Funding Trauma Centers: Using the Bardach Framework to Develop a Rational Policy

Ellen J. MacKenzie, PhD, MSc
Johns Hopkins University
Overview

- In this lecture, we’ll look at another strategy for reducing the burden of injury and assuring optimal care to those injured
  - Tertiary prevention strategy
    - Doesn’t prevent injury-causing event or injury
    - Response to and treatment of injuries
- Optimal strategy—systems approach to delivering care
Section A

Trauma Centers and Trauma Systems: Some Background
Distribution of Trauma Deaths

- 50% occur at the scene or in transport
- 30% occur within the first few hours
- 20% occur later—within days or weeks

Prevention is key!
What Is a Trauma Center?

- Specialty referral center designed, equipped, and staffed to provide immediate and definitive care to the most seriously injured
- Part of an overall systems approach to care
  - Established criteria for pre-hospital triage and inter-hospital transfer
  - Integration of components to ensure rapid discovery and transport to definitive care within the “golden hour”
Trauma Center vs. Non-trauma Center

- Above and beyond the resources and facilities:
  - 24/7 availability of these resources
  - Team approach—multiple specialties
  - Commitment to trauma care
  - Volume of major trauma cases
  - Research, education, system leadership
How Are Trauma Centers Identified?

- In 36 states with formal systems, TCs are designated by a lead agency.
- In states without formal systems, hospitals can voluntarily seek verification by the American College of Surgeons (ACS).
- Centers are categorized by level of resources available.
Trauma Centers: Level of Care

- Levels I and II provide comprehensive trauma care; level I serves as a regional resource and provides leadership in education, research, and system planning.
- Levels III, IV, and V provide prompt assessment, resuscitation, and stabilization with transfer to Level I or II as needed; serve communities that do not have immediate access to a Level I or II.
Access to Trauma Centers

- 69% of US citizens live within 45 minutes of a trauma center

Disparities in Access by Rurality

Percent of population living within 45 minutes of a trauma center

- Urban: 89%
- Suburban: 73%
- Rural: 8%

Trauma Systems Are Effective

- Two national studies
  - Population-based study examined motor vehicle crash fatality rates before and after implementation of a trauma system in 21 states
  - Cohort study compared case-fatality rates among patients treated in trauma centers versus non-trauma centers
Step 1: The Problem(s)

- Access to trauma centers is not uniform; particularly poor in rural U.S.
- Access does not translate into appropriate use—in states with well-established systems in place, one-third of major trauma patients are not getting to trauma centers
Step 1: The Problem

- Trauma centers are closing or reducing their level of care—across the U.S. and here in Maryland
The Problem—Nationally

- Las Vegas Sun
  - “Malpractice woes may force Nevada trauma center to limit hours as of March 12”

- Orlando Sentinel
  - “Malpractice crisis threatens level I trauma center . . . a distinct possibility that hospital will not have enough on-call physicians to maintain its center”

- Kansas City Star
  - “Mo. system strained by impending closure of St. Joseph’s trauma center . . . it’s going to fill up other hospitals in a domino effect”
The Problem—Nationally

- Between 2002 and 2005
  - 18 level I and II centers closed
  - 14 reduced their level of care to level III or IV
  - 70+ reported their viability was threatened
The Problem in Maryland

- In June of 2002, Washington County in Hagerstown was forced to suspend its trauma program.
- Reopened in October 2002, but downgraded from a level II to a level III.
- Peninsula Regional Medical Center in Salisbury threatened.
- Study panel appointed by Maryland General Assembly to study the problem and make recommendations.
Section B

Assembling the Evidence
Step 2: Assemble the Evidence

- So what
  - What’s the impact?
- Why are they closing?
## The Potential Impact

- Percentage of population living within 45 minutes of any level I/II trauma center

<table>
<thead>
<tr>
<th>Location</th>
<th>With TC</th>
<th>Without TC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maryland—Washington County</td>
<td>90%</td>
<td>86%</td>
</tr>
<tr>
<td>Las Vegas</td>
<td>86%</td>
<td>17%</td>
</tr>
<tr>
<td>Orlando</td>
<td>78%</td>
<td>69%</td>
</tr>
<tr>
<td>Kansas City</td>
<td>65%</td>
<td>65%</td>
</tr>
</tbody>
</table>
The Potential Impact

- Based on a study of trauma center effectiveness . . .
  - For every 100 major trauma patients who are treated at a trauma center versus non-trauma center, we can expect to save 3–4 lives
<table>
<thead>
<tr>
<th>Contributing Factors—News Stories</th>
</tr>
</thead>
<tbody>
<tr>
<td>General lack of funds</td>
</tr>
<tr>
<td>Hospital reimbursement</td>
</tr>
<tr>
<td>High patient volumes</td>
</tr>
<tr>
<td>Physician availability</td>
</tr>
<tr>
<td>— General trauma surgeons</td>
</tr>
<tr>
<td>— Orthopedic surgeons</td>
</tr>
<tr>
<td>— Neurosurgeons</td>
</tr>
</tbody>
</table>
Step 1: Redefining the Problem

- The short- and long-term viability of trauma systems is threatened by waning participation of physicians in taking care of trauma patients
  - Poor lifestyle; workload is increasing
  - Profession is changing—less surgery
  - Trauma surgeons not adequately paid for services
- Each must be addressed to solve the problem
Financial Burden on Physicians

- Identified as most serious problem facing Maryland trauma system
  - Uncompensated care and under-compensated care
  - Lost revenue due to taking trauma calls
  - Rising malpractice premiums (less of a current threat in Maryland)
### Under-compensated and Uncompensated Care

- **Payer mix at Maryland trauma centers**

<table>
<thead>
<tr>
<th>Payer</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Self pay</td>
<td>25%</td>
</tr>
<tr>
<td>Medicaid</td>
<td>10%</td>
</tr>
<tr>
<td>Medicare</td>
<td>10%</td>
</tr>
<tr>
<td>Commercial</td>
<td>50%</td>
</tr>
<tr>
<td>Other*</td>
<td>5%</td>
</tr>
</tbody>
</table>

*Other includes workers’ comp and auto insurance*
Percentage of Physician Cost Paid by Payer

Percentage of Cost Paid by Payer:
- Self pay (20%)
- Medicaid (19%)
- Medicare (10%)
- Blue Shield
- HMO
- Commercial

Note: 100% represents full payment by the payer.

Md. Shock Trauma, 2002
## Underpayment of Trauma Physicians

### Underpayment of trauma physicians—Maryland Shock Trauma FY 2002

<table>
<thead>
<tr>
<th></th>
<th>% Total charges</th>
<th>Est. cost (in 000s)</th>
<th>Actual collections</th>
<th>Deficit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Uninsured</td>
<td>20%</td>
<td>$2,395</td>
<td>$455</td>
<td>$(1,941)</td>
</tr>
<tr>
<td>Medicaid</td>
<td>19%</td>
<td>$2,274</td>
<td>$674</td>
<td>$(1,600)</td>
</tr>
<tr>
<td>Medicare</td>
<td>10%</td>
<td>$1,218</td>
<td>$996</td>
<td>$(222)</td>
</tr>
<tr>
<td>Commercial/HMO</td>
<td>51%</td>
<td>$6,131</td>
<td>$8,580</td>
<td>$2,449</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>100%</strong></td>
<td><strong>$12,018</strong></td>
<td><strong>$10,704</strong></td>
<td><strong>$(1,314)</strong></td>
</tr>
</tbody>
</table>

Physician Reimbursement: Percentage of Cost

Percentage of Cost

FY '99 | FY '00 | FY '01

Md. Shock Trauma, 2002
Lost Revenue Due to Taking Call

- Most physicians in level II and Level III trauma centers have private surgical practices that incur economic losses when they take a trauma call
  - Unable to see regular patients or perform elective surgeries when on call
  - Forced to reschedule or postpone elective cases when trauma cases spill over into regular surgical schedules
Trauma centers forced to subsidize physician income—through on-call stipends—to ensure adequate coverage.

Stipends cost individual trauma centers between $462,000 and $876,000 annually.

Federal law prohibits including provider reimbursement or professional fees in hospital rates, so trauma centers must rely on their operating margins to cover these expenses.
The Problem: A Summary

- Trauma centers are closing
  - Impact access to quality trauma care
- Principal reason
  - Lack of physician coverage
- Physicians less likely to take trauma call because their costs are not adequately covered
- Physician costs are not covered due to
  - Uncompensated care
  - Under-compensated care
  - Lost revenue due to taking call
  - High malpractice premiums
Putting a face on the problem is key!

- A 24-year-old, UNINSURED male was admitted to Shock Trauma after a motorcycle crash
- Injuries included multiple leg fractures, head trauma, and an abdominal wound
- After multiple trips to the operating room, and 65 days in the trauma center, he was discharged to inpatient rehab
Actual cost: $55,000

Payment

Self pay  Medicaid  Medicare  Blue Shield  Commercial

Md. Shock Trauma, 2002
Section C

Constructing the Alternatives and Making a Decision
Step 3: Construct the Alternatives

- Two layers of decisions
  - How to solve the problem?
  - How to finance the solution?
Alternative Solutions

- Reduce amount of uncompensated care (e.g., universal health insurance; expand Medicaid eligibility criteria)
- Increase reimbursement rates for trauma care (e.g., increase Medicaid from 33% to 100% of Medicare)
- Pay physicians for on-call coverage
The Solution

- The Maryland Trauma Physician Services Fund
  - Pay trauma physicians for uncompensated and under-compensated care
  - Grants to trauma centers to cover physician on-call costs

*How to finance the solution? . . .*
Step 3: Construct the Alternatives

- Alcohol tax: proposed in Calif., Ore.
- Motor vehicle fees: Md., Wash.
- Traffic fines: Miss., Wash., Ill., Tex.
- DUI/DWI convictions: Ill., Calif., N.C.
- Firearms tax/violations: Ill, Calif.
- Gas tax: None
- Property/sales/cigarette tax: Calif., Ariz.
Step 4: Select the Criteria

- Efficient
  - Will it produce sufficient resources at low administration cost?
- Dependable
  - Large stable tax base; are there other competing uses of the funds?
- Flexible
  - Easily changed if more revenue needed
- Equitable
  - Is the cost spread over all potential users of the service?
- Politically acceptable
  - Is re-election possible?
- Population benefit
  - Is there a health benefit associated with tax?
### Step 5: Project the Outcomes

<table>
<thead>
<tr>
<th></th>
<th>Alcohol tax</th>
<th>Motor vehicle registration</th>
<th>Traffic court fees</th>
<th>Gas tax</th>
</tr>
</thead>
<tbody>
<tr>
<td>Efficient</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Flexible</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dependable</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Equitable</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Politically acceptable</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Population health benefit</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>$20 million</td>
<td>$0.20 per gallon</td>
<td>$5.00 per registration</td>
<td>$25.00 per case</td>
<td>$0.01 per gallon</td>
</tr>
</tbody>
</table>
### Step 5: Project the Outcomes

<table>
<thead>
<tr>
<th></th>
<th>Alcohol tax</th>
<th>Motor vehicle registration</th>
<th>Traffic court fees</th>
<th>Gas tax</th>
</tr>
</thead>
<tbody>
<tr>
<td>Efficient</td>
<td>++</td>
<td>+++</td>
<td>+</td>
<td>+++</td>
</tr>
<tr>
<td>Flexible</td>
<td>++</td>
<td>++</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>Dependable</td>
<td>++</td>
<td>+++</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>Equitable</td>
<td>++</td>
<td>+++</td>
<td>++</td>
<td>+++</td>
</tr>
<tr>
<td>Politically acceptable</td>
<td>0</td>
<td>+++</td>
<td>++</td>
<td>0</td>
</tr>
<tr>
<td>Population health benefit</td>
<td>++</td>
<td>0</td>
<td>0</td>
<td>+?</td>
</tr>
<tr>
<td>$20 million</td>
<td>$0.20 per gallon</td>
<td>$5.00 per registration</td>
<td>$25.00 per case</td>
<td>$0.01 per gallon</td>
</tr>
</tbody>
</table>
### Step 5: Project the Outcomes

<table>
<thead>
<tr>
<th></th>
<th>Alcohol tax</th>
<th>Motor vehicle registration</th>
<th>Traffic court fees</th>
<th>Gas tax</th>
</tr>
</thead>
<tbody>
<tr>
<td>Efficient</td>
<td>++</td>
<td>+++</td>
<td>+</td>
<td>+++</td>
</tr>
<tr>
<td>Flexible</td>
<td>++</td>
<td>++</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>Dependable</td>
<td>++</td>
<td>+++</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>Equitable</td>
<td>++</td>
<td>+++</td>
<td>++</td>
<td>+++</td>
</tr>
<tr>
<td>Politically</td>
<td>0</td>
<td>+++</td>
<td>++</td>
<td>0</td>
</tr>
<tr>
<td>acceptable</td>
<td>++</td>
<td>0</td>
<td>0</td>
<td>+?</td>
</tr>
<tr>
<td>Population health</td>
<td>$0.20 per</td>
<td>$5.00 per registration</td>
<td>$25.00 per case</td>
<td>$0.01 per gallon</td>
</tr>
<tr>
<td>benefit</td>
<td>gallon</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Step 6: Confront the Trade-offs

- Any we would eliminate?
- One alternative clearly dominant?
- Which criterion is most important?
Step 7: Making the Decision

- Increase MV registration fee by $2.00
- Increase alcohol tax by $0.05 per gallon
- Increase traffic court fee by $10.00

Increase MV registration fee by $5.00
Policy Advocacy

- Maryland is a special case
- Only 12 states currently provide additional funding for trauma centers
- How to convince other states that trauma systems and trauma centers should be considered a public good?
- Focus groups with key legislative aids and state officials
- Development of a “tool kit” for decision makers