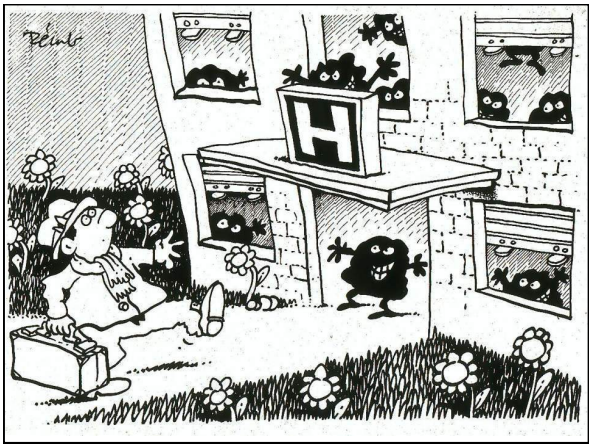
WHO Webinar series, 16 February 2010

The Modern Approach to Infection Control

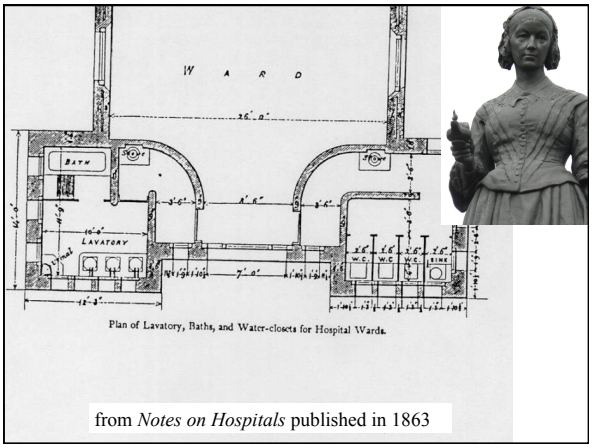
Professor Didier Pittet, MD, MS,
Infection Control Program
University of Geneva Hospitals, Switzerland

Division of Investigative Science
Imperial College, London, UK

Lead, 1st Global Patient Safety Challenge,
World Health Organization (WHO) Patient Safety

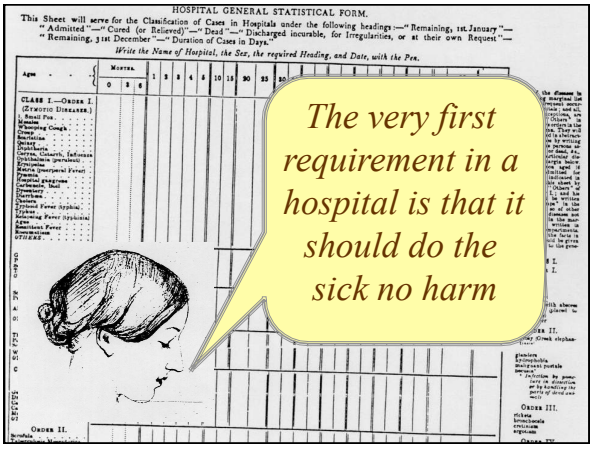


Florence Nightingale, 1820 - 1907



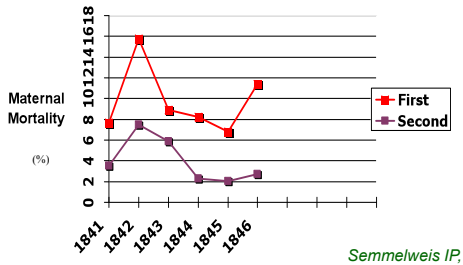
Plan of Lavatory, Baths, and Water-closets for Hospital Wards.

from *Notes on Hospitals* published in 1863



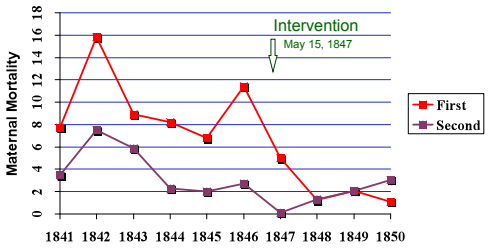
Ignaz Philipp Semmelweis

Maternal mortality rates, First and Second Obstetric Clinics, GENERAL HOSPITAL OF VIENNA, 1841-1850



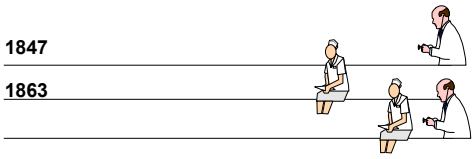
Semmelweis IP, 1861

Maternal mortality rates, First and Second Obstetric Clinics, GENERAL HOSPITAL OF VIENNA, 1841-1850



Semmelweis IP, 1861

Early times of infection control



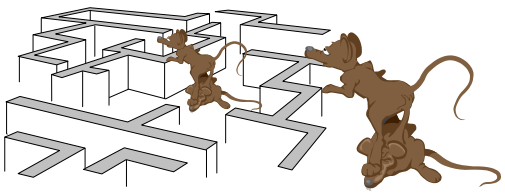
Infection Control and Quality Healthcare in the New Millenium

Are there lessons to be learned ?

Recognize
Explain
Act

Pittet D, *Am J Infect Control* 2005, 33:258

Does infection control

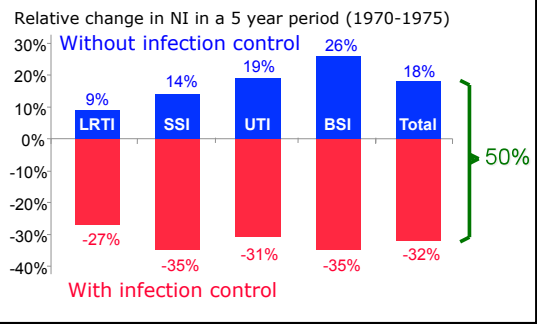


control infections ?

SENIC study

Study on the **E**fficacy of **N**osocomial **I**nfection **C**ontrol

Haley RW et al. Am J Epidemiol 1985;121(2):182-205



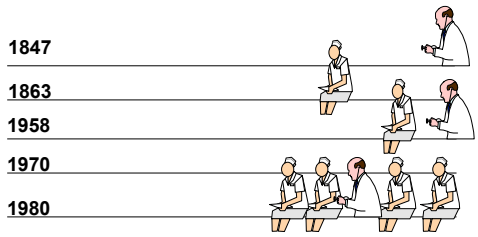
SENIC

Study on the Efficacy of Nosocomial Infection Control

- 1 infection control nurse per ~~200 to~~ 250 beds per 110 beds
- 1 hospital epidemiologist per hospital (1000 beds)
- Organized surveillance for nosocomial infections
- Feedback of nosocomial infection rates

Haley RW et al. Am J Epidemiol 1985;121(2):182-205

Approach to infection control



Pittet D, *Am J Infect Control* 2005, 33:258

1st principle of infection prevention

at least 35-50% of all healthcare-associated infections are associated with only 5 patient care practices:

- Use and care of urinary catheters
- Use and care of vascular access lines
- Therapy and support of pulmonary functions
- Surveillance of surgical procedures
- Hand hygiene and standard precautions

1st principle of infection prevention

at least 35-50% of all healthcare-associated infections are associated with only 5 patient care practices:

- Use and care of urinary catheters
- Use and care of vascular access lines
- Therapy and support of pulmonary functions
- Surveillance of surgical procedures
- Hand hygiene and standard precautions

Healthcare-Associated Urinary Tract Infection

- Urinary tract infection (UTI) causes ~ 40% of hospital-acquired infections
- Most infections due to urinary catheters
- 25% of inpatients are catheterized
- Leads to increased morbidity and costs

SUPPLEMENT ARTICLE: SHEA/IDSA PRACTICE RECOMMENDATION

Strategies to Prevent Catheter-Associated Urinary Tract Infections in Acute Care Hospitals

Infect Control Hosp Epidemiol . 2008 Suppl 1:S41-50.

epic2: National Evidence-Based Guidelines for Preventing Healthcare-Associated Infections in NHS Hospitals in England

J Hosp Infect. 2007 65 Suppl 1:S1-64

International Journal of Antimicrobial Agents

European and Asian guidelines on management and prevention of catheter-associated urinary tract infections

Int J Antimicrob Agents 2008 Suppl 1:S68-78.

Prevention of Catheter-Associated Urinary Tract Infection (CA-UTI)

Two main principles

Avoid unnecessary catheterization

Limit the duration of catheterization

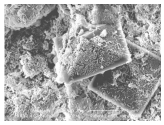
Indications for the use of indwelling urethral catheters

- **Indications**
  - Perioperative use for selected surgical procedures
  - Urine output monitoring in critically ill patients
  - Management of acute urinary retention and urinary obstruction
  - Assistance in pressure ulcer healing for incontinent residents
  - **As an exception**, at patient request to improve comfort
- Urinary incontinence is **not** an accepted indication for urinary catheterization
  - 21 to 50 percent of urinary catheters not indicated

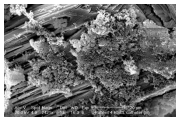
Lo et al. (2008) *Infect Control Hosp Epidemiol* Suppl 1:S41-50

Is one catheter better than another?

- No significant difference between latex and silicone catheters
- What about coated / impregnated catheters?
- The concept: prevention of biofilm formation



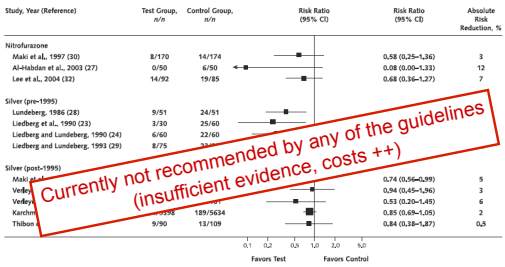
EM pictures of biofilms on silver coated catheters



Morgan et al. (2009) *Urol Res* 37:89–93.

Antimicrobial-coated urinary catheters

Proportion of participants (or catheters) developing catheter-associated **bacteriuria**

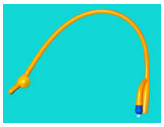


Some effect, but studies mostly of poor quality
Useful in high-risk groups?

Johnson et al. (2006) *Ann Intern Med* 14:116-26

Catheter insertion and maintenance

- Practice hand hygiene (A-III)
  - before insertion of the catheter
  - before and after any manipulation of the catheter site



http://www.who.int/gpsc/tools/en/

Catheter insertion and maintenance

- Insert catheters by use of aseptic technique and sterile equipment (A-III)
- Cleanse the meatal area with antiseptic solutions is unnecessary (A-I)
  - routine hygiene is appropriate
- Properly secure indwelling catheters after insertion to prevent movement and urethral traction (A-III)
- Maintain a sterile, continuously closed drainage system (A-I)
- Do not disconnect the catheter and drainage tube unless the catheter must be irrigated (A-I)

Lo et al. (2008) *Infect Control Hosp Epidemiol* Suppl 1:S41-50

Catheter insertion and maintenance

- Maintain unobstructed urine flow (A-II)
- Empty the collecting bag regularly, using a separate collecting container for each patient, and avoid allowing the draining spigot to touch the collecting container (A-II)
- Keep the collecting bag below the level of the bladder at all times (A-III)
- Do not routinely use silver-coated or other antibacterial catheters (A-I)
- Do not screen for asymptomatic bacteruria in catheterized patients (A-II)
- Do not treat asymptomatic bacteruria in catheterized patients except before invasive urologic procedures (A-I)

Lo et al. (2008) *Infect Control Hosp Epidemiol* Suppl 1:S41-50

What you should not do to prevent CAUTI

- Do not use (avoid) catheter irrigation (A-I)
- Do not use systemic antimicrobials routinely as prophylaxis (A-II)
- Do not change catheters routinely (A-III)

Lo et al. (2008) *Infect Control Hosp Epidemiol* Suppl 1:S41-50

Incidence of UTI, before and after a multimodal intervention

Stéphan F. et al D, *Clin Infect Diseases* 2006, 42:1544

UTI	Pre-intervention period (n=280)		Post-intervention period (n=259)		RR (95%-CI)
	N	ID*	N	ID*	
Overall	39	27.0	17	12.0	0.44 (0.24-0.81)
Orthopedic surgery *Intervention group*	34	45.8	10	18.6	0.41 (0.20-0.79)
Digestive surgery *Control group*	6	9.0	3	5.6	0.62 (0.14-2.50)

* ID: episodes per 1000 catheter-days

Stéphan F. et al D, **Reduction of UTI and antibiotic use after surgery: a controlled, prospective, before-after intervention study** *Clin Infect Diseases* 2006, 42:1544

- Incidence density of UTI decreased by 60% after orthopedic surgery following a multimodal intervention
- Results were maintained after 2 years
- Less indwelling urinary catheters placed in the operating room
- Decrease UTI antibiotic-related consumption

1st principle of infection prevention

at least 35-50% of all healthcare-associated infections are associated with only 5 patient care practices:

- Use and care of urinary catheters
- Use and care of vascular access lines
- Therapy and support of pulmonary functions
- Experience with surgical procedures
- Hand hygiene and standard precautions

Sources of the catheter-associated bloodstream infection

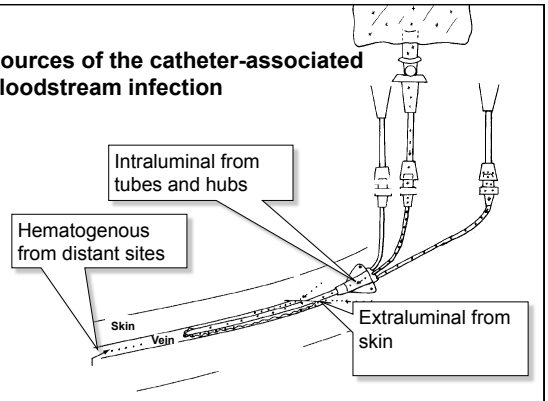


Figure. Source of intravascular catheter–related infections.

Reported incidence rates of catheter-associated bloodstream infections in surveillance networks in ICUs:

NHSN: 2.7 per 1000 catheter-days (1.5/1'000 – 6.8/1'000) National Healthcare Safety Network

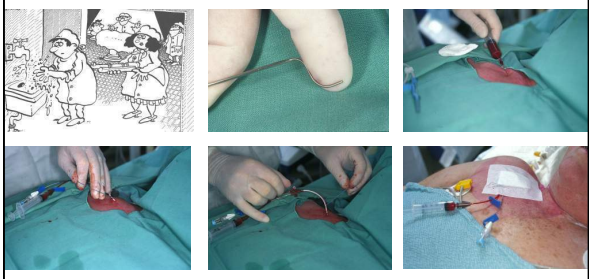
Michigan: 2.7 per 1000 catheter-days (median before intervention)

Germany: 2.1 per 1000 catheter-days

18 developing countries: 8.9 per 1000 catheter-days International Nosocomial Infection Control Consortium (INICC) 2002-2007

Edwards RJ. *Am J Infect Control* 2007; 35:290 – Gastmeier P. *J Hosp Infect* 2006; 64: 16
Pronovost P. *N Engl J Med* 2006; 355:26 – Rosenthal V. *Am J Inf Control*, 2008:36:627-637

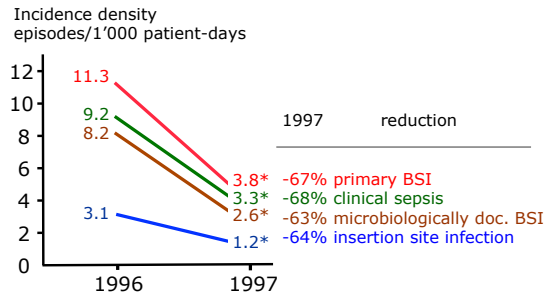
Education-based, multimodal prevention strategy of CRI



Eggimann and Pittet *Sepsis Monitor* 2000

Prevention of vascular access line infection
Medical intensive care unit

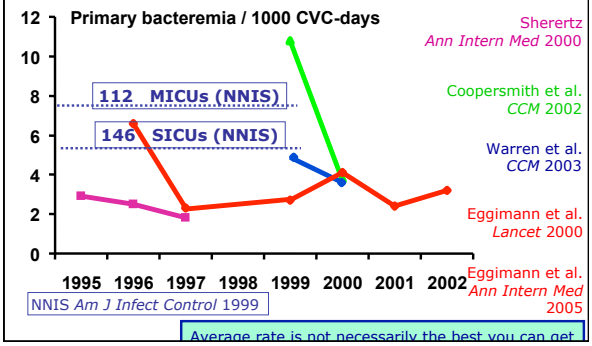
HUG



Eggimann et al. Lancet 2000; 355:1864

* $P < 0.05$

Education-based prevention of vascular catheter-associated bloodstream infection



Multimodal intervention strategies to reduce catheter-associated bloodstream infections:

- Hand hygiene
- Maximal sterile barrier precaution at insertion
- Skin antisepsis with alcohol-based chlorhexidine-containing products
- Subclavian access as the preferred insertion site
- Daily review of line necessity
- Standardized catheter care using a non-touch technique
- Respecting the recommendations for dressing change

Eggimann P. *Lancet* 2000; 35: 290
Pronovost P. *N Engl J Med* 2006; 355: 26
Zingg W. *Crit Care Med* 2009; 37: 2167

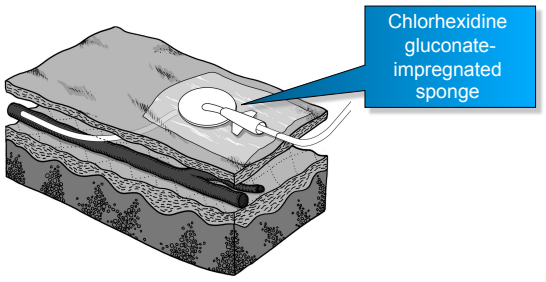
Efficacy of multimodal intervention strategies:

	Baseline	Intervention
Eggimann *Lancet* 2000 *Ann Intern Med* 2005	3.1/1000 catheter-days	1.2/1000 catheter-days
Pronovost *NEJM* 2006	*7.7/1000 catheter-days	*1.4/1000 catheter-days
Zingg *Crit Care Med* 2009	3.1/1000 catheter-days	1.1/1000 catheter-days

***mean** pooled CRBSI-episodes per 1'000 catheter-days

Eggimann P. *Lancet* 2000; 35: 290
Eggimann P. *Ann Intern Med* 2005; 142: 875 – 5 year follow-up
Pronovost P. *N Engl J Med* 2006; 355: 26
Zingg W. *Crit Care Med* 2009; 37: 2167

Could we do better ?



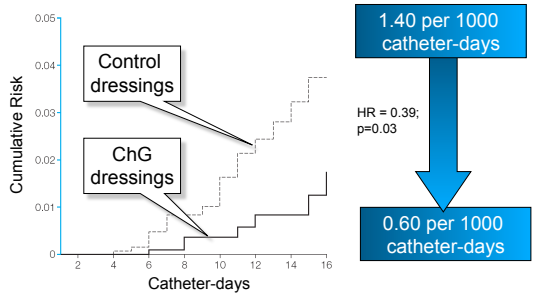
Chlorhexidine-Impregnated Sponges and Less Frequent Dressing Changes for Prevention of Catheter-Related Infections in Critically Ill Adults

Multi-centre randomized controlled trial

- 3'778 catheters
- 28'931 catheter-days
- Baseline rate of major catheter-related infections: **1.4/1000** catheter-days!

Timsit JF. *JAMA* 2009; 301: 1231

Chlorhexidine-gluconate impregnated dressings decreased major catheter-related infections:



Timsit JF. *JAMA* 2009; 301: 1231

Efficacy of multimodal intervention strategies:

	Baseline	Intervention
Eggimann	3.1/1000 catheter-days	1.2/1000 catheter-days
Pronovost	*7.7/1000 catheter-days	*1.4/1000 catheter-days
Zingg	3.1/1000 catheter-days	1.1/1000 catheter-days
Timsit	1.4/1000 catheter-days	0.6/1000 catheter-days

***mean** pooled CRBSI-episodes per 1'000 catheter-days

Eggimann P. *Lancet* 2000; 35: 290
Pronovost P. *N Engl J Med* 2006; 355: 26
Zingg W. *Crit Care Med* 2009; 37: 2167
Timsit JF. *JAMA* 2009; 301: 1231

1st principle of infection prevention

at least 35-50% of all healthcare-associated infections are associated with only 5 patient care practices:

- Use and care of urinary catheters
- Use and care of vascular access lines
- Therapy and support of pulmonary functions
- Experience with surgical procedures
- Hand hygiene and standard precautions

Risk factors for Ventilator-Associated Pneumonia (VAP)

Patient
- Age
- Burns
- Coma
- Lung disease
- Immunosuppression
- Malnutrition
- Blunt trauma

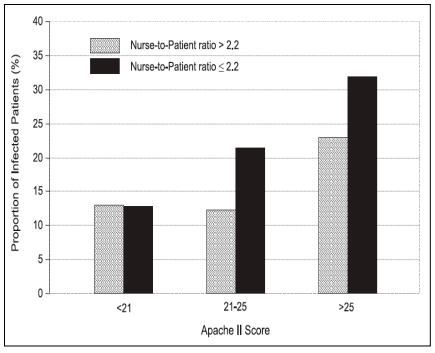
Devices
- Invasive ventilation
- Duration of invasive ventilation
- Reintubation
- Medication
- Prior antiobiotic treatment
- Sedation

General precautions

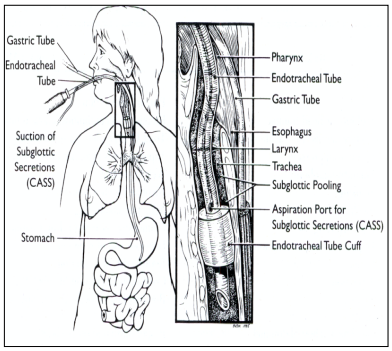
- Staff education, hand hygiene, isolation precautions (I)
- Surveillance of infection and resistance with timely feedback (II)
- Adequate staffing levels (II)

ATS Guidelines 2005

Effect of staffing level in late onset VAP



Hugonnet S, et al. *Crit Care Med* 2007;35(1):76



Intubation and ventilation

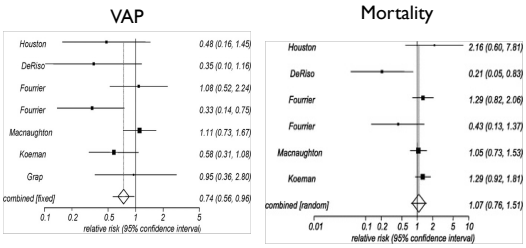
- Avoid intubation and reintubation - I
- Prefer non-invasive ventilation - I
- Prefer orotracheal intubation & orogastric tubes - II
- Continous subglottic aspiration - I
- Cuff pressure > 20 cm H2O - II
- Avoid entering of contaminate consendate into tube/nebulizer - II
- Use sedation and weaning protocols to reduce duration – II
- Use daily interruption of sedation and avoid paralytic agents - II

ATS Guidelines 2005

Is there a role for oral antiseptics ?

ATS Guidelines 2005

Oral decontamination Chlorhexidine



Schlebiki MP et al. *Crit Care Med* 2007;35:595-602

Is there a role for oral antiseptics ?

- Oral chlorhexidine application reduces VAP in one study but not for general use – I

ATS Guidelines 2005

Systemic and enteral antibiotics

- Selective decontamination of the digestive tract (SDD) reduces the incidence of VAP & helps to contain MDR outbreaks – I
- But SDD not recommended for routine use – II
- Prior systemic antibiotics helps to reduce VAP in selected patient groups but increases MDR – II
- 24-hour AB prophylaxis helps in one study but not for routine use - I

ATS Guidelines 2005

Stress bleeding, transfusion, hyperglycemia

- Trend towards less VAP with sucralfate (vs H2 blockers) but increased gastric bleeding > individual choice - I
- Prudent transfusion, leukocyte-depleted red blood cell transfusion - I
- Intensive insulin therapy to keep glucose 80 - 110 mg/dl - I

Aspiration, body position

- Semirecumbent position (30 - 45°) especially when receiving enteral feeding - I
- Enteral nutrition is preferred over parenteral because of translocation risk - I

ATS Guidelines 2005

A multifaceted program to prevent ventilator-associated pneumonia: Impact on compliance with preventive measures*

Lila Bouadma, MD; Bruno Mourvillier, MD; Véronique Deiler, RN; Bertrand Le Corre, RN; Isabelle Lolom, BS; Bernard Régnier, MD; Michel Wolff, MD; Jean-Christophe Lucet, MD, PhD

Crit Care Med 2010: volume 38 in Press

1. Adherence to hand hygiene
2. Adherence to glove and gown use
3. Backrest elevation maintenance
4. Correct tracheal-cuff maintenance
5. Orogastric tube use
6. Gastric overdistention avoidance
7. Good oral hygiene
8. Elimination of non-essential tracheal suction

2 year intervention study:
Compliance with preventive measure increased
VAP prevalence rate decreased by 51%

VAP Prevention

1. Hand hygiene before and after patient contact, preferably using alcohol-based handrubbing
2. Avoid endotracheal intubation if possible
3. Use of oral, rather than nasal, endotracheal tubes
4. Minimize the duration of mechanical ventilation
5. Promote tracheostomy when ventilation is needed for a longer term
6. Glove and gown use for endotracheal tube manip

VAP Prevention (con't)

7. Avoid non-essential tracheal suction
8. Oral hygiene with chlorhexidine
9. Backrest elevation 30-45°
10. Maintain tracheal tube cuff pressures (>20) to prevent regurgitation from the stomach
11. Avoid gastric overdistension
12. Promote enteral feeding
13. Careful blood sugar control in patients with diabetes
14. SDD in selected cases

A multimodal strategy

1st principle of infection prevention

at least 35-50% of all healthcare-associated infections are associated with only 5 patient care practices:

- Use and care of urinary catheters
- Use and care of vascular access lines
- Therapy and support of pulmonary functions
- Experience with surgical procedures
- Hand hygiene and standard precautions

Strategies to prevent SSI

- Objectives
  - Reduce the inoculum of bacteria at the surgical site
    - Surgical Site Preparation
    - Antibiotic Prophylaxis Strategies
  - Optimize the microenvironment of the surgical site
  - Enhance the physiology of the host (host defenses)
- In relation to risk factors, classified as
  - Patient-related (intrinsic)
  - Pre-operative
  - Operative

Patient-related factors

- **Diabetes** - Recommendation (IDSA/SHEA)
  - Preoperative
    - Control serum blood glucose; reduce HbA1C levels to <7% before surgery if possible (A-II)
  - Post-operative (cardiac surgery patients only)
    - Maintain the postoperative blood glucose level at less than 200 mg/dL (A-I)
- **Smoking**

  - Rationale
    - Nicotine delays wound healing
    - Cigarette smoking = independent RF for SSI after cardiac surgery
  - Studies: None
  - Recommendation
    - Encourage smoking cessation within 30 days before procedure

Procedure-related risk factors

- Hair removal technique
- Preoperative infections
- Surgical scrub
- Skin preparation
- Antimicrobial prophylaxis
- Surgeon skill/technique
- Asepsis
- Operative time
- Operating room characteristics

Antimicrobial prophylaxis

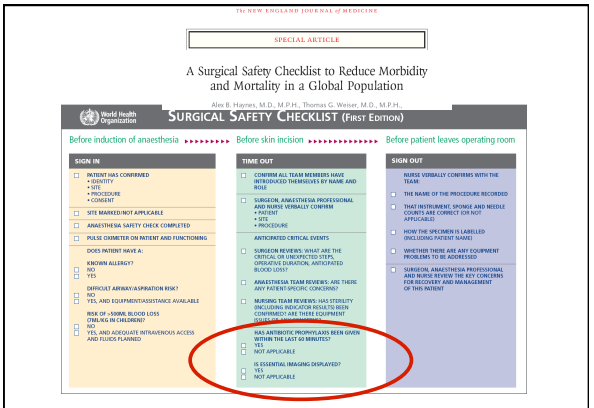
- Recommendations (A-I)
  - Administer within 1 hour of incision to maximize tissue concentration
    - Once the incision is made, delivery to the wound is impaired

Antimicrobial prophylaxis

- Duration of prophylaxis (A-I)
  - Stop prophylaxis
    - within 24 hours after the procedure
    - within 48 hours after cardiac surgery
  - To:
    - Decrease selection of antibiotic resistance
    - Contain costs
    - Limit adverse events

Bratzler et al *Arch Surg* 2005, 140:174-82

Harbarth S et al. *Circulation* 2000;101:2916–2921



The NEW ENGLAND JOURNAL of MEDICINE

SPECIAL ARTICLE

A Surgical Safety Checklist to Reduce Morbidity and Mortality in a Global Population

Alex B. Haynes, M.D., M.P.H., Thomas G. Weiser, M.D., M.P.H.

World Health Organization — SURGICAL SAFETY CHECKLIST (FIRST EDITION)

Before induction of anaesthesia ▸▸▸▸▸▸▸▸▸ Before skin incision ▸▸▸▸▸▸▸▸▸▸▸▸▸ Before patient leaves operating room

SIGN IN

- PATIENT HAS CONFIRMED
  - IDENTITY
  - SITE
  - PROCEDURE
  - CONSENT
- SITE MARKED/NOT APPLICABLE
- ANAESTHESIA SAFETY CHECK COMPLETED
- PULSE OXIMETER ON PATIENT AND FUNCTIONING
- DOES PATIENT HAVE A:
  - KNOWN ALLERGY? NO / YES
  - DIFFICULT AIRWAY/ASPIRATION RISK? NO / YES, AND EQUIPMENT/ASSISTANCE AVAILABLE
  - RISK OF >500ML BLOOD LOSS (7ML/KG IN CHILDREN)? NO / YES, AND ADEQUATE INTRAVENOUS ACCESS AND FLUIDS PLANNED

TIME OUT

- CONFIRM ALL TEAM MEMBERS HAVE INTRODUCED THEMSELVES BY NAME AND ROLE
- SURGEON, ANAESTHESIA PROFESSIONAL AND NURSE VERBALLY CONFIRM
  - PATIENT
  - SITE
  - PROCEDURE

ANTICIPATED CRITICAL EVENTS

- SURGEON REVIEWS: WHAT ARE THE CRITICAL OR UNEXPECTED STEPS, OPERATIVE DURATION, ANTICIPATED BLOOD LOSS?
- ANAESTHESIA TEAM REVIEWS: ARE THERE ANY PATIENT-SPECIFIC CONCERNS?
- NURSING TEAM REVIEWS: HAS STERILITY (INCLUDING INDICATOR RESULTS) BEEN CONFIRMED? ARE THERE EQUIPMENT ISSUES OR ANY CONCERNS?
- HAS ANTIBIOTIC PROPHYLAXIS BEEN GIVEN WITHIN THE LAST 60 MINUTES? YES / NOT APPLICABLE
- IS ESSENTIAL IMAGING DISPLAYED? YES / NOT APPLICABLE

SIGN OUT

- NURSE VERBALLY CONFIRMS WITH THE TEAM:
- THE NAME OF THE PROCEDURE RECORDED
- THAT INSTRUMENT, SPONGE AND NEEDLE COUNTS ARE CORRECT (OR NOT APPLICABLE)
- HOW THE SPECIMEN IS LABELLED (INCLUDING PATIENT NAME)
- WHETHER THERE ARE ANY EQUIPMENT PROBLEMS TO BE ADDRESSED
- SURGEON, ANAESTHESIA PROFESSIONAL AND NURSE REVIEW THE KEY CONCERNS FOR RECOVERY AND MANAGEMENT OF THIS PATIENT

Surgeon Skill and Technique

- Excellent surgical technique reduces the risk of SSI (A-III)
- Includes
  - Gentle traction and handling of tissues
  - Effective hemostasis
  - Removal of devitalized tissues
  - Obliteration of dead spaces
  - Irrigation of tissues with saline during long procedures
  - Use of fine, non-absorbed monofilament suture material
  - Wound closure without tension
  - Adherence to principles of asepsis

Active surveillance

Système	N patients	Période	Réduction ISO
PREZIES *Geubbels, IJ Qual HCare, 2006*	21 920	5 ans	- 57%*
KISS *Brandt, ICHE 2006*	119 114	4 ans	- 25%*
INCISO *Rioux, JHI 2007*	150 440	6 ans	- 50%**

Courtesy: Astagneau, SFHH 2007

Summary: Relative SSI reduction

- Active surveillance	38% 55%	*Haley et al, Am J Epidemiol 1985* *Rioux et al, J Hosp Infect 2007*
- Multimodal intervention	27% 57%	*100k lives campaign* *Trussel et al, Am J Surg 2008*
- Correct and timely antibiotic prophylaxis	18%	*Saxer et al, Ann Surg 2009*
- Normothermia	13%	*Kurz et al, NEJM 1996*
- Normoglyceamia	38%	*Ambiru et al, J Hosp Infect 2008*
- *Chlorhexidine-alcohol?*	41%	*Darouiche et al, NEJM 2010*
- *Suppl. oxygen?*	25%	*Qadan et al, Arch Surg 2009*
- *Nasal mupirocin for MSSA?*	58%	*Bode et al, NEJM 2010*
- Surgical hand antisepsis no data	no random	*Widmer et al, J Hosp Infect 2010*

Examples of Multimodal approach(es) to reduce SSI

Timely antibiotic prophylaxis, strict glycaemia control, no shaving

SSI 1.5% vs. 3.5% in controls

Trussel et al, Am J Surg 2008

100k lives campaign

(antibiotic prophylaxis, glycaemia control, normothermia)

SSI from 2.3% to 1.7% (-27%)

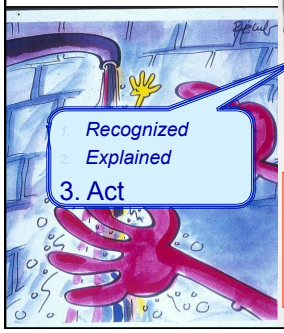
100k lives campaign

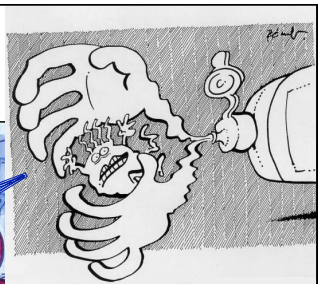
1st principle of infection prevention

at least 35-50% of all nosocomial infections are associated with patient care practices:

- Use and care of urinary catheters
- Use and care of vascular access lines
- Therapy and support of pulmonary functions
- Experience with surgical procedures
- Hand hygiene and standard precautions

Handwashing ...
an action of the past
(except when hands are visibly soiled)





Alcohol-based hand rub is standard of care

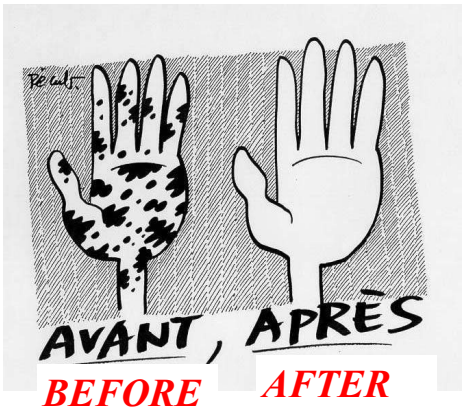
Alcohol-based hand rub at the point of care

HUG

The University of Geneva Hospitals, 1995

Before and after any patient contact
After glove use
In between different body site care

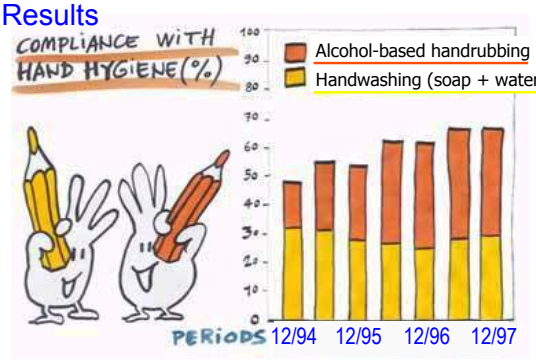
The University of Geneva Hospitals (HUG), 1995



The University of Geneva Hospitals (HUG), 1995 - 1998

« Talking walls »

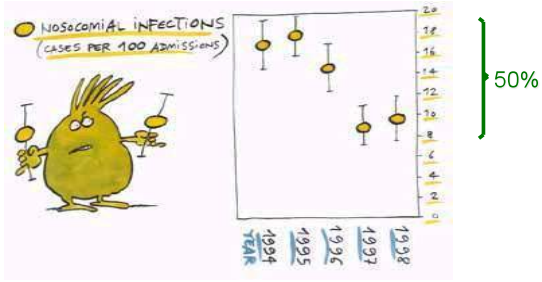
Results



www.hopisafe.ch

Pittet D et al, *Lancet* 2000; 356: 1307-1312

Hospital-wide nosocomial infections; trends 1994-1998



www.hopisafe.ch

Pittet D et al, *Lancet* 2000; 356: 1307-1312

The University of Geneva Hospitals (HUG), 8 years follow-up

Pittet D et al, *Inf Control Hosp Epidemiol* 2004; 25:264

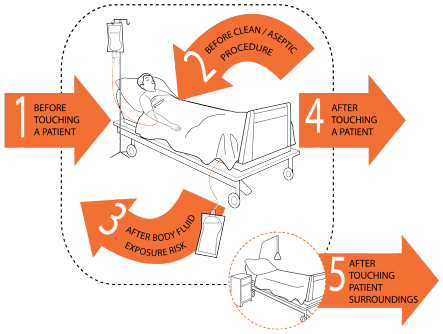
« Success story – Key Parameters »

- System change
- Education of healthcare workers
- Monitoring and feedback of performance
- Administrative support
- Leadership and culture change
- Associated with reduction in cross-transmission and infection rates

- The 5 core components of the WHO Multimodal Hand Hygiene Improvement Strategy

1. System change
   - Alcohol-based handrub at point of care
   - Access to safe, continuous water supply, soap and towels
2. Training and Education
3. Observation and feedback
4. Reminders in the hospital
5. Hospital safety climate

"My 5 Moments for Hand Hygiene"



Sax H, Allegranzi B, Uçkay I, Larson E, Boyce J, Pittet D. *J Hosp Infect* 2007;67:9-21

A multimodal strategy

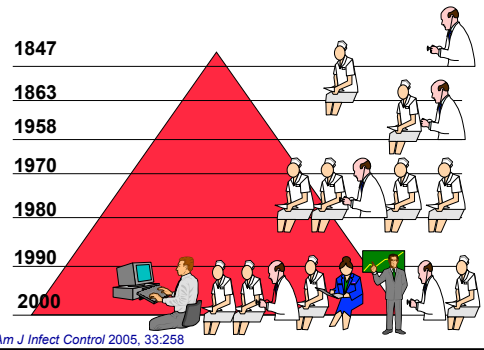
- System change
- Education
- Monitoring performance + feedback
- Reminders
- Safety culture

Evolving to new challenges in infection control and patient safety

- Team and multidisciplinary team work
- Successful interventions
- Adaptability of actions
- Scaling up
- Sustainability of actions / interventions
- Leadership commitment / Governance

Infection Control and Quality Healthcare in the New Millenium

Multidisciplinary team approach

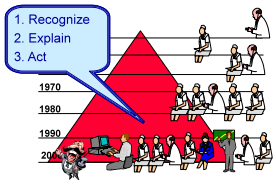


Pittet D, *Am J Infect Control* 2005, 33:258

Infection Control and Quality Healthcare in the New Millenium

Where are we going ?

Multidisciplinary team approach



Healthcare system:
-Hospitals
-Ambulatory services
-Nursing homes
-Long-term care facilities
-Home care delivery systems

State/country epidemiology program

International surveillance systems

Financing bodies

Patient safety promotion

Pittet & Sax, *Infectious Diseases*. Cohen textbook (2nd ed.), chap.85, 2004

Registered health-care facilities – May 2009 on…

Work in progress….

The global impact of SAVE LIVES: Clean Your Hands - Jan 2010
5996 health-care facilities from 126 countries

Aiming at… 10 000 registered health-care facilities by May 2010

The countdown has started!

SAVE LIVES: Clean YOUR Hands 5 May 2009-2020

A WHO Patient Safety Initiative 2009

Encourage health-care facilities to show their commitment by signing up now on:

http://www.who.int/gpsc/5may

Clean Care is Safer Care

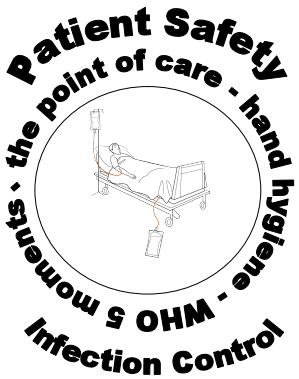
Global Patient Safety Challenge

***WHO* Patient Safety**

***WHO* Collaborating Centres**

Country **campaigns & activities**

Facility **campaigns & activities** *including evaluation and feedback*



SAVE LIVES