

Discoveries of Biological Sciences and their implications for nursing practice

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For the longest time, the production of knowledge in the field of biological sciences was viewed as the exclusive responsibility and competence of medical professionals. This scenario has changed in light of the worldwide trend of improvements in other health professions, which includes the need to implement the use of evidence-based methodology in nursing practice. This approach is an operational model of clinical competence that involves making decisions based on access to and interpretation of scientific information. To enable this complex form of practice, we must be able to rely on the knowledge provided by a set of basic disciplines that underpin the model's application. Nursing overcomes its own limitations when it appropriates itself of knowledge obtained via the scientific method, new discoveries, knowledge and technologies that determine better outcomes of their practice, improving skills for providing essential care even further.

The inter-relation between biological sciences and nursing is a two-way avenue. We could cite numerous findings that contribute to the formation of this bridge between the two areas, but few have been as influential as the discovery of nitric oxide (NO). Studies dating back to the 1990s have shown the endogenous synthesis of this gas, which until then was known only as a product of pollution. Nitric oxide is a soluble and highly lipophilic gas, synthesized by endothelial cells, macrophages and neurons. It is an important intracellular and extracellular signaling molecule, which promotes smooth muscle relaxation, causing a powerful hypotensive effect. It also acts as a neuromodulator, is bactericidal, and has a modulating effect in hormonal liberation, tissue healing and other biological actions.

This discovery made by Robert F. Furchgott, Louis Ignarro and Ferid Murad granted them a Nobel Prize in physiology or medicine in 1998. It is now common knowledge that virtually all diseases are directly or indirectly associated with altered NO homeostasis, including those considered the current main concerns in public health: hypertension, obesity and diabetes.

Based on this discovery, practically everything that was considered known in biological sciences was revised taking into account the participation of NO. Such knowledge, therefore, became of fundamental importance and interest to nurses of different specialties⁽¹⁾.

This knowledge has clarified the understanding of the acting principle of different nitrogen-derived medications (such as sodium nitroprusside), in addition to the development of new nonsteroidal anti-inflammatory drugs. Similarly, there is the use of NO action donor and inhibitor drugs that have become part of the arsenal for treating ICU patients with pulmonary hypertension, septic shock and hypertension resistant to other treatments.

Furthermore, in the field of nursing practice, pressure ulcers are a constant concern for individuals with reduced mobility. When untreated, they cause irreparable harm to patients, elevating the risk of mortality, especially among older adults. In recent years, NO has been used as an effective method for treating pressure ulcers. In 2016, Saidkan and collaborators conducted an elegant study in which they assessed the healing process of pressure ulcers in 58 patients treated with a NO releasing cream. They observed that the lotion was able to accelerate the healing process efficiently, safely and accessibly. Its low cost together with its therapeutic visibility should elevate its potential as a pressure sore treatment substance in the very near future⁽²⁾.

Considering the worldwide trend of narrowing the distance between the knowledge produced by biological sciences and the application of its results to nursing practice (also known as "from bench to bedside"), there is

no doubt of the need to increasingly strengthen the coordination between these two dimensions, thus maintaining nursing in its incessant search for excellence in healthcare service provision.

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