Teamwork and communication for quality in the perioperative setting in New Zealand

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Health Quality and Safety Commission
### Teamwork and Communication

1. Teamwork impossible without good communication
2. Requires everyone to have a similar vision
3. Done poorly it commonly leads to errors and omissions
4. Needs training and practice
5. Needs everyone engaged in a common task
6. Needs to be present throughout the duration of the task
7. Good teamwork requires effective leadership
Foreign body results

Figure 2. Foreign body left in during procedure (crude rate per 100 000 discharges)

<table>
<thead>
<tr>
<th>Country</th>
<th>Adults 15-99 years old</th>
<th>Children 0-14 years old</th>
</tr>
</thead>
<tbody>
<tr>
<td>Poland</td>
<td>0.4</td>
<td>4.7</td>
</tr>
<tr>
<td>Denmark</td>
<td>1.3</td>
<td>1.2</td>
</tr>
<tr>
<td>Israel</td>
<td>2.0</td>
<td>1.2</td>
</tr>
<tr>
<td>Belgium</td>
<td>2.0</td>
<td>0.8</td>
</tr>
<tr>
<td>Ireland</td>
<td>2.3</td>
<td>0.8</td>
</tr>
<tr>
<td>Finland</td>
<td>2.4</td>
<td>0.8</td>
</tr>
<tr>
<td>Italy</td>
<td>2.4</td>
<td>0.8</td>
</tr>
<tr>
<td>Germany</td>
<td>3.8</td>
<td>0.8</td>
</tr>
<tr>
<td>Sweden</td>
<td>4.4</td>
<td>0.8</td>
</tr>
<tr>
<td>Spain</td>
<td>4.8</td>
<td>0.8</td>
</tr>
<tr>
<td>Norway</td>
<td>5.2</td>
<td>0.8</td>
</tr>
<tr>
<td>France</td>
<td>5.7</td>
<td>0.8</td>
</tr>
<tr>
<td>OECD</td>
<td>6.8</td>
<td>0.8</td>
</tr>
<tr>
<td>United States</td>
<td>5.9</td>
<td>0.8</td>
</tr>
<tr>
<td>Portugal</td>
<td>6.4</td>
<td>0.8</td>
</tr>
<tr>
<td>United Kingdom</td>
<td>7.0</td>
<td>0.8</td>
</tr>
<tr>
<td>Canada</td>
<td>9.0</td>
<td>0.8</td>
</tr>
<tr>
<td>Australia</td>
<td>9.4</td>
<td>0.8</td>
</tr>
<tr>
<td>New Zealand</td>
<td>10.8</td>
<td>0.8</td>
</tr>
<tr>
<td>Switzerland</td>
<td>11.5</td>
<td>0.8</td>
</tr>
<tr>
<td>Slovenia</td>
<td>18.9</td>
<td>0.8</td>
</tr>
<tr>
<td>Singapore</td>
<td>4.1</td>
<td>0.8</td>
</tr>
</tbody>
</table>

Adults 15-99 years old

Children 0-14 years old
A few 2012–13 Serious Adverse Events

- Bilateral brachial plexus injury as a result of positioning during surgery
- Burn from chlorhexidine igniting
- Air in bypass system resulting in cerebellar infarct
- Wrong patient had cardiac procedure
- Infected pacemaker sites (x3) due to inadequate skin-prep
Health care requires a team approach

- Analyses of adverse events: communication and teamwork failures common contributory factors
- 25 percent of operating room communications fail: inappropriate timing, inaccurate or missing content, failure to resolve issues
- >35 percent have visible effects: tension in the team, inefficiency, waste of resources, delay or procedural error
  - (Lingard et al. 2004)
What are the features associated with good teamwork in the OR?

Is there a "Big Five" in Teamwork?
Eduardo Salas, Dana E. Sims and C. Shawn Burke
Small Group Research 2005 36: 555
DOI: 10.1177/1046496405277134

- Team leadership
- Mutual performance monitoring
- Backup behaviour
- Adaptability
- Team orientation
What are the features associated with good teamwork in the OR?

- Team leadership
  - Able to direct and coordinate the activities of other team members, assess team performance, assign tasks, motivate team members and establish a positive environment
What are the features associated with good teamwork in the OR?

- Mutual performance monitoring
  - Apply appropriate strategies to monitor teammate performance
What are the features associated with good teamwork in the OR?

- Backup behaviour
  - Ability to anticipate other team members needs and the ability to shift workload among members to achieve balance
What are the features associated with good teamwork in the OR?

- Adaptability
  - Ability to adjust strategies based on information gathered in the environment
What are the features associated with good teamwork in the OR?

- Team orientation
- Belief in the importance of the team goals over other individual members goals
Shared mental models

• Knowledge of the relationships between the task the team is engaged in and how the team members interact
  – Anticipating and predicting each others needs
  – Identifying changes in the team or task and implicitly adjusting strategies as needed
Mutual trust

• The shared belief that team members will perform their roles and protect the interests of their teammates
  – Information sharing
  – Willingness to admit mistakes and accept feedback
Closed-loop communication

- The exchange of information between the sender and the receiver irrespective of the medium
  - Following up with team members to ensure message was received
  - Acknowledging that a message was received
  - Clarifying with the sender of the message that the message received is the same as the intended message
Reducing perioperative harm

Effective interventions

• Perioperative harm can be reduced by:
  o *Effective team work and communication strategies* such as briefings and debriefings
  o *Effective use of the World Health Organization Surgical Safety Checklist*
Reducing perioperative harm

• So is 95 percent use of the checklist enough to achieve our goals or is there something more to safety and quality?
Teamwork in surgery
Aviation leadership

• The pilot in command of an aircraft is directly responsible for, and is the final authority as to, the operation of that aircraft
How one button made a difference
Synopsis

NZ90 – Boeing 777

Scheduled service: Narita, Japan to Auckland

Take off from Runway 34L at Narita at 10:04am local

At rotate call the First Officer said: “It won’t fly”

Take off rejected at high speed

Aircraft stopped in the remaining runway length
RWY 34L = 3990m

Calculated stop at $V_1$ (168kts) = 3813m

Stopping from 182kts should use 4098m

Distance used = 3798m
High speed stop ....

The aircraft stopped in 300m (7 percent) less than the calculated stopping distance required.

Why:

• Headwind (not included in calculation)
• Brakes in good condition (algorithm assumes brakes are 100% worn)
• Reverse thrust used (algorithm assumes no reverse thrust)
Initial investigation

- JCAB (Japan)/TAIC (NZ) declined to investigate
- Investigation conducted by AirNZ Operations and Integrity team
- Ops & Integrity team have trained investigators
- Ops & Integrity team responsible to the CEO and to NZ CAA
- Initial Finding: Autopilot inadvertently engaged prior to takeoff roll
- Investigation focused on the human factors and organisational factors which contributed
The primary reason for the First Officer stating: “It won’t fly!” was the fact that an autopilot was selected ON during the take off roll.

There were also issues around cockpit monitoring.
Autopilot selection

- N1 switch

Autopilot engagement switch

Autothrottle switch
Flight deck monitoring

The *Gorilla* in the room
Stopping after “V1”

“V1” is the speed from which the aircraft can be safely stopped or continue the take off.

The brief is that the takeoff will be rejected prior to “V1”.

Boeing, the FAA and the UK CAA all counsel:

“The V1 call is the GO point unless the Captain considers that the ability of the aircraft to fly is seriously compromised.”
Organisational analysis

• This was not the first time the autopilot had been inadvertently selected on the Boeing 777
• Previous incidents had not resulted in high-speed rejections of the take off
• Hence the ‘trigger-level’ for concerns was low
• Boeing promulgated the possibility of this happening through a low-level communication called a *Multi Operator Message*
# Risk assessment

<table>
<thead>
<tr>
<th>Likelihood</th>
<th>Insignificant</th>
<th>Minor</th>
<th>Moderate</th>
<th>Major</th>
<th>Critical</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rare ((p &lt; 5%)</td>
<td>Green</td>
<td></td>
<td></td>
<td></td>
<td>Yellow</td>
</tr>
<tr>
<td>Unlikely ((p 5 \text{ to } 35%))</td>
<td>Green</td>
<td>Green</td>
<td>Green</td>
<td>Green</td>
<td>Yellow</td>
</tr>
<tr>
<td>Possible ((p 35 \text{ to } 65%))</td>
<td>Yellow</td>
<td>Yellow</td>
<td>Yellow</td>
<td>Yellow</td>
<td>Green</td>
</tr>
<tr>
<td>Likely ((p 65 \text{ to } 95%))</td>
<td>Yellow</td>
<td>Yellow</td>
<td>Yellow</td>
<td>Yellow</td>
<td>Red</td>
</tr>
<tr>
<td>Almost Certain ((p&gt;95%))</td>
<td>Yellow</td>
<td>Yellow</td>
<td>Yellow</td>
<td>Yellow</td>
<td>Red</td>
</tr>
</tbody>
</table>

Manage through normal systems

Incorporate risk reduction measure
Outcomes – strategic level

• Boeing notified
• Other operators notified
• A risk assessment resulted in a Boeing modification of the flight system software to prevent the autopilot from engaging while the aircraft is on the ground
Outcomes – internal process

The safety action / recommendation process:

• Recommendations are made and actions assigned to the responsible area / personnel

• Achievable time frames are agreed – can be 1 week to 1 year – risk vs productivity

• If a ‘people issue’ then the Just Culture investigation / outcome process is actioned
Outcomes – company level

• Ops Integrity & Safety
  – Risk Assessment Processes
  – Reporting Requirements

• Airline Technical Support
  – Information management processes
Outcomes – fleet / pilot level

• Flight standards
  – Flight Mode Annunciation awareness
  – Training syllabus
  – Standardisation

• GM airline operations & safety
  – Human Factors learnings disseminated
Are we doing it better?

• We need to understand what worked and why
• Continuing to seek answers from incidents creates the risk of:
  – Hindsight bias
  – Patching over the ‘holes’
  – Creating unintended consequences
• Proactive reporting (near misses) and debriefing of normal procedures helps us all learn about what went well and why
Acknowledgments

Air New Zealand for sharing the story

Alan Bradbury, Manager Operations and Integrity, for the analysis
What are the messages in health care?

- Just having good leadership, teamwork and communication is not enough to prevent error.
- Numbers 2-5 of the Big 5 also important to provide safe quality care:
  - Mutual performance monitoring
    - The leader needs to be monitored too
  - Backup behaviour
    - Anticipating team members needs
  - Adaptability
    - Responding to crises with all available information
  - Team orientation
    - Overall goal (safety) more important than any individual need
What can we do better?

• Effectively use the checklist tools that we have
• Report near misses, not just actual events
• Start doing, and improve the performance of briefings and debriefings