Surveillance of Healthcare Associated Infection

The National Approach

Jennie Wilson
Senior Nurse
Healthcare Associated Infection and Antimicrobial Resistance Dept. CDSC

Hosted by:
Paul Webber paul@webbertraining.com

www.webbertraining.com

Political interest in HAI

- **Antimicrobial resistance strategies (1999 +)**
- **Socio-economic burden of HAI project (1999)**
- **Clinical governance / Controls Assurance**
- **NAO: Value for Money study (2000)**
- **Performance management - CHAI**
- **Getting ahead of the Curve (2002)**

National Audit Office

Value for Money study (2000)

- **Effective surveillance essential**
- **ICTs want to spend more time on surveillance**
- **Lack of comparable data on rates**
- **Variation in extent data is disseminated**
- **NINSS starting to show benefits of surveillance**
- **Need for post-discharge surveillance**

Controls Assurance:

Surveillance criteria

- **Surveillance carried out using:**
  - Defined methods
  - Agreed objectives and priorities
  - Specified in annual infection control programme
- **Key indicators to show improvement in infection control and/or early warning of risk**
  - Demonstrate performance of IC
  - Monitor IC service

CHAI: infection control indicators

Infection control procedures

- Average of % scores for 15 controls assurance criteria

MRSA bacteraemia improvement score (from July 03)

- Difference between no. of MRSA bacteraemia (01/02)
- Bandings for improvement/deterioration

Getting Ahead of the Curve (2002)

"Intensifying control measures to reduce illness/death from key infectious disease problems"

TB, HCAI, antimicrobial resistant, BBV, STDs

- HPA to co-ordinate surveillance systems
- CHI to address deficiencies in standards of infection control
- Action plan for HCAI

Department of Health
HCAI Action Plan

- Hospital-based surveillance
- Nationally and Regionally co-ordinated

1. Alert organisms
- S.aureus (MRSA): move to routine reporting
- Glycopeptide resistant enterococcus: routine bacteraemia reporting
- C.difficile: routine reporting from Jan 04

2. Monitoring of serious untoward incidents
- Incidents associated with infection
- Significant morbidity / virulence
- Impact of patient care

3. Enhanced surveillance of SSI
- Develop mandatory surveillance in orthopaedics

4. Develop IT systems for HAI surveillance
- Evaluate software for IC

Winning Ways (CMO 2003)
What is needed….

1. *'Make HCAI a visible and unambiguous indicator of quality and safety of patients care'*
2. *'Provision of high quality information for the public/patients and clinical teams so that the risks associated with the performance of certain procedures are transparent.'*

Action Area 1: Active surveillance and investigation

- **Mandatory surveillance for BSI, SSI, *C.difficile*, serious incidents, PDS**
- **Root cause analysis/HACCP**
- **Co-ordination of diagnostic data on HCAI**
- **Comparative data for clinical teams**
- **Rates of HCAI published on CMO website**
- **Audit of deaths form HCAI**
- **Serious outbreaks reported to HPA**

What is surveillance of HCAI ?

- ***'..the active, ongoing observation of the occurrence and distribution of HAI among patients (and staff) and of the events or condition that increase or decrease the risk of acquiring such infections.'***

Haley *et al 1985*

It requires:

- **Precise definition of the events to be surveyed**
- **Systematic collection of data**
- **Analysis and interpretation of data**
- **Dissemination of results to those who need to know, so that appropriate action can be taken**

Why do surveillance of HCAI?

1. **Target infection control activities to prevent infection**
   - Use information to initiate/support change in practice
   - Use information to monitor change
   - Use information to demonstrate good practice
2. **Early detection/prevention of outbreaks**
   - Less than 10% of HCAI part of an epidemic (Stamm 1981)

SENIC study (Haley *et al* 1985)

Best infection control programmes

- reduced rate of HAI by 32%

No infection control programmes

- rate increased by 18%

Components of infection control programme (SENIC)

1. **Control activities**
   - **detect, investigate,control outbreaks**
   - **produce, implement, monitor policies**
   - **educate staff**
2. **Surveillance activities**
   - **identify infections**
   - **analyse data**
   - **disseminate results**

Reductions of HAI by effective IC programmes

Surgical wound infection:

- 20% (19%) reduction if organised IC and surveillance programme and rates of SWI reported to surgeons
- 35% (41%) if also Dr. with IC/epidemiology expertise

Reductions of HAI by effective IC programmes

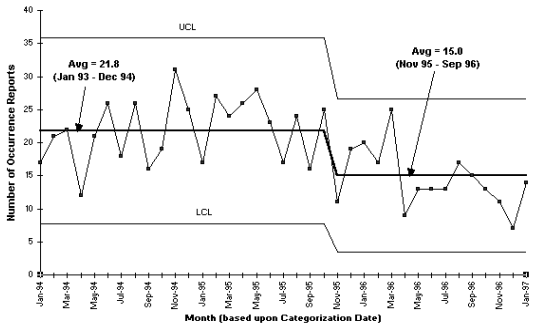
Hospital acquired bacteraemia

- 15% reduction in rates if organised IC programme
- 35% reduction if surveillance, and ICN/250 beds

Making surveillance work

- Set objectives
- Design tools/methods appropriate for each objective
  - Monitoring, not research *(i.e. don't try to collect too much data)*
  - Clear case definitions
- Data quality
  - Systematic data collection
  - Rely on data to inform action

Example of SPC chart (for 'event' data)



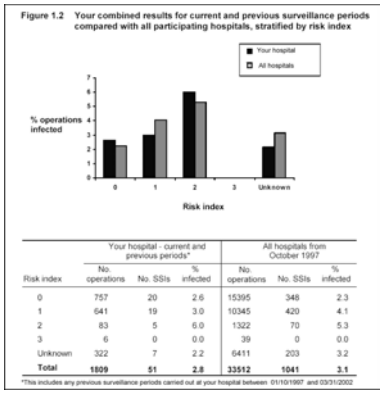


Figure 1.2 Your combined results for current and previous surveillance periods compared with all participating hospitals, stratified by risk index

Risk index	Your hospital - current and previous periods* No. operations	No. SSIs	% infected	All hospitals from October 1997 No. operations	No. SSIs	% infected
0	757	20	2.6	15395	348	2.3
1	641	19	3.0	10345	420	4.1
2	83	5	6.0	1322	70	5.3
3	6	0	0.0	39	0	0.0
Unknown	322	7	2.2	6411	203	3.2
Total	**1809**	**51**	**2.8**	**33512**	**1041**	**3.1**

*This includes any previous surveillance periods carried out at your hospital between 01/10/1997 and 03/31/2002

Surveillance i.e. case finding

Passive = 'HAI identified and reported by people other than trained personnel'
- designated personnel not required
- unreliable, definition not applied consistently
- sensitivity: 14-34% (Perl, 1998)

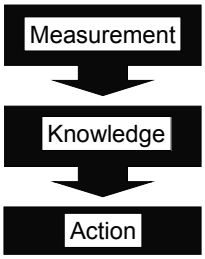
Active = 'trained personnel use a variety of data sources to determine whether an HAI has occurred'
- requires designated staff but data reliable
- sensitivity = 85-100% (Perl, 1998)

Active vs. passive surveillance

Lee & Baker, APIC 1996

*"If the ICP asks the nursing staff to report any ICU patients with signs or symptoms of pneumonia and waits to hear from them, this would be a **passive** approach. If, on the other hand, the ICP makes routine contact with the nursing staff to determine if any cases have been noted, this is an **active** approach"*

Making surveillance work

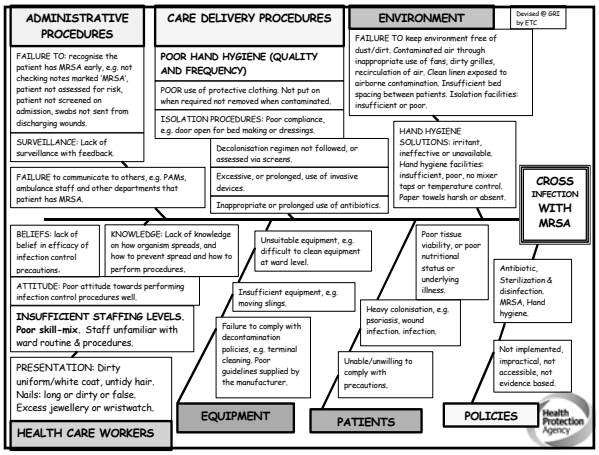


Evaluate practice
Challenge beliefs
Review protocols
Appraise evidence - base
Stimulate change

Factors that contribute to the risk of SSI

Mangram (1999) CDC Guideline for Prevention of Surgical Site Infection.

- **Pre-operative shaving**
- **Pre-operative skin preparation**
- **Duration of operation**
- **Antimicrobial prophylaxis**
- **Theatre ventilation and staff movement**
- **Foreign material in surgical site**
- **Surgical drains**
- **Surgical techniques**
  - poor haemostasis, tissue trauma, dead space



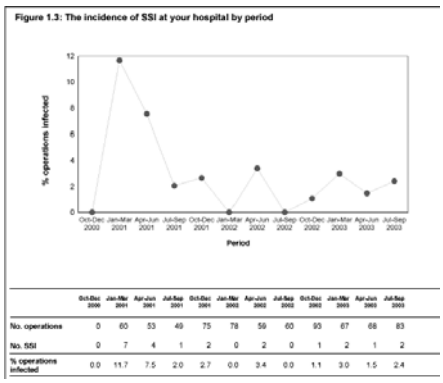
Dissemination of results

- **Feedback to those who can prevent infections**
- **How should data be presented?**
  - Actively discuss results
  - Target audience(s)?
  - Both good & bad results are important
- **How often should data be presented?**
  - Depends on volume of data / precision of estimates
  - Risk adjustment

Improving practice

Derriford Hospital, Plymouth

- **Ward and theatres audited**
  - theatre discipline improved
  - environmental cleanliness improved
  - pre-operative preparation for coronary artery bypass graft changed
- **Raised awareness of infection control**
- **Wound management on wards improved**
- **Increased number of IC Link Nurses**



	Oct-Dec 2000	Jan-Mar 2001	Apr-Jun 2001	Jul-Sep 2001	Oct-Dec 2001	Jan-Mar 2002	Apr-Jun 2002	Jul-Sep 2002	Oct-Dec 2002	Jan-Mar 2003	Apr-Jun 2003	Jul-Sep 2003
No. operations	0	60	53	49	75	78	59	60	93	67	68	83
No. SSI	0	7	4	1	2	0	2	0	1	2	1	2
% operations infected	0.0	11.7	7.5	2.0	2.7	0.0	3.4	0.0	1.1	3.0	1.5	2.4

External benchmarks

External benchmarks are a powerful driver for effecting change, but require

- standardised data collection methods
- standardised analysis
- high data quality
- central co-ordination

Comparison of infection rates

Validity of comparisons within / between hospitals affected by:

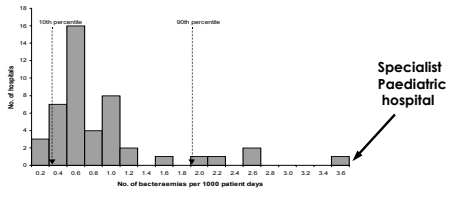
1. Definitions of infections & other criteria
2. Surveillance methods
3. Differences in case mix (i.e. intrinsic risks of infection)
4. Small numbers - imprecise estimates i.e. rates vary by chance

Principles underpinning SSI Surveillance Service in England

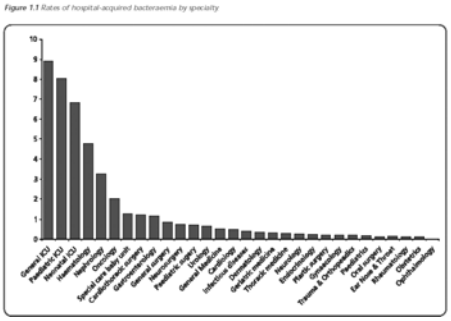
- **Defined methods based on active, systematic surveillance**
- **Case definitions that can be applied consistently (minimise subjectivity)**
- **Surveillance personnel trained in methods**
- **Data checked for errors**
- **Account for variation in risk factors**

Hospital case-mix affects rates

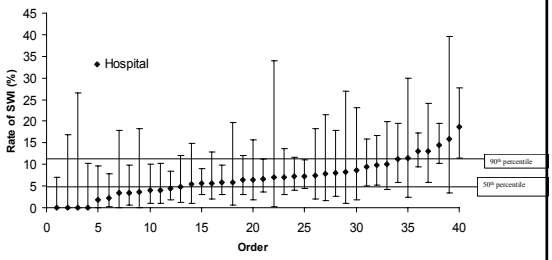
Distribution of bacteraemia by hospital (*NINSS data to 2001)*



Hospital acquired bacteraemia by medical specialty (rate per 1000 patient-days)



Crude rates of SSI for vascular surgery (95% CI) by hospital



Action Area 1: Active surveillance and investigation

- **Mandatory surveillance for BSI, SSI, *C.difficile*, serious incidents, PDS**

Chief Medical Officer, Winning Ways. 2003

Routine reporting by laboratories

Significant pathogens e.g. bacteraemias, salmonella etc
- Voluntary reporting
- Organism-based, no clinical details, CAI and HAI
- No denominators

New Lab-base program extracts required data
- Not all labs have this link

Data sent electronically to Region who 'clean' it e.g. remove duplicates and send it onto CSDC for national CDR reports

Mandatory reporting (via Lab-base)

MRSA & GRE bacteraemia
- Trust level data, KO3 denominators
- Limited clinical/speciality data

Clostridium difficile CDR Weekly 2003: 13(40)
- Toxin A or B+ves
- New episodes, symptomatic
- Reporting of rates in >65yrs
- KH03 denominators

Other HCAI surveillance

- **Anti-Microbial Surveillance (AmSurv)**
  - Region based, extracts all sensitivity data
- **'Outbreak/adverse event' reporting**
  - Region-based STEISS system being developed

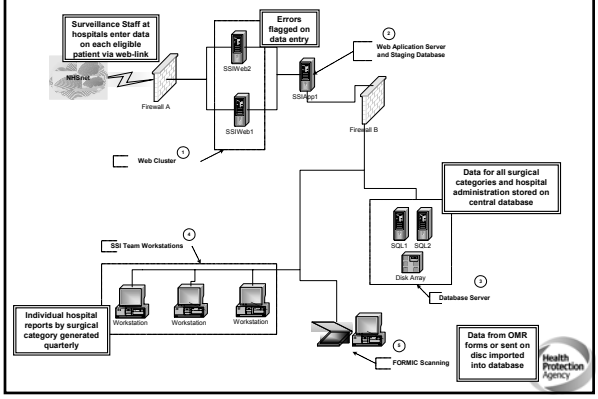
Mandatory orthopaedic surveillance

- **All Trusts undertaking orthopaedic surgery (from April 2004):**
  - Total hip replacement
  - Hip hemiarthroplasty
  - Knee replacment
  - Open reduction of long bone fractures
- **Minimum 3-month surveillance in at least one category**
- **Role for Regional Epidemiologist?**

Developments to SSI Surveillance service

- **Improvement to efficiency of data handling**
  - Web-link to enter data
  - Error correction on entry
- **Amendments to dataset**
  - Specific orthopaedic data items
- **Data collection methods as NINSS**
  - Case definitions
  - Active case-finding
- **Encouraging partnership between orthopaedic surgeons & ICT**

Web-based surveillance data handling system



ASEPTIC project: evaluating software for infection control

- **Identify user needs & advise on solutions**
- **Pilot of best software (in development)**
- **Outcome of this project will support surveillance of alert organisms and SSI**
  - Local data entry & management
  - Flexible reporting

What should ICTs be doing?

- **Plan a surveillance programme**
  - Consider enhanced bacteraemia/C.difficile to better understand/explain your rates
- **Identify resources required**
  - 'Mandatory' and local priorities
    - Routine lab data vs. SSI surveillance
  - Trained surveillance personnel
  - Flexibility improves efficiency
- **Develop partnerships with clinical teams**
- **Make the business case**

Morbidity associated with HAI

On average a single infection acquired in hospital costs £3000 to treat and results in the patient spending 3 times longer in hospital

Plowman *et al* 1999

Continuing Education Certificate

To find out how to get a Continuing Education Certificate for this teleclass contact . . .

certificates@webbertraining.com

(Continuing Education Certificates for Teleclass Education are not issued or endorsed by the Health Protection Agency)