BACKGROUND

- Dabbling in checklists
- (Not so much) fun in SIM at Wellington
- No complete/up to date manual at Hutt
- Foolish volunteer

Maternal arrest: 14 differentials
Hypoxia: 27 differentials
- SIM - never seen the CCDHB manual used there
- ED SIM easier - more regular, practised
- Anaesthetics - complex issues,

HISTORY OF CHECKLISTS

- Introduced in anaesthesia first in 1980's
- Vitals = a checklist
- Improvement in:
  - CLAB
  - Ventilator management
  - End of life care
  - But do they work in an emergency?

WHAT IS THE POINT?

- Cognitive aid/Manual/checklist = same
- Crises are rare (145/10,000 operations)
- Failure to adhere to critical management steps is common
- Human's are unreliable - especially under stress:
  - recall
  - critical decision making
  - task fixation
- All other major safety focused industries have accepted this. Why haven't we?

CHECKLIST FATIGUE

- This is a culture problem
- Gawande WHO Surgical checklist work:
  - Researchers regularly thrown out of theatre
  - Despite significant improvement in morbidity & mortality
  - 20% of people did not like using the checklist
  - 93% would want it to be used on them!!

Any complication: 11% to 7%
Death 1.5 to 0.8%
CHECKLISTS IN ACTION

PROOF

<table>
<thead>
<tr>
<th>Cardiac arrest in the OR: How are our ACLS skills</th>
</tr>
</thead>
<tbody>
<tr>
<td>• High fidelity simulation</td>
</tr>
<tr>
<td>• Anaesthetists of varying seniority</td>
</tr>
<tr>
<td>• 89 subjects each given a scenario</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>ACLS trained</th>
<th>No ACLS trained</th>
</tr>
</thead>
<tbody>
<tr>
<td>n = 42</td>
<td>n = 223</td>
</tr>
<tr>
<td>62% adherence: 21/21</td>
<td>10/10</td>
</tr>
<tr>
<td>Minor adherence: 20/21</td>
<td>10/10</td>
</tr>
<tr>
<td>Major adherence: 3/21</td>
<td>10/223</td>
</tr>
<tr>
<td>Faster adherence: 3/21</td>
<td>10/223</td>
</tr>
<tr>
<td>Easier adherence: 3/21</td>
<td>10/223</td>
</tr>
</tbody>
</table>

| Worse in people not trained in ACLS                |
| 6% never even used the defibrillator               |

(Can J Anaesthetesia 1998)

An example of the unreliability of humans - not a checklist survey

Minor = changes in energy levels, drug doses, Rx order
Major = failure to stop anaesthetic, no defib, no adrenaline

Small study incl 2 teams exposed to 8 sims
Developed their own checklist
Video review of adherence to critical tasks
Use of checklist =
  x6 reduction in adherence failure (OR 0.15, CI: 0.04-0.6, p=0.007)
Adjusted relative risk of failure = 0.15 (CI: 0.04-0.6, p=0.007)
Participants would want checklists available in a real crisis

Journal American College of Surgeons 2011

46 processes measured against incl MH, tachycardia, haemorrhage, VF/VT, brady, air embolism, anaphylaxis

Comment on checklist in LAST research:
• No checklist = 8/21 tasks
• Checklist = 16/21 tasks
• No trainee asked for checklist despite being informed of best practice to use one
• Conclude a major culture problem

Regional Anaesthesia & Pain Medicine 2012
48 simulations

Noted specifically that teams which read instructions out loud with members responding to tasks scored the highest

48 simulations

(Anaesthesia & Analgesia 2006)
No instructions or pre-training on what or how to use checklist
Max score = 25
Different tasks got different points
Frequency of use = 1 - minimal use; 5 = extensive use

(NEJM 2013)
air embolism, anaphylaxis, cardiac arrest, haemorrhage & VF, MH, unexplained hypotension, hypoxia, bradycardia, tachycardia

CHECKLISTS IN ACTION

elaine bromley

HOW TO USE A CHECKLIST

Impossible to write the ‘perfect checklist’
2 major types:
Read → Do
Do → Check
Read it yourself
Use a ‘reader’

Boeing/Airbus have people employed whose sole job is to update & improve these
Shutting down the wrong engine = checklist design failure

THE POWER OF A READER

Why are people are reluctant to use aids in a crisis?
Culture & Ego
Picking up an unfamiliar document in a crisis might just add confusion
Human multi-tasking ….. it is dogma!
Decreased situational awareness
Decreased communication
A reader …. solved
22-31% in maternal arrest
33% in Mh crisis used reader

Resident physicians, 1 month on the floor, lectured on CRM, ACLS trained
AN only for MH scenario. Maternal collapse incl O&G

L = leader
T = team
R = reader
10min random video clip analysis
CRITICAL INFO & ACTION
TRANSFERS

- Pre-reader - didn’t break out people

L = leader
T = team
R = reader
10min random video clip analysis
CRITICAL INFO & ACTION
TRANSFERS

Survey - Those that did use the aid:
- 33% - Thought it would be too hard to use themselves
- 16% - Use of aid is not appropriate in a crisis
- 29% - Thought didn’t have time to stop working & use it

Survey - Those that did use the aid (without a reader):
- 77% - Found using the aid distracting
- 22% - Found it hard to start communicating after reading

Burg khalifa 829.8m since 2009 in Dubai
YOUR NEW CRISIS CHECKLIST

PROPERTIES OF AN IDEAL AID

22-1 (Anaesthesia & Analgesia 2013) assist other team members = infusion instructions!!!!

22-2

Content derived from best practise guidelines
Design appropriate for use in the context of the emergency
Familiar format, that people have used & practised
Should assist other team members
Refined and reviewed by local experts - a continual process

DESIGN CHOICES
- Bold = use me
- Quick reference index & tabs
- Fluid proof
- Main priority aims at top of each page
- List based design aimed at anyone
- Information broken down into colour coded sections
- Visual aids to help clarity
  - Coloured drugs
  - Highlighted decision points
  - Bolded phrases and key actions
CONTENT CHOICES
- Instructions on best use at front
- Category headings are based on previously published works
- Localised & updated from many sources
- Keeping it simple
- 2 sections - one for known problems, one to help diagnose
- Paeds pre-calculations page & actually useful drug formulary
- Drug doses pre-calculated to 70kg adult
- Infusions presented with instructions on how to make up & rate to start

WHY NOT REPRODUCE ALGORITHMS?
- Not designed to be used in an emergency
- Not in a familiar consistent format
- Not ‘lay person’ reader friendly
- Visually busy - need cerebral effort to work out which fork to take
- Not localised to Anaesthesia
- Not localised to our theatre setup

VERSUS
- Use of reader - is the algorithm as easy to use in a crisis OR is it a reference document
- More information eg speed of compressions, REVERSIBLE CAUSES, drug doses!
- Localised to us - stop gases, ventilate at a different rate (as airway

VERSUS
- Lack of clear flow in Hutt protocol - esp for a reader!!!!
- Too much unimportant information in MTP protocol
- Lacks surgery specific stuff eg permissive hypotension, good access, rapid transfusion setup, aggressive warmth

INTENDED USE
- Implementation problems
- Culture change
- Ideal = the ‘Reader’ becomes a vital member of the team
- Flexibility:
  - Use a reader
  - Read → do
  - Do → check
  - Self education during down time
  - Education of others

Calling for help, 100% O2 is not on every page…feedback!?!
THE FUTURE

• Your feedback
• Roll out & final print
• Manual in each theatre
  (??one in delivery suite)
• Familiarisation
• Practise - Tin SIM
• Evolution & improvement
• Improving patient safety

HOME

• On the side of the anaesthetic cart

SUGGESTIONS & GOOD IDEAS

• It is your manual - please help improve it:
  • Design and layout
  • General comments
  • Individual Pages

HOW TO START A MOVEMENT
THANKS FOR LISTENING

Anaesthetic Crisis Manual

By Adam Hargreaves

Thanks to the many people who contributed to the creation of this manual with suggestions, improvements, but I humbly Sherman in modest ways. The is written for (not limited to) 5% J 

Harms, D E Hams, D E Heals, D E Stools, H D Weer, D B 

Harms in ways they much.