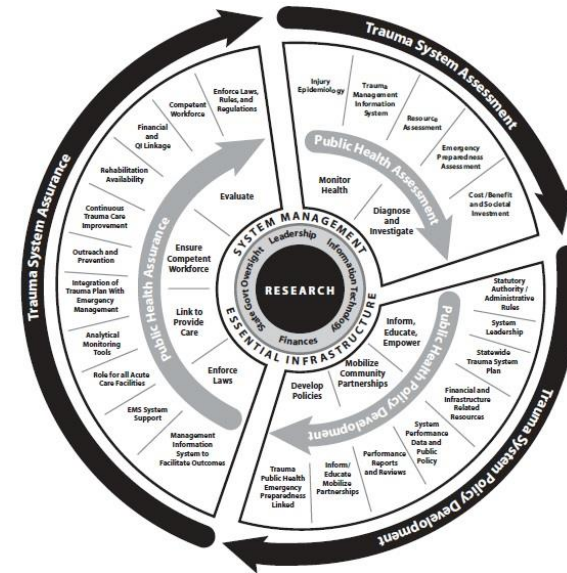
Trauma Centers are ONE component of the Trauma System

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

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Priority Recommendations

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Priority Recommendation

Injury Epidemiology

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

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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.

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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

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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.

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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.

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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.

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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.

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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.

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ACS Review Team Orange County 2019

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Thank You!!

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