

Hospital Pharmacy: an Evidence-Based Profession

L. Lee Dupuis

Proof that clinical pharmacy services benefit patients hit a high-water mark in the last year of the second millennium. This evidence came not only from single institutions that provide excellent pharmaceutical care but also from broad surveys of multiple institutions.

First, Bond and colleagues explored the relationship between mortality rates adjusted for severity of illness and pharmacist staffing levels¹ and clinical pharmacy services² in general hospitals in the United States. Although death is a fairly extreme and nonspecific end point, it is closely associated with quality of care.³ Higher staffing levels of pharmacists (as well as of medical residents, registered nurses, medical technologists, and total hospital personnel) were associated with lower mortality rates.¹ In addition, all 14 clinical pharmacy services evaluated were associated with lower mortality rates.² For 4 of the clinical pharmacy services, this association was statistically significant: drug information services, clinical research, participation on the resuscitation team, and admission drug histories. Pharmacists save lives!

Second, Leape and colleagues⁴ evaluated the effect of pharmacist participation in physician rounds on the rate of adverse drug events in the medical intensive care unit of a tertiary care hospital. They also described the type of interventions performed by the pharmacist and the level of acceptance of the pharmacist by physicians. During the 9-month study, the pharmacist made 398 interventions, including 178 order clarifications and 100 drug information responses, and the rate of adverse drug events decreased from 33.0 to 11.6 per 1000 patient-days. Given that adverse drug events in hospital patients have been identified as a significant source of morbidity and mortality, as well as a source of hospital costs, this contribution of pharmacists to the quality of patient care cannot be underestimated.⁵ Pharmacists prevent drug-related injury!

Third, 2 studies have evaluated the relationship between pharmacists' activities and drug costs. McMullin and colleagues⁶ prospectively evaluated the economic benefits of pharmacist-initiated interventions on several wards in a large teaching hospital. During the 30-day study, the pharmacists made 967 interventions to improve the quality of care. Another 259 interventions with potential cost-saving implications were identified. The latter interventions were randomized to either an intervention group, in which the pharmacists' suggestions were enacted, or a control group, in which the pharmacists' suggestions were not put forward to the care team. Drug costs for the intervention group were 41% lower than those for the control group, with no difference in the quality of care provided. Pharmacist-initiated interventions aimed at reducing costs represented only a small proportion of the interventions observed in this study, contrary to the traditional impression of medical staff that pharmacists are more concerned with costs than with quality of care. Nevertheless, such interventions can lead to significant cost reductions.

Bond and colleagues⁷ evaluated the direct relationships and associations among 14 clinical pharmacy services, pharmacist staffing, and drug costs, adjusted for severity of illness, in 934 hospitals in the United States. They observed that 4 clinical pharmacy services had a statistically significant association with lower hospital drug costs: in-service education, drug information services, drug protocol management, and admission drug histories. Furthermore, as hospital staffing of clinical pharmacists increased, drug costs decreased. Each clinical pharmacist position was



associated with a decrease of approximately US\$22 000 (1992 dollars) in drug costs. This information about the economic impact of pharmacy services, coupled with the previous determination by these researchers as to which services influence mortality rates, identifies drug information services and admission drug histories as core pharmacy services. Pharmacists save lives and money!

On good days, we know that we pharmacists make a difference to the quality of care our patients receive. On bad days, we begin to doubt our effectiveness. Previous studies that have evaluated the impact of the pharmacist have been criticized from both sides of the argument: for overattributing outcomes to pharmacists' interventions and for being unable to tease out pharmacists' contributions. The studies summarized above were well designed, well executed, and well documented. Without doubt, these studies collectively confirm the role of the hospital pharmacist on the interdisciplinary clinical team. Every hospital pharmacist and every hospital administrator in the country should be aware of the results of these studies.

References

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L. Lee Dupuis, MScPhm, FCSHP, is Manager of Clinical Services, Research and Education, Department of Pharmacy, The Hospital for Sick Children, and Assistant Professor, Faculty of Pharmacy, University of Toronto, Toronto, Ontario. She is also an Associate Editor for *CJHP*.

Address correspondence to:

L. Lee Dupuis
Department of Pharmacy
The Hospital for Sick Children
555 University Avenue
Toronto ON
M5G 1X8
e-mail: lee.dupuis@sickkids.on.ca