An Evaluation of Pharmacy Assessment for Geriatric Patients

L. Romonko and L. Pereles

ABSTRACT

Evaluation of a pharmacy assessment for geriatric patients on a geriatric assessment and rehabilitation unit is described. The assessment has been developed to identify functional, comprehension and therapeutic problems affecting an elderly patient's ability to self-medicate. The pharmacy assessment identified more obstacles to self-medication than the nursing and medical assessments. The detection of obstacles was particularly apparent in the areas of medication knowledge deficit, complicated medication regimes and the inability to follow directions. The pharmacist made more recommendations than the other health professionals for improving the safety and efficacy of drug therapy and medication compliance (p < .01). Recommendations included simplification of medication regimes, requesting drug levels or specific lab tests, and the use of compliance aids. Seventy-seven percent of the recommendations made by the pharmacist were acted upon by the physician or nurse. Results of the study demonstrate the pharmacy assessment was the most significant predictor of self-medication success.

Key Words: *assessment, compliance, geriatric, pharmacy, self-medication*

Can J Hosp Pharm 1992;45:15-20

RÉSUMÉ

Voici une description de l'évaluation d'un examen en pharmacie gériatrie pour des patients sous examen gériatrique et en programme de réadaptation. L'examen a été développé pour identifier les problèmes fonctionnels, de compréhension et thérapeutiques affectant l'habileté des personnes âgées à prendre eux-mêmes leurs médicaments. L'examen de la pharmacie a identifié un plus grand nombre de problèmes d'auto-médication par l'examen parvenant des soins infirmier(e)s et médicaux. Selon les découvertes, il est évident qu'il y a des problèmes dans les domaines d'administration de médicaments compliqués, l'incapacité de suivre les instructions et particulièrement le manque de connaissances des médicaments. Le pharmacien est celui qui a fait le plus grand nombre de recommandations et cela dans le but d'assurer la sécurité et l'efficacité de la thérapie et la compliance du patient (p < .01). Ces recommandations suggèrent un régime de médication simplifié, un meilleur monitoring des niveaux sériques des médicaments et de certains tests de laboratoire et l'utilisation d'outils aidant à la compliance. Les médecins et les infirmier(e)s ont suivi soixante dix sept pour cent des recommandations faites par le pharmacien. Les résultats de cette évaluation ont significativement démontré que l'examen de la pharmacie était le plus prometteur pour le succès de l'auto-médication.

Mots clés: *auto-médication, conformité, examen, gériatrique, pharmacie*

L. Romonko, B.S.P. is a Pharmacist with the Calgary District Hospital Group.
L. Pereles, MD, CCFP, works at Calgary District Hospital Group as well.
Address correspondence to: L. Romonko, Geriatric Assessment and Rehabilitation Program, Rockyview General Hospital, 7007-14 Street S.W., Calgary, Alberta T2V 1P9.

INTRODUCTION

A thorough assessment of the geriatric patient by the pharmacist can improve patient care and reduce medication complications. Elderly patients are at high risk for medication-related problems. Geriatric patients undergo many physiological changes that alter their response to drugs. Changes in distribution and elimination of drugs can produce an increased sensitivity to drug effects.[1] The occurrence of polypharmacy and complicated drug regimes in the geriatric population has also been shown to reduce medication compliance.[1,2,4,5,7] Numerous functional problems are also barriers to safe medication use. These problems may include the inability to read a prescription label, to differentiate between various coloured tablets or the inability to open various medication containers.[3,5,10,11]

In conjunction with comprehensive pharmacotherapy monitoring, the pharmacist can make a valuable contribution by providing patient specific and drug-specific recommendations that ensure rational drug therapy.[4,7,10,17] The recommendations of the pharmacist can assist the geriatric health team in making rational plans for discharge as well as reducing the number of hospital readmissions related to medication misadventure.[2,11,15] Ability to self-medicate is an important determining factor in the decision to discharge a patient to an unsupervised setting. If

a deficiency in self-medicating ability is suspected then the patient can be placed on a self-medication trial for further evaluation. Alternate discharge arrangements for medication administration can also be arranged.

To ensure appropriate self-medication the pharmaceutical assessment of geriatric patients must include an evaluation of the patient's mental and physical function. Visual, auditory and dexterity problems need to be identified as these factors may be important obstacles in the patient's ability to self-medicate. To assess functional ability, the patient must be asked to read labels and open various medication containers. The pharmacist, in addition to reviewing the patient's present medication regimen, must make an assessment of the patient's medication knowledge and self-medication safety. The assessment should include recommendations for rationalizing drug therapy, simplifying regimes, and enlisting the use of aids to improve compliance.

Pharmacy assessments have been developed to identify problems in drug therapy and medication compliance but none have been systematically evaluated.[4,7,10,11,16,17] It was our objective to develop an appropriate pharmacy assessment to better identify drug and patient-specific concerns and to then evaluate that assessment by comparing it to nursing and medical assessments already being utilized on a geriatric assessment unit. The number and type of problems identified, subsequent recommendations, and assessment of ability to self-medicate were also analyzed.

METHODS

Subjects

A total of 51 consecutive patients from a Geriatric Assessment and Rehabilitation program were assessed at the time of their admis-

sion. The assessments were performed by three physicians, seven nurses and one pharmacist.

The nurse, physician, and pharmacist each conducted their own comprehensive geriatric assessment. Each professional assessed the patient's medical problems, and functional and cognitive ability. Each was then asked to identify any factors that could prevent the patient from self-medicating and to make recommendations to improve the patient's present medication regimen. Based on their assessment each discipline was asked to predict whether the patient could self-medicate. The patient's actual ability to self-medicate was determined by a follow-up home visit three month's post-discharge or by their success on an inpatient self-medication program in the event that the patient was not to be discharged home.

Data Analysis

The type and number of self-medication obstacles and recommendations made were compared for the three groups by analysis of variance. The Linear Logistic Regression method by Cox using the

subject's success in self-medication on discharge or on a self-medication program as the dependent variable was used to determine whether each health care professional was able to predict a patient's ability to self-medicate.[19]

RESULTS

The average subject age was 80.9 years (range 62 - 94 years). There were 22 males and 29 females. The average number of medications prescribed per patient during length of stay was 6.5. The most common diagnoses were post cerebral vascular accident, diabetes, hypertension, chronic obstructive pulmonary disease, and post-fractured hip.

The type of self-medication problems identified by each of the disciplines varied (Figure 1). On average the pharmacist identified 0.96 obstacles per patient; nursing 0.58; physicians 0.63. The most common problems identified were comprehension, the inability to follow through on directions given, lack of motivation, visual and auditory deficits, manipulation problems, and lack of knowledge. A small number of other problems
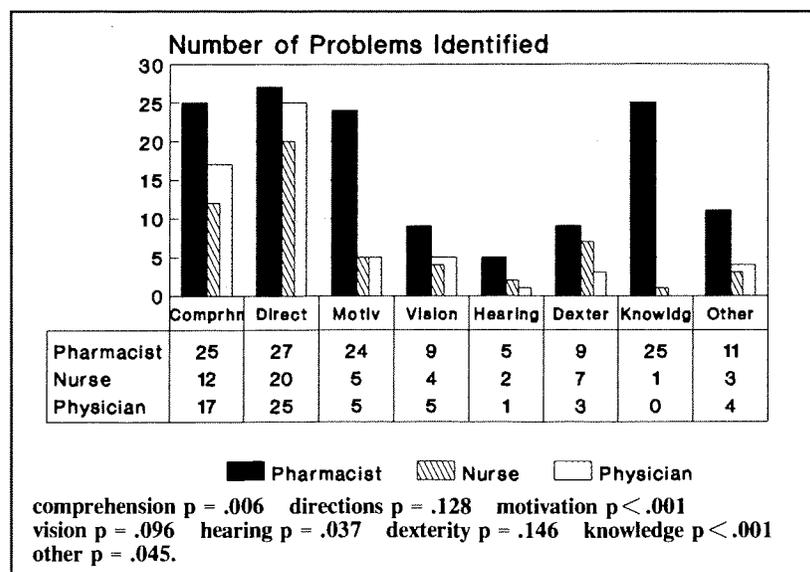

Number of Problems Identified								
	Comprhn	Direct	Motiv	Vision	Hearing	Dexter	Knowldg	Other
Pharmacist	25	27	24	9	5	9	25	11
Nurse	12	20	5	4	2	7	1	3
Physician	17	25	5	5	1	3	0	4

■ Pharmacist   ▨ Nurse   ☐ Physician

comprehension p = .006   directions p = .128   motivation p < .001
vision p = .096   hearing p = .037   dexterity p = .146   knowledge p < .001
other p = .045.

Figure 1: Medication Problem Identification. Comparison of Pharmacist Nurse Physician.

such as substance abuse or complicated drug regimens were also identified. The pharmacist identified more auditory (p = 0.037), knowledge (p < 0.001), comprehension (p = 0.006) and motivational deficits (p < 0.001) than the other disciplines. The pharmacist's assessment lasted twenty minutes on average. Physician and nursing assessments lasted one and two hours respectively.

The pharmacist made more compliance-related and drug-related recommendations than the other disciplines (Figure 2). The pharmacist made 1.5 recommendations per patient; nurse 0.35; physician 0.37 (p = 0.001). Types of recommendations included: discontinuing or changing medications (p = 0.01), trying medication aides (p < 0.001). The pharmacist alone recommended simplifying medication regimens and checking drug levels and lab values. Seventy-seven percent of the pharmacist's recommendations were acted upon. Physicians were most likely to follow through on pharmacy recommendations related to compliance. This included the use of aids or long-acting drug products and simplifying dosage regimes as well as placement of patients on a self-medication program. The drug-related recommendations most often acted upon involved discontinuing a drug and replacing it with a drug producing less side effects and checking drug levels or lab values. Physicians were more reluctant to discontinue a medication when no other would be given in its place and in reducing the dosages of certain drugs. Of the patient population, 43% were judged able to self-medicate by a home visit three months post-discharge or a sufficient trial on a self-medication program. All three disciplines' assessments were good predictors of a patient's abil-
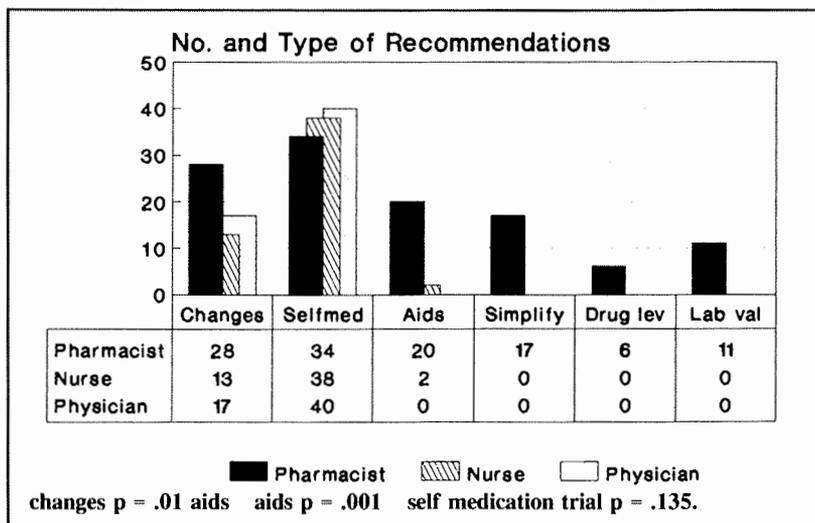

No. and Type of Recommendations

	Changes	Selfmed	Aids	Simplify	Drug lev	Lab val
Pharmacist	28	34	20	17	6	11
Nurse	13	38	2	0	0	0
Physician	17	40	0	0	0	0

■ Pharmacist   ▨ Nurse   ☐ Physician

changes p = .01 aids   aids p = .001   self medication trial p = .135.

Figure 2: Medication Recommendations. Comparison of Pharmacist Nurse Physician.

ity to self-medicate. The pharmaceutical assessment was the best predictor at a predictive accuracy of 69% (p = 0.0002). The physician and nurse predictive accuracy was 62% (p = 0.0169) and 58% (p = 0.0006) respectively.

DISCUSSION
This study confirms the value of an independent pharmacy assessment of the geriatric patient. While other investigators have shown the importance of the pharmacy assessment in improving drug therapy, drug compliance and patient knowledge, this study shows the importance of the pharmacist in identifying obstacles to self-medication and in predicting the patient's ability to self-medicate.[7,16,17] Functional problems are very common in this age group and are an important aspect of any pharmacy assessment.[4,5,11] Functional deficits in vision, hearing and manipulation were identified in 10% to 18% of patients in this study. The pharmacist was more aware of these problems than the physician or the nurse. The pharmacist was also more likely to identify problems in comprehension, patient knowledge, motivation and complicated medication regimes. Determining

use and misuse of non-prescription drugs is also an important aspect of the initial medication assessment and the pharmacist's unique knowledge base enables better identification of drug-drug and drug-disease interactions.

Recommendations are an essential aspect of any assessment. The pharmacist is in a position to recommend discontinuing, modifying or substituting drugs more appropriate for the geriatric patient. The pharmacist has more in-depth knowledge of drug pharmacology, including long-acting products suitable for simplifying a patient's regime. The pharmacist also possesses considerable knowledge of the available compliance aids and can facilitate their use. The importance of compliance aid familiarity was well-illustrated in the study as the pharmacist recommended aids in almost 40% of patients, compared with 4% of nurses and 0% of physicians. In the study, 77% of the recommendations made by the pharmacist were followed further emphasizing the value of the pharmacist's input and patient pharmacotherapy monitoring skills.

In predicting the ability to self-medicate, all three disciplines were significant predictors but the phar-

macist was the best predictor. The identification of patients who are unable to self-medicate is particularly important in the geriatric patient. Physicians and nurses overestimated the ability of patients to self-medicate.

The incorporation of a pharmaceutical assessment as a part of an assessment and rehabilitation unit assures that most problems in drug therapy will be identified. Medication compliance is one of the most significant issues considered in discharge planning. The pharmacy assessment quickly identifies problems in self-medication and allows time to improve medication compliance prior to discharge. The pharmacy assessment is structured so that a nurse or physician may administer the evaluation and the results reviewed with a pharmacist at a later date. Use of the pharmacy assessment by another health professional would be appropriate in a situation where the pharmacist is not a full-time member of the geriatric health team and may be unable to assess every patient admitted.

The widespread applicability of the results of the study in other clinical settings remains unknown. The study was conducted on the only established geriatric assessment and rehabilitation unit in the city. A single pharmacist performed all assessments while medical assessments were performed by three physicians and nursing assessments by numerous different nurses. In most cases, pharmacists are not yet well-established members of geriatric assessment teams. The pharmacist's high profile on this interdisciplinary team may have contributed to the high incidence of acceptance of recommendations. A further evaluation utilizing other clinical settings and different pharmacists would provide an even more accurate evaluation of the assessment's value.

Polypharmacy, non-compliance and adverse drug reactions are pre-valent in the elderly. The results of our evaluation demonstrate that the pharmacist, because of the specific drug-related components of the pharmacy assessment, is the best predictor of self-medication success, the most likely to discover obstacles to self-medication and the most likely to make recommendations for improvements or simplifications to individual drug therapies. A comprehensive pharmacy assessment provides the geriatric team a basis on which to fulfill one of their goals in treatment: safe and efficacious drug therapy. ☒

REFERENCES

1. Beers MH, Ouslander JG. Risk factors in geriatric prescribing. *Drugs* 1989; 37:105-12.
2. Hale WE, et al. Drug use in an ambulatory elderly population: a five-year update. *Drug Intell Clin Pharm* 1897; 21:530-5.
3. Hatch AM, Tapley A. A self-administration system for elderly patients at Highbury Hospital. *Nursing Times* 1982; Oct 20:1773-4.
4. Meyer ME, Schuna AA. Assessment of geriatric patients' functional ability to take medication. *Drug Intell Clin Pharm* 1989; 23:171-4.
5. Murray MD, et al. Factors contributing to medication noncompliance in elderly public housing tenants. *Drug Intell Clin Pharm* 1986; 20:146-52.
6. Pelletier RD. Self-medication promotes patient independence in a rehabilitative setting. *Hosp Pharm* 1983; 18:86-9.
7. Sedgeworth CH, et al. Pharmacist assessment of very elderly patients' ability to self medicate: (1) a structured home interview. *Pharm J* 1990; Feb 17:R24-6.
8. Sharpe TR, et al. Medicine use among the rural elderly. *J Health and Social Behavior* 1985; 26:113-27.
9. Stanaszek WF, Baker D. Drug monitoring in the geriatric patient. *Am Pharm* 1983; NS23:3237.
10. Cole P, et al. Drug consultation: its significance to the discharged hospital patient and its relevance as a role for the pharmacist. *Am J Hosp Pharm* 1971; 28:954-60.
11. Hurd PD, Butkovich SL. Compliance problems and the older patient: assessing functional limitations. *Drug Intell Clin Pharm* 1986; 20:228-30.
12. Wandless I, Davie JW. Can drug compliance in the elderly be improved? *Brit Med J* 1977; Feb 5:359-61.
13. Zuccollo G, Liddell H. The elderly and the medication label: doing it better. *Age and Ageing* 1985; 14:371-6.
14. Hood JC, Murphy JE. Patient noncompliance can lead to hospital readmissions. *Hospitals J.A.H.A.* 1978; 52:79-84.
15. Johnston M, et al. Facilitating comprehension of discharge medications in elderly patients. *Age and Ageing* 1986; 15:304-6.
16. Owens NJ, et al. The senior care study: the optimal use of medications in acutely ill older patients. *J Am Ger Soc* 1990; 38:1082-7.
17. Sweeney SJ, et al. The impact of the clinical pharmacist on compliance in a geriatric population. *Pharm J* 1989; Feb 18:R4-R6.
18. Wong BSM, Norman DC. Evaluation of a novel medication aid, the calender blister-pak, and its effect on drug compliance in a geriatric outpatient clinic. *J Am Ger Soc* 1987; 35:21-6.
19. Cox DR. The Analysis of Binary Data. London, Methuen 1970; 355-64.
20. Kendrick R, Bayne JR. Compliance with prescribed medication by elderly patients. *CMA Journal* 1982; 127:961-2.
21. Folstein MF, Folstein SE, McHugh PF. Mini-mental State Test: A practical method for grading the cognitive state of patients for clinician. *J Psych Research* 1975; 12:189-98.

Appendix I

A. Mental Status and Functional Ability

   1. Cognitive Function

     Education Level _____

     Folstein's Mini-Mental Status (21) _____

2. Ability to read a prescription label	YES _____ NO _____
3. Ability to open and close a child-resistant cap	YES _____ NO _____
4. Ability to open a non-child resistant cap	YES _____ NO _____
5. Ability to manipulate a dosett	YES _____ NO _____
6. Ability to remove TWO small tablets from a vial	YES _____ NO _____
7. Ability to describe a three times daily dosage regime	YES _____ NO _____
8. Ability to differentiate tablets by color a) white from yellow	YES _____ NO _____
b) green, blue and lavender	YES _____ NO _____
9. Ability to swallow pills	YES _____ NO _____
10. Ability to hear instructions clearly	YES _____ NO _____

B. Daily Routine at Home (relevant to dosing)

Patient ate three regular meals per day	YES _____ NO _____
Alcohol Consumption	YES _____ NO _____
Does patient have a system for taking medications when away from home?	YES _____ NO _____
Sleep Times _____	YES _____ NO _____

C. Medication and Dosing Considerations

1. Has patient experienced any allergies to any medications?	YES _____ NO _____
2. Does patient know which drugs he/she is on at the present time and why? *Comment* (include names, doses, times of administration and indications)	YES _____ NO _____
3. Can patient recall any medications he/she was on in the last six months? *Comment*	YES _____ NO _____
4. Does patient self-medicate?	YES _____ NO _____

    If so which over-the-counter products has he/she taken?

    _____ internal/external analgesics   _____ antacids/suppositories
    _____ cough/cold/antihistamines   _____ antidiarrheals/laxatives
    _____ eye/ear/nose/throat   _____ vitamins/minerals
    _____ topicals

PHARMACY
ASSESSMENT & CONSULTATION
Southern Alberta Regional Geriatric Centre

CDHG 4-0004 Rev Aug 90

5. Does he/she know what to do if a dose is missed?   YES _____ NO _____

6. Does patient store medicine appropriately?   YES _____ NO _____

7. Does patient keep his/her medication in the original containers?   YES _____ NO _____

8. Does patient have a special system to help them remember to take his/her medication?
   Describe

       YES _____ NO _____

9. Is patient using any compliance aids at the present time or had he/she used any in the past?   YES _____ NO _____

10. Is there another individual involved in the patient's drug therapy? If YES, who?

        YES _____ NO _____

11. Has the patient perceived any side effects to his/her medication?
    If YES, which side effect and which drug?

        YES _____ NO _____

12. Does patient dispose of old or out-dated medicines?   YES _____ NO _____

13. Does the patient ever share his/her medications with anyone?   YES _____ NO _____

14. Does the patient have a regular pharmacist/pharmacy?
    (Name and phone number of pharmacy)   YES _____ NO _____

D. Assessment Summary

Can the patient adhere to the prescribed medication regimen at home? Comment

_____

_____

_____

Are there any opportunities to simplify the patient's regimen **i.e.:** with an appropriate extended action product?

_____

_____

_____

Other comments/recommendations (includes: asking for lab values and drug levels, any changes in drug therapy, use of aids or a trial on the Self-med Program if appropriate)

_____

_____

_____

Pharmacist _____   Date _____

PHARMACY
ASSESSMENT & CONSULTATION
Southern Alberta Regional Geriatric Centre

CDHG 4-0004 Rev Aug 90