

Healthcare Acquired Infections



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Healthcare Acquired Infections (HAI) also known as nosocomial infections, are various types of infections that can be caught in a healthcare facility. These can be a hospital, a nursery home, or any other healthcare facility. The infection is usually spread to the patient from various sites. It can be the healthcare staff member, the equipment used, the beds and linens, air droplets, and even the patient's own body germs.

In the USA, 1.7 million nosocomial infections occur annually, resulting in 99,000 deaths. Europe in general, which has stricter laws regarding antibiotic use, has 25,000 deaths annually from HAIs, of which two thirds are Gram negative bacteria.

Nosocomial infections account for 7% of hospital infections in the developed world, while this figure increases to 10 % of infections in the developing world. According to the W.H.O., 15% of hospitalized patients will suffer from a nosocomial infection. This in turn is related to the risk factors stated above, in addition to the length of stay in the hospital (the longer you stay, the higher the risk of catching something) and where this stay is (ICU patients who are more debilitated are at a higher risk than other areas).

Pathogens involved in HAIs are usually bacterial (85%). They include the Gram negative *Acinetobacter*, the enteric bacteria (*E.coli*, *Klebsiella pneumoniae*), *Pseudomonas aeruginosa*, and the Gram positive *Staphylococcus aureus*. Viruses and fungi account for the rest of the infection

types and are more associated with immune-compromised types of patients.

Regarding the bacteria of HAIs, they are found all around us in nature. *Acinetobacter* is a common soil and water bacterium, whereas all enteric bacteria are already present inside all human being guts. *S. aureus* is found on the skin, and *Pseudomonas* is a common nature bacterium also. These "natural" bacteria in their natural settings are not pathogenic, and most of them have a job to do where they are; enteric bacteria a necessary for daily digestion of food and life. However, when these bacteria enter a hospital setting, they come in contact with the many antibiotics present there, and with time, those with resistance genes will survive long enough to enter a patient. It is these antibiotic-resistant bacteria that cause all kinds of problems for us. Once contracted, they prolong hospital stay by 9 days and increase a hospital bill in the US by up to 20,000\$- that is if they don't kill you first. They are harder to treat than an ordinary infection due to their drug-resistance genes, only a very specific, expensive, and powerful set of drugs will work. Laboratories have special terminologies for such germs, such as Extended Spectrum Beta-Lactamase" or ESBL, and "Methicillin Resistant Staph Aureus" or MRSA.

Usual sites of infection are respiratory for those on "respirators", urine (UTI) if urinary catheters are involved, skin and blood stream infections for patients with surgeries &/or IV catheter sites.

Main prevention schemes have been tried, and the successful ones have been shown to be:

- Hand washing and wearing gloves by medical personnel.
- Alcohol pad usage during examination by personnel going from one patient to another.
- Careful and planned usage of antibiotics: some countries in Europe still use basic Penicillin in hospitals as a starting point, and prescribing other stronger antibiotics is very restricted and controlled by the government.
- Reduce the length of hospital stay, especially if it is in ICU.

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