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Geriatric Education Centers Address Medication Issues Affecting Older Adults

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Synopsis

Serious problems have been identified in the prescribing of medications for elderly patients and use of prescription and nonprescription drugs by older persons. Overuse, underuse, and inappropriate use of drugs by the elderly have been widely documented, and the harmful consequences have been described. This paper reviews information concerning the need for action to improve health professionals' knowledge and skills with respect to drugs and the elderly and activities being undertaken by geriatric education centers (GECs) to enhance these capacities.

Grant support for the centers from the Health Resources and Services Administration, a Public Health Service component agency, began in 1983. In fiscal year 1992 there are 31 centers operating in 26 States. The centers are multi-institutional and conduct four types of educational activities. These include review of pharmacological issues for multidisciplinary groups, specialized training for pharmacists, discipline-specific programs focusing on medication issues, and activities aimed at educating the public. Examples of the GECs' educational activities are given.

OLDER PERSONS, WHO HAVE HIGHER rates of chronic disease and use more health services than the total population, are major users of prescription and nonprescription drugs. Persons ages 65 and older compose approximately 12 percent of the population but use about 30 percent of all prescrip-

tion medications (*1*). They also use about 40 percent of all nonprescription drugs and about the same percentage of sedative and hypnotic drugs.

Most older persons living in the community take at least one drug and many take several (*2*). Older adults average more than 15 prescriptions a year, four times the rate among younger persons. Some older adults take considerably more; a large group of Medicare beneficiaries who rated their health poor in 1987 reported an average of 31 prescriptions a year (*3*). Nursing home patients are among the heaviest of medication users. A 1987 study of Massachusetts nursing facilities found an average of 8.1 prescription orders per patient (*4*).

The number and proportion of drugs used by older adults are likely to increase. Contributing to this trend are projected growth in the size and resources of the older population, increased coverage of outpatient prescriptions by third-party insurance, and the continuing introduction of new drugs to manage chronic diseases (*5,6*). Changes in medications from prescription to nonprescription status also will likely increase utilization.

The potential benefits of appropriate and effective use of medications by older persons are great. Drugs, wisely used, can reduce or eliminate needs for surgical and hospital care, prevent premature deaths, and extend capacities for independent living. For example, reductions in deaths from heart disease and stroke in recent years have been attributed in part to more effective cardiovascular and anti-hypertensive drugs.

Shortcomings in Drug Therapy

Risks. Unfortunately, a good deal of drug use among older persons is inappropriate. In many cases, adverse drug reactions, accompanied by serious human and financial costs, result. It has been estimated that more than 9 million adverse drug reactions occur each year among older Americans (26 percent of the total). More than 200,000 older adults are hospitalized annually because of adverse drug reactions or experience an adverse drug reaction during hospitalization. A 1986 report indicated that persons ages 60 and older accounted for one-third of all hospitalizations for adverse drug reactions (*7*).

While not all cases of drug-related hospital admissions are preventable (some are unavoidable reactions resulting from the use of necessary drugs in appropriate dosages), many are attributable to errors in prescribing and dosage and to avoidable interactions. "The overwhelming proportion of drug-induced illness in the elderly stems from the prescribing of the wrong drug (if a drug is needed at all) or the wrong dose in an elderly patient," according to a leading geriatrician (*8*). Another major problem is that a drug prescribed for one of a patient's medical problems may exacerbate another illness or condition.

Many older persons use multiple medications over long periods. Moreover, they often take drugs prescribed by several specialists who may or may not be aware of medications prescribed by other practitioners. The more prescriptions used, the greater the chances of mismedication. Furthermore, elderly people use a disproportionate share of drugs that have a high risk of adverse reactions. With many drugs there are age-related changes in drug distribution in the body and in drug clearance. The risks of adverse reactions and iatrogenic illness are also greater in elderly patients than in younger patients because of lower reserve capacities and slower homeostatic responses (*9*).

Adverse drug reactions related to sedatives and psychotropics are a serious problem. Older persons are especially heavy users of sleeping pills; 2 million older persons are estimated to be addicted or at risk of addiction due to overprescribing of tranquilizers and sleeping pills (*10*). Further, diagnoses of mental problems related to behavioral abnormalities, such as intellectual deterioration and memory loss, may be attributable to drugs; more medications may be prescribed, often making conditions worse.

The heavy use of medications, especially tranquilizers, in nursing homes is a special concern. Numerous reports have indicated excessive reliance on antipsychotic and other drugs. While the 1987 Omnibus Budget Reconciliation Act introduced new regulations on reviewing and documenting drug use in Medicare- and Medicaid-certified nursing facilities, educationai interventions have been urged as well (*4,11-13*).

Underuse. Misuse of medications also includes under-utilization of needed drugs. Although limited incomes and a number of other conditions contribute to this problem, a major factor is the failure of patients to use prescribed drugs in the most appropriate ways (*11*). Patient "noncompliance" has been reported in as many as 55 percent of studied cases. While overuse occurs—"if one tablet is good, two is better"—the most common tendency is to take less medication than prescribed. The result may be that physicians increase the dosage or switch to a more potent agent (*14*).

Breakdowns in effective communication and counseling between physicians and patients and between pharmacists and patients are major causes of these failures (*15*). Health care practitioners often do not understand or take into account the beliefs and behavior patterns of their patients, thereby overlooking the impact on compliance of language, culture, and tradition. Educational approaches have improved communication considerably and thereby enhanced compliance (*11*).

Another cause of drug underuse is indicated by findings from a prospective randomized controlled trial examining the impact of clinical pharmacists' consultation concerning geriatric drug prescribing and use. The researchers found a dose too low to achieve therapeutic effect for 17 percent of the patients as prescribed (*16*).

Drug utilization review programs. Drug utilization review programs attempt to deal with mismedication difficulties. Many State Medicaid Programs (their total outpatient drug outlays exceed $3.5 billion a year, of which about 45 percent is for the elderly) as well as some health maintenance organizations and other health care delivery and financing systems have initiated such efforts. While State activities focus largely on cases of fraud, some programs take a broader approach in analyzing physician and patient profiles. Studies have shown that regulatory approaches that do not address underlying educational needs and behavioral factors are inadequate (*12*). Review findings do, however, provide a valuable starting point for followup educational efforts (*17*).

Educational issues. Lack of information and shortcomings in provider behavior are viewed as the principal causes of mismedication problems. As one leading researcher observes: "There is no malevolent force in all of this. What we are fighting here is sheer ignorance and lethargy" (*11*). The Chairman of a House Congressional Subcommittee agrees, and stresses the importance of consumer education as well: "There is a great need to find more ways to further educate physicians and pharmacists in the treatment of elderly people, both those practicing and those studying to be (practitioners). . . .The elderly themselves need to be educated further about the possibility of adverse reactions to the drugs they are taking. . . ." (*18*).

Gaps in the education of physicians about geriatrics have been widely documented (*6,19*). Adding to the problem are deficiencies in physicians' knowledge of pharmacology, a subject which receives limited coverage in medical school (*20,21*). This unsatisfactory situation is compounded by the rapid rate of introduction of new drugs in recent years, the difficulty of disseminating the results of recent research in clinically useful ways, and the self-interested promotional activities of pharmaceutical manufacturers' representatives. Further, the development of sophisticated communication and listening skills, particularly in dealing with older persons, is not usually emphasized in medical education.

'While overuse occurs—"if one tablet is good, two is better"—the most common tendency is to take less medication than prescribed. The result may be that physicians increase the dosage or switch to a more potent agent.'

The preparation of pharmacists with respect to the health conditions and needs of the elderly is deficient as well. This shortcoming becomes more important with rising expectations within the profession about the role of clinical pharmacists as they relate to high-risk older adults (*22*). A survey of 260 practicing pharmacists reported that more than 80 percent assessed themselves as not prepared or inadequately prepared by their formal education for geriatric pharmacy (*23*).

Part of the problem lies in pharmacy's educational institutions; efforts to infuse geriatrics into their curriculums are hampered by the scarcity of faculty with geriatric expertise and the difficulty of funding new clinical pharmacy services. A survey of 72 accredited pharmacy schools found that in academic year 1985–86 only 9 schools required students to take a course in geriatric pharmacy; 53 schools required minimal course content in geriatrics of 5 to 15 hours; 19 schools had no required course work in geriatrics; and 6 offered no geriatric courses at all (*24,25*). A 1986 survey of 12 selected geriatric pharmacy programs found that although offerings in geriatrics varied from one to five courses, all but one didactic course was an elective; 7 offered a course in geriatric pharmacy to students from other disciplines; all 12 offered opportunities for multidisciplinary involvement in clinical settings (*26*).

Education in geriatric pharmacotherapeutics is important for other health professions as well. Nurses, for example, monitor the effectiveness of

Region, States, and Headquarters of 31 Geriatric Education Centers (GEC) October 1, 1991–September 30, 1992

East

Harvard GEC, Boston, MA
New Jersey GEC, Stratford
Hunter/Mt. Sinai GEC, New York City
Western New York GEC, Buffalo
Delaware Valley Mid-Atlantic GEC, Philadelphia, PA

South

University of Alabama at Birmingham GEC, Birmingham
University of Florida GEC, Gainesville
University of South Florida GEC, Tampa
Ohio Valley Appalachia Regional GEC, Lexington, KY
Louisiana GEC, New Orleans
Mississippi GEC, Jackson
Appalachian GEC, Winston-Salem, NC
Meharry Consortium GEC, Nashville, TN
Texas Consortium of GECs, Houston
South Texas GEC, San Antonio
Virginia GEC, Richmond

Midwest

Illinois GEC, Chicago
Indiana GEC, Indianapolis
Minnesota Area GEC, Minneapolis
Missouri Gateway GEC, St. Louis
Creighton Regional GEC, Omaha, NE
Western Reserve GEC, Cleveland, OH
Oklahoma GEC, Oklahoma City

West

California GEC, Los Angeles
Pacific GEC, Los Angeles
Stanford GEC, Stanford, CA
Colorado GEC, Denver
Pacific Islands GEC, Honolulu, HI
New Mexico GEC, Albuquerque
Oregon GEC, Portland
Northwest GEC, Seattle, WA

drug therapy and watch for adverse effects; nurse practitioners may prescribe medications. In nursing homes, where approximately 50 percent of all orders are written with directions that the medication be administered "as needed," nurses bear major responsibility for prescribing decisions (*4*). Dentists need information on age-related pharmacology of the drugs they prescribe and use. Social workers must be aware of the effects of prescribed and nonprescribed medications so that they can detect drug-related problems and arrange appropriate referrals.

Despite noteworthy advances in recent years, shortages of faculty well prepared in geriatrics remain, constraining the development of needed geropharmacy content in programs preparing both pharmacists and other health professionals. Attention also must be paid to strengthening continuing education offerings focused on these issues inasmuch as current practitioners—whether physicians, pharmacists, nurses, dentists, or others—will compose more than half of all health care providers until at least 2010 (*6*).

Mission of Geriatric Education Centers

Scope and purpose. Operating with grant support from the Public Health Service, geriatric education centers (GEC) are university-based programs that offer training and technical assistance in geriatrics to health professions educators and practitioners. Annual funding has increased ten-fold since the GEC grant program began in 1983, and the number of centers has risen accordingly (see table). The 31 centers supported during the fiscal year ending September 30, 1992, are located in 26 States, as shown in the accompanying box.

The purpose of the GEC Program is to encourage multidisciplinary education and training in geriatrics in order to improve the nature and quality of health care for older persons. Comprehensive geriatric assessment and the team approach to diagnosis and treatment are taught at the centers. They also stress the importance of the social and medical components of patient care, and they encourage a functional approach to health care for older adults. The centers' multidisciplinary approach is particularly relevant to improved use of drugs by the elderly, a development that requires appropriate knowledge and effective communication across several health disciplines.

Structure. The centers are multi-institutional, reflecting the program's multidisciplinary thrust. The typical GEC is headquartered in a school of medicine, dentistry, public health, or allied health, but it maintains collaborative relationships with a dozen or more academic departments, programs, schools, colleges, and universities. Centers also develop affiliations and other partnership arrangements with local health care facilities and community agencies. Thus most GECs serve as the hub for a network of affiliated educational institutions and clinical sites.

Faculty development is central to the GEC mission because of the shortage of health professions faculty who are adequately prepared in geriatrics. By focusing on educators, GECs seek to achieve a multiplier or "ripple" effect throughout the health care system. One aim is to increase the number of health professions faculty members equipped to develop courses and clinical training experiences in geriatrics and also to serve as mentors and role models for students. Another aim is to strengthen the geriatric expertise of inservice educators, administrators, and supervisors who train staff members in hospitals, nursing homes, and community agencies.

Educational programs at GECs are tailored to meet the needs of participants. Scheduling as well as content is planned in line with identified needs of individuals and groups. As a result, a variety of educational models and approaches is in evidence across the GEC network. Centers sponsor short-term programs including seminars, conferences, workshops, and symposia; offer intensive training institutes of several weeks' duration; and set up "mini-fellowships" which generally entail part-time study and clinical activities over a period of several years.

To enhance teaching skills, GECs offer training in curriculum development and instructional methods as well as in geriatrics and gerontology. Thus trainees learn how to develop geriatric course content or revise a curriculum, to establish degree or certificate programs in geriatrics and gerontology, to institute clinical training experiences in geriatrics, to conduct inservice programs, and to set up interdisciplinary health care teams.

Continuing education activities of the GECs are often conducted in cooperation with health professions schools, professional associations, or health care facilities. Attendees usually include community practitioners as well as people with teaching or supervisory responsibilities.

Resource sharing is an important area of GEC activity and includes the identification, development, and dissemination of educational resources in geriatrics. Information on curriculum materials is provided through libraries and resource centers. Lists of speakers and consultants with expertise in various phases of geriatric care are usually available. Many GECs distribute news letters as well as monographs, self-study modules, videotapes, and other educational materials.

The typical GEC selects 5 to 10 disciplines for priority attention. Pharmacy, together with medicine, nursing, and social work, are among the most frequently chosen disciplines. Over two-thirds of the GECs operating in fiscal year 1992 listed pharmacy as a target discipline.

Public Health Service awards to geriatric education centers, 1983–91

Fiscal year [1]	Total awards	Number of centers
1983	$ 871,700	4
1984	958,000	4
1985	6,021,100	20
1986	6,419,800	22
1987	8,582,300	31
1988	9,543,100	33
1989	10,653,100	38
1990	9,171,500	33
1991	9,493,820	31

[1] Year of grant award. Supports program operations the following fiscal year.

GEC Medication Management Activities

Almost all GECs offer programs on the appropriate use of medications by older persons, whether or not pharmacy is formally designated as a target discipline. Many GECs have developed related curriculum modules and other educational items; examples are listed in the box on page 42.

Pharmacists are active in many ways in planning and implementing the GEC programs. In some cases, they are members of the boards that oversee planning and development. In almost all GECs, they are part of the educational leadership; in one center, the project director is a pharmacy educator.

Four major types of drug education activities are conducted at GECs. The first is review of pharmacological issues as part of multidisciplinary programs attended by health professionals representing a variety of disciplines. The second, and usually the most intense, is specialized training for pharmacists. The third is a focus on medication issues in other discipline-specific programs, typically those for physicians, nurses, and dentists. The fourth type of educational activity is directed at the public.

Multidisciplinary programs. Multidisciplinary programs have multiple benefits. They increase the knowledge of pharmacists concerning geriatrics and enhance their capacities to work effectively with other health care professionals. They also further the knowledge of other health professionals with respect to medication issues. Overall, they help overcome traditional barriers complicating communication and relationships among the various types of health care professionals whose contributions are so critical to the care of older persons.

Examples of Pharmacy-Related Materials and Their Geriatric Education Center Developer

Curriculum module on geropharmacy—Pacific GEC
Learning module in geriatrics: pharmacology—Texas Consortium of GECs
Geropharmacy course outline—Texas Consortium of GECs
Curriculum module on "Medication Issues in Geriatric Education"—Ohio Valley Appalachia Regional GEC
Conference syllabi on geriatric clinical pharmacology and psychopharmacology—Northwest GEC
Curriculum module on "Health Beliefs and Medication: Interviewing Techniques"—Northwest GEC
Medication regimens and the home care patient—Northwest GEC
Curriculum resource guide on geriatric pharmacy—Virginia GEC
Conference proceedings on "Traditional and Nontraditional Medication Use Among Ethnic Elders"—Stanford GEC
Conference proceedings on "Substance Abuse in the Older Population: Polypharmacy"—Hunter/Mt. Sinai GEC
Conference proceedings on "The Promotion of Practice Strategies for the Appropriate Use and Limitations of Psychoactive Medications"—Hunter/Mt. Sinai GEC
"Medication and Elders...A Delicate Balance" (videotape)—New Mexico GEC
"Dealing with Bioethical Issues and Safe Medication Usage" (videotape)—New Mexico GEC
"Drug Use in the Elderly" (videotape)—University of Alabama at Birmingham GEC
"Drug Use and Abuse in Older Adults" (videotape)—Mississippi GEC
"Drug Use: Misuse and Interaction Effects" (videotape)—Mississippi GEC
Geriatric pharmacy mini-residency syllabus (diskette)—California GEC
Drug therapy in the elderly (self-study series)—Missouri Gateway GEC
Pharmacogeriatrics curriculum—Duke GEC
"Yesterday, Today, and Tomorrow: Moving Forward in Geriatric Pharmacology"—San Diego GEC

Drug education topics are incorporated into multidisciplinary programs in about two-thirds of the GECs. Pharmacological issues are commonly addressed in GEC "core" courses, sometimes offered as summer institutes. The Delaware Valley Mid-Atlantic GEC, for example, presented a session on "Selection and Use of Drugs," the Virginia Commonwealth University GEC conducted a session on "Rational Use of Psychopharmacy in the Elderly," and the Ohio Valley Appalachia Regional GEC reviewed "Drugs in the Elderly" during annual summer institutes in geriatrics. The Western Reserve GEC addressed "Pharmacological Issues" in its Aging and Pathology Core Course and "Geriatric Psychopharmacology and Delirium" in its mini-course on Geriatric Assessment.

Teleconferencing offers a way of bringing the latest research findings and clinical advances in geriatrics to practitioners restrained from joining on-site offerings by barriers of time or distance. Five GECs reported in 1990 that pharmacy information is featured in their teleconference series; one example is the University of Florida GEC's teleconference on "Alcohol and Medication Abuse in the Elderly." Teleconferencing is highly developed at the Virginia GEC, which coordinates three conferences a year to sites throughout the United States and develops related videotapes for further distribution; several of the 15 teleconferences since 1985 have dealt with geropharmacy.

Eight examples of multidisciplinary programs in geropharmacy follow:

1. The Texas Consortium of GECs provides "The Learning Module in Geriatrics" as part of its 40-hour core training program in geriatrics. The module includes a major component, "Pharmacology and Aging," that addresses issues of pharmacokinetics and aging, drug interactions, factors influencing treatment decisions, benefit-risk ratios, drugs causing adverse effects, and drug misuse and alcoholism in the elderly.

2. The Minnesota Area GEC uses a case-based learning approach. During the geriatric pharmacotherapy session, trainees are assigned one of three ambulatory care patients. They schedule medication use during a 24-hour period, develop a system to help patients remember how and when to take all of the prescribed doses, and prepare a list of questions for the pharmacist concerning the patients' medications, drug interactions, timing of doses, toxicities, side effects, and potential beneficial results. The interactive session is designed to make students acutely aware of the dangers of polypharmacy and problems in prescribing for the elderly.

3. The Western Reserve GEC has conducted conferences on "Contemporary Approaches to Pharmacologic Treatment Problems in the Geriatric Patient," "Clinical Issues in Geriatric Pharmaco-

therapy," and "Over-the-Counter Medications and the Elderly." The sessions have reached about 400 health care professionals, including physicians, pharmacists, nurses, nutritionists, social workers, and area agency on aging personnel.

4. The Stanford GEC conducted a conference on "Traditional and Non-traditional Medication Use Among Ethnic Elders" for health professions educators and practitioners. The conference explored folk beliefs and health practices of ethnic elders, provided information from the California Department of Health on 12 toxic substances in herbal remedies, and featured workshops on interviewing and medication assessment techniques, patient medication education for ethnic elders, and medication problems in long-term care.

5. The Miami Area GEC has organized two major conferences on medication misuse among the elderly. A 1989 conference for nurses, clinical social workers, physicians, psychologists, alcohol and drug abuse counselors, and other health care professionals addressed medication misuse problems, treatment methods, and ways in which culture affects medication use. A followup session focused on provider-patient communication issues. A 1991 conference sponsored jointly by all three Florida GECs examined "The Critical Role of the Health Care Professional in Preventing Substance Misuse and Abuse in Older Adults."

6. The Duke GEC provides clinical training in the principles of geriatric pharmacotherapeutics. Health care professionals from several disciplines participate in a 3-day clinical module in which geriatric patients in inpatient, outpatient, and long-term care settings are assessed by a multidisciplinary team consisting of faculty members from pharmacy, medicine, nursing and social work; the coordinator is a clinical pharmacist faculty member. Participants usually work with each team member individually in assessing older patients and also join team meetings where data from all team members are presented and integrated into a joint assessment and care plan.

7. The Hunter/Mt. Sinai GEC conducted a series of conferences in New York City, Albany, and Rochester during June 1990 that highlighted six "best practice" programs with respect to the appropriate use of psychotropic drugs in long-term care facilities. The objective was to recognize innovators and encourage others to develop similar programs.

8. The Northwest GEC has conducted workshops for multidisciplinary audiences on "Introduction to Drug Use and Misuse in the Elderly," "Geriatric Pharmacotherapeutics," and "Geriatric Clinical Psychopharmacology." It has co-sponsored conferences on "Geriatric Drug Therapy: Clinical Pharmacology in Private Practice" and "Geriatric Pharmacy." The GEC's outreach program for Alaska has featured workshops in Anchorage on "Medication Management: A Multidisciplinary Approach" and Geriatric Grand Rounds with a focus on geriatric psychopharmacology. More activities of this nature are planned in line with a new training initiative on drug use and misuse among the elderly that was launched in 1990.

Programs for pharmacists. Discipline-specific training for pharmacists was reported by more than 20 GECs in 1990. Conferences and workshops for pharmacists were identified by 13 GECs; at least 5 were cosponsored with schools of pharmacy or State pharmacy associations. These activities often included students and practitioners as well as faculty members.

Nine GECs had developed or were developing educational models specifically for pharmacy education programs in 1990. At least six schools of pharmacy have adopted additional courses on geriatric issues based on materials provided by cooperating GECs.

Pharmacists participated in clinical activities at about half the GECs in 1990. These activities provide practical experiences both in handling complex medication problems among varied types of older patients and in working effectively on these issues with other health care professionals. Clinical experiences involved nursing homes in at least 12 cases, hospitals in 8, geriatric clinics in 5, and home health agencies in 4.

Three GECs used teleconferences, with site coordinators, to extend continuing education sessions for pharmacists. For example, the University of Alabama at Birmingham GEC offered a teleconference on "Drug Use and the Elderly" and also produced a videotape on that subject for further distribution and application.

Program reports indicate that 345 pharmacists completed GEC training programs of 40 hours or more between 1984 and 1990. Approximately 3,400 pharmacists participated in shorter programs.

Examples of four GEC programs specifically for pharmacists:

1. The California GEC provides a 30-week Geriatric Pharmacy Mini-Residency yearly for 10–12 practicing pharmacists. Lectures and case conferences are presented weekly by a multidisciplinary

'The New Mexico GEC, for example, reports that, as a result of pharmacists' efforts through a multidisciplinary team, medication use in the State's nursing home population is one-half to one-third that of the national average. Increased consultations to reduce use of chemical restraints in nursing homes have also been initiated.'

faculty at the University of California at San Francisco, and clinical experiences are offered at a multipurpose senior center serving low-income and frail elderly, an Alzheimer's disease assessment clinic, and a 1,200-bed long-term care facility. Lectures address such issues as physiology of aging, pharmacokinetics, functional assessment, patient compliance, urinary incontinence, pain management, pulmonary disease, pressure sores, dermatology and herpes zoster, falls and fractures, osteoporosis, neurology, diabetes, thyroid disease, anemia, chemotherapy, degenerative joint disease, hypertension, arrhythmias, congestive heart failure, depression, neuroleptics, and Alzheimer's disease. Clinical experiences include contributions to a team treatment plan, acting as a drug information resource, and consulting. Pharmacists who have completed the mini-residency have used these experiences to conduct geriatric training at their home institutions and to consult more effectively with physicians and nurses about the care of individual patients.

2. The Northwest GEC sponsored an in-residence Individualized Traineeship Program (ITP) in geriatric pharmacy for pharmacy faculty members during its first 5 years, from 1985 to 1990. GEC trainees were offered the opportunity to complete the ITP and simultaneously earn a Certificate in Geriatric Pharmacy Practice from the University of Washington School of Pharmacy. The certificate requires completion of a rigorous academic program of didactic and clinical activities. Geriatric pharmacy clerkship sites include two continuing care retirement communities, two nursing homes, and a hospital-based geriatric assessment unit. A total of 39 pharmacists, mostly faculty members, took part in the GEC's ITP during the 5 years it was offered by the GEC; the certificate program has been institutionalized, and it continues without Federal grant support. Drug use and misuse among the elderly is one of three GEC initiatives for the 1991-93 period. Activities include a 12-hour Winter Seminar Series, a conference on alcohol and the older adult, and participation in activities of the GEC's Clearinghouse Resource Center.

3. At the University of Connecticut GEC, a significant geriatric component has been incorporated into the required fifth year pharmacy clerkship. Teaching sites include a Veterans Affairs medical center, a private hospital, and a nursing home. Emphasis is given to (*a*) the concept of individualized drug selection based on the patient's advanced age, concurrent pathology, and coadministration of other medications; (*b*) design and adjustment of dosage regimens; (*c*) identification and monitoring of efficacy and safety endpoints for drug therapy in the elderly; and (*d*) sources, retrieval, and evaluation of drug and medical literature on the elderly. A unique feature of the pharmacy clerkship is the close interaction between Geriatric Medicine Fellows at the Travelers Center on Aging and pharmacy students. All pharmacy students and their preceptor make rounds with the fellows daily and discuss the drug therapy in pertinent or problem cases at the bedside or nursing station or in a conference room.

4. The New Mexico GEC has developed a series of faculty development seminars for pharmacy faculty. These activities have led to incorporation of geriatric content throughout the entire required pharmacy curriculum. Additionally, an elective didactic course called "Pharmacy Practice for the Geriatric Patient" is offered fourth and fifth year students. An elective clinical pharmacy rotation in geriatrics in a multidisciplinary setting is available to fifth year pharmacy students.

The reported impact of these and similar programs has been substantial. Faculty trainees have returned to their schools to expand courses and increase required student participation in geriatric units. Hospital pharmacists have undertaken to strengthen both inpatient procedures and discharge planning. Staff pharmacists in primary care settings have enhanced clinical practices, increased patient counseling, and expanded continuing education activities. New drug educational materials have been developed and widely disseminated to health care providers and the public.

Pharmacists working with nursing homes report improvements in practice patterns and in the quality of inservice education as a result of GEC

efforts. The New Mexico GEC, for example, reports that, as a result of pharmacists' efforts through a multidisciplinary team, medication use in the State's nursing home population is one-half to one-third that of the national average. Increased consultations to reduce use of chemical restraints in nursing homes have also been initiated.

Programs for other disciplines. At virtually all GECs, topics in geropharmacy are incorporated into discipline-specific programs for physicians, nurses, dentists, and other health professionals. Topics range from general pharmacological considerations in caring for older adults to specific examples of drug abuse and misuse. For example, the Ohio Valley Appalachia Regional GEC developed a program for dentists on "Oral Health and Medication Issues in Geriatric Education," and a Pacific Islands GEC conference on geriatric dentistry included a session on "Pharmacology Treatment and Effects." The University of Connecticut GEC included a section on "Adverse Drug Reactions in the Elderly—A Hidden Cause of Decreased Mobility and Confusion" in a curriculum module for allied health personnel, and the Illinois GEC presented a section on "Nutrition and Drug Interactions" in a curriculum module for nutritionists.

Multidisciplinary collaboration also takes the form of pharmacy input into new course offerings in geriatrics in other disciplines. Thus pharmacy faculty members at the University of Connecticut, for example, teach 2 lecture-hours on medication issues in a course on geriatric dentistry offered by the School of Dental Medicine.

Six examples of programs of this type:

1. One chapter of the eight-chapter syllabus used by physicians participating in the California GEC's Geriatric Mini-Residency Program in Internal Medicine deals with pharmacology. The material reviews drug interactions, pharmacokinetic and pharmacodynamic changes, and patient compliance. Learning to avoid polypharmacy is a prominent feature of the supervised clinical experience in this residency program.

2. The Delaware Valley Mid-Atlantic GEC offers a course on "Drug Therapy and the Aged Patient" for medicine, nursing, and pharmacy students. The course is cosponsored by the Schools of Medicine and Nursing of the University of Pennsylvania and the Philadelphia College of Pharmacy and Science. It includes such issues as physiological changes of aging and effects on drug therapy, psychotropic drug therapy for the elderly, drug therapy in the long-term care setting, and issues in drug-taking behavior.

3. At the Hunter/Mt. Sinai GEC, polypharmacy issues and the proper use of medications by the geriatric population are topics in the seminar series offered each of the target disciplines of medicine, nursing, social work, nutrition, and health education. For example, "Principles of Geriatric Clinical Pharmacology" is a regular feature of GEC training for physicians. Altered pharmacokinetics and pharmacodynamics in the older adult is the topic of one of six seminars taken by nurses who participate in the GEC's Nursing Associate Program. In addition, a senior citizens drama group has presented skits for an audience of medical students and older persons that portray aspects of the physician-patient relationship and emphasize the need for proper use of medications.

4. The New Mexico GEC's Nursing Faculty Development Program includes material on "Overview of Pain Medicine" and "Pharmacological Considerations" in patient care.

5. The Duke GEC offers clinical training and didactic presentations in geriatric pharmacotherapy to dentists, social workers, nurses, and psychologists. Clinical experiences include one-on-one sessions with clinical pharmacist faculty members as they take medication histories, recommend drug therapy regimens, and counsel patients to enhance compliance.

6. The Western Reserve GEC typically includes at least one session on pharmocology in the Topics in Geriatric Medicine Series offered four times a year to physicians, health professions students, and other health care professionals. Recent pharmacological sessions considered "Practical Guidelines for the Use of Drugs in the Elderly" and "Sleep, Sleeping Pills, and the Elderly."

Public education. Although education of the public is not usually emphasized in GEC programming, some activities directly advance the public's knowledge about medication issues. For example, the library and reference services of GECs, generally available to the public upon inquiry, provide information on speakers and consultants as well as bibliographies and other published and audiovisual products.

A number of GECs have carried out consumer-oriented education projects. The University of Alabama at Birmingham GEC has developed an instructional videotape for elderly consumers on drug use and abuse. The New Mexico GEC cosponsors

an annual statewide Brown Bag program which recruits local pharmacists to counsel elders about the medications they take; counseling takes place in local pharmacies or senior centers. The Duke GEC has organized presentations for community groups on "Safe Use of Medicines by the Elderly."

Conclusion

GECs are actively involved in addressing medication issues affecting older adults. These initiatives are based on widespread recognition of the many serious problems associated with the use of drugs by elderly persons and the likelihood that these problems will grow worse. To counter this trend, patients, families, and health care practitioners need more knowledge about drugs and the elderly.

A broad range of health professionals participate in GEC-sponsored educational endeavors across the nation. The approach of these programs is multidisciplinary, reflecting the essential character of geriatric care. In addition, numerous discipline-specific activities are conducted, focused not only on pharmacists but also on nurses, physicians, and the many other categories of health personnel involved in the care of older persons.

The importance of these efforts will increase as relationships between older Americans and their health care providers change. With greater education and income, the elderly (and their adult children) are becoming more informed consumers of health care. In the future, older adults are likely to demand greater responsiveness and information from physicians and other health care practitioners. Consumer needs and regulatory trends suggest that pharmacists will be expected to provide more advice and counseling in the future; at least 17 States now require some form of pharmacist-patient consultation regarding dispensed medications, and such programs will probably grow.

Changes in knowledge and practices may also present further challenges in coming years. An example is new methods of approving drugs for widespread use that introduce greater flexibility in the approval process and give greater emphasis to post-marketing monitoring; while these procedures have been largely limited to date to drugs for the care of HIV-AIDS patients, they are not so restricted and may well be applied before long to drugs used more commonly among older patients, especially persons with Alzheimer's disease and stroke (*27*). Such situations are likely to involve even greater risks and call for even more expertise among health care providers.

Polypharmacy, the use of multiple prescription and over-the-counter medications, is the principal drug safety issue of the decade of the 1990s, according to national experts who developed the National Health Promotion and Disease Prevention Objectives for the Year 2000 (*28*). A key objective calls for an increase to at least 75 percent in the proportion of primary care providers who routinely review all prescribed and over-the-counter medications with patients ages 65 and older whenever a new medication is prescribed. In order to achieve this objective, health professionals and patients alike need to be better educated about the nature and possible dangers of medication use by older adults.

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Some Current Factors Influencing the Prescribing and Use of Psychiatric Drugs

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Synopsis

A reprise of selected known factors about the influences affecting the prescribing and use of drugs, and some new developments in the drug marketplace, are the basis for this summary and observations about future expectations regarding psychotherapeutic agents. This information can be used to assist in formulating or updating, or both, conceptualizations and hypotheses for future policy and research planning in this area.

IN THE 1970S MANY PUBLIC INSTITUTIONS for the mentally ill were emptied of large numbers of patients. Following the advent of new and powerful antipsychotic drugs and other psychotherapeutic agents useful in maintenance therapy, the likely control of patients' symptoms and their destructive behaviors toward self and others was possible. Accordingly, psychotropic drugs, halfway houses, and local outpatient treatment resources were often used in combination with the intent of integrating patients back into local communities and family settings as a putatively more effective and humane therapeutic alternative to long-term warehousing of the mentally ill.

Interest in these drugs and psychotherapeutic agents has continued relative to certain variables of importance that influence the process of drug prescribing and use. Some of these variables have been previously identified and reported (*1*). They include information resources such as professional journals, reference texts, peers, and clearinghouses; the nature, extent, and presenting symptoms of disorders and illness; an assessment of available alternative treatment interventions and their cost benefit to risk analysis (*2*); patient characteristics (*3-5*); physician-prescriber attributes such as age, sex, type of practice, and treatment orientation (*1*); prescriber-patient relationship (*6-8*); and others.