COUNTY OF SAN DIEGO
TRAUMA SYSTEM

Thirty plus years of MAC..........and still going strong!

Candy Schoenheit, RN, BSN, PHN, MICN
QA Specialist/Trauma/EMSC System Coordinator
No conflicts and nothing to disclaim
Welcome to San Diego County, the 2\textsuperscript{nd} most populous county in California and 5th most populous in the United States!

**FUN FACTS:**

- 3.3 million residents.
- Majority minority population.
- Busiest land border crossing in the world – 1 of every 13 people who enter US come through San Ysidro.
- 70 miles of Coastline.
- 16 naval and military installations.
- 18 federally recognized Indian reservations.
- A total area of 4,526 square miles, larger than Rhode Island and Delaware combined.
Feasibility study completed in 1982

- MTV Definition
  - Prolonged unconsciousness following injury (>5 MIN)
  - Severe multiple systems injury, including burn victims with involvement of 15-20% BSA under 16 y.o., or involvement of >30-40% BSA over 16 y.o. and/or
  - Unstable vital signs/shock accompanying trauma.

On June 5, 1984, the San Diego County Board of Supervisors approved agreements with six local hospitals to create the San Diego County Trauma System as a public/private partnership.

August 1, 1984 the first trauma patient arrived at a trauma center.
3- Level I Trauma Centers
- University of California San Diego Medical Center
- Scripps Mercy Hospital
- Rady Children’s Hospital

3- Level II Trauma Centers
- Scripps Memorial Hospital
- Sharp Memorial Hospital
- Palomar Medical Center
Trauma Center Designation:
CoSD Board of Supervisors

Contracts with CoSD:
Administered by EMS

Contract Compliance Review:
Triennial surveys by the American College of Surgeons, Committee on Trauma (ACS, COT) AND CoSD EMS
TRAUMA PATIENTS VS. GENERAL POPULATION

Source: County of San Diego, Health and Human Services Agency, Emergency Medical Services, Trauma Registry, 1984 - 2016
MODE OF ARRIVAL

- Ambulance: 80.0%
- Inter-facility Transfer: 12.9%
- Intra-facility Transfer: 0.3%
- Non-Trauma Service: 0.1%
- Walk In: 6.7%

Source: County of San Diego HHSA, Emergency Medical Services, Trauma Registry 2015
BLUNT VS PENETRATING

Source: County of San Diego HHSA, Emergency Medical Services, Trauma Registry 2015
ISS SCORES

San Diego County Trauma Volume by ISS Category, 2016

- Less than 9: 7,647 (63%)
- 9 - 14: 3,196 (26%)
- 15 - 24: 991 (8%)
- 25 and Above: 670 (5%)

Source: County of San Diego HHSA, Emergency Medical Services, Trauma Registry 2016
San Diego County Trauma Patient Mortality Rates, 1982 - 2015

1982: Year Prior to Development of the Trauma System
26.4%

1984: First Year of the New Trauma System
8.2%

2015: National Trauma Mortality Rate = 4.3%
2.5%

Sources: Shackford et al. *The Effect of Regionalization upon the Quality of Trauma Care as Assessed by Concurrent Audit before and after Institution of a Trauma System: A Preliminary Report*. County of San Diego, HHSA, EMS, Trauma Registry, 1990 – 2015. National Trauma Data Bank, 2015 Annual Report.
Trauma Center Volume by Year, 2010 - 2016

- Mercy
- Palomar
- La Jolla
- Sharp
- UCSD
- Rady
SAN DIEGO TRAUMA SYSTEM

PERFORMANCE IMPROVEMENT
County of San Diego
Trauma Medical Audit Committee
Better known as “MAC”
San Diego County Trauma Centers participate in a **Monthly** Medical Audit Committee

**Chair**-Dr. Raul Coimbra, Trauma Medical Director, UCSD  
**Vice Chair**-Melanie Gawlik, RN, Trauma Program Manager, Scripps Memorial  

**Members include:**  
**County EMS Medical Director**-Dr. Kristi Koenig  
**County Medical Examiner**-Dr. Robert Stabley**  
**EMS QA Specialist**-Candy Schoenheit, RN  
**EMS Trauma Epidemiologist**-Dr. Joshua Smith  

**Trauma Medical Directors/Trauma Program Managers from each Trauma Center:**  
**UCSD**-Dr. Raul Coimbra/Pat Stout, RN  
**Scripps Mercy**-Dr. Vishal Bansal/Tony Chiatello, RN  
**Sharp**-Dr. Diane Wintz/Kathi Ayers, RN  
**Scripps Memorial**-Dr. Imad Dandan/Melanie Gawlik, RN  
**Palomar Medical Center**-Dr. John Steele/Melinda Case, RN  
**Rady Children’s**-Dr. Mary Hilfiker/Renee Douglas, RN  

**Neurosurgeon Representative**-Dr. Hal Meltzer  
**Anesthesiologist Representative**-Dr. Kris Bjornson  
**Orthopedic Surgeon**-Dr. Jeffery Smith  
**Non Trauma Center Representative**-Dr. Jessica Deree, Kaiser  
**Base Hospital Physician representing Prehospital Audit Committee**-Dr. Saul Levine
BIG MAC
OR
MAC ATTACK
The San Diego Model:

Collaboration and Cooperation is essential for successful System PI

- Prevention
  - Injury Prevention
  - Advocacy
  - Medical Education

- Intervention
  - Prehospital Integration
  - Triage Protocols
  - Trauma Protocols

- Quality Assurance
  - MAC Case Review
  - Education
  - Research
San Diego County Trauma System Data Dictionary is updated every year!!!

Over 100 SD specific audit filters
OLD

- Notebook submission
- Driving exchange
- Drive to pick up

NEW

- Every Case is reviewed by a TMD from another facility
- Case presented at MAC
- Adjudication happens at MAC
Each Trauma Medical Director rotates every other month for case review
COMPLETED CASES

• Cases that have been closed.
• Dictations if required are complete.
• Autopsy results are reviewed.
• The case has been through the Trauma Center PI process
  ➢ Trauma M&M
  ➢ Specialty M&M
Reviewer receives cases via Watchdox:
Pre-Mac summary of every case
  • De-indentified
  • Pre-selected fields from registry including all audit filters

Dictation if indicated

Autopsy if indicated
Cases chosen by the reviewer to be presented at MAC receive an Adjudication
Cases that receive an additional or different adjudication are taken back through the Trauma Center PI (M&M, physician consultation...)

MAC BACK
MORE ON MAC

➢ Case Review- California Evidence Code Section - 1157 PROTECTION

➢ Trauma Dashboard- trending

➢ Annual Medical Examiner Report

➢ Annual Trauma Report

➢ Performance Improvement Projects ie. Falls

➢ Annual Trauma Center Administrators Meeting
## COSD Trauma Center Dashboard

<table>
<thead>
<tr>
<th>Trauma Volume &amp; Utilization</th>
<th>Definition</th>
<th>SD County Benchmark</th>
<th>Trend</th>
</tr>
</thead>
<tbody>
<tr>
<td>Month is Complete</td>
<td>&quot;X&quot; designates the month as &quot;mostly&quot; complete</td>
<td></td>
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<tr>
<td>Total patients in the registry</td>
<td></td>
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</tr>
<tr>
<td>Total patients that meet NTDB registry criteria</td>
<td>The number of patients that meet NTDB Trauma Inclusion Criteria</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total Activations</td>
<td>The total number of activations called</td>
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</tr>
<tr>
<td>Full Activations</td>
<td>The total number of Full Activations (Entire Trauma Team)</td>
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<td></td>
</tr>
<tr>
<td>Partial Activations</td>
<td>The total number of Partial Activations (partial team)</td>
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<tr>
<td>Trauma Resource</td>
<td>The Total number of patients transported for trauma resource</td>
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<tr>
<td>Total Admissions</td>
<td>Total number of patients admitted from the resuscitation room</td>
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<td></td>
</tr>
<tr>
<td>Percent Admitted</td>
<td>Percent of total patients who were admitted from the resuscitation room</td>
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<td></td>
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<tr>
<td>Transferred patients into the system</td>
<td>Total number of patients transferred to the Trauma Centers</td>
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</tr>
<tr>
<td>Total Discharges</td>
<td>Total number of patients discharged (excluding deaths)</td>
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<td></td>
</tr>
<tr>
<td>Discharged from ED</td>
<td>Total number of trauma patients discharged without admission</td>
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<td></td>
</tr>
<tr>
<td>% of trauma patients discharged from ED</td>
<td>Total % of trauma patients discharged from ED</td>
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<td></td>
</tr>
<tr>
<td>Average Length of Stay</td>
<td>Average LOS of trauma patient (in days)</td>
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<tr>
<td>Average LOS ICU</td>
<td>Average ICU LOS (in days)</td>
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</table>
MAC SUBCOMMITTEES

- Trauma Program Managers
- Performance Improvement
- Trauma Research Education Foundation (TREF)
  - TREF Injury Prevention
    - My Gray Matters
    - Bike to work-helmets
    - Education for staff nurses
    - Live Well San Diego Partner
## Top Five Trauma Mechanisms by Age Group

<table>
<thead>
<tr>
<th>Age</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
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<tr>
<td>0 - 4</td>
<td>Falls</td>
<td>MV Traffic</td>
<td>Pedestrian</td>
<td>Struck By</td>
<td>Oth Trans</td>
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<td>205</td>
<td>36</td>
<td>26</td>
<td>19</td>
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<tr>
<td>5 - 14</td>
<td>Falls</td>
<td>MV Traffic</td>
<td>Pedestrian</td>
<td>Pedalcycle</td>
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<td>15 - 24</td>
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<td>Struck By</td>
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<td>608</td>
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<td>321</td>
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<td>65 - 74</td>
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<td>75 - 84</td>
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<td>MV Traffic</td>
<td>Pedestrian</td>
<td>Oth Trans</td>
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<td>85+</td>
<td>Falls</td>
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<td>Oth Trans</td>
<td>Pedestrian</td>
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<td>931</td>
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<tr>
<td>Total</td>
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<td>4704</td>
<td>2220</td>
<td>1163</td>
<td>990</td>
<td>638</td>
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</tbody>
</table>
Regional Trauma Coordinating Committees

**Northern California Region**
- North Coast EMS Agency
- NorCal EMS Agency
- Sierra-Sacramento EMS Agency
- Sacramento County EMS Agency
- El Dorado County EMS Agency
- San Joaquin County EMS Agency
- Coastal Valleys EMS Agency
- Marin County EMS Agency

**Central California Region**
- Central California EMS Agency
- Mountain Valley EMS Agency
- Tuolumne County EMS Agency
- Merced County EMS Agency
- Kern County EMS Agency

**Bay Area Region**
- Solano County EMS Agency
- Contra Costa County EMS Agency
- San Francisco County EMS Agency
- San Mateo County EMS Agency
- Alameda County EMS Agency
- Santa Clara County EMS Agency
- Santa Cruz County EMS Agency
- San Benito County EMS Agency
- Monterey County EMS Agency

**Southern Region**
- San Luis Obispo County EMS Agency
- Santa Barbara County EMS Agency
- Ventura County EMS Agency
- Los Angeles County EMS Agency
- Orange County EMS Agency

**South Eastern California Region**
- Inland Counties EMS Agency
- Riverside County EMS Agency
- San Diego County EMS Agency
- Imperial County EMS Agency
Region #5

South Eastern California Region
Inland Counties EMS Agency
Riverside County EMS Agency
San Diego County EMS Agency
Imperial County EMS Agency
PI PROJECTS

• IMAGING FOR NON-TRAUMA CENTERS
• ADULT CERVICAL SPINAL CLEARANCE ALGORITHM FOR NON-TRAUMA CENTERS
System Leadership: San Diego Trauma System is a collaborative effort resulting from a public/private partnership lead by the county.
Coalition Building/Community Support: Collaboration between all trauma centers. TREF is active in many community events. Partnership with Live Well San Diego.
Lead Agency: EMS is empowered by Title 22 to create and monitor county trauma systems. Annual reviews. Combined ACS visits.
Trauma System Plan: Trauma System plan is updated every year and submitted to EMSA. Any changes or needs to the Trauma System are identified in this report.
System Integration: Each trauma center has a relationship with their catchment communities. Non-trauma centers are assigned to Trauma Centers in their catchment area for collaboration. Kaiser is included in MAC.
Financing: LEMSFA fee schedule was evaluated and revised this year. TPM/TMD meet with their Administration on a regular basis.