

Catheter-Associated Urinary Tract Infections

Lauren Tew, Bard Ltd, UK
A Webber Training Teleclass

Catheter-Associated Urinary Tract Infection

Lauren Tew
Infection Control Nurse and
Clinical Consultant

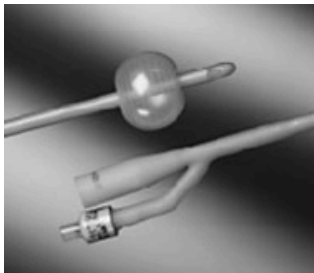
Hosted by Debbie King
debbie@webbertraining.com

A Webber Training Teleclass www.webbertraining.com

Tew L, Pomfret I & King D (2005)

Infection risks associated with urinary catheters

Nursing Standard. 20, 7, 55-61



Catheter-Associated Urinary Tract Infections

Lauren Tew, Bard Ltd, UK
A Webber Training Teleclass

At the end of this session you will be able to:

- Explain the infection risks associated with urinary catheterisation
- describe nurses' accountability and responsibility for catheterised patients
- summarise contemporary evidence-based guidelines

A Significant Danger

'Catheterising patients places them in significant danger of acquiring a urinary tract infection.'

Pratt, Pellowe, Loveday et al., (2001)
Guidelines for preventing infections associated with the insertion and maintenance of short-term indwelling urethral catheters in acute care.
Journal of Hospital Infection (2001) 47 (Suppl): S39-S46

Background

- 15-25% hospitalised patients catheterised
(Tenke et al., 2004)
- Sometimes unnecessarily
(Saint et al., 2005)
- Most preventable device-related infection
(Salgado et al., 2003)
- Most common nosocomial infection world-wide
(Tambyah, 2004)

Catheter-Associated Urinary Tract Infections

Lauren Tew, Bard Ltd, UK
A Webber Training Teleclass

The risks have been known for years!

- The decision to use catheters should be made with the knowledge that it involves the risk of producing serious disease
(Beeson 1958)
- In this era of magnificent biotechnological advances, we should be able to solve the apparently simple problem of draining the bladder without producing infection
(Kunin 1988)

Catheters can kill

- Increase morbidity threefold
(Saint et al., 2002)
- Length of hospitalisation increased by more than 3 days
(Plowman et al., 1999)
- Increased risk of surgical site infection
(Salgado et al., 2004)
- Perinephric, vesicular and urethral abscesses, prostatitis, orchitis, epididymitis
(Salgado et al., 2004)

A Significant Danger

- Urinary catheters are the second most common cause of bacteraemia after central venous catheters
(PHLS, 2002)
- 13-30% of those patients will die
(Pratt et al., 2001)
- Afebrile at death - 1/3 pyelonephritis on autopsy
(Tenke et al., 2004)

Catheter-Associated Urinary Tract Infections

Lauren Tew, Bard Ltd, UK
A Webber Training Teleclass

Reasons for catheterisation

- Urinary tract obstruction
- Acute or chronic retention
- Hypotonic/neurogenic bladder
- Pre & post pelvic surgery
- Accurately measure urine output IU
- Uncontaminated urine specimen
- Irrigate/treat the bladder
- Urodynamic investigations
- Last method of choice for management of urinary incontinence
(Pomfret, 1999)

Assessment

- Correct device
 - Diameter, balloon size, length, composition
- Most appropriate route
 - urethral, suprapubic, intermittent
- Drainage system
 - Valve, length, link system
- NOT EXHAUSTIVE LIST
 - seek expert advice!

Nurse accountability

- Respect the patient as an individual
- Obtain consent before treatment or care
- Protect confidential information
- Cooperate with others in the team
- Maintain professional knowledge & competence
- Be trustworthy
- Identify & minimise risk to patients
(Nursing and Midwifery Council, Code of Professional Conduct, 2002)

Catheter-Associated Urinary Tract Infections

Lauren Tew, Bard Ltd, UK
A Webber Training Teleclass

Pause for thought - 1

- Consider your professional accountability in relation to your care of a catheterised patient.
- Are you practicing within your code of conduct, or are there areas where you could improve?

A Significant Danger - Consent

- Informed consent is essential (ACA, 2003)
- Only valid if given voluntarily with informed choice (DH, 2001)
- Many patients are unaware of how catheters work/why it is needed
- Need to understand effects of catheterisation (Rigby, 1998)
- Accurate documentation essential

Pause for thought - 2

- Consider giving information when you catheterise a patient:
 - What information do you give them when obtaining consent?
 - How do you document that the patient has consented to the procedure
 - What other issues do you document and how could this be improved?

Catheter-Associated Urinary Tract Infections

Lauren Tew, Bard Ltd, UK
A Webber Training Teleclass

Urinary catheters cause infection:

- They breach the host defences (Tenke et al., 2004)
- Biofilms will form (Tambyah, 2004)
- Urease forming bacteria may gain access (Pomfret & Tew, 2004)
 - Encrustation may form
 - Catheter blockage may occur
- Systemic infections may develop

Biofilms - CAUTI villains

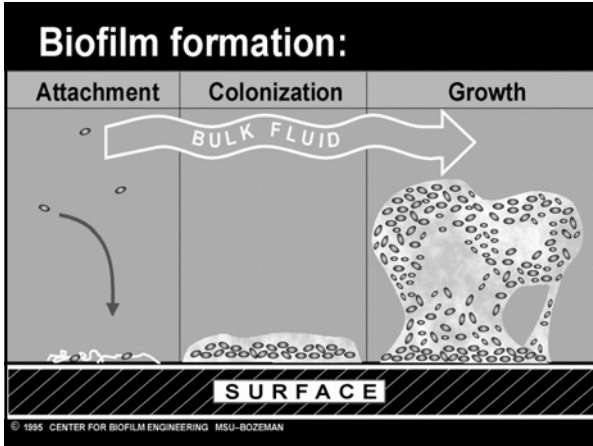
- Influence of biofilms extends to diagnosis, treatment and prevention
- Survival mechanism
 - resistant to shear forces, phagocytosis & antimicrobial agents
 - slow growing, different species, resistance transfer
- Found on catheters, uroepithelium and drainage systems (Trautner & Darouiche, 2004)

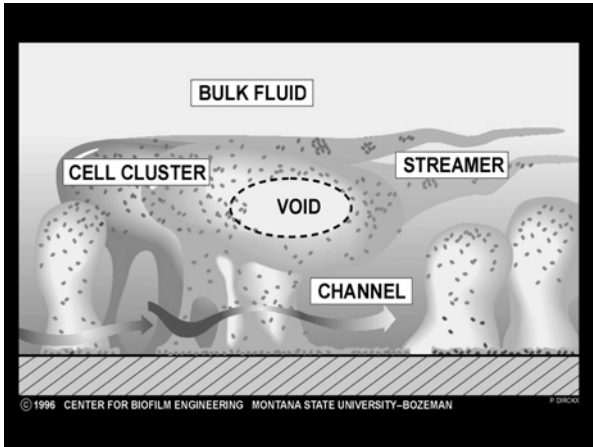
Biofilms ...

- & antimicrobial resistance
 - 22%-89% of antibiotic prescriptions are inappropriate (Loeb et al., 2001)
 - increased resistance in chronic catheters (14%) (Tal et al., 2005)
- & blockage
 - 50% block (Getliffe, 1994)

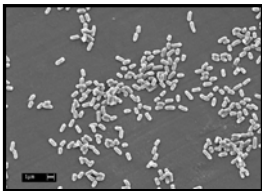
Catheter-Associated Urinary Tract Infections

Lauren Tew, Bard Ltd, UK
A Webber Training Teleclass

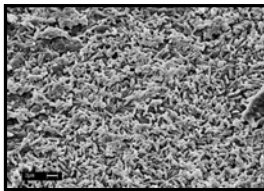




How Fast do Organisms Multiply?



Pseudomonas aeruginosa
2hrs on a 100% Silicone
Foley Catheter

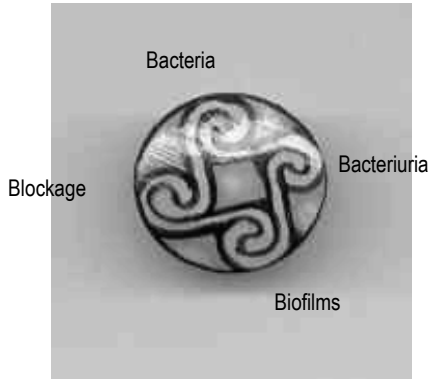


Pseudomonas aeruginosa
18hrs on a 100% Silicone
Foley Catheter

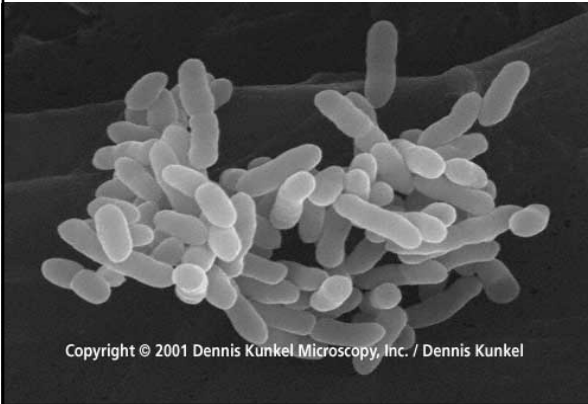
Catheter-Associated Urinary Tract Infections

Lauren Tew, Bard Ltd, UK
A Webber Training Teleclass

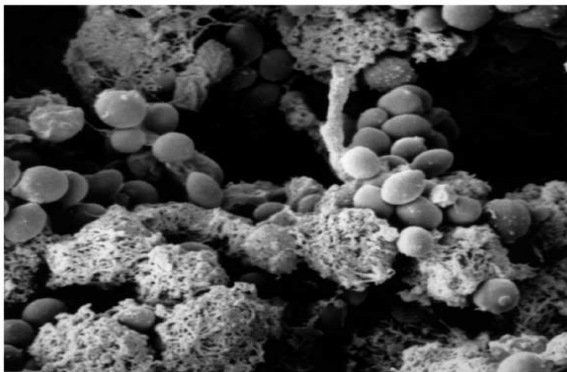
Biography of Blockage



Bacteria



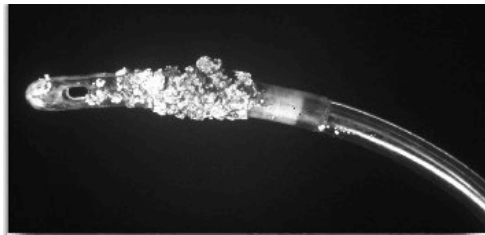
Biofilms



Catheter-Associated Urinary Tract Infections

Lauren Tew, Bard Ltd, UK
A Webber Training Teleclass

Blockage



Patient risk factors

- Prolonged catheterisation
 - Female
 - Other infections
 - Diabetes
 - Malnutrition
 - Renal failure
 - Drainage tube above bladder
 - Microbial virulence factors
 - Older age
- (Salgado et al. (2003), Tambyah (2004))

Pause for thought - 3

- Consider a patient with an indwelling urinary catheter who you have cared for and identify how many risk factors for catheter associated urinary tract infections (CAUTI) they had
- Was there an alternative management that could have prevented the need for the patient to be catheterised?

Catheter-Associated Urinary Tract Infections

Lauren Tew, Bard Ltd, UK

A Webber Training Teleclass

Evidence-based guidelines - i

- ? necessary
- review
- remove asap
- assess duration, preference & infection risk
- consider ISC
- consider valve
- smallest gauge
- 10ml balloon
- lubricant
- hand decontamination
- use of gloves
- competent aseptic insertion and management
- maintain closed system

Evidence-based guidelines - ii

- aseptic samples
- bag below bladder
- meatal hygiene
- document individual catheter regime
- instillations DO NOT prevent infection
- Use infection prevention silver alloy coated Foley catheters
- training and support for patient and carers
- Avoid antibiotic prophylaxis

(Pratt et al., (2001); NICE (2003); Pellowe et al., (2004))

Reducing risks of CAUTI

- Educating healthcare staff
- Staff awareness of alternatives to catheterisation
- Use of audit to reduce inappropriate use of catheters
- Systems to promote catheter removal/assessment of catheter need
- Strategies to reduce inappropriate use of catheters

Saint S, Lipsky BS & Goold SN (2002)

Catheter-Associated Urinary Tract Infections

Lauren Tew, Bard Ltd, UK
A Webber Training Teleclass

Technology vs behaviour

'Given the choice of changing human behaviour or designing a better device, the device will always be more successful.'

Weinstein R (1998)
Nosocomial Infection Update
Emerging Infectious Diseases 4, 3, July - September 1998
<http://www.cdc.gov/ncidod/eid/vol4no3/weinstein.htm>

Compliance vs technology

'These data indicate that we are at the point of diminishing returns with regard to what further might be achieved with compliance in catheter care and point up the importance of novel technology designed for prevention of CAUTI - vis-à-vis infection-resistant catheters, a goal coming to fruition with catheters manufactured with anti-infective surfaces.'

- 850 newly-catheterised patients prospectively studied for CAUTI
- Independent predictors for increased risk
 - extended catheterisation
 - female gender
 - urologic stent
 - other active infections
 - malnutrition
 - insulin requiring diabetes
 - drainage tube position

Catheter-Associated Urinary Tract Infections

Lauren Tew, Bard Ltd, UK
A Webber Training Teleclass

Only catheter-care violation predictive of increased risk of CAUTI:-

- drainage tube above the bladder or sagging below the level of the collection bag

Maki, Knasinski, Halvorson & Tambyah (1998)

A novel silver-hydrogel urinary catheter reduced catheter-associated urinary tract infections. A prospective, randomised, double-blind trial.

Infect Control Hosp Epidemiol 1998; 19 (Suppl N); 27, Abstract 10

Independent support for silver alloy-coated catheters

- *Epic* guidelines update, 2004
- Rapid Review Panel, 2003-5
- Cochrane Review, 2004

Post-registration education & practice - continuing professional development

- Describe the learning activity
- My key learning points from the above learning activities were:
- The way in which this learning has influenced my work is:

NMC (2002)

Catheter-Associated Urinary Tract Infections

Lauren Tew, Bard Ltd, UK
A Webber Training Teleclass

Thank you for listening

Any questions?

References

Please contact Paul Webber at
www.webbertraining.com

The Next British Teleclass

January 9, 2007

*National Infection Prevalence Survey of
UK and Ireland Hospitals
– Process and Initial Results*

With Chris Perry

Director/Nurse Consultant
Infection Prevention and Control
United Bristol Healthcare Trust
