

**Time is Money.  
Does Prophylactic Antibiotic Timing  
(PABT) affect Hip and Knee Joint  
Replacement Surgical Site Infection (SSI)  
Rates?**

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**When was PABT issue first identified?**

- **2000-2001 C-Section SSI report**
  - Pre-operative antibiotic prophylaxis inconsistent.
  - No consensus among surgeons about administering antibiotics or timing (pre-op or after cord clamp).
- **October 1, 2002 to Sept 30, 2004 324** patients from selected procedures for **General Surgery** were surveyed for SSIs and PABT.
  - IPAC lead the team to address appropriate PABT which included anaesthesia, nursing and pharmacy. IPAC was supported by the Chief of General Surgery and Infectious Diseases.
  - Process for initiation of prophylactic antibiotic before start of cut time by anaesthesia began



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**When was PABT issue first identified?**

- SSI surveillance prompted decision to go hospital-wide with a pre-operative prophylaxis program initiated in January 2004.



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### Hip and Knee SSIs and Prophylactic Antibiotic Timing

**Objective:**

- Surveillance of post-op Hip and Knee SSIs and correct PABT was conducted from November 1, 2004 to June 22, 2007 on:
  - 643 clean elective hip joint replacement patients
  - 1,331 clean elective knee joint replacement patients.
  - SSI data was compared to the National Healthcare Safety Network (NHSN) Report, issued 2008.



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### Hip and Knee SSIs and Prophylactic Antibiotic Timing

**Method:**

- AICE (Automated Infection Control Expert) interfaced with OR's program to download data and generate a record on every patient
- The record includes patient and surgical information, wound classification, surgery start and stop times, ASA scores, prophylactic antibiotics and timing.



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### Hip and Knee SSIs and Prophylactic Antibiotic Timing (PABT)

**Method continued:**

- AICE calculates composite risk index 0,1,2,3 for predicting SSI outcome
- CDC definitions of SSIs followed
- Rates compared to NHSN data summary for 2006 through 2007 issued Nov 2008



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### Hip and Knee SSIs and Prophylactic Antibiotic Timing (PABT)

**Method continued:**

- Surveillance was 30 days for post-op superficial SSIs and 1 year for deep, organ/space SSIs
- Review of Microbiology reports, ER/Urgent Care visits, Re-admissions, Fracture Clinic consult notes, antibiotic prescribing, surgeon post-discharge feedback
- AICE review of PABT included:  
0-60 mins.(CZ, CZ/GM, Clinda),  
0-120 mins.for Vanco




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### Results for HIP SSIs- In-Hospital (In-H) In-Hospital plus Post Discharge (In-H+PD)

|                                | Risk Index                      | %SSI In-H  | %NHSN       | %SSI In-H+PD |
|--------------------------------|---------------------------------|------------|-------------|--------------|
| <b>Nov 1.04 to June 30.05</b>  | 0                               | 0/74= 0%   | <b>0.75</b> | 1/74= 1.4%   |
|                                | 1                               | 0/82= 0%   | <b>1.68</b> | 4/82= 4.9%   |
|                                | 2,3                             | 2/21= 9.5% | <b>2.97</b> | 2/21= 9.5%   |
|                                | <b>%SSI In-H+PD 7/177= 3.9%</b> |            |             |              |
| <b>July 1.05 to May 31.06</b>  | 0                               | 1/86=1.2%  | <b>0.75</b> | 1/86 = 1.2%  |
|                                | 1                               | 0/104 = 0% | <b>1.68</b> | 0/104 = 0%   |
|                                | 2,3                             | 0/16 = 0%  | <b>2.97</b> | 0/16 = 0%    |
|                                | <b>%SSI In-H+PD 1/206= 0.5%</b> |            |             |              |
| <b>June 1.06 to June 22.07</b> | 0                               | 1/95 = 1%  | <b>0.75</b> | 2/95=2%      |
|                                | 1                               | 1/133=.7%  | <b>1.68</b> | 4/133=3.0%   |
|                                | 2,3                             | 2/32= 6.3% | <b>2.97</b> | 2/32= 6.3%   |
|                                | <b>%SSI In-H+PD 8/260= 3.0%</b> |            |             |              |

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### Type of Hip SSIs In-H+PD and PABT

Type of SSIs:

- 13/16 superficial
- 2/16 deep
- 1/16 organ/space

Prophylactic Antibiotic Timing:

- Nov 1.04 – June 30.05  
159/177 = **90%** correct PABT
- July 1.05 to May 31.06  
190/206 = **92%** correct PABT
- June 1.06 to June 22.07  
249/260 = **96%** correct PABT




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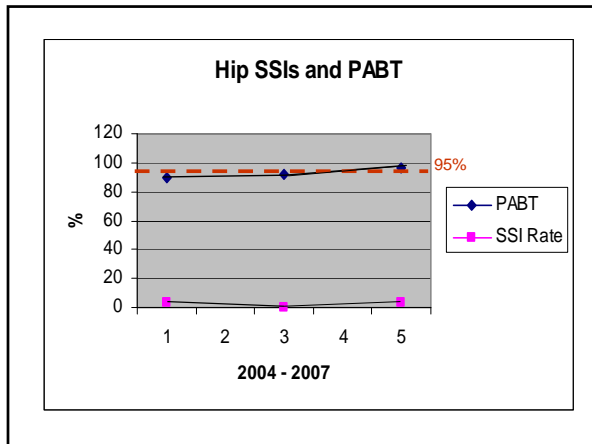
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### Results for Knee SSIs- In-Hospital (In-H) In-Hospital plus Post Discharge (In-H+PD)

|                         | Risk Index | %SSI In-H   | %NHSN       | %SSI In-H+PD |
|-------------------------|------------|-------------|-------------|--------------|
| Nov 1.04 to June 30.05  | 0          | 1/135= .7%  | <b>0.68</b> | 2/135= 105%  |
|                         | 1          | 0/174= 0%   | <b>1.12</b> | 7/174= 4.0%  |
|                         | 2,3        | 0/14= 0%    | <b>2.82</b> | 0/14= 0%     |
| July 1.05 to May 31.06  | 0          | 2/185= 1.1% | <b>0.68</b> | 4/185= 2.1%  |
|                         | 1          | 4/237= 1.7% | <b>1.12</b> | 8/237= 3.4%  |
|                         | 2,3        | 0/11= 0%    | <b>2.82</b> | 0/11= 0%     |
| June 1.06 to June 22.07 | 0          | 1/220= 0%   | <b>0.68</b> | 5/220= 2.3%  |
|                         | 1          | 3/339= 0.9% | <b>1.12</b> | 10/339=2.9%  |
|                         | 2,3        | 0/16=0%     | <b>2.82</b> | 0/16=0%      |

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### Type of Knee SSIs In-H+PD and PABT

Type of SSIs:  
 28/36 superficial  
 2/36 deep  
 6/36 organ/space

Prophylactic Antibiotic Timing:  
 Nov 1.04 - June 30.05  
 292/323 = **90%** correct PABT  
 July 1.05 – May 31.06  
 401/433 = **93%** correct PABT  
 June 1.06 – June 22.07  
 553/575 = **96%** correct PABT




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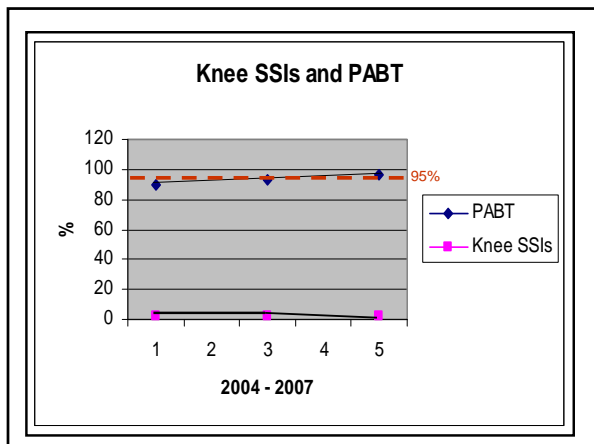
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### Impact of SSI – Time is Money.

|                                | Infected                 | Uninfected  |
|--------------------------------|--------------------------|-------------|
| <b>Mortality (in-hospital)</b> | <b>7.8%</b>              | <b>3.5%</b> |
| <b>ICU admission</b>           | <b>29%</b>               | <b>18%</b>  |
| <b>Readmission</b>             | <b>41%</b>               | <b>7%</b>   |
| <b>Median initial LOS</b>      | <b>11d</b>               | <b>6d</b>   |
| <b>Median total LOS</b>        | <b>18d</b>               | <b>7d</b>   |
| <b>Initial excess cost</b>     | <b>+\$3,644 (median)</b> |             |
| <b>Total excess cost</b>       | <b>+\$5,038 (median)</b> |             |

\*Pairs matched for procedure, NNIS index, age Kirkland. *Infect Control Hosp Epidemiol.* 1999;20:725. Prospective, case-controlled study of 22,742 patients undergoing inpatient surgical procedures between 1991–1995.

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### Conclusions

- The additional 8 hip and 25 knee SSI detected post-discharge suggests that a more active post-discharge surveillance is necessary for accurate rates.
- In our study overall SSI rates decreased and correct prophylactic antibiotic timing (PABT) improved.
- PABT is a key component of perioperative care




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### Ontario's MOH-LTC Public Reporting

- The Ontario Health Quality Council funds the Quality Healthcare Network (QHN) with a purpose to aggregate the performance data of the Safer Healthcare Now (SHN) measures, engage the public and support local teams within SHN.
  - <http://www.ghn.ca/SSI.html>
  - [http://www.health.gov.on.ca/patient\\_safety/index.html](http://www.health.gov.on.ca/patient_safety/index.html)
- Currently reported:
  - Clostridium Difficile Associated Disease
  - MRSA (bacteremia)
  - VRE (bacteremia)
  - Hospital Standardized Mortality Ratio
  - Central-Line Primary Blood Stream Infection
  - Ventilator-Associated Pneumonia
  - Surgical Site Infection Prevention (PABT)\*\*
  - Hand Hygiene Compliance



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The SSI phenomena:  
A simply complex problem

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Now for your QUIZZ Question.....

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**Name the Movie??  
Who is the Director??**



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**The Birds and Alfred Hitchcock**

Thank you!

Questions?



My email: [dweinwurm@thc.on.ca](mailto:dweinwurm@thc.on.ca)



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