Preventing HAI: risks, healthcare systems and behaviour

John Ferguson

Recorded live at the 2009 New Zealand infection control conference

Preventable healthcare associated infection a common mode of injury

http://tinyurl.com/haisurv

2008 Analysis

- Estimated annual number of infection cases triggered by healthcare: Australia 177,392
- Estimated bed days lost because of health care infections: Aust: 1,970,142
- Mortality: no reliable Aust. estimates; based on international estimates c.5,000 per annum

Australian Commission on Safety & Quality in Healthcare, 2008

Reducing harm to patients: the role of surveillance

How hazardous is healthcare?

Dr. Lucien Leape National Patient Safety Network, 2004

Risks to healthcare staff

- Blood borne virus infection following needlestick injury or mucosal splash
- Respiratory illness:
  - SARS: 1 in 5 reported cases were in staff with significant mortality
  - Influenza and respiratory syncytial virus
  - Tuberculosis
- MRSA:
  - 127 investigations of hospital MRSA and involvement of healthcare staff indicated on average
    - 4.6% of healthcare staff were MRSA carriers
  - 1 in 20 experienced MRSA infection
- Community-type MRSA USA paediatric clinic: 16 of 45 staff experienced skin infections with one death
- Norovirus, Hepatitis A
Models of error

- Person model
  - Errors the product of wayward mental processes: distraction, carelessness etc
  - Remedial measures directed at the sharp-end error-maker: naming, shaming, retraining etc
- Legal (moral) model
  - Responsible professionals should not make errors (duty of care)
  - Such errors are rare but sufficient to cause adverse consequences
  - Bad (negligent) people make bad errors and deserve deterrent sanctions

System model

- Errors are commonplace: “to err is human”
- They only occasionally cause adverse events
- Sharp-enders are more likely to be inheritors than the instigators
- Adverse events are the product of many causal factors
- Direct remedial efforts at removing error traps and strengthening defences (systems)

### A system model of accident causation

- Active failures: unsafe acts committed by people in direct contact with patient or system: slips, lapses, mistakes, procedural violations. Hard to foresee or prevent.
- Latent conditions: “resident pathogens” in the system. Arise from decisions made by designers, builders, procedure writers, top level management.
  - Can provoke conditions that increase error
  - Can create long-lasting holes/weaknesses in defences

### A just culture (Reason)

- We cannot change the human condition, but we can change the conditions under which humans work

<table>
<thead>
<tr>
<th>Culpable</th>
<th>Blameless</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sabotage</td>
<td>System-induced violations</td>
</tr>
<tr>
<td>Substance abuse</td>
<td>&quot;Honest&quot; errors</td>
</tr>
<tr>
<td>Reckless violations, etc.</td>
<td>System-induced errors etc.</td>
</tr>
</tbody>
</table>
System approach to error management

- Limit dangerous errors AND create systems that are better able to tolerate error and contain damaging effects
- Comprehensive approach aims at:
  - The person
  - The team
  - The task
  - The workplace
  - The institution as a whole

“...It’s not just about reporting, protocols, safe practices. It’s about working together in multi-disciplinary teams with mutual respect.” Lucien Leape

Scorecard of latent conditions in healthcare that affect HAI risk (Aust)

- Personnel
- Clinical care
- Environmental systems
- Quality systems
- Support services

Risk assessment - subjective synthesis of the likelihood of an unsafe condition or event coupled to the potential severity of outcome

Personnel management

<table>
<thead>
<tr>
<th>System elements</th>
<th>Existing status of the element</th>
<th>Latent unsafe conditions that increase the risk of HAI</th>
<th>Risk rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>Infection control training</td>
<td>Variable</td>
<td>Inconsistent undergraduate training</td>
<td>High</td>
</tr>
<tr>
<td>Surgical procedure sterilization</td>
<td>Variable</td>
<td>Deficient aseptic procedures and use of devices</td>
<td>High</td>
</tr>
<tr>
<td>Occupational health and safety training</td>
<td>Variable</td>
<td>Unsafe disposal of sharps</td>
<td>Medium</td>
</tr>
<tr>
<td>Immunisation</td>
<td>Variable</td>
<td>Non-manual or staff carrying bloodborne viruses allowed in practice to create the cause patient risk</td>
<td>Medium</td>
</tr>
</tbody>
</table>

Clinical care

<table>
<thead>
<tr>
<th>System elements</th>
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</tr>
</thead>
<tbody>
<tr>
<td>Standard and Additional Prescriptions</td>
<td>Variable</td>
<td>Variable compliance with hand hygiene and other requirements</td>
<td>High</td>
</tr>
<tr>
<td>Antimicrobial stewardship</td>
<td>Variable</td>
<td>Indiscriminate antibiotic prescribing increases selection of multidrug-resistant HAI and increases the incidence of HAI and antibiotic resistance in the community</td>
<td>High</td>
</tr>
<tr>
<td>Immunisation of patients</td>
<td>Variable</td>
<td>Anti-biotics not prescribed in accordance with guidelines</td>
<td>Medium</td>
</tr>
<tr>
<td>Infection disease management</td>
<td>Variable</td>
<td>Lack of availability or active response to consultation leads to risk of death or escape from HAI</td>
<td>Medium</td>
</tr>
</tbody>
</table>

Environmental systems

<table>
<thead>
<tr>
<th>System elements</th>
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<th>Latent unsafe conditions that increase the risk of HAI</th>
<th>Risk rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>Environment cleaning and decontamination</td>
<td>Variable</td>
<td>Variable resources and policy given to cleaning</td>
<td>High</td>
</tr>
<tr>
<td>Built environment (eg. facility design)</td>
<td>Variable</td>
<td>Lack of specific isolation facilities for infection patients</td>
<td>Medium</td>
</tr>
<tr>
<td>Ventilation</td>
<td>Variable</td>
<td>Lack of specified respiratory isolation</td>
<td>Low</td>
</tr>
<tr>
<td>Waste</td>
<td>Variable</td>
<td>Low</td>
<td>Low</td>
</tr>
<tr>
<td>Food</td>
<td>Variable</td>
<td>Adequacy of hazard analysis and critical control point plans</td>
<td>Low</td>
</tr>
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Quality systems

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<tr>
<th>System elements</th>
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<th>Latent unsafe conditions that increase the risk of HAI</th>
<th>Risk rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>Document control</td>
<td>Variable</td>
<td>Formal risk assessment guidelines remain accessible</td>
<td>High</td>
</tr>
<tr>
<td>Communication</td>
<td>Variable</td>
<td>Poorly developed communication channels amongst clinicians and between management and clinicians</td>
<td>Medium</td>
</tr>
<tr>
<td>HAI Surveillance</td>
<td>Variable</td>
<td>Increase in infection due to cohorts between admitted patients and facilities</td>
<td>Medium</td>
</tr>
<tr>
<td>Clinical pathways for common infective conditions</td>
<td>Variable</td>
<td>Inappropriately delayed or suboptimal treatment</td>
<td>Medium</td>
</tr>
<tr>
<td>Audit programs</td>
<td>Variable</td>
<td>Audit too infrequent, not rigorous or not followed by review</td>
<td>Medium</td>
</tr>
</tbody>
</table>
Support services

<table>
<thead>
<tr>
<th>System elements</th>
<th>Existing status of these elements</th>
<th>Implementation conditions that increase the risk of HA</th>
<th>Risk rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sterilization of surgical equipment</td>
<td>√ √</td>
<td>Rare</td>
<td>Low</td>
</tr>
<tr>
<td>Stone retrieval and destruction of endoscopes</td>
<td>√</td>
<td>Variable practice and training of staff</td>
<td>Medium</td>
</tr>
<tr>
<td>Supplier controls</td>
<td>√ √</td>
<td>Rare</td>
<td>Low</td>
</tr>
<tr>
<td>Medication supply, compounding, transcription and administration</td>
<td>√</td>
<td>Rare</td>
<td>Low</td>
</tr>
</tbody>
</table>

Five transforming concepts

- Reform of Medical Education
- Joy and Meaning of Work
- Engaging Consumers
- Transparency
- Integration of Care

Reforming medical education

- As key lever to all of health professions education
- New emphasis on skills, behaviors and attitudes
- New content relevant to safety
- New focus on teachers

Finding joy and meaning in work

- Focus on workforce
- Culture that is a true learning environment
- Requires that everyone:
  - be treated with respect and dignity every day
  - given education, training, tools and encouragement needed so they can make a contribution that gives meaning to their lives
  - Be recognized and appreciated for what they do

Engaging consumers

- Patient and family centered care
- Patients and families as members of team
- Respected partners in health care and solutions design
- Engaged at every level, all of the time

See also Atul Gawande, “Better” chapter on Cystic Fibrosis care

Transparency

- Among staff
- Between caregivers and patients/families
- Among institutions
- To the public at large
Integration of care

- Integrated care platforms built around families of conditions or illnesses that share common work
- Maximize efficiency, safety, quality and reliability
- Produce consistently superior outcomes at lower cost

National Safety and Quality Framework June 09 released for stakeholder review

- New set of S & Q accreditation standards that will replace relevant EQUIP standards
  - Governance for S & Q
  - Healthcare-associated infection
  - Medication safety
  - Patient identification and procedure matching

Healthcare Standard on HAI specify:

- Systems and governance for IPC and surveillance
- Infection prevention policies and protocols
- Managing patients with infection
- Antimicrobial stewardship
- Cleaning, disinfection and sterilisation
- Consumer information (patient, public, other service providers)

References:

- Atul Gawande, Better. Metropolitan Books, NY
- Improving quality and safety of hospital care: a reappraisal and an agenda for clinically relevant reform
  - H. K. Scott, P. J. Poole and D. Hawkes