HEALTHCARE ASSOCIATED INFECTIONS (HAI) PAST AND PRESENT

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OBJECTIVES

- Describe the history of infection control and the impact of the SENIC study on modern day infection prevention programs.
- Discuss the human and financial impact of Healthcare Associated Infections (HAIs)
- Review at least 3 simple steps you can take to reduce HAIs for you and your loved ones.
Historical perspective of one of the first hospitals
St Thomas Hospital, London, UK 1212 and 1871

Rules for Taking-In of Patients
(St Thomas Hospital 1821)

1. On Thursday Present Petitions to Takers-In, namely Hospital Surgeons, Physician, and Governor.
2. Present evidence of Ability to pay for Burial Shroud, and Burial Expenses.
3. Explain When and How the Distemper Commenced.
5. Show that Disorder is not Incurable.
6. Pay 2s 6p if Cleane, 5s if Foule.
7. Foule Patients straying from Veneral Disease Wards will be expelled.

By Order of the Governors
EARLY HOSPITALS IN ALASKA

Providence Hospital, Anchorage, AK 1939

St. Joseph’s Hospital, Fairbanks, AK 1930
WHAT IS A HEALTHCARE ASSOCIATED INFECTION OR HAI?

- Simply put: you go into the hospital for treatment or surgery and after being there….acquire a new infection (HAI).
- Older term “nosocomial infection”
- HAI usually occurs two to three days after admission to hospital. These infections occur at a cost to the community and illness to the patient:
  - Longer stay in hospital
  - Longer recovery time
  - Costs associated with a longer stay and longer recovery time.
HEALTHCARE ASSOCIATED INFECTIONS (HAIs)
WHERE DO THEY COME FROM?

Environment (contaminated equipment and surfaces)

Medical devices (improperly cleaned, disinfected or sterilized)
- Contaminated or defective products or devices
- Mechanical problem or contamination

Health Care Workers (inadequate hand hygiene)

Patient
- Severity of illness (greater **length of stay**)
- Host factors (**immunocompromised**, very young or old)
- Compliance (non-adherence with medication regimen, antibiotic-overuse can lead to resistance can)
- Medical devices (urinary catheters, IV’s can introduce infections)
- Operations and High Risk Procedures
BRIEF HISTORY OF EARLY INFECTION CONTROL (IC) CHALLENGES IN UNITED STATES

- 1950’s hospitals concerned about an “epidemic” of *Staphylococcal* infections (intensive medical care units)
- 1960-1970’s growth in IC programs supported by the American Hospital Association and Joint Commission
- 1973-1983 Robert Haley, MD chief investigator in the Epidemic Intelligence Service/Director of the Hospital Infections Program conducted a nationwide Study on the Efficacy of Nosocomial Infection Control (SENIC Project) to identify methods of controlling hospital-acquired infections.
RESULTS FROM THE SENIC STUDY AND ITS IMPLICATIONS FOR INFECTION CONTROL

Purpose: Evaluate nosocomial infection prevention and control programs in US hospitals

Retrospective chart review from 1970-1976 (338 hospitals)

Bottom line: 32% fewer nosocomial (HAI) infections in the hospitals that had a well-organized infection control program.

Components of a well-organized Infection Control Program from study:

1. Surveillance and vigorous control efforts
2. Minimum of one full-time infection preventionist per 250 beds
3. Trained hospital epidemiologist
4. Feedback to surgeons on SSI rates
MOVING FORWARD

- 1970-CDC training course for infection control, start of NNIS
- 1976-With such strong scientific evidence from the SENIC study accrediting agencies such as, Joint Commission mandated an Infection Control Program.
- 1999-Institute of Medicine or IOM report revealed harm to patients from infections and falls in hospitals.

http://www.iom.edu/~/media/Files/Report%20Files/1999/To-Err-is-Human/To%20Err%20is%20Human%201999%20Report%20Brief.pdf
1999-TO ERR IS HUMAN

- America’s wake up call about medical errors in our healthcare system
  - 44,000 – 99,000 deaths from medical errors annually
    - (Another ~100,000 from healthcare associated infections)
  - Between $17-29 billion annually
  - Report highlighted the fact that human error is inevitable – the only way to reduce medical errors is to design a safer system
HEALTHCARE ASSOCIATED INFECTIONS (HAIs): THE NATIONAL BURDEN

- Leading cause of morbidity & mortality
- Annual burden (2002 data)
  - About 1 out of 20 hospitalized patients will contract an HAI
  - 1.7 million HAIs in US healthcare settings
  - 99,000 deaths associated with HAIs
- Annual cost
  - $33 billion added healthcare costs
- Standard prevention recommendations (developed by CDC) can reduce HAIs by 70%; virtually eliminate some types of infection
### Estimated Annual Hospital Cost of HAI by Site of Infection

<table>
<thead>
<tr>
<th>Major Site of Infection</th>
<th>Total infections</th>
<th>Hospital Cost per Infection (2002 $)</th>
<th>Total annual hospital cost (in millions $)</th>
<th>Deaths Per year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Surgical Site Infection</td>
<td>290,485</td>
<td>$25,546</td>
<td>7,421</td>
<td>13,088</td>
</tr>
<tr>
<td>Central line associated-Bloodstream Infection</td>
<td>248,678</td>
<td>$36,441</td>
<td>9,062</td>
<td>30,665</td>
</tr>
<tr>
<td>Ventilator-associated Pneumonia</td>
<td>250,205</td>
<td>$9,969</td>
<td>2,494</td>
<td>35,967</td>
</tr>
<tr>
<td>Catheter associated-Urinary Tract Infection</td>
<td>561,667</td>
<td>$1,006</td>
<td>565</td>
<td>8,205</td>
</tr>
</tbody>
</table>


CDC’s National Healthcare Safety Network is the nation’s most widely used healthcare-associated infection (HAI) tracking system.

- NHSN can also track blood safety errors and important healthcare process measures (i.e. healthcare personnel influenza vaccination and hand hygiene adherence rates)
- NHSN provides medical facilities, states, regions, and the nation with data collection and reporting to:
  - identify infection prevention problems by facility, state, or specific quality improvement project
  - benchmark progress of infection prevention efforts
  - comply with state and federal public reporting mandates, and ultimately,
  - drive national progress toward elimination of HAIs.

- Beginning decades ago with 300 hospitals, NHSN now serves more than 11,000 medical facilities tracking HAIs.
ALASKA HAI PROGRAM

- Began in 2009, federally funded grant to 49 states
- Prevention Plan completed December 28, 2009
- Two prevention targets:
  - central line-associated bloodstream infections and
  - invasive methicillin-resistant *Staphylococcus aureus* (MRSA) infections.

- Alaska HAI Advisory Group **AK-ICPAC**
  - Alaska Infection Control and Prevention Advisory Council
  - Alaska State Hospital and Nursing Home Association (1)
  - Local Association for Professionals in Infection Control and Epidemiology (1)
  - Practicing infectious disease physicians (2)
  - Hospital laboratory supervisor (1)
  - Mountain-Pacific Quality Health-Alaska (2)
  - University of Anchorage Alaska (1)
  - Hospital using NHSN (1)
  - Hospital not using NHSN (1)
  - Alaska State Public Health Laboratory (1)
  - Other members may be added
Alaska Activities to Prevent Healthcare-associated Infections

Financial and/or technical support provided by CDC

Alaska

- Patients in Alaska hospitals had 28 percent fewer central line-associated bloodstream infections in 2011 than would have been predicted. (SIR=0.72, What is this?)
- The percent of healthcare facilities in this state reporting HAI data to CDC’s NHSN:
  - CLABSIs: 34.6%
  - CAUTIs: 19.2%
  - The number of facilities reporting SSIs: 1-4
- State has implemented CDC injection safety initiatives
- State has implemented a CAUTI Prevention Collaborative
- 2012 Affordable Care Act (ACA) funding amount: $105,000.00
  - Activity: HAI Prevention Infrastructure (see ACA Activities Funded for more information)
FUTURISTIC VIEW OF AK HAI PROGRAM........

- AK-IPAC met to discuss next steps!

New regulations are at the Department of Law for final review under the state Administrative Procedure Act.
AK Regulatory Changes (7 AAC 27.05)

Highlights for those regulatory changes:

- **Antibiotic-resistant organisms of national significance**
  (vancomycin-resistant *Staphylococcus aureus* and carbapenemase-producing Enterobacteriaceae or CRE)

- **Reporting of health care-associated infections.**
  A facility required under federal law to report health care-associated infection data to the Centers for Medicare and Medicaid Services Quality Reporting Program through the Centers for Disease Control and Prevention (CDC), shall grant the department access to the reported information

  - **Bottom line to the new regulation is to allow Public Health access to nationally collected and published data on HAI from Alaskan facilities (i.e. hospitals).**
Catheter-Associated Urinary Tract Infections (CAUTI)

Why is this important?

Hide Graph

Lower Numbers are Better

ALASKA NATIVE MEDICAL CENTER

PROVIDENCE ALASKA MEDICAL CENTER

ALASKA REGIONAL HOSPITAL

Alaska

U.S. National Benchmark = 1

Legend:
- Better than U.S. National Benchmark
- No different than U.S. National Benchmark
- Worse than U.S. National Benchmark
- U.S. National Benchmark

Interval Estimate

Standardized Infection Ratio (SIR)

Hover over the caret to view interval estimate range

No data are available from the hospital for this measure

0.867

1.842

0.919

http://www.medicare.gov/hospitalcompare/results.html
How to Stop Hospitals From Killing Us

Medical errors kill enough people to fill four jumbo jets a week. A surgeon with five simple ways to make healthcare safer.

By MARTY MAKARY

When there is a plane crash in the U.S., even a minor one, it makes headlines. There is a thorough federal investigation, and the tragedy often yields important lessons for the aviation industry. Pilots and airlines thus learn how to do their jobs more safely.

The world of American medicine is far deadlier: Medical mistakes kill enough people each week to fill four jumbo jets. But these mistakes go largely unnoticed by the world at large, and the medical community rarely learns from them. The same preventable mistakes are made over and over again, and patients are left in the dark about which hospitals have significantly better (or worse) safety records than their peers.

As doctors, we swear to do no harm. But on the job we soon absorb another unspoken rule: to overlook the mistakes of our peers for fear of being accused of making one ourselves.

http://online.wsj.com/news/articles/SB10000872396390444620104578008263334441352
And see on the internet to promote involvement

Hospital Infections

Hospital-acquired infections are rampant in U.S. hospitals, with an estimated 2.2 million people affected each year. By far, the biggest culprit in the spread of these potentially deadly infections is unwashed, or poorly washed, hands. The #1 thing we can all do to stop the spread of infection is simply wash our hands properly with good old soap and water.

Infection can invade through a surgical incision, catheter insertion — even contact with an unsterilized stethoscope and plaque from the patient’s own teeth. All of these conditions are ripe for bacterial attacks on vulnerable patients.

When it comes to infection, it’s important to know that hospital doors swing in both directions. Hospital-acquired infections are migrating to our communities in alarming numbers, passed from person to person, locker to locker, and then they come back again with new patients, family members and other hospital visitors. Already, 1% of us are colonized with a superbug. But don’t panic; just learn to wash your hands the right way!

Watch the video below to learn how to properly wash your hands inside and outside of health care settings. (Thanks to Minda Beck, Health Editor at The Wall Street Journal, for the video.)
WHAT CAN YOU DO?
AN OUNCE OF PREVENTION IS WORTH A POUND OF CURE…..

- Hand washing
- Stop smoking
- Keep up to date - Vaccinate!
  (influenza, pneumonia, tetanus)
- Exercise to keep mobile and maintain a healthy weight
- Healthy diet
- And get your zzzzz’s
What happens if you or a loved one are in the hospital?

Patient Advocacy is powerful!
- Be informed.
- Be empowered.
- Be prepared.

Never believe that a few caring people can’t change the world. For, indeed, that’s all who ever have.

Margaret Mead
- **Speak up.**
  Talk to your doctor about any worries you have about your safety and ask them what they are doing to protect you.

- **Keep hands clean.**
  If you do not see your providers clean their hands, please ask them to do so. Also remind your loved ones and visitors. Washing hands can prevent the spread of germs.

- Ask if you still need a **central line catheter** or **urinary catheter**. Leaving a catheter in place too long increases the chances of getting an infection.

- **Ask your healthcare provider**, "will there be a new needle, new syringe, and a new vial for this procedure or injection?" Healthcare providers should never reuse a needle or syringe on more than one patient.

- **Be careful with medications.**
  Avoid taking too much medicine by following package directions. Also, to avoid harmful drug interactions, tell your doctor about all the medicines you are taking.

- **Get Smart about antibiotics.**
  Help prevent antibiotic resistance by taking all your antibiotics as prescribed, and not sharing your antibiotics with other people. Remember that antibiotics don’t work against viruses like the ones that cause the common cold.

- **Prepare for surgery.**
  There are things you can do to reduce your risk of getting a surgical site infection. Talk to your doctor to learn what you should do to prepare for surgery. Let your doctor know about other medical problems you have.

- **Watch out for C. diff** (aka Clostridium difficile)
  Tell your doctor if you have severe diarrhea, especially if you are also taking an antibiotic.

- **Know the signs and symptoms of infection.**
  Some skin infections, like **MRSA**, appear as redness, pain, or drainage at an IV catheter site or surgical incision site, and a fever. Tell your doctor if you have these symptoms.

- **Get your flu shot.**
  Protect yourself against the flu and other complications by getting vaccinated.

Healthcare-associated infections (HAIs)

- Reduce central line-associated blood stream infections (CLABSI) in hospitals by 60%.
- Reduce healthcare-associated invasive methicillin-resistant Staphylococcus aureus (MRSA) by 60%.
- Reduce surgical site infection (SSI) in hospitals by 30%.
- Reduce catheter-associated urinary tract infections (CAUTI) in hospitals by 30%.
YOUR TURN!
QUESTIONS??
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TEAMWORK!
WORKING TOGETHER GETS THE GOODS!