Is OHCA Unaffordable?

What are the real economics and true costs of saving lives lost to SCA?

Michael Levy MD, FAEMS, FACEP, FACP
Anchorage, Alaska
CARDIAC COSTS
The economic impact of out-of-hospital cardiac arrest care
By Keith Lurie, MD, Mike Levy, MD, FACEP, FAEMS, Robert Swor, DO & Johanna Moore, MD, MS

OHCA: Huge Money Loser...Right?
Cardiac Arrest Today

- Leading cause of death in the U.S.
  - > 350,000 out of hospital
  - Average age: 66 years old
  - Average age of survivor: 56 years old

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Economic Impact Issues

Cost per life year lost
Cost per life year saved
Cost to families who lose a parent/spouse/child
Practical solutions to improve care
Practical solutions to pay for care (drugs/devices)

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Economic Impact of Cardiac Arrest

Direct Costs
Every time somebody has a cardiac arrest - expenses can include emergency services and medical care.

Indirect Costs
Factors include lost income, losses to employers, and impact on quality of life

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What is the Cost for Pre-hospital Care?

- Data based upon a population of 400,000 using Minneapolis MN
- ~400 arrests/year (1 arrest per 1000 people/year)
- Assumption: all pre-hospital EMS capital equipment used for 3 years and then replaced
- Total budget for CPR technologies $383,000 annually or $960/patient (alive or dead)
- With a 15% overall survival rate from the Take Heart Bundle of Care, the cost for pre-hospital care for each survivor is $6390
Table 1. Annual cost of prehospital equipment per vehicle used to treat OHCA (over three years)

<table>
<thead>
<tr>
<th>Equipment</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Defibrillator</td>
<td>$13,000</td>
</tr>
<tr>
<td>Automated CPR device</td>
<td>$13,000</td>
</tr>
<tr>
<td>ACD+ITD devices</td>
<td>$1,000</td>
</tr>
<tr>
<td>Intra-osseous (IO) device</td>
<td>$400</td>
</tr>
<tr>
<td>Annual equipment cost (ammortized over 3 years)</td>
<td>$9,133</td>
</tr>
<tr>
<td>Consumables (annual cost)</td>
<td>$1,500</td>
</tr>
<tr>
<td><strong>Total annual cost per vehicle</strong></td>
<td><strong>$10,633</strong></td>
</tr>
</tbody>
</table>
What is In-hospital Cost of In-hospital Care?
Lick et al. Critical Care Medicine, 2010

<table>
<thead>
<tr>
<th></th>
<th>Average Revenue Per Patient</th>
<th>Direct Cost Per Patient</th>
<th>Direct Margin Per Patient</th>
</tr>
</thead>
<tbody>
<tr>
<td>Discharged</td>
<td>$57,783</td>
<td>$37,099</td>
<td>$20,684</td>
</tr>
<tr>
<td>Died</td>
<td>$12,014</td>
<td>$8,686</td>
<td>$3,329</td>
</tr>
</tbody>
</table>

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Table 2. Direct costs of care for an OHCA patient who survives to discharge

<table>
<thead>
<tr>
<th>Type of care</th>
<th># of patients</th>
<th>Direct cost per patient</th>
<th>Direct cost per taxpayer&lt;sup&gt;1&lt;/sup&gt;</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prehospital</td>
<td>52,500</td>
<td>$1,063</td>
<td>$17</td>
</tr>
<tr>
<td>In-hospital</td>
<td></td>
<td>$37,000</td>
<td></td>
</tr>
</tbody>
</table>

<sup>1</sup> Calculated by multiplying cost per patient ($38,063) by the number of OHCA survivors (52,500), divided by the number of tax payers (120,000,000)

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Table 3. Direct costs of care for an OHCA patient who dies before discharge

<table>
<thead>
<tr>
<th>Type of care</th>
<th># of patients</th>
<th>Direct cost per patient</th>
<th>Direct cost per taxpayer$1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prehospital</td>
<td>297,500</td>
<td>$1,063</td>
<td>$24</td>
</tr>
<tr>
<td>In-hospital</td>
<td></td>
<td>$8,700</td>
<td></td>
</tr>
</tbody>
</table>

$1 Calculated by multiplying cost per patient ($9,763) by the number of OHCA patients who die (297,500), divided by the number of tax payers (120,000,000)


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Table 4. Direct costs of care for an OHCA patient, regardless of outcome

<table>
<thead>
<tr>
<th># of Patients</th>
<th>Direct Cost per patient</th>
<th>Direct cost per taxpayer(^1)</th>
</tr>
</thead>
<tbody>
<tr>
<td>350,000</td>
<td>$12,945</td>
<td>$38</td>
</tr>
</tbody>
</table>

\(^1\) CALCULATED BY MULTIPLYING COST PER PATIENT ($12,945) BY THE NUMBER OF OHCA EACH YEAR (350,000), DIVIDED BY THE NUMBER OF TAXPAYERS (120,000,000)


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Table 5. Incident costs per year in the U.S.

<table>
<thead>
<tr>
<th>Incident type</th>
<th>Cost (in billions)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cancer¹</td>
<td>$125 billion</td>
</tr>
<tr>
<td>Motor vehicle accidents²</td>
<td>$871 billion</td>
</tr>
<tr>
<td>OHCA</td>
<td>$4.5 billion</td>
</tr>
</tbody>
</table>


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Indirect Costs for OHCA: Let’s do the math

Notoriously difficult to calculate but let’s assume:

350,000 patients; 85% mortality

Cost to families in terms of a lost “statistical life”
350,000 x .85 x $6.2 million = $1.8 TRILLION

OK – let’s say ½ are over 65 so no lost wages.

So – revised indirect costs in terms of lost productivity and wages:
$1.8 trillion/2 = $900 billion

similar to the societal cost from MVAs

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Economic Impact of OHCA

• Annual US budget is $3.8 trillion

• Annual US direct ($2.3 billion) and indirect ($900 billion) of out-of-hospital cardiac arrest (OHCA)

• **Annual loss per US taxpayer due to OHCA = $7517**

• For every 1% increase in survival from OHCA the economic impact is reduced by $9 billion nationwide

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