



Where does Infection Control fit into a hospital management structure?

Alison Holmes

What should the structure provide?

1. Go beyond addressing any legislation and statutory requirements
2. Provide a framework and systems to support organisational change
 - A belief in a shared purpose and aspiration
 - Reinforcement systems
 - Skills required for change
 - Consistent role models

*E. Lawson, C. Price McKinsey Quarterly 2003: Psychol of Change Management
Holmes Bull RCPATH April 2008*

4. Foster reliability and resilience

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Infection Prevention and Control

How should management consider infection control?

- A core aspect of patient safety
- An indicator of quality of care
- Dependent on best practice in individual clinical care
- Delivery requires expert input operationally and strategically
- But it also..... relies upon the successful interplay of multiple management systems



Multiple management systems must specifically consider and minimise infection risk

- e.g. human resources, staff patient ratios, bed management, patient pathways, training, information and IT, contract management, procurement, estates and facilities, capital planning, building, design, performance monitoring, antibiotic stewardship, organisational learning, adoption of innovation, risk management, governance, priority setting, resource allocation, communications, business planning.....

- Cannot therefore rely on individual specialist teams or isolated group of committed experts
- Comprehensive whole scale organisational approach required
- Infection risk needs to be considered in almost all areas of hospital management, patient pathways and care. Embedded and prerequisite in decision making
- Fully integrating infection control into structure, systems, metrics and culture
- Included in research and education strategy

For example....

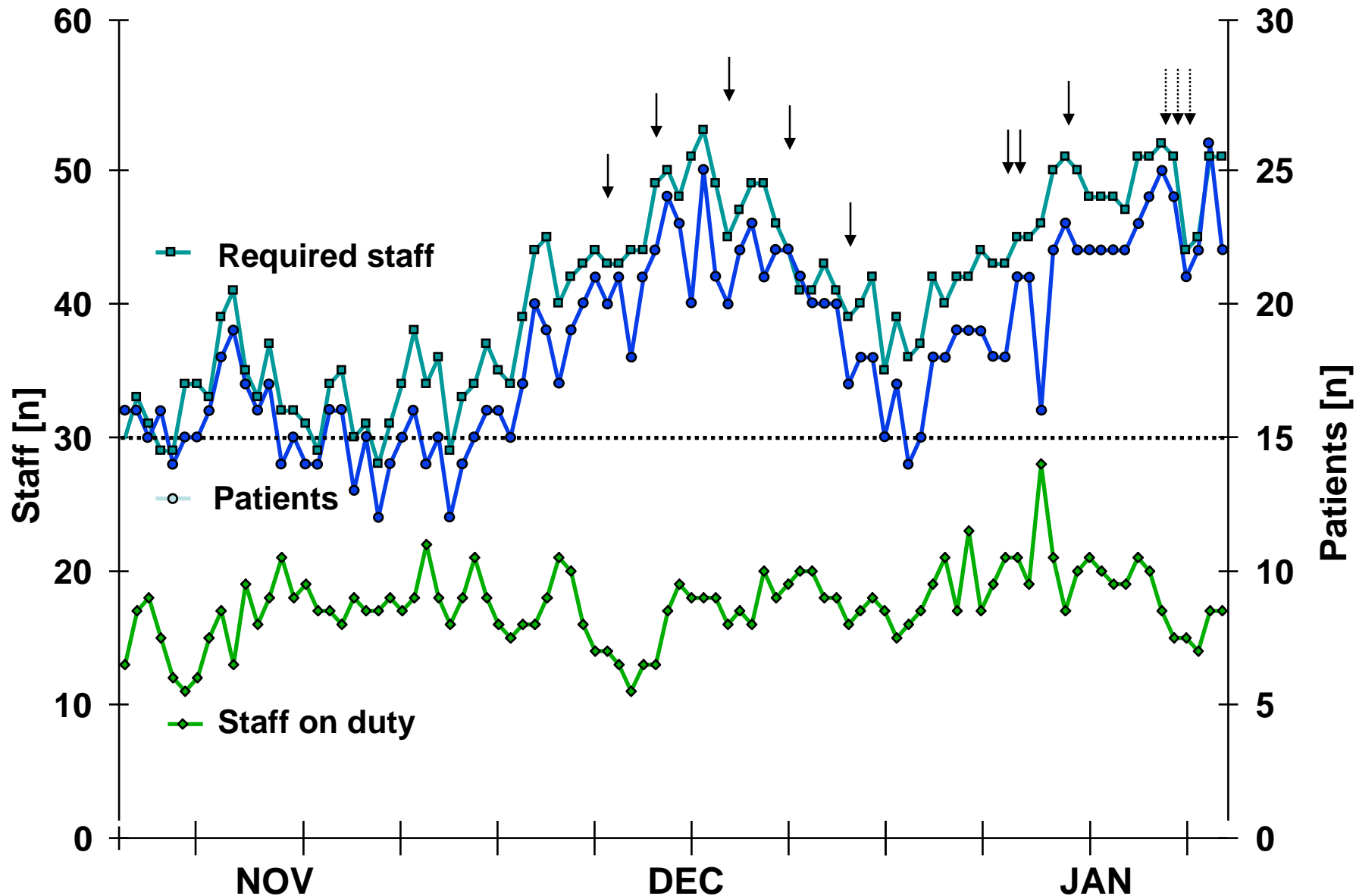
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Consider HR as an example of an area of management with significant impact on infection control:

- Occupational Health, Health clearance, Vaccination
- Working patterns, team formation
- Staffing levels, training, recruitment, retention, appraisals, job descriptions, induction, leave management, agency, shifts

Particular impact in context of ICUs

NICU *E. cloacae* outbreak related to understaffing



Harbarth, ICHE 1999; 20(9):598-603.

Reduced infection rates linked to better nurse staffing

Elderly intensive care unit (ICU) patients have lower rates of nosocomial infections in hospitals with better nurse staffing levels and where nurses work fewer overtime hours, say researchers from the Columbia University School of Nursing (New York, NY, USA).

Investigators examined data from the US Centers for Disease Control and Prevention's National Nosocomial Infection Surveillance system protocols and Medicare files on 15846 elderly patients in 51 ICUs in 31 US hospitals. Additionally, 1095 nurses working at these ICUs were surveyed on working conditions, including measures of staffing (nurse hours per patient per day), overtime use, wages, and nurses' perceptions of working conditions.

"Patients admitted to an ICU with more registered nurse hours per patient day had significantly lower incidence of central-line-associated bloodstream infections, ventilator-associated pneumonia, 30-day mortality, and pressure ulcers", said Patricia Stone, lead author of the study. Increased overtime hours

in ICUs were associated with higher rates of catheter-associated urinary tract infections and pressure ulcers, but slightly lower rates of central-line-associated bloodstream infections.

According to Stone, "Improving nurse working conditions using the systems approach is likely to help with nurse retention and recruitment, and this is very important given the magnitude of the nursing shortage we face and what is predicted".

"Several studies have shown that better staffing levels reduce infection. However, sometimes a high infection rate in a hospital or ICU is just a marker of other problems in management—eg, managing staff", said Alison Holmes (Imperial College London, UK). "What is new here is that this research particularly focuses on nurses' overtime in ICUs and the researchers provide some potential solutions", she added.

Stone said "The US Institute of Medicine has recommended a multi-pronged approach to keep patients safe, which includes improving management

in the hospital, attention to adequate trained workforce and work processes, and improving the organisational culture. Results from this study support these recommendations."

In the UK, the Healthcare Commission said last month that it will carry out unannounced inspections at 120 National Health Service trusts over the coming year in its biggest ever programme of visits relating to health-care-associated infection. Cases of methicillin-resistant *Staphylococcus aureus* are falling, but there were 55681 cases of *Clostridium difficile* infection reported in patients aged 65 years and above in England in 2006—an 8% increase on the year before. Assessment managers will



For more information on nurse working conditions and patient safety outcomes see *Medical Care* 2007; 45: 571-76; DOI:10.1097/MLR.0b013e31803f3817

For more information on the UK Healthcare Commission see <http://www.healthcarecommission.org.uk>

ORIGINAL ARTICLE

Medical care, 45, 6, June 2007

Nurse Working Conditions and Patient Safety Outcomes

Patricia W. Stone, PhD,* Cathy Mosney-Kane, MPH,† Elaine L. Larson, PhD,* Tamara Horan, MPH,‡ Lauren G. Glance, MD,‡ Jack Zwanziger, PhD,§ and Andrew W. Dick, PhD(¶)

Medical Care • Volume 45, Number 6, June 2007

Background: System approaches, such as supporting working conditions, have been advocated to improve patient safety. However, the independent effect of many working condition variables on patient outcomes is unknown.

Key Words: patient safety, organizational climate, nursing workforce, nosocomial infections

(*Med Care* 2007;45: 571-579)

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P. J. Pronovost, D C. Angus, et al.
Physician Staffing Patterns and Clinical Outcomes in Critically Ill Patients: A Systematic Review.
JAMA 288 (17):2151-2162, 2002.

But infection related outcomes not specifically addressed-
largely LOS and mortality

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JAMA

S Hugonnet, JC Chevrolet, D Pittet. The Effects of Workload on Infection risk in critically ill patients.

Crit Care Med 2007, 35(1)296-8

26.7% of all infections in medical ICU could be avoided if nurse to patient ratio was maintained >2.2

Bridging Managers and Clinicians.....

- If infection control sits solely within a separate service or team, not linked to management strategy, or with little clinical and managerial influence, it has limited effectiveness and impact
- Strategic decision makers without knowledge or without systems to ensure consideration of infection control put patients at risk
- Managers to be aware of impact, knock on risk, collateral damage
- Bridging gap between managers and clinician
J. Silversin, M. Kornacki 2000 Leading Physicians through Change
- Need for improved dialogue and common agenda
SM Shortell et al JAMA 1998, 280, N Edwards Clin Med 2005;5
N Edwards, M Kornacki J Silversin BMJ 2002, 324
- Infection control provides opportunity, agenda and framework for bridge

Organisational Approach

- A comprehensive organisational approach should be adopted, recognising existing management structure
- Developing a model that fully integrates infection control into hospital management and quality agenda
- Making it core part of governance
- High clinical profile
- High management profile
- Skill and training needs must be realised
- Clear lines of accountability following funding structures, supported by agreed performance indicators

Holmes Public service review, Issue 8 , 2006 HSJ Feb 2006

| Information Management | | The Hammersmith Hospitals | | NHS | | | | | | | | | | | | | | | | | | | | | |
|--|---|--|----------------------|------------------------|---|---|--------------|--------|--------|----------------------|---|--------|---|--------|---|--------|---|--------|---|--------|------|--------|-----------|------------|--------|
| Deliver information for better decisions | | Directorate Infection Prevention and Control Summary | | NHS Trust | | | | | | | | | | | | | | | | | | | | | |
| Directorate: XXXXX | | Time period: FY 2007/8 | | | | | | | | | | | | | | | | | | | | | | | |
| | | 2004/5 | | 2005/6 | | 2006/7 | | 2007/8 | | LAST 12 MONTHS CASES | | | | | | | | | | | | March | FY to end | March 2008 | |
| | | target | actual | target | actual | target | actual | target | actual | A | M | J | J | A | S | O | N | D | J | F | M | rate | cases | rate | colour |
| MRSA bacteraemia episodes per year | | 9.35 | 11 | 9.4 | 4 | 5.2 | 0.0 | 2.0 | 0.0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 1 | 0 | 0.0 | 3 | 3.0 | red |
| MRSA clinical isolates per 1000 bed days | | 2.14 | 2.53 | 1.98 | 1.76 | 1.72 | 1.18 | 1.33 | 3 | 0 | 2 | 0 | 2 | 2 | 0 | 3 | 3 | 1 | 3 | 1 | 0.57 | 20 | 1.131 | green | |
| C diff incidents per 1000 bed days | | 0.87 | 1.10 | 0.90 | 1.50 | 1.10 | 1.12 | 0.97 | 3 | 2 | 1 | 3 | 0 | 2 | 2 | 0 | 0 | 3 | 0 | 2 | 0.90 | 18 | 0.761 | green | |
| Hand hygiene observation results | | Apr 07 | | May 07 | | Jun 07 | | Jul 07 | | Aug 07 | | Sep 07 | | Oct 07 | | Nov 07 | | Dec 07 | | Jan 08 | | Feb 08 | | Mar 08 | |
| Audits expected (one per ward per quarter) | | 5 | | 5 | | 5 | | 5 | | 5 | | 5 | | 5 | | 5 | | 5 | | 5 | | 5 | | 5 | |
| Audits with 30+ observations | | 5 | | 4 | | 2 | | 5 | | 5 | | 5 | | 4 | | 5 | | 4 | | 5 | | 5 | | 5 | |
| Average percent compliance | | 66.4 | | 80.6 | | 86.7 | | 81.1 | | 76.7 | | 80.6 | | 74.7 | | 84.1 | | 71.3 | | 84.0% | | 90.6% | | 87.3% | |
| Antibiotic Surveys Date | Number of patients on anti-infectives (AIs) | Pts with AI starts > 2d post elective op | Total AIs prescribed | Number of reserved AIs | Percent of reserved AIs in line with policy | Comments | | | | | | | | | | | | | | | | | | | |
| May 2004 | 32 | | 58 | 17 | 65% | Five out of six AIs for ciprofloxacin were not in line with policy | | | | | | | | | | | | | | | | | | | |
| December 2004 | 28 | | 45 | 10 | 30% | Four out of seven AIs for ciprofloxacin were not in line with policy. Slight improvement in use of ciprofloxacin | | | | | | | | | | | | | | | | | | | |
| July 2005 | 21 | | 33 | 8 (24%) | 75% | Two AI not in line with policy - ciprofloxacin and clarithromycin | | | | | | | | | | | | | | | | | | | |
| December 2005 | 25 | 4 | 39 | 13 (33%) | 69% | Four AI not in line with policy, of which three were ciprofloxacin used in CABG patients, and one imipenem | | | | | | | | | | | | | | | | | | | |
| May 2006 | 22 | 4 | 35 | 12 (34%) | 8% | Ten AIs not in line with policy, of which 9 were ciprofloxacin, one was oral clarithromycin. One further anti-infective (ciprofloxacin) with indication not documented in medical notes | | | | | | | | | | | | | | | | | | | |
| December 2006 | 24 | 1 | 38 | 7 (18%) | 71% | Two AIs for ciprofloxacin used outside of policy | | | | | | | | | | | | | | | | | | | |
| May 2007 | 27 | 4 | 39 | 8 (21%) | 100% | | | | | | | | | | | | | | | | | | | | |
| December 2007 | 19 | 1 | 28 | 8 (29%) | 63% | Three AIs not in line with policy Tazocin (for Usher - diabetic foot / leg), 1 clarithromycin for CABG and ciprofloxacin for UTI | | | | | | | | | | | | | | | | | | | |
| Ward move compliance | Sep07 81.6% | Oct07 83.2% | Nov07 85.9% | Dec07 75.9% | Jan08 87.6% | Feb08 81.4% | Mar 08 72.3% | | | | | | | | | | | | | | | | | | |

The Balanced Scorecard

- A framework to measure performance beyond finances in private industry
- Align performance measures with strategic mission and goals- so measures performance, and factors driving performance.
- Caution:
 - you get what you measure
 - NB skews activity
 - needs regular refreshing and updating

Kaplan and Norton 1996 Harvard Business School Press

- Many trusts use them for internal performance managing

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Patient Safety and Score cards

A Framework for Health Care Organizations to Develop and Evaluate a Safety Scorecard

Peter J. Pronovost, MD, PhD

Sean M. Berenholtz, MD, MHS

Dale M. Needham, MD, PhD

THE DEMAND TO IMPROVE PATIENT SAFETY IS INCREASING within health care organizations. Boards of trustees have a fiduciary responsibility to ensure patient safety, and senior management is often charged with

knowing an overlap between quality and safety. This framework is based on the premise that the goal of the scorecard is to monitor progress in improving patient safety over time or relative to a benchmark. Organizations need to stop conceptualizing safety as a dichotomous variable (ie, safe or unsafe) and start viewing safety as a continuous variable (ie, is it improving?).

Framework

- “Leaders select outcome or process measures that represent the interests of frontline healthcare workers”
- Must ensure it has local face validity
- Will performance on this measure help focus quality improvement?

Pronovost, Berenholtz, Needham JAMA, Nov 7th; 298, 17, 2063-2065

Organisational Approach

- Creating continuous learning and quality improvement shared across professional bodies, directorates and units
- Adopting systems based approaches for sustainability, supported by clinical and managerial expertise, within a culture that supports and reinforces infection control as a corporate priority, shaping behaviours and values.
- ‘Achieving safety requires more than individual carefulness. It is a corporate responsibility’
Leape 2002 NEJM 347,16 , GJ Annas 2006 NEJM 354, 19
- Supported by feedback, monitoring systems and metrics.....
- A critical component is strong corporate accountability and hospital leadership

Providing Leadership

Chief Executive Officer (CEO)

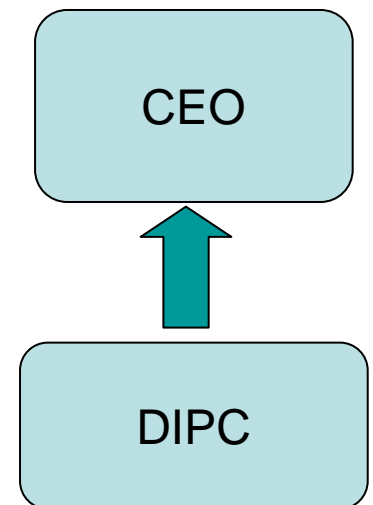
- Demonstrable commitment and leadership
- 'CEO backing- providing clear organisational leadership'
'IOM report - To Err is Human 1999 National Academies Press report

Director of Infection Prevention and Control (DIPC)

- In England *DoH 'Winning Ways' Dec 2003*
- Direct line of accountability to CEO
- Opportunities for specialist leadership and composite roles

Leads /champions at multiple levels

- Embedded in directorates, groups, teams, networks
- Consistent role models key to organisational change
E. Lawson, C. Price McKinsey Quarterly 2003:
- Profile and recognition by peer groups and organisation



Infection prevention and control is a priority in our hospitals

“ Every member of staff is responsible for preventing infection.

Strict hand hygiene practice must be observed, antibiotics must be used carefully and a clean environment maintained. ”



Claire Perry
Managing director

Addressing:

- Patients and public concern
- Clear message to staff
- States shared goal
- Involves all staff, multidisciplinary
- Strong message to all prescribers (ie Doctors)
- Bridges managers and clinicians
- Internal reinforcement
- Leadership
- Board to Ward engagement
- Organisational commitment
- Role model
- Corporate responsibility

Lessons from management approaches

Reductions seen - not due to new technology or scientific advances but through better application of existing knowledge using a variety of managerial approaches

- Embedding infection control in running of hospitals and delivery of clinical care – organisational approach
- Adopting Care bundles/ ‘board to ward’ approach/ quality improvement/ indicators/ scorecards/ dashboards etc (but understand limitations)
- External reinforcement (campaigns, mandatory reporting, legislation, media, patient choice)
- Campaigns (IHI 5 million lives, DoH Saving Lives)
- CEO accountability and mandatory data sign off

- Better use of teams. Teamwork rather than individual interventions, relies on; leadership, adaptability, mutual performance monitoring and support *Baker, D. (2006) Health Services Research 41:4, 1576 – 1598*
Wenzel et al (2006) NEJM 355;26, 2781-2783
- Addressing mobilising evidence into practice in organisation
Pronovost et al (2008). J Crit Care 23, 207-221
- Developing systems that address human factors and reliability (decision aids, desired action is the default, habits and patterns used in design, process clearly specified, takes advantage of pathways)
Resar, R (2006) HSR 41:4, 1677-89, Pronovost et al (2006) HSR 41:4, 1599-1617

- Pressure for greater use of quality indicators and measures (infection control a major indicator)

Darzi, High Quality Care for All. NHS Next Stage Review Final report June 2008

http://www.dh.gov.uk/en/Publicationsandstatistics/Publications/PublicationsPolicyAndGuidance/DH_085825

“There will also be measures of safety and clinical outcomes. All registered healthcare providers working for, or on behalf of, the NHS will be required by law to publish ‘Quality Accounts’ just as they publish financial accounts.”

Vincent C et al. Is health care getting safer? BMJ. 2008 Nov 13;337

Consider HCAI as an indicator...

Infection control serves as a marker of capacity to manage multiple, complex systems

HCAI can therefore be a proxy indicator of

- levels of staffing
- levels of training
- organisational stress
- management failure
- inadequate systems
- reliability
- resilience



Resilience

- The system quickly recovers stability after unexpected event or in face of continuous significant stresses in a complex, dynamic environment
- Stability provided by constant change rather than continuous repetition

Weick and Sutcliffe (2007) Managing the Unexpected.

- Structure and approach must facilitate reliability – but also recognise resilience....to internal and external threats and stressors e.g. Mergers, Leadership change, Financial deficit, Outbreaks, Global recession, Major policy shift, Environmental incident, Technology change etc
- Supporting the development of shifting networks....

Common Themes of Health Care Commission reports

HCC *C. difficile* reports

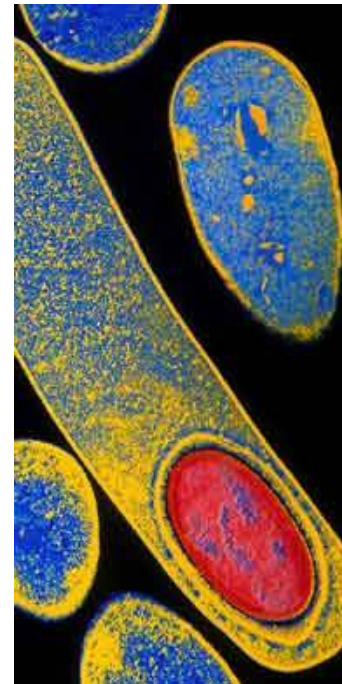
Common themes

- Recent mergers
- Preoccupation with financial situation
- Service reconfigurations
- Occupancy levels > 90%
- Poor antibiotic stewardship

In addition to isolation facilities and state of environment

HCC Maidstone report Oct 2007

HCC Stoke Mandeville report July 2006



Resilient Performance

| Insufficiently resilient organisations (violation of 5 principles) | Resilient organisations |
|---|---|
| Small failures denied | Tracks small failures |
| Simple diagnoses/assessment accepted | Resists oversimplification |
| Frontline operations taken for granted | Remains sensitive to operations |
| Recovery is treated as routine | Maintains capabilities for resilience |
| Experts defer to authority | Monitors/takes advantage of shifting locations of expertise |

Weick and Sutcliffe 'Managing the Unexpected'
2007 Wiley

In Summary:

Q. Where does it sit?

A. Throughout the structure.

- From the top and at every level of decision making and care
- Supported by clear leadership, systems, structures and expert input
- An organisational approach to Infection prevention is needed, involving management structures and systems to change behaviour and culture, to drive and support sustainable improvement

Training needs must be addressed and applied research on health care models, that best deliver effective, reliable and resilient infection prevention

McDonald, Wilson, Goodacre- BMJ 2006 14 Jan

UKCRC Translational research initiative 2008



Imperial College
London