



EDELWEISS PUBLICATIONS
OPEN ACCESS

<https://doi.org/10.33805/2573.3877.158>
Volume 7 Issue 1 | PDF 158 | Pages 2

Nursing and Health Care

Commentary

ISSN: 2573-3877

The Necessity of More Close Co-operation and Communication between Health Professionals Involved in Pharmacotherapy

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Citation: Goudochnikov VI. The necessity of more close cooperation and communication between health professionals involved in pharmacotherapy (2026) Nursing and Health Care 7: 4-5.

Received: July 30, 2026

Accepted: Aug 24, 2026

Published: Sep 01, 2026

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Abstract

The opinion is justified on the importance of pharmacokinetics knowledge and that's why, the necessity of pharmacists working together with physicians and specialists in nursing, particularly when treating the special groups of patients.

Keywords: Pharmacology, Pharmacokinetics, Adverse Drug Reactions, Drug Interactions.

Abbreviations: ADR-Adverse Drug Reactions, DOHaD-Developmental Origins of Health and Disease, GC-Glucocorticoids, ISOAD-International Society on Aging and Disease, LA- DOHaD-Latin American Chapter of International Society for DOHaD, PK-pharmacokinetics.

Introduction

This article represents the author's personal view elaborated along his scientific trajectory during chronologic period of almost 50 y, but the principal its part was generated at the University of Ijuí (Unijui) in the South of Brazil in the first decade of current century.

At that time 4 educational courses worked together in the Department of Health Sciences of Unijui: Nursing, Pharmacy, Physiotherapy and Nutrition. These activities have clearly shown to us that only Pharmacy course had the conditions of better comprehension of Pharmacology [1], simply because of exclusive presence of Pharmacokinetics (PK) in the Curriculum of disciplines offered to students of this course. Nevertheless, even the Pharmacy students needed not only conventional textbooks on pharmacology, but also specialized literature on PK [2].

Later activities in the international societies of LA-DOHaD and ISOAD have attracted out attention to peculiarities of drug action in special groups of patients: first of all, pregnant and lactating women, but also children and adolescents, elderly and even elite athletes. It is important that exactly these patient groups are usually less represented (or not represented at all) in clinical trials of novel medicines. Where does this importance stem from?

Peculiarities of drug action in perinatal and early postnatal periods

All the activities of International Society for DOHaD allow to suggest that at least some drugs are capable to cause so called phenomena of programming/imprinting, if applied during the critical periods of development. Our attention was focused principally on GlucoCorticoids (GC) and psychoneurotropic agents [3,4]. Moreover,

in these critical periods of early life there exists certain underdevelopment of the mechanisms of drug metabolism that should be considered especially for premature newborns. As referred to GC, their higher capacity to inhibit somatic growth in perinatal period may result in several long-term consequences, at least till adult state and perhaps, up to the senescence [5,6].

Alterations of drug action with aging

Because of rapid populational aging in the majority of countries on various continents, this topic has gained particular emphasis in the recent decades, taking into account also that exactly the elderly have not rarely the following sequence of events:

Multimorbidity → Polypharmacy → ADR and drug interactions

In addition, the body organs responsible primarily for drug metabolism and elimination, i.e. liver and especially kidneys, clearly show signs of significant functional decline with aging that result in certain slowing of drug biotransformation and excretion. All this evidence indicates that both at the beginning and the end of human life correct comprehension of drug action should strictly depend on the knowledge of PK.

The contribution of pharmacokinetics to better understanding of drug action in early and late periods of human life

Previously we have already stressed that the capacity of GC to serve as mediators of programming/imprinting phenomena may be facilitated

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by underdevelopment of desensitization mechanisms [7], as well as of the events dependent on active transport of drugs such as dexamethasone from cells to extracellular fluids in perinatal period. On the other hand, because of much lower number (or even complete absence) of clinical trials in this field, the practitioners in perinatology are faced to the following dilemma: for example, to use or not to use opioid analgesics in newborns [8]. Since if to use, then these drugs may in principle provoke long-term consequences, whereas if not to use, protracted pain may do more or less the similar thing... Therefore, it is easy to understand why opioid analgesics are frequently used in off-label mode in perinatal medicine.

In addition, the incomplete comprehension of PK by health professionals may result sometimes in devastating sequelae for the elderly patients. In fact, the inadequate use of benzodiazepines with longer half-life, such as diazepam may greatly increase the risk of accidental falls and bone fractures with significant morbidity and mortality, particularly in women with subclinical osteoporosis. Since only the specialists in pharmacy possess specific knowledge in PK, then the necessity of their cooperation and communication with physicians and nurses becomes increasingly evident.

Final Remarks

Although true PK is quite complex and full of advanced mathematics [9], it is possible, in principle, to develop special courses of continuous medical education, containing simplified topics of this discipline, by offering largely theoretical concepts, instead of complex equations. Surely, these courses should be given, at least to both physicians and specialists in nursing. Moreover, softwares and smartphone applications of medical and bioinformatics on PK and pharmacodynamics, using artificial intelligence, should be elaborated, in order to facilitate and accelerate the decision making in difficult clinical situations.

Finally, open access to databases on drug interactions (like that of Medscape) should be provided to all health professionals, but in particular to specialists in community pharmacies. Together with physicians and nurses, they may help in organizing, long-term planning and maintenance of medicines utilization, as well as in studies of pharmacoepidemiology and drug surveillance [10].

In conclusion, better communication between health professionals involved in pharmacotherapy should be promoted on various levels, for the sake of well-being of both in- and outpatients, particularly in special patient groups.

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