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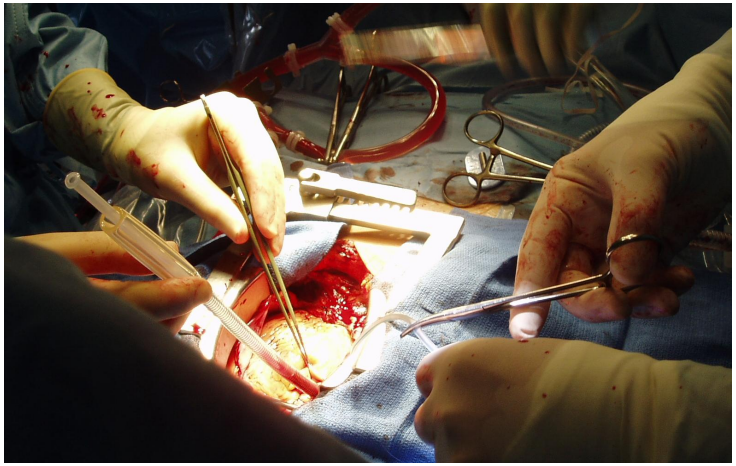
A hygienic intervention program decreased post-operative wound infections following CABG



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Disclosure

- No conflicts of interests

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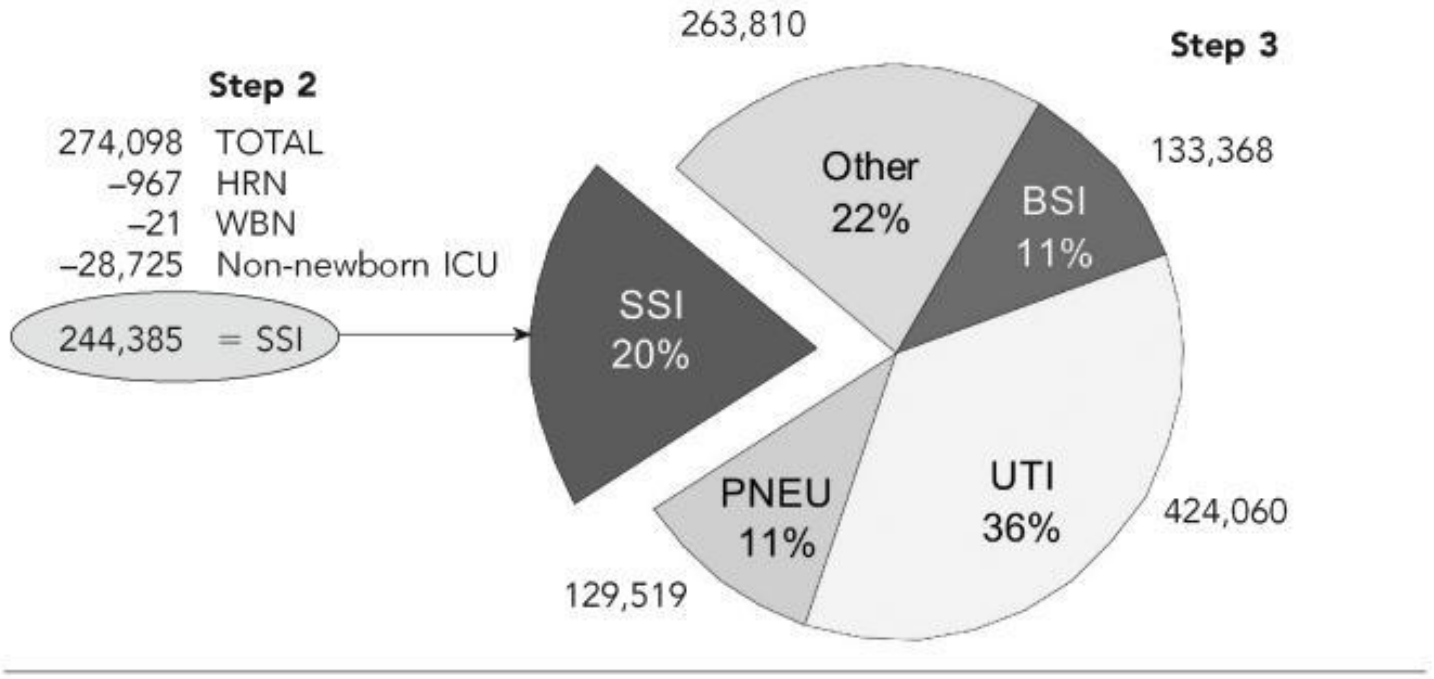
Surgical site infections



CDC, 2007

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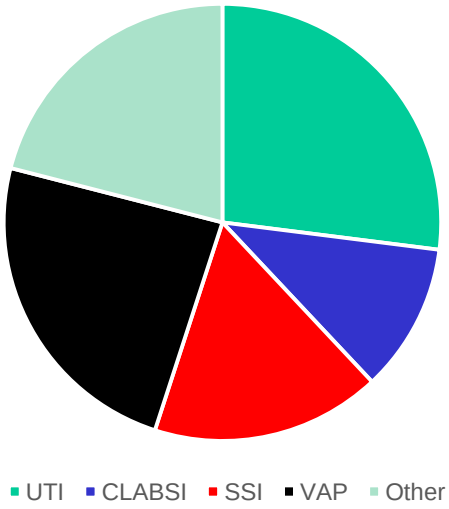
Europe

Health-care associated infections Europe 2008



ECDC Annual report 2008

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By proceedures

TABLE 4. Distribution of Procedure-Associated Infections Reported to the National Healthcare Safety Network, by Type of Surgery, 2009–2010

Type of surgery	No. (%) of SSIs
Orthopedic[a]	6,486 (40.5)
Abdominal[b]	3,598 (22.5)
Cardiac[c]	3,508 (21.9)
Ob/gyn[d]	1,543 (9.6)
Neurological[e]	386 (2.4)
Vascular[f]	245 (1.5)
Transplant[g]	160 (1.0)
Breast[h]	64 (0.4)
Neck[i]	14 (0.1)
Other[j]	15 (0.1)
Total	16,019 (100)

Sievert et al. ICHE 2013

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Sir James Simpson (1867)

”The man laid on the operating table on our surgical hospital is exposed to more chances of death than the English soldier on the field of Waterloo”.

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Journal List › Public Health Rep › v.122(2); Mar-Apr 2007 › PMC1820440

PUBLIC HEALTH Reports

Public Health Rep. 2007 Mar-Apr; 122(2): 160–166. PMCID: PMC1820440

Estimating Health Care-Associated Infections and Deaths in U.S. Hospitals, 2002

R. Monina Klevens, DDS, MPH,[Ⓜa] Jonathan R. Edwards, MS,[a] Chesley L. Richards, Jr., MD, MPH,[a,b,c,d] Teresa C. Horan, MPH,[a] Robert P. Gaynes, MD,[a,e] Daniel A. Pollock, MD,[a] and Denise M. Cardo, MD[a]

Consequences US data 2002

- Mortality 3 %
- Costs

  10.000 – 25.000 USD per SSI

Complicated re-operations, prolonged hospital stay, prolonged AB-therapy, sick leave

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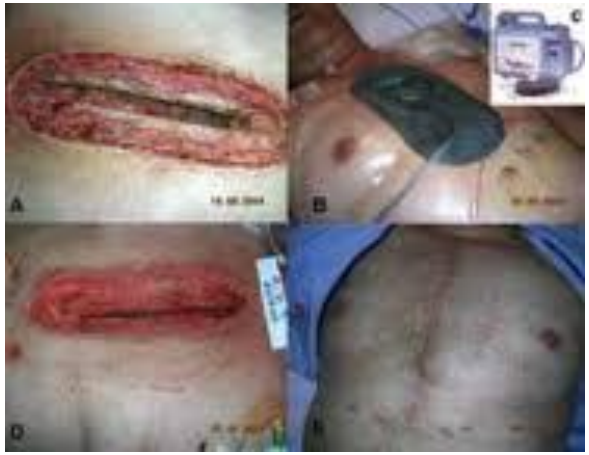
Mediastinitis

- Incidence 1-2 %
- Mortality 50 %
- Cost 50 000 USD per case



Garner, JS et al. AJIC 1988; 16: 128-140
Gaynes, R et al. J Inf Dis 1991; 193:117-121
Horan TC et al. I C H E 1992; 13: 606-608
Ottino G et al. Ann Thorac Surgery1987; 44: 173-179
Rodriguez-Hernandez, JM et al. CMI, 1997; 3: 523-530
Mossad, SB et al. Ann Thorac Surgery 1997, 63:395-401
Hollenbeak CS et al. CHEST 2000; 118: 189-193
Robicsek R Am Surg 2000; 66:184-192
Rich et al. Am Heart Hosp J, 2006
De Lissovoy G AJIC 2009; 37:387-397

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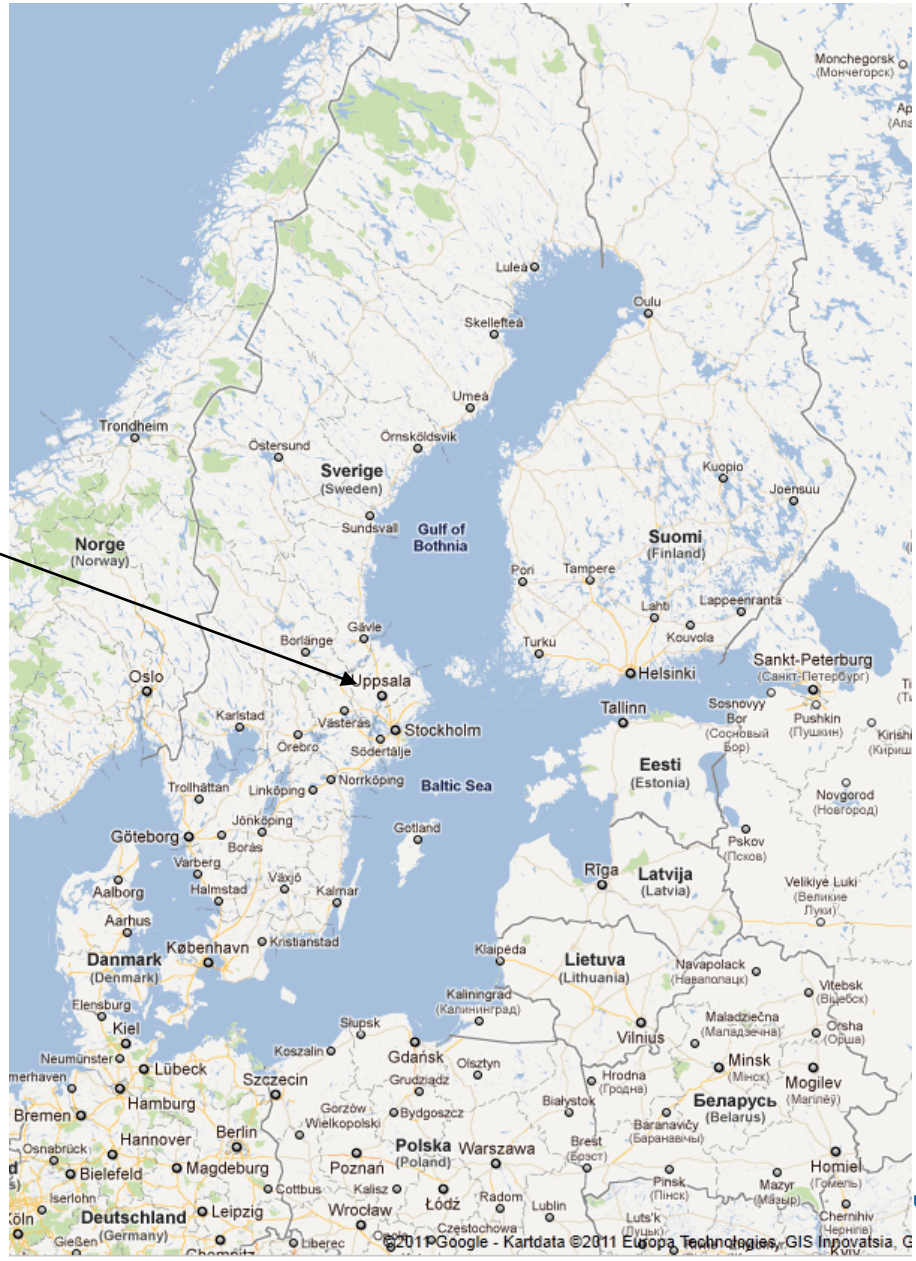
Uppsala



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Uppsala University Hospital, Sweden

Highly specialised public hospital

- 1100 beds
- 80 wards 20-25 patients
- 5 intensive care units
- 10 % of beds in single rooms with en-suite bathrooms

LÄN

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Uppsala University Hospital, Sweden

Burn´s unit
Cardiothorasic surgery
Neurosurgery
Neonatal care

For at region of 3 million citizens

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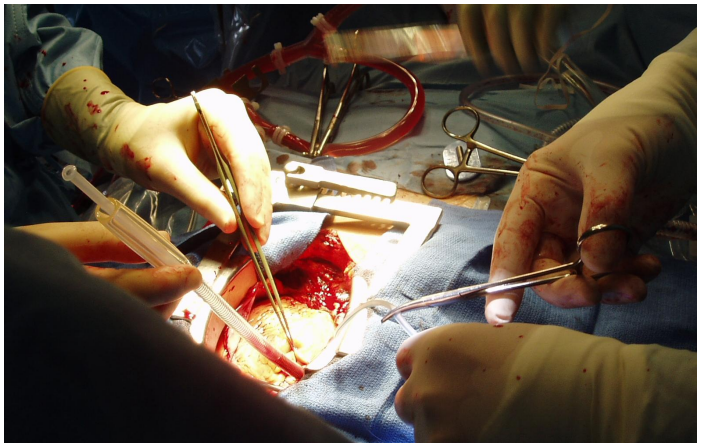
Department of Cardiothorasic Surgery UUH

700 open heart surgeries annually
250 CABG isolated operations



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Deparment of Cardiothorasic Surgery at UUH

1. Operating theatre with 5 OR
2. Postoperative ICU 14 beds
3. Ward 25 beds

One boss

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September 2009

- Chief epidemiologist at the Department of Communicable Disease Control and Prevention
- Closed the department for one week
- Swedish Communicable Diseases Act

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Litterature

Vol. 20 No. 4 INFECTION CONTROL AND HOSPITAL EPIDEMIOLOGY 247

GUIDELINE FOR PREVENTION OF SURGICAL SITE INFECTION, 1999

Alicia J. Mangram, MD; Teresa C. Horan, MPH, CIC; Michele L. Pearson, MD; Leah Christine Silver, BS; William R. Jarvis, MD;
The Hospital Infection Control Practices Advisory Committee

CDC guidelines

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Excellent compilation of evidence

World Health Organization | Patient Safety
A World Alliance for Safer Health Care

WHO Guidelines for Safe Surgery 2009

Safe Surgery Saves Lives

WHO

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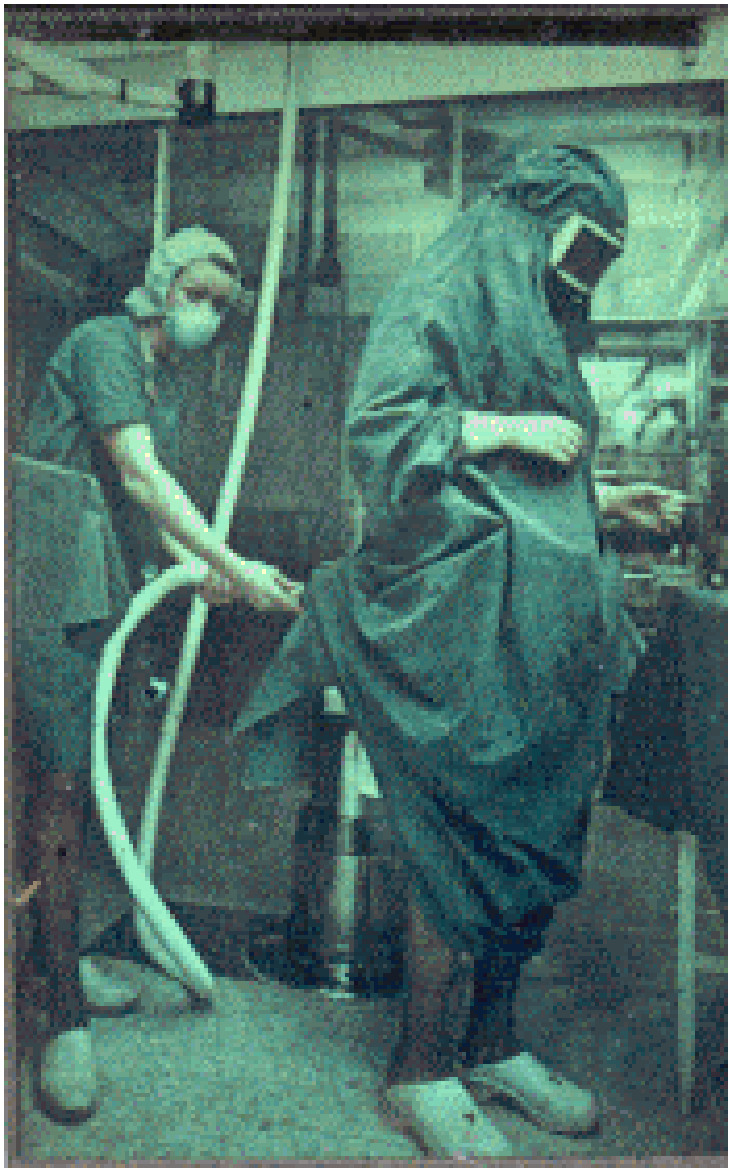
Sir John Charnley (1911-1982)



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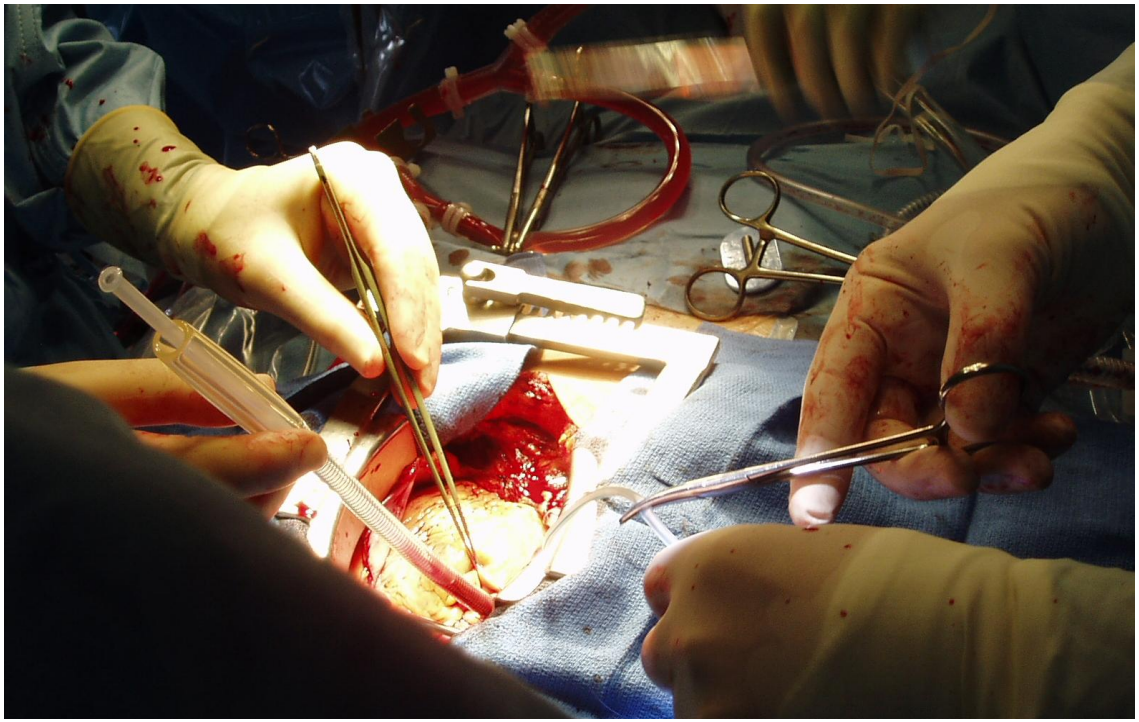
Three fundamental principles



1. Deep SSI rise from bacteria inoculated in the wound during operation

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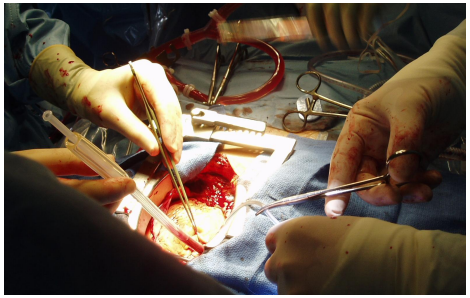

2. Infection depends on

number of microorganisms x virulence

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patient´s immune system

Burke, JF Ann Surg 1963
Cruse, P 1992
Mangram AJ Inf Control Hosp Epidemiol 1999
Fry, D Medscape Surgery 2003

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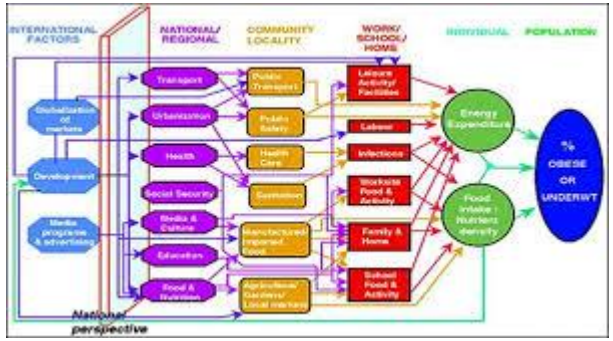
3. SSI are mutifactorial



”Web of causation”

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How could it happen?

In my hospital???

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✓ Infection control team

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- ✓ **Hospital wide hand hygiene guidelines**

Alcohol-based disinfectant…

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Before and after

tending to at patient

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✓ Uniform code

- Short sleeves
- No rings
- No wristwatches
- No bracelets

Makes proper desinfection of hands possible

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All cathegories of staff

clothes gets contaminated change every day

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Gowns or aprons

close contact

to patient and

patient´s bed

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Gloves

only when risk of touching secretions, excretions risk and contaminated and dirty equipment

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✓ Dress code in OR

Clean air suites according to standards

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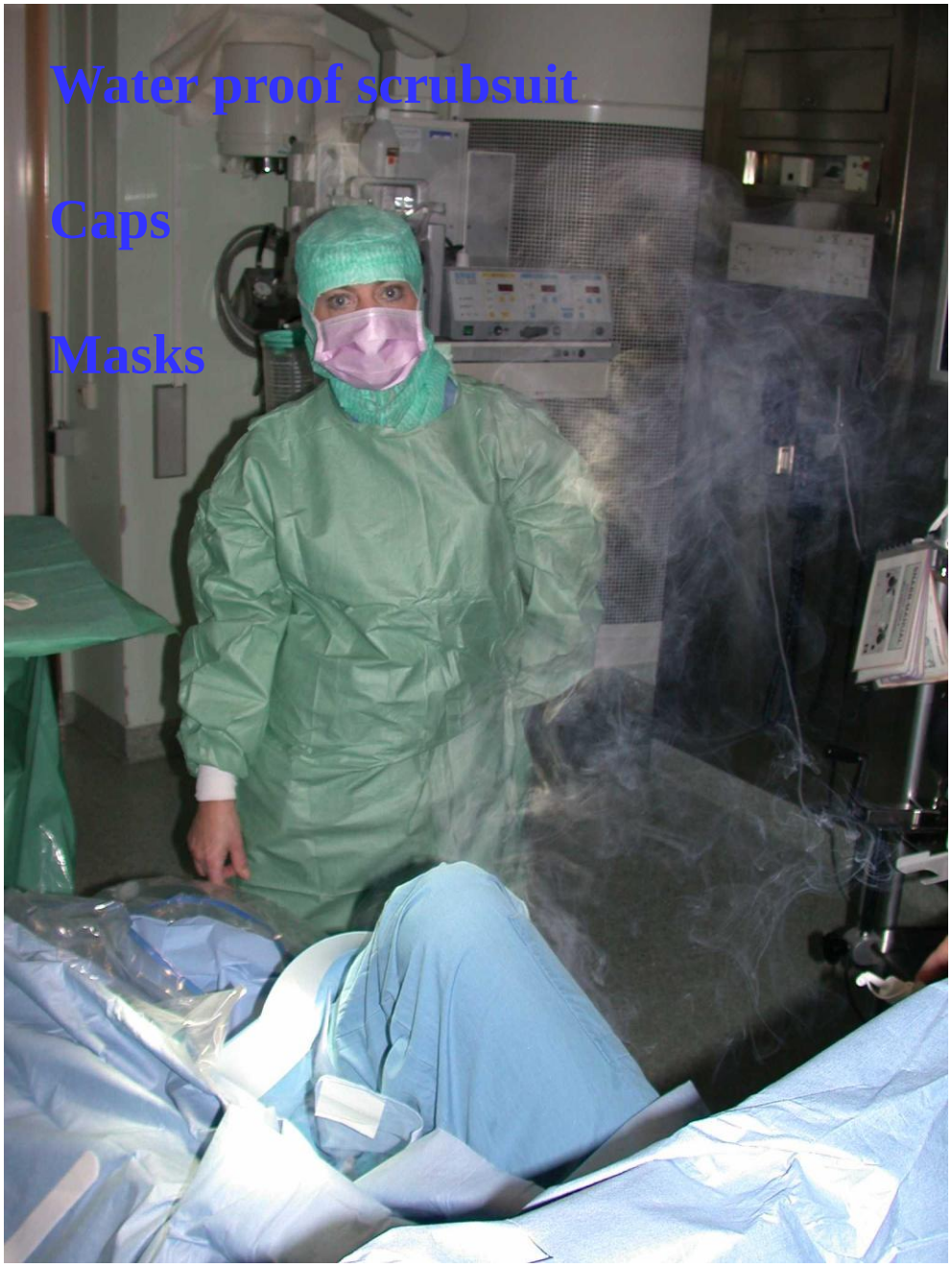

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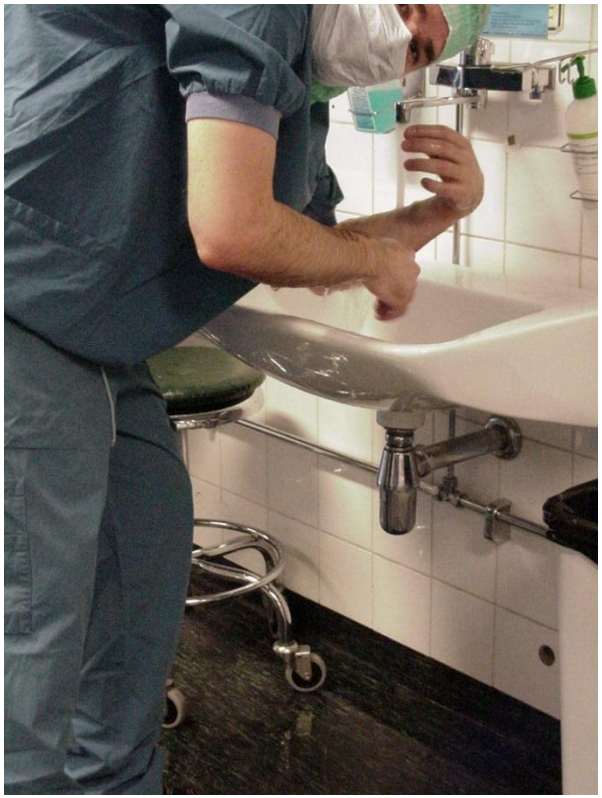
✓ Hand disinfection routines



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✓ Patient's skin whole body wash

- Two whole body washes with 4 % chlorhexidine detergent
  24 h pre-operatively
- Surgical field disinfected with chlorhexidine 5mg/ml in 70% ethanol by the OR nurse in OR

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✓ Hair removal

- Chest and leg clipping machine
- No razors

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✓ Protocol for prophylaxis

- Cloxacillin (isoxazolyl-penicillin) 2 g >30 min before skin inscision

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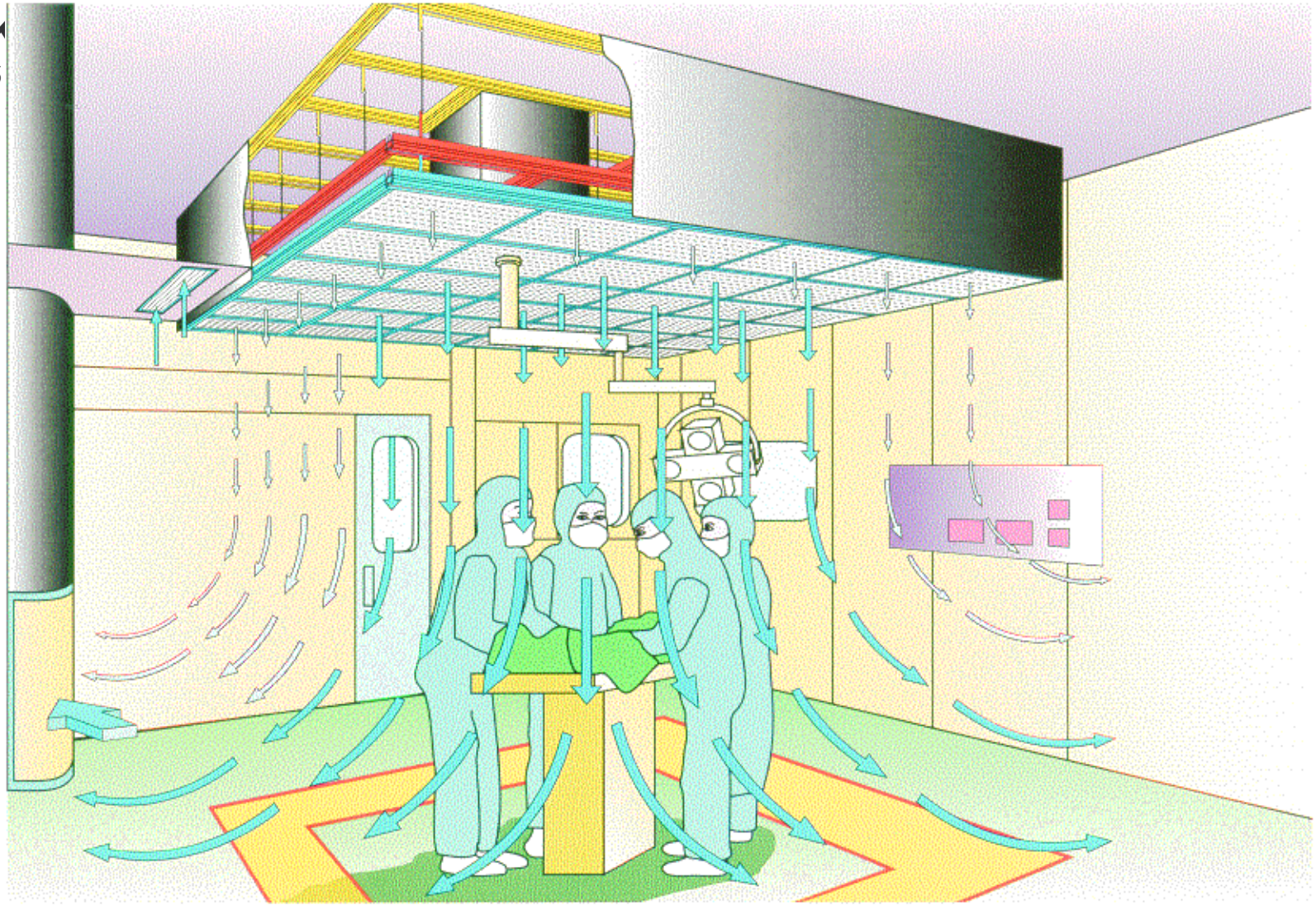
✓ Disinfection and sterilization process

✓ Ultra-clean air



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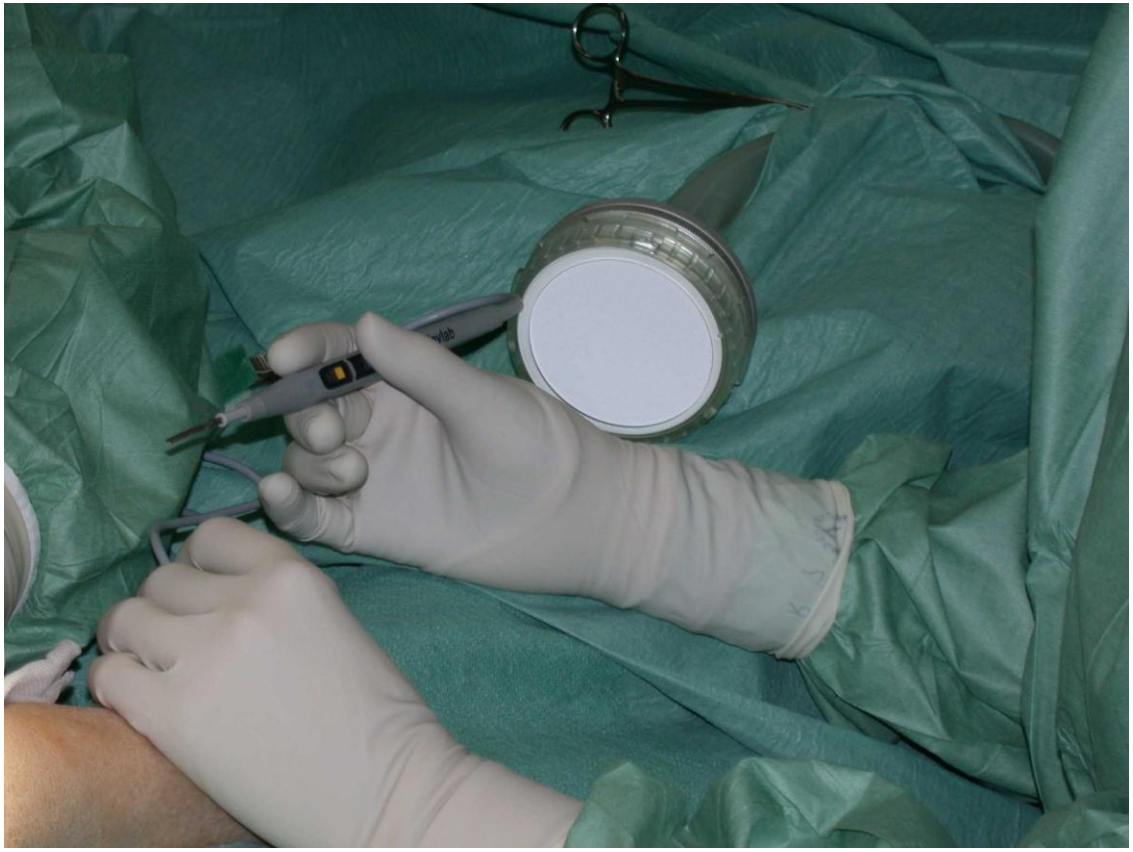
Active air sampling



Sartorius™ MD8 membrane impactor

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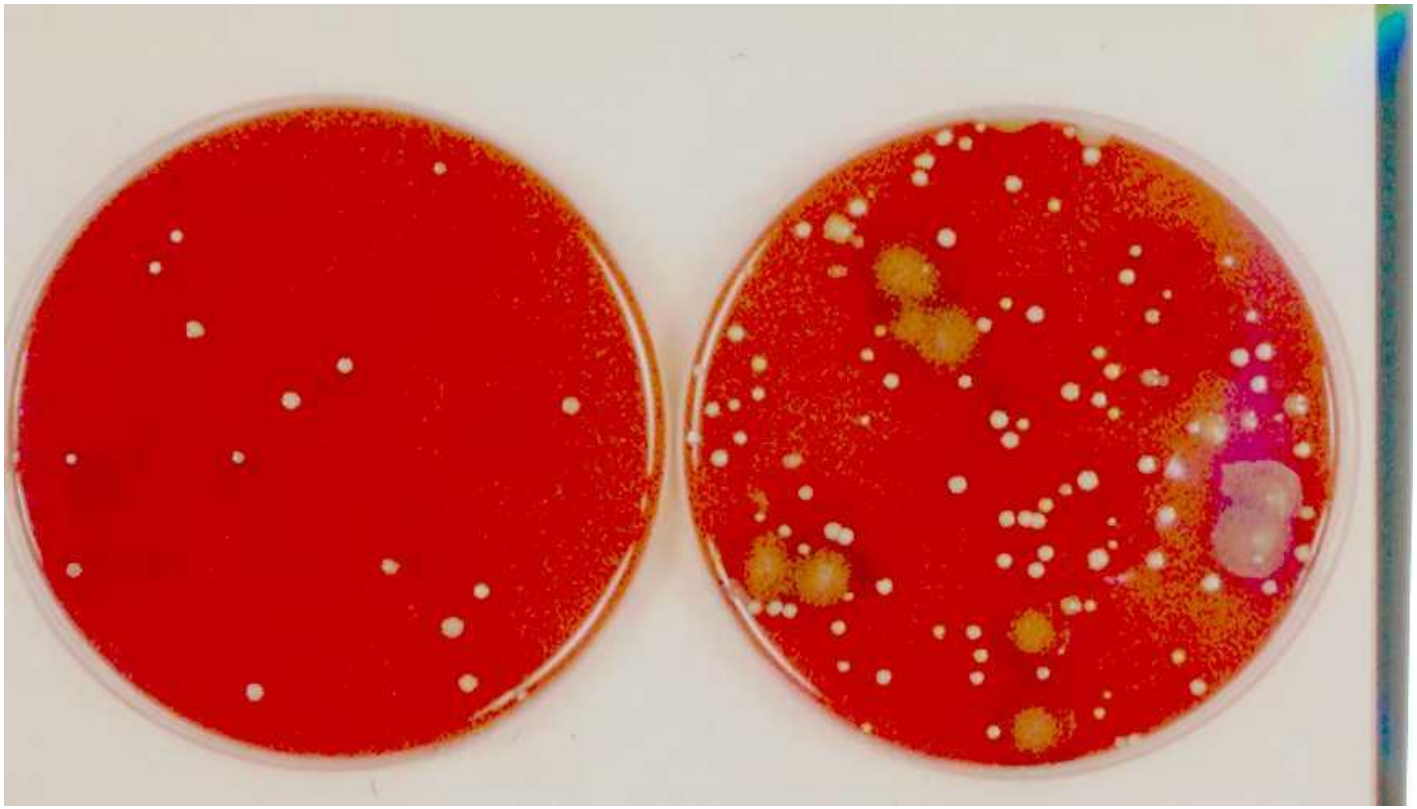
✓ Air counts < 1 cfu/m^3 in OR



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✓ Active surveillance

- Incidence of SSI monitored since 2000 at the department

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Root cause analysis

- One year 2009 - 2010
- Led by Chief Physiscian of Hospital

1.Preoperative team

2.Intraoperative team

3.Postoperative team

Identify, score and select risks for action plan

Bagian, JP 2001

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Early identified important problems

- No standard proceedures among surgeons – surgical technique
- Weak leadership allowing subgroups and different cultures among staff
- Surgeons not responsible for their patients before and after surgery
- Hygiene guidelines ignored

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Lessons learned

- Guidelines and good facilities is not enough to prevent SSI
- Compliance to existing guidelines must be in place
- All staff engaged pulling at the same direction
- Culture, attitudes and leadership
- Proceedures must be standardized

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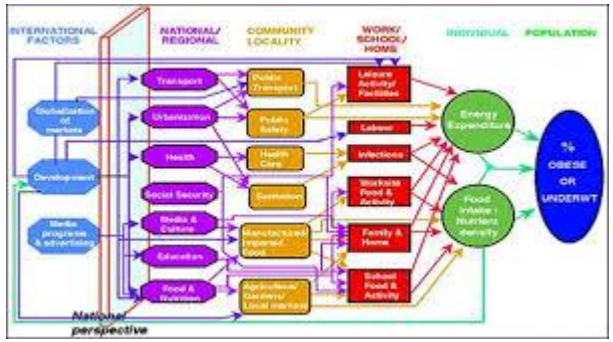
When etiology is multifactorial



Systemaic approach
-root-cause analysis

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Root cause analysis improves teamwork
All staff engaged towards common goal

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Thanks to

All staff at the

Department of Cardiothorasic Surgery

Uppsala University Hospital