EXERTION

the EXERCISE stress Test collaboration

Dr Martin Schultz
Menzies Institute for Medical Research

Data Linkage Symposium
Wednesday 22nd June 2016
Exercise Stress Test (EST)/ Graded Exercise Test (GXT)

• More than 400,000 exercise stress tests conducted in Australia every year – Medicare data
  ➔ Many millions worldwide!

• Measurement of BP before, during and in recovery is a standard (mandatory) requirement of every test.
The importance of abnormal exercise BP

CV Events & Mortality

Organ Damage

Abnormal Exercise BP

Hypertension

Blood pressure abnormalities - Masked hypertension
Issue 1.

No threshold values that denote normal or abnormal exercise BP via association to clinical outcomes.

→ *This means supervising clinicians have no way of knowing whether the BP response to a GXT is to be considered normal or abnormal.*

→ *No clinical decisions or follow-up care can be initiated based on the BP response to a GXT*
Exercise BP – Key Clinical Issues

Issue 2.

No evidence-based rationale (association with exercise-induced CV outcomes) for abnormal BP values that form indications to stop a GXT outlined in GXT guidelines.

→ Is it safe to continue an GXT with abnormally high/low exercise BP?

→ Are their acute risks associated with large increases/drops in exercise BP?

→ Current guideline recommendations are only based on the weakest level of evidence - expert consensus
Establishing a national database of GXT results linked to outcomes

Primary aims are to determine:

1. Age- and sex-specific exercise BP reference values for each stage of a clinical GXT.

2. Threshold values denoting abnormal exercise BP through data-linkage to long-term (e.g. 10 years) CV events and mortality.

3. Whether abnormal exercise BP confers increased risk of exercise-induced (acute) clinical events through data-linkage to short-term (e.g. 30-day) CV hospitalizations and mortality.
EXERTION

the EXERCise stress Test collaboratION

How?

Manual extraction of de-identified data from GXT testing machines

→ Multiple collaborating (nationwide) centers that perform clinical GXT’s.
→ Retrospective data - all data available
→ Expected n >200,000 (nationally)
EXERTION

the EXERcise stress Test collaboratION

Linking to clinical outcomes:

• State-by-state data linkage

• Linkage goal is to gain a patient characterization and ascertain acute (within 30 days) and chronic (up to 15 years) outcomes (CV events & mortality).

• Linkage to core/master linkage datasets including hospital admissions, emergency department presentations and death registries – coded causes of death, reason for hospital admission.

• Feasibility and coverage to be assessed in TAS and WA first.
Tasmania – the EXERTION pilot study

Data custodians attach clinical data and strip off identifiers leaving the PPID as the identifier. Researcher receives 5 separate datasets.

Researchable Dataset merged by PPID
## EXERTION

### the EXERcise stress Test collaboratION

**Linkage variables**

<table>
<thead>
<tr>
<th>Data set name</th>
<th>Source Identifier</th>
<th>Title</th>
<th>First name</th>
<th>Middle name(s)</th>
<th>Surname</th>
<th>Sex</th>
<th>DOB</th>
<th>Address1</th>
<th>Address2</th>
<th>Suburb / Town</th>
<th>Postcode</th>
<th>Birthweight</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stress Test Data</td>
<td>THCI?</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td>Tasmania Public Hospital Admitted Patient</td>
<td>THCI</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td>Tasmanian Emergency Department Presentations</td>
<td>THCI</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td>Tasmanian Death Register</td>
<td>Death Registration Number</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
</tr>
</tbody>
</table>
the EXERCise stress Test collaboration PROGRESS.....

Ongoing considerations

- Data coverage (public vs. private records)

- Access to pharmaceutical data for patient characterisation
  - Linking to PBS (a national process with ongoing cost)