Chapter 77

The Evolving Role of Pharmacoinformatics in Targeting Drug–Related Problems in Clinical Oncology Practice

Kevin Yi-Lwern Yap
Institute of Digital Healthcare, WMG, University of Warwick, UK

ABSTRACT

The rapid growth of the internet and the World Wide Web has led to the development of pharmacoinformatics technologies to assist oncology healthcare professionals in delivering optimum pharmaceutical care and health-related outcomes. The proliferation of online health information has also empowered patients with cancer with the knowledge to better participate in the management of their own condition. This chapter introduces the evolving roles of pharmacoinformatics in oncology and discusses some problems that have arisen due to these technologies. Various pharmacoinformatics channels for practitioners and patients are described together with drug interaction parameters that are clinically relevant to oncology clinicians. Additionally, this chapter addresses certain quality issues associated with online anticancer drug interactions and proposes several design principles for developers of pharmacoinformatics tools. Finally, readers will be given an insight as to how pharmacoinformatics can be harnessed for the future improvement of pharmaceutical care in patients with chronic diseases such as cancer.

INTRODUCTION

The practice of pharmaceutical care forms the cornerstone of any health science discipline which concerns itself with the rational use of drugs. Its concept combines a careful blend of caring orientation with specialized therapeutic knowledge, experiences, and judgments, so as to ensure optimal medication-related outcomes (American College of Clinical Pharmacy, 2005; American Society of Hospital Pharmacists, 1993). These outcomes include the prevention or cure of diseases, elimination or reduction of symptoms, and slowing or arresting of disease processes (American Society of Hospital Pharmacists, 1993). Healthcare professionals, particularly clinical pharmacists, apply their knowledge and understanding of evidence-based therapeutic guidelines, evolving sciences and relevant ethical, social and economic principles so as to provide optimal medication therapy management in direct patient care settings. Clinical researchers, on the other hand, aim to contribute to new knowledge which improves the patients' health and quality of life (American College of Clinical Pharmacy, 2005).

Pharmaceutical care is essential in helping patients make the best use of their medications, and is applicable and achievable in any practice setting. It involves identifying, solving and preventing potential or actual drug-related problems with regards to a patient's drug therapy (American Society of Hospital Pharmacists, 1993; Westerlund, Almarsdóttir, & Melander, 1999). There are a number of definitions to drug-related problems, but in essence, they can be easily understood as events or circumstances involving drug therapies that can actually or potentially interfere with the desired health outcomes for patients (American Society of Hospital Pharmacists, 1993; van Mil, Westerlund, Hersberger, & Schaefer, 2004). The Pharmaceutical Care Network Europe Foundation classifies drug-related problems in terms of problems and causes (Table 1) (Pharmaceutical Care Network Europe, 2006). The former classification identifies the drug-related problems in terms of dosing, drug use and drug choice problems, as

Table 1. Classification of drug-related problems (adapted with modification from the Pharmaceutical Care Network Europe, 2006)

Drug-related problem	Meaning
Classification by Problems	
Adverse reaction(s)	Patient suffers from an adverse drug event.
Drug choice problem	Patient gets or is going to get a wrong or no drug for his/her disease and/or condition.
Dosing problem	Patient gets more or less than the amount of drug he/she requires.
Drug use problem	Wrong or no drug taken/administered.
Drug Interactions	There is a manifest or potential drug-drug, drug-food or drug-herb interaction.
Other	Other types of drug-related problems.
Classification by Causes	
Drug/dose selection	Cause is related to selection of drug and/or dosage schedule.
Drug use process	Cause is related to the way patient uses the drug, in spite of proper dosage instructions on the label.
Information	Cause is related to an absence or misinterpretation of information.
Patient	Cause is related to personality or behavior of patient.
Logistics	Cause is related to the logistics of the prescribing or dispensing mechanism.
Other	Other causes of drug-related problems.

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