Trauma Maps & Stroke maps: Population-based system design

Brendan G. Carr, MD MS
Charles C. Branas, PhD
University of Pennsylvania
Philadelphia, USA
Disclosures

Federal research funding (CB & BC)
AHRQ, NICHD, CDC, NINDS, NLM
www.traumamaps.org
www.strokemaps.org

American Trauma Society (CB & BC)

AHA research funding (BC)

National Quality Forum (BC)
RECS Steering Committee

HHS/ASPR Senior Policy Advisor (BC)
Not appearing in this role today
Overview & Goals

• University of Pennsylvania & American Trauma Society
• Burden of disease
• Inventory & mapping of resources
• Geographic access to care
• Optimizing the system
• Website demo

• Please interrupt and give feedback
Smoothed County Stroke Death Rates

Total Population
Ages 35 Years and Older

*Stroke death rates are spatially smoothed to enhance the stability of rates in counties with small populations. See Appendix B for details.
RESOURCES FOR OPTIMAL CARE OF THE INJURED PATIENT 2006

COMMITTEE ON TRAUMA
AMERICAN COLLEGE OF SURGEONS
Regionalization of Care for Acute Ischemic Heart Disease: A Call for Specialized Centers

Recommendation to Develop Strategies to Increase the Number of ST-Segment–Elevation Myocardial Infarction Patients With Timely Access to Primary Percutaneous Coronary Intervention

Regional Systems of Care for Out-of-Hospital Cardiac Arrest: A Policy Statement From the American Heart Association

Recommendations for the Establishment of Stroke Systems of Care: Recommendations From the American Stroke Association's Task Force on the Development of Stroke Systems

Potential Value of Regionalized Intensive Care for Mechanically Ventilated Medical Patients
Injuries in the US - 2009

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Level 1 Trauma Center</td>
<td>12.96</td>
</tr>
<tr>
<td>Level 2 Trauma Center</td>
<td>12.29</td>
</tr>
<tr>
<td>Level 3 Trauma Center</td>
<td>9.63</td>
</tr>
<tr>
<td>Non-trauma Center</td>
<td>65.12</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Severe injury, ISS &gt;15 (percent)</th>
<th>Level 1</th>
<th>Level 2</th>
<th>Level 3</th>
<th>Non-TC</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>3.69</td>
<td>2.29</td>
<td>1.02</td>
<td>0.64</td>
</tr>
</tbody>
</table>
US Trauma and Nontrauma Centers
Driving only
(within 45 mins)
Driving and Flying
(within 45 mins)
Trauma Center – Helicopter Depot Pairs

TC — 60 minutes — HD

TC — 30 mins — HD

www.traumamaps.org

www.strokemaps.org
Driving and Flying

84.1% of population with access to level I/II trauma centers within 60 minutes

Branas, JAMA 2005
US Stroke Center Access

www.traumamaps.org  www.strokemaps.org
Access to Trauma Care Benchmark

Data sources:
• Census Bureau
• Trauma Information Exchange Program
• Atlas & Database of Air Medical Services
So what?

National assessment of geographic access to stroke and trauma centers.
But only of existing resources - i.e. where are stroke and trauma centers located?
What about policy questions like – where could stroke trauma centers be located?
Adding 1 Helipad (60 mins)
Real World Example
(not optimized)
(stroke)
Remaining Questions & Next Steps

Redundancy & Capacity
Inter-facility Transportation
On the fly optimization
Exportable maps and data (excel)

1 emergency care system instead of many
Thanks and please visit us online:

www.traumamaps.org
www.strokeemaps.org