

Fellowship Training for Clinical Pharmacists in Family Practice

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Inclusion of the clinical pharmacist on the family practice health care team is rapidly gaining acceptance.^{1,2} The primary function of the clinical pharmacist in this setting is monitoring patients' total drug therapy. Primary care team involvement of the clinical pharmacist has included the drug therapy management of selected patients with acute and chronic diseases. In addition, the clinical pharmacist serves as a consultant and educator in drug-related matters to patients and the health care staff.^{3,4}

The University of Iowa College of Pharmacy provides clinical pharmacy services to three family practice residency offices in Iowa (Oakdale, Iowa City, and Mechanicsville). The clinical pharmacist at each office is fully or partially salaried by the College of Pharmacy, where they also have academic appointments. A fourth clinical pharmacy program, located in Davenport, is community based and financed.⁵

In the Iowa models, the activities of the clinical pharmacists can be classified into six areas: (1) patient service, (2) family practice resident education, (3) pharmacy student education, (4) education of allied health professionals, (5) research, and (6) family practice departmental functions. Clinical pharmacy services at each office include drug therapy monitoring, drug therapy management of physician-referred patients with acute and chronic diseases, pharmacokinetic interpretation of serum drug levels, reviewing patient medication histories, patient education, and maintaining liaison with community pharmacists and pharmaceutical representatives. The pharmacy practice at Mechanicsville includes dispensing medications to patients and providing unit dose drug services to a nursing home in addition to clinical services. Each office has similar interdisciplinary objectives and promotes allied health personnel participation in primary health care activities. The major objective of clinical pharmacy services in the residency training programs is to monitor drug use through a

variety of methods aimed at improving rational pharmacotherapeutics. Educational strategies include individualized resident instruction in the office, teaching rounds at affiliated hospitals and extended care facilities, development of prescribing standards and participation in therapeutic audits, and formal presentations in pharmacology and therapeutics.

Clinical Pharmacy Training

Family practice clinical pharmacy training emphasizes attainment of ambulatory care skills in an environment simulating private practice, utilizing patients who are representative of a cross-section of the community, and incorporating those problems most frequently encountered by physicians practicing primary care. The family practice clinical pharmacist must be versatile and have broad-based training. He or she should be competent in providing drug information, managing therapy of a variety of patients, and serving as a drug therapy educator to the patient and health care team.

The Clinical Pharmacy Fellowship at the University of Iowa incorporates individualized experiences in patient care, research, and teaching. The fellow has an appointment in the College of Pharmacy and works closely with the Department of Family Practice. The training program is designed to prepare the fellow for academic positions in colleges of pharmacy or departments of family practice and nonacademic positions in ambulatory care, such as private medical group practice, health maintenance organizations, or primary care clinics.

The fellow is required to have completed a minimum of two years of postbaccalaureate clinical experience in a Doctor of Pharmacy or Master of Science program. The patient care experience in the fellowship provides the fellow with an expanded exposure to the specialized therapeutics in family practice. The fellow has patient care responsibilities throughout the 12 months in the same family practice office, providing continuity with the patient population.

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Brief Summary: Before prescribing, please consult complete prescribing information, a summary of which follows:

Indications: IMODIUM is indicated for the control and symptomatic relief of acute nonspecific diarrhea and of chronic diarrhea associated with inflammatory bowel disease. IMODIUM is also indicated for reducing the volume of discharge from ileostomies.

Contraindications: IMODIUM is contraindicated in patients with known hypersensitivity to the drug and in those in whom constipation must be avoided.

Warnings: Antiperistaltic agents should not be used in acute diarrhea associated with organisms that penetrate the intestinal mucosa, e.g., enteroinvasive *E. coli*, *Salmonella*, *Shigella*, and in pseudomembranous colitis associated with broad-spectrum antibiotics.

Fluid and electrolyte depletion may occur in patients who have diarrhea. The use of IMODIUM does not preclude the administration of appropriate fluid and electrolyte therapy. In some patients with acute ulcerative colitis, agents which inhibit intestinal motility or delay intestinal transit time have been reported to induce toxic megacolon. IMODIUM therapy should be discontinued promptly if abdominal distention occurs or if other untoward symptoms develop in patients with acute ulcerative colitis.

Precautions: In acute diarrhea, if clinical improvement is not observed in 48 hours, the administration of IMODIUM should be discontinued.

Abuse and Dependence: Physical dependence to IMODIUM in humans has not been observed. However, studies in monkeys demonstrated that loperamide hydrochloride at high doses produced symptoms of physical dependence of the morphine type.

Carcinogenesis: In an 18-month rat study with doses up to 133 times the maximum human dose (on a mg/kg basis) there was no evidence of carcinogenesis.

Pregnancy: Safe use of IMODIUM during pregnancy has not been established. Reproduction studies performed in rats and rabbits with dosage levels up to 30 times the human therapeutic dose did not demonstrate evidence of impaired fertility or harm to the offspring due to IMODIUM. Higher doses impaired maternal and neonate survival, but no dose level up to 30 times the human dose demonstrated teratogenicity. Such experience cannot exclude the possibility of damage to the fetus. IMODIUM should be used in pregnant women only when clearly needed.

Nursing Mothers: It is not known whether IMODIUM is excreted in human milk. As a general rule, nursing should not be undertaken while a patient is on a drug since many drugs are excreted in human milk.

Pediatric Use: Safety and effectiveness in children have not been established. Therefore, use of IMODIUM is not recommended in the pediatric age group (under the age of 12). In case of accidental ingestion of IMODIUM by children, see Overdosage Section for suggested treatment.

Adverse Reactions: The adverse effects reported during clinical investigations of IMODIUM are difficult to distinguish from symptoms associated with the diarrheal syndrome. Adverse experiences recorded during clinical studies with IMODIUM were generally of a minor and self-limiting nature. They were more commonly observed during the treatment of chronic diarrhea. The following patient complaints have been reported: Abdominal pain, distention or discomfort; constipation; drowsiness or dizziness; dry mouth; nausea and vomiting; tiredness.

Hypersensitivity reactions (including skin rash), however, have been reported with IMODIUM use.

Overdosage: Animal pharmacological and toxicological data indicate that overdosage in man may result in constipation, CNS depression, and gastrointestinal irritation. Clinical trials have demonstrated that a slurry of activated charcoal administered promptly after ingestion of loperamide hydrochloride can reduce the amount of drug which is absorbed into the systemic circulation by as much as ninefold. If vomiting occurs spontaneously upon ingestion, a slurry of 100 gms of activated charcoal should be administered orally as soon as fluids can be retained.

If vomiting has not occurred, gastric lavage should be performed followed by administration of 100 gms of the activated charcoal slurry through the gastric tube. In the event of overdosage, patients should be monitored for signs of CNS depression for at least 24 hours. If CNS depression is observed, naloxone may be administered. If responsive to naloxone, vital signs must be monitored carefully for recurrence of symptoms of drug overdose for at least 24 hours after the last dose of naloxone.

In view of the prolonged action of loperamide and the short duration (one to three hours) of naloxone, the patient must be monitored closely and treated repeatedly with naloxone as indicated. Based on the fact that relatively little drug is excreted in urine, forced diuresis is not expected to be effective for IMODIUM overdosage.

In clinical trials an adult who took three 20 mg doses within a 24-hour period was nauseated after the second dose and vomited after the third dose. In studies designed to examine the potential for side effects, intentional ingestion of up to 60 mg of loperamide hydrochloride in a single dose to healthy subjects resulted in no significant adverse effects.

How Supplied: IMODIUM is available as 2-mg capsules of loperamide hydrochloride. The capsules have a light green body and a dark green cap, with "ORTHO 1000" imprinted on one segment and "IMODIUM" on the other segment. IMODIUM capsules are supplied in bottles of 100 and 500.

IMODIUM (loperamide hydrochloride) is an original product of Janssen Pharmaceutica, Belgium, and co-developed by Ortho Pharmaceutical Corporation, Raritan, New Jersey.

U.S. Patent 3,714,159

*Trademark

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Brief exposures to clinical pharmacy practices in three other family practice offices allow the fellow to experience other ambulatory care models. Selected subspecialty experience is available if not previously obtained. The fellow continues to have patient care responsibilities in family practice while on these special rotations. All patient care experiences are supervised by a clinical pharmacy faculty preceptor.

Research is a major component of the fellowship. The fellow, with faculty guidance, is required to conceptualize a research project, prepare a proposal, collect and analyze the data, and prepare a manuscript for publication. The investigation must relate to the evaluation of clinical pharmacy services or involve an ambulatory care therapeutic topic. Through participation with faculty projects, experience in other research projects is obtained. The fellow also assists with grant preparations.

Teaching experience is obtained through preparation and presentation of baccalaureate pharmacy student lectures, graduate student seminars, and Department of Family Practice therapeutic conferences. Faculty provide evaluations of these presentations. The fellow also acts as a preceptor to pharmacy students in the clinic setting.

The clinical pharmacist who establishes a working relationship with an interdisciplinary family practice team will be presented with significant challenges. He or she will be called upon to demonstrate clinical skills in drug-related matters that complement (not merely duplicate) those skills of the other team members. The clinical pharmacist must appreciate the knowledge and the role of other team members in order to achieve compatible working relationships and in academic positions, must contribute also through independent and collaborative research. The training provided in this Clinical Pharmacy Fellowship prepares an individual to contribute significantly to the family practice specialty.

References

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