Trauma - What’s in a Definition?

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Just when you thought it was safe to get back into the water........

- May 4th 2016 JAMA Cardiology article..

“The Case for a revised Definition (Universal third definition) of Myocardial infarction - Resolving the Ambiguity of Type 2 Myocardial infarction”

😊 ☹️ ❓

(Thanks to Dr Goran Lazic – AMP CMO for sending me this article)
Agenda

• The boat has been rocked w.r.t trauma definitions - now does one size fits all?
• Trauma definitions from a medical perspective
• Academic vs Insurance definitions
• Thoughts on Myocardial infarction and cancer
• Severity based trauma
• What’s the best definition?
• Standardised definitions
Trauma Definitions - One size fits all?
Considering a trauma definition

- Needs to meet the medical, financial, biopsychosocial components to the defined event
- Must be objective and understandable
- Must be robust, sustainable with alignment of interest for all parties
- Must be acceptable to the insurance industry and sanctioned by specialist external resources
- If linked to an exact academic definition it has to be reviewable
- Ideally not incorporating very specific treatment modalities as treatment protocols probably change faster than disease definitions.
What’s in a definition - Academic vs Insurance definition
MI universal definition

- Diagnosis of a myocardial infarction in a clinical setting
- Rise and fall of biomarkers (troponin) above 99th percentile (15ng/l)
- At least 1 of the following
  - Symptoms of ischemia
  - New or presumed new significant ST/ T wave changes
  - Development of pathological Q waves
  - Imaging evidence of loss of viable myocardium/ wall motion abn
  - Identification of an intracoronary thrombus
Troponins becoming more sensitive

Troponin is a protein released into the blood when heart cells are damaged. The more damage to the heart, the higher the troponin.
Good news for Cardiac Disease Mortality in Australia

Figure 1. Mortality rates for cardiovascular diseases and all other causes of death in Australia and OECD countries

Source: OECD Health Statistics.
Comparison of old and new troponin assays

CLINICAL RESEARCH STUDY

Increase of 22%

Introduction of High-sensitivity Troponin Assays: Impact on Myocardial Infarction Incidence and Prognosis

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## MI’s in Australia - AIHW Datacubes

<table>
<thead>
<tr>
<th>Year</th>
<th>Number of MI Separations</th>
<th>Australian Population</th>
<th>Incidence Rate per mille</th>
</tr>
</thead>
<tbody>
<tr>
<td>1998-1999</td>
<td>33,550</td>
<td>18.7 m</td>
<td>1.79</td>
</tr>
<tr>
<td>1999-2000</td>
<td>35,418</td>
<td>18.9 m</td>
<td>1.87</td>
</tr>
<tr>
<td>2000-2001</td>
<td>37,672</td>
<td>19.2 m</td>
<td>1.97</td>
</tr>
<tr>
<td>2001-2002</td>
<td>40,333</td>
<td>19.4 m</td>
<td>2.08</td>
</tr>
<tr>
<td>2002-2003</td>
<td>43,767</td>
<td>19.6 m</td>
<td>2.23</td>
</tr>
<tr>
<td>2003-2004</td>
<td>46,885</td>
<td>19.8 m</td>
<td>2.36</td>
</tr>
<tr>
<td>2004-2005</td>
<td>47,633</td>
<td>20.1 m</td>
<td>2.38</td>
</tr>
<tr>
<td>2005-2006</td>
<td>49,534</td>
<td>20.3 m</td>
<td>2.44</td>
</tr>
<tr>
<td>2006-2007</td>
<td>51,667</td>
<td>20.6 m</td>
<td>2.50</td>
</tr>
<tr>
<td>2007-2008</td>
<td>55,676</td>
<td>21.0 m</td>
<td><strong>2.65</strong></td>
</tr>
<tr>
<td>2008-2009</td>
<td>55,223</td>
<td>21.5 m</td>
<td>2.57</td>
</tr>
<tr>
<td>2009-2010</td>
<td>55,003</td>
<td>21.9 m</td>
<td>2.52</td>
</tr>
<tr>
<td>2010-2011</td>
<td><strong>56,545</strong></td>
<td>22.2 m</td>
<td>2.55</td>
</tr>
<tr>
<td>2011-2012</td>
<td>56,172</td>
<td>22.5 m</td>
<td>2.49</td>
</tr>
<tr>
<td>2012-2013</td>
<td>54,068</td>
<td>22.9 m</td>
<td>2.36</td>
</tr>
<tr>
<td>2013-2014</td>
<td>54,116</td>
<td>23.3 m</td>
<td>2.32</td>
</tr>
</tbody>
</table>

1. Australian Institute of Health & Welfare - Separation statistics by principal diagnosis
2. Australian Bureau of Statistics - 3101.0 Australian Demographic Statistics
ST elevation MI’s (STEMI’s) vs Non STEMI’s

ST Elevated Myocardial Infarction (STEMI)

Normal

ST Elevated Myocardial Infarction (STEMI)

TRENDS OF STEMI AND NSTEMI IN NRMI REGISTRY (1990–2006)

PATIENTS (%) vs YEAR

Blood Troponin assay used
**Troponin levels in 345 infarcts**

<table>
<thead>
<tr>
<th>Quartile</th>
<th>Peak troponin level cTn</th>
<th>STEM (n=159) 46%</th>
<th>NSTEMI (n=186) 54%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quartile 1</td>
<td>10 ng/l - 719 ng/l</td>
<td>18 (11.3%)</td>
<td>68 (36.5%)</td>
</tr>
<tr>
<td>Quartile 2</td>
<td>720 ng/l - 22,359 ng/l</td>
<td>31 (19.5%)</td>
<td>55 (29.6%)</td>
</tr>
<tr>
<td>Quartile 3</td>
<td>22,360 ng/l - 85,729 ng/l</td>
<td>47 (29.5%)</td>
<td>40 (21.5%)</td>
</tr>
<tr>
<td>Quartile 4</td>
<td>85,730 ng/l - 500,000 ng/l</td>
<td>63 (39.6%)</td>
<td>23 (12.4%)</td>
</tr>
</tbody>
</table>

19% of infarcts
Causes of elevated Troponin other than Heart attack

- **Cardiac causes**
  - Cardiac contusion resulting from trauma
  - Cardiac surgery
  - Cardioversion
  - Acute and chronic heart failure
  - Aortic dissection
  - Aortic valve disease
  - Hypertrophic cardiomyopathy
  - Tachyarrhythmia, bradyarrhythmia, heart block
  - Apical ballooning syndrome
  - Rhabdomyolysis with myocyte necrosis
  - Myocarditis or endocarditis/pericarditis

- **Non cardiac causes**
  - Pulmonary embolism
  - Severe pulmonary hypertension
  - Renal failure
  - Stroke, subarachnoid haemorrhage
  - Infiltrative diseases, e.g. amyloidosis
  - Cardiotoxic drugs
  - Critical illness, Sepsis
  - Extensive burns
  - Extreme exertion
**Implications**

- More sensitive testing is picking up infarcts at an earlier stage.
- This is great news for mortality and morbidity.
- It is postulated that more sensitive testing will increase incidence but there is more to a diagnosis of MI than just troponin and there are other mitigants to think about.
- The MI definition has softened due to more sensitive troponin assays and less restrictive ECG changes compared to when the trauma product was originally designed.
- The increased sensitivity of troponin muddies the waters at low levels of troponin as there are many causes of a raised troponin other than an MI.
Cancer - One size fits all?
Change in age standardized incidence of specific Cancers in Australia from 1982-2014

Notes:
1. The bars indicate the percentage change in incidence rates between 1982 and 2014.
2. The 2014 estimates are based on 2010-2011 incidence data (see Appendix G).
3. The percentage change between 1982 and 2014 is a summary measure that allows the use of a single number to describe the change over a period of multiple years. However, it is not always reasonable to expect that a single measure can accurately describe the trend over the entire period.
4. The rates were age-standardised to the Australian population as at 30 June 2001.
5. The data for this figure are in online Table D.3.
Source: AIHW ADC 2011.
Thyroid cancer

- Hospital stay 1-2 nights
- Thyroid hormone replacement therapy - daily tablet
- May need radioactive iodine treatment
- External radiotherapy - usually not required
- Chemotherapy - usually not required

(Cancer Council Australia)

Figure B34(c): Relative survival at diagnosis and 5-year conditional survival from thyroid cancer, Australia, 2007-2011

Source: AIHW ADC 2011.
Screening is detecting Cancer at an earlier stage

Breast cancer stage at diagnosis*

* Data obtained from Cancer in Victoria Statistics and trends 2013
**Stages of cancer - Example of male distribution (SEER data)**

<table>
<thead>
<tr>
<th>Age</th>
<th>20-39</th>
<th>40-49</th>
<th>50-59</th>
<th>60-69</th>
<th>70+</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stage I</td>
<td>42%</td>
<td>48%</td>
<td>46%</td>
<td>38%</td>
<td>32%</td>
</tr>
<tr>
<td>Stage II</td>
<td>17%</td>
<td>14%</td>
<td>15%</td>
<td>17%</td>
<td>15%</td>
</tr>
<tr>
<td>Stage III</td>
<td>18%</td>
<td>18%</td>
<td>18%</td>
<td>22%</td>
<td>24%</td>
</tr>
<tr>
<td>Stage IV</td>
<td>23%</td>
<td>20%</td>
<td>21%</td>
<td>23%</td>
<td>27%</td>
</tr>
</tbody>
</table>

100% 100% 100% 100% 100%

Most cancers are detected at an early stage and with all the new technology coming through, early cancer detection will increase further.
Do we want to pay for an event or its impact?
Severity-based trauma

- Not a new concept—already in place for some conditions but eroded by the recent social media case.
- Aligns payment to impact
- Would need input from specialist affinity bodies
- Would prevent windfall payments
- Would aid maintaining sustainability and affordability of the product
What’s in a definition?

Severity of the disease

- High
- Low

- Alignment with Client’s Insurance Needs
  - High
  - Low

- Incidence rates = Premium
  - High
  - Low

- Anti-selection Risk
  - High
  - Low

- Alignment with Client Expectations
  - High
  - Low
So... what is best for the consumer?

Severity of the disease

- Alignment with Client’s Insurance Needs
  - Benefit only available in Severe Cases
  - High vs Low

- Incidence rates = Premium
  - High vs Low

- Anti-selection Risk
  - High vs Low

- Alignment with Client Expectations
  - High vs Low
So... what is best for the consumer?

<table>
<thead>
<tr>
<th>Severity of the disease</th>
<th>Incidence rates = Premium</th>
<th>Anti-selection Risk</th>
<th>Alignment with Client’s Insurance Needs</th>
<th>Alignment with Client Expectations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low</td>
<td>High</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
</tr>
<tr>
<td>High</td>
<td>Low</td>
<td>Low</td>
<td>High</td>
<td>Low</td>
</tr>
</tbody>
</table>

100% Benefit Paid in all cases
So... what is best for the consumer?

- More than 4 weeks off work: Average Claim Amount $106,000
- 1-4 weeks off work: Average Claim Amount $93,000
- Less than 1 week off work: Average Claim Amount $93,000
So... what is best for the consumer?

Severity of the disease

Benefit Amount Reflects Severity

Alignment with Client’s Insurance Needs

Incidence rates = Premium

Anti-selection Risk

Alignment with Client Expectations

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Poll: What role should Trauma Insurance play?

Mr. Smith has just been diagnosed with early stage thyroid cancer. He is scheduled for surgery next week, and will miss a number of days of work in order to recover. No other treatment is required (chemo, radiation), and he is expected to make a full recovery.

What role should Trauma Insurance play for Mr. Smith?

A. Up to $2m benefit. He’s paid his premiums, and is thrilled to receive the benefit. He is now in a much better financial position than before, and has been seen shopping for Ferraris a few days following his surgery. A happy insurance customer!

B. A smaller $25K benefit. The money has helped Mr. Smith through the challenges following his diagnosis, but has not had a material impact on his financial position following recovery.

C. No benefit. The diagnosis has had very little impact on Mr. Smith’s life, therefore he doesn’t need an insurance payout.

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Learnings from other markets...

....what have other markets done to address this challenge?

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Move to Standardised Definitions?

<table>
<thead>
<tr>
<th>Country</th>
<th>Standard Definitions</th>
</tr>
</thead>
<tbody>
<tr>
<td>United Kingdom</td>
<td>Association of British Insurers (ABI) standard definitions</td>
</tr>
<tr>
<td>Singapore</td>
<td>Life Insurance Association (LIA) Members’ Undertaking, Critical Illness (CI) Framework 2014</td>
</tr>
<tr>
<td>South Africa</td>
<td>The Association of Savings and Investments of South Africa (ASISA) Standardised Critical Illness Definitions Project (SCIDEP)</td>
</tr>
<tr>
<td>Canada</td>
<td>Canadian Life and Health Insurance Association (CLHIA) Benchmark Definitions</td>
</tr>
</tbody>
</table>

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Move to Standardised Definitions?

Would Standardised definitions benefit Australian Trauma Market?

A. Yes
B. No
C. Not Sure

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Move to Standardised Definitions?

What do you think would be the main benefit of standardised definitions in Australia?

A. Reduced Reputation Risk
B. Improved Customer and Advisor understanding
C. Easier to Price
D. Higher Sales
E. Encourages innovation in product/service rather than definitions
F. Other

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Move to Standardised Definitions?

What are your Top Concerns with Standardised Definitions?

A. Restricts Competition
B. Difficult to develop and keep current
C. Complexity
D. Other

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Move to Standardised Definitions?

If Australia moves, what level of standardisation should be considered?

A. Strict definition for 100% payout
B. Broad definition for 100% payout
C. Broad definition, payout % selected by insurer
D. Multiple Severities defined for each condition
E. Other

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Move to Standardised Definitions?

Who would benefit the most from Standardised Definitions?

A. Insurance Companies
B. Consumers
C. Advisors
D. Other

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Case Study: Canada

- Benchmark Definitions were developed in 2007 by representatives from Canadian Insurance and Reinsurance companies.
- Not mandatory, but adopted by nearly 100% of the market
- CLHIA tasked with maintaining definitions, with review every 5 years. First update was completed in 2013.
- Easier to understand for consumers/advisors
- Increased sales
- Challenging to maintain
Conclusion and actions

• One size does not fit all!
• In considering what’s best for consumers, accessibility and retention of insurance cover needs to be top of mind.
• Alignment, communication and a common interest approach needed between the insurance industry and medical industry.
• Standardised definitions should be tabled for round table discussion....
Questions?
Audience Question
Audience Question
Audience Question