

# Nursing involvement in surveillance and prevention of antimicrobial resistance

Editorial

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## Highlights

- Controlling of antimicrobial resistance is one of the biggest problems modern hospitals face.
- The World Health Organization (WHO) estimates that 700,000 deaths/year were attributed to drug-resistant germ infections in 2020, and they could reach 10 million deaths/year by 2050.
- Developing new antimicrobials is complex, and a multidisciplinary approach is essential for infection control at hospitals, in which nursing is key.

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Nosocomial infections originated when hospitals were born. However, before the development of antibiotics, hospitals were institutions for the poor in need of care. They had a high mortality rate not only because of the underlying diseases, for which there was no treatment, but even because of circumstances conducive to nosocomial infections<sup>1</sup>.

The Crimean War in 1854 was the first to be covered by the press, and it highlighted the poor care conditions of soldiers wounded in combat, with mortality rates around 42%. English popular pressure encouraged Florence Nightingale (1820-1910) to travel to Crimea, and her sanitary measures quickly reduced the mortality rate to 2%<sup>2,3</sup>. Although the Germ Theory was not yet known by then, it is possible to state that success depended on wound infection control. Florence Nightingale's efforts ensured her the notoriety to be entrusted with improving hospital sanitary conditions when she returned to England, strengthening asepsis (cleaning followed by sterilization of equipment for procedures) and antisepsis (the use of sterilizing substances). One of the changes was the development of nursing as a profession, which was already associated with infection control.

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Hospitals' transformation was completed with the discovery of antibiotics in the 1940s, the birth of anesthesia, and the cities' social changes. Modern hospitals had been born, equipped to perform surgeries and administer treatments, becoming the centers of health care that they are today. Hospitals significance increased after Flexner's reports about teaching conditions in medical schools in the USA were made<sup>4</sup>.

As antibiotics so successfully impacted infection rates when they first came into use, emphasis on other preventive measures diminished<sup>5</sup>. In addition, the incidence of antibiotic resistance was detected early, almost simultaneously when antibiotics were introduced. Together, these two points added to the increase in invasive procedures, and the indiscriminate use in other fields different from healthcare, such as livestock, contributed to antibiotic resistance becoming the calamity we face today.

While the search for new antibiotics continues, much research is devoted to finding other solutions such as vaccines, immunotherapy, nanobes, phage therapy, stem cells, and adhesion molecules. However, although much has been discovered, we have yet to be ready to use them in daily clinical practice<sup>6</sup>.

Consequently, the correct use of aseptic and antiseptic techniques is increased and improved, something in which nursing participation is key. The hospital infection control committees are identifying and correcting hand washing techniques, proper use of gloves, masks, and other personal protective equipment, and rules for respiratory isolation and contact isolation. Focusing on the process of using these techniques is the common point to be addressed by continuing education<sup>7</sup>.

In addition, nursing is involved in the fundamental shift from a passive attitude, based on the documentation of infection indicators, to an active attitude in which prevention is sought. The Antibiotic Stewardship Programs (ASPs) include control tools such as the Defined Daily Dose (DDD) to control antibiotics consumption, the identification of stewardship champions to monitor daily processes, change of cleaning procedures, the introduction of new antiseptics technologies, and the approach to hospital structure reforms. These programs require trained personnel and represent a field of specialization for all health professionals. Although these changes are already advocated by the WHO and used in developed countries, they are still incipient in developing countries<sup>8,9</sup>.

However, the key point is avoid making the same mistake as in the past when we neglected aseptic and antiseptics measures because of the success of antimicrobials. Our best strategy is not to use one technique or another but to apply them together and in a coordinated manner by trained personnel under constant surveillance. The lessons of Florence Nightingale remain true and necessary.

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