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Mandatory Reporting of Catheter Related Blood Stream Infections

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Why Bother Looking for CR-BSIs?

- 75% of all catheter-related infections are due to the use of a short-term (non-PICC, non-implanted, non-cuffed) central line
- Crude mortality from CR-BSI up to 40%; attributable mortality up to 15%
- Attributable cost of one CR-BSI ranges from $34,000 to 56,000 (USD)
- CR-BSIs are preventable ……

Wey et al. Arch Intern Med 1988; Voss et al. Infection 1997;
Pelz et al. J Int Care Med 2000; Blot et al. Am J Med 2002

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Epidemiology of CR-BSIs

- Skin is the main source of organisms causing CR-BSI
- Migration of organisms along the percutaneous tract during insertion or manipulation, entry of organisms from infusion ports and other line access points
- CNS, *S. aureus,* enterococci, gram negative bacilli and *Candida* spp most common

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Epidemiology of CR-BSIs

- Rates of CR-BSI are influenced by patient factors – severity of illness, length of time catheter is required
- And by catheter-related factors – conditions under which catheter inserted, type of catheter (tunneled, non-tunneled; number of lumens), location of catheter (SC, IJ, femoral), number of lines

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Diagnosis of CR-BSIs

- Notoriously difficult to diagnose accurately: symptoms can be non-specific in a very ill patient, exit site inflammation associated with a sensitivity of approximately 3%
- Should draw simultaneous central line and peripheral vein cultures – same organism should be found in both
- Can also assess differential time to positivity – central line positive growth at least 2 hours earlier than peripheral vein

Crit Care Med 2002; **30**: 2632–35.

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Prevention of CR-BSI

- Standardization of insertion procedures – process elements
- Experienced staff
- Use of ultrasound guidance
- Adequate staffing levels
- Specialized IV teams

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Prevention of CR-BSI - Process

- Hand hygiene
- Maximal barrier precautions – cap, mask, sterile gown, sterile gloves, full body sterile draping
- Skin prep with 2% chlorhexidine/70% alcohol

Infect Control Hosp Epidemiol 1994; 15:231–8.

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Prevention of CR-BSI - Process

- Regular visualization of catheter entry site (may be facilitated by use of transparent dressings)
- Aseptic access
- Discontinue unnecessary lines
- Dedicated lumen for TPN

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Mandatory Reporting - Pros

- Public reporting can be considered one trigger for change
  - Can no longer hide your ‘dirty laundry’
  - Focuses attention and resources
  - Makes an issue of something that no one was aware of previously
- Increases transparency
- Encourages consistency of information – standardized definitions and reporting requirements, facilitates benchmarking

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Mandatory Reporting - Cons

- May divert resources away from other important initiatives
- May result in ‘gaming’ of numbers, no one wants to be the worst in the numbers game
- May not result in culture change as the focus is on numbers rather than behaviours
- Impossible to ensure that data collection is being done consistently in all institutions – can only guide

Mandatory Reporting

- Need to ensure that definitions yield meaningful data, reflect the burden of disease or risk
- Definitions and reporting rules must be clear and unambiguous
- Definitions must be relevant in the ‘real world’ – the problem with surveillance versus clinical definitions
- Data must be linked to the ability to improve processes – data for data’s sake doesn’t help anyone

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Mandatory Reporting – the Ontario Story

- As of April 30, 2009, all Ontario hospitals with an ICU (including step down units) must report all cases of CLI to the Ministry of Health and Long-Term Care
- Both actual number of cases plus the rate per 1000 catheter/line days
- Only central line related infections
- Reporting is quarterly

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Mandatory Reporting – the Ontario Story

- Central line must have been in place for the preceding 48 hours
- Problem – patients with central lines not followed once they leave the ICU setting, 48 hour window may exclude some patients

Mandatory Reporting – the Ontario Story

- Data entered directly into a web-based application – Critical Care Information System
- Accessible by all hospitals with an ICU
- Problem – technological limitations restrict the time window that data may be entered, if blood culture results obtained after the time window has expired then infection not ‘counted’

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Mandatory Reporting – the Ontario Story

- Data entered directly into a web-based application – Critical Care Information System
- Accessible by all hospitals with an ICU
- Once data entered, sent back for validation prior to posting
- Posting is on a publicly available website
- Problem – currently no way to risk stratify hospitals ie. to compare like hospitals with like hospitals or to compare similar ICU settings – no way to benchmark

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Overall

- When/if these problems are addressed, mandatory reporting will likely have a positive impact
  - Will focus on need for resources to accomplish proper surveillance and reporting
  - Will increase awareness of a preventable problem
  - May lead to some public/peer pressure
  - Will ensure consistency

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Thank You

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