

# Mid-Level Providers in Gastroenterology

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**One response to the challenges of modern day clinical practice has been to employ “mid-level providers” (MLPs), such as physician assistants and nurse practitioners. MLPs may complement physicians by supporting patient self-management and performing routine, protocol-guided management. In turn, MLPs may improve health outcomes and simultaneously lower costs. Within gastroenterology, the prevalence of MLPs remains unknown, though it appears to be significant and increasing. Additionally, professional organizations predict that in the future, MLPs will play a central role in digestive disease care. Although incorporating MLPs into gastroenterology has great potential, numerous challenges exist, and their specific roles must first be defined and evaluated.**

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## Background

Traditionally, care for digestive diseases has been delivered by gastroenterologists alone. However, the effectiveness of this model in present-day practice has been tested by considerable challenges. First, while an aging population and emerging technologies have increased the demand for and complexity of services, the supply of gastroenterologists has remained largely unchanged (1,2). Second, in the quest to contain continually rising health-care expenditures (3), reimbursement for gastroenterologists' services has faced constant downward pressure. Consequently, many gastroenterologists feel compelled to see more patients, perform more highly reimbursable procedures, or both (4). As a result, many gastroenterologists experience burnout (5) and feel professionally dissatisfied (6).

Patients who seek care for digestive diseases also face numerous difficulties. Often the time they spend with their physicians is too short (7), the coordination of care across visits and between providers is poor, and the quality of care is uneven (8,9). Consequently, many leave their visits feeling dissatisfied (10) and without a clear understanding of their condition (11). This may result in low adherence to therapy (12) and suboptimal health outcomes (13). Thus, new health-care delivery models are sorely needed.

## Mid-level providers

Outside of gastroenterology, one response to this need to reorganize care has been to redesign health-care delivery around multidisciplinary teams. Within these teams, physicians act as team leaders, and non-physicians, such as “mid-level providers” (MLPs), serve as extended providers (14). MLPs include both physician assistants (PAs) and advanced nurses, particularly nurse practitioners (NPs). PAs undergo master's-level training that averages 26 months in duration (15) and is rooted in the biomedical model. In their subsequent practice they are closely dependent on their

supervising physician (16), under whose license they practice (17) in a role described as “negotiated performance autonomy” (18). On the other hand, NPs are practicing nurses who receive master's-level training in advanced nursing. Unlike PAs, their practice philosophy is rooted in nursing, with disease prevention and patient education emphasized (19). NPs practice more autonomously with less frequent physician supervision (17). In fact, some states allow NPs to practice independently (**Table 1**) (19).

Over the past decade, MLP practice prerogatives have expanded, the number of training programs has multiplied, and cost-containing efforts have intensified. As a result, the numbers of PAs and NPs have increased dramatically (20,21). Recent surveys place their numbers at more than 63,000 (ref. 15) and 97,000 (ref. 22), respectively. When combined, they constitute more than one-sixth of the total US medical workforce (23). Given increasing demand due to an aging population and a fixed physician supply (with some predicting a physician deficit (24)), this proportion will almost certainly continue to grow (23). For instance, between 2004 and 2014, the US Bureau of Labor Statistics projects a 50% increase in the number of PAs, making it the fourth fastest growing profession in the country (25). Likewise, the number of new NPs prepared each year approaches 6,000 (ref. 22).

## The mid-level provider experience in the general health-care system

Although PAs and NPs differ in philosophy, training, and practice prerogatives, they have many similarities (19). When integrated into a physician-led, multidisciplinary health-care team, both NPs and PAs can complement physicians by “assuming tasks that doctors have neither the skills nor time to do well” (26). One such area is supporting patient self-management. Because physicians are under considerable time constraints and often communicate

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**Table 1. Defining characteristics of nurse practitioners and physician assistants**

	Nurse practitioner (NP)	Physician assistant (PA)
<b>Population size</b>	97,000	63,000
<b>Education</b>	Bachelor's degree in nursing plus 2- to 4-year graduate-level NP degree (master's or doctoral degree)	Bachelor's degree (most) plus an average of 26-month graduate-level PA degree (master's degree)
<b>Practice philosophy</b>	Nursing model that emphasizes patient education, self-care, and health promotion	Biomedical model that emphasizes organ systems and disease processes
<b>Licensure</b>	State nursing boards	State medical boards
<b>Practice prerogatives</b>	Vary by state, although almost one-half of states have granted ability to practice independent of physician supervision	Works closely under supervising physician in a role of "negotiated performance autonomy"

ineffectively (27–29)—e.g., by the end of an office visit, more than one-half of patients do not understand what they were told by their physician (30)—their patients' involvement in medical decisions is low (31), and this lower involvement portends poorer health outcomes (32). This creates a prime opportunity for incorporating MLPs, who, compared with physicians, use more effective, patient-centered communication styles (33–35) and have more time to spend with their patients (36). MLPs are thus better able to discuss the psychosocial aspects and functional impact of their patients' illnesses (35,37,38) and to provide more information on the course of their patients' conditions and the side effects of available treatments (35,39,40). The result is a stronger emphasis on patient self-management (41), increased patient adherence (42), and, in turn, improved health outcomes (43).

MLPs may also complement physicians by providing routine, protocol-guided patient management (26). If acute issues arise or chronic care becomes too complex, physicians may reassume the role of primary provider (43,44). The resulting system is more responsive to the needs of patients (45) and frees physicians to manage more complicated cases and to perform more difficult procedures (19). Furthermore, because MLPs' salaries are considerably lower than physicians', this strategy may also cut costs (46,47). In total, by better supporting patient self-management and by increasing the quantity and quality of available services, incorporating MLPs into multidisciplinary teams may be an extremely cost-effective means of improving health outcomes (26).

### Mid-level providers in gastroenterology

Even though MLPs are employed widely throughout clinical practice, most studies have focused specifically on NPs in their role as substitutes to physicians rather than as members of a collaborative team. In this context, the quality (36,48), health outcomes (36,40,42,49), and cost-effectiveness (50) of care provided by NPs and primary-care physicians have been proven quite similar, and patients cared for by NPs are consistently more satisfied

(35,36,39,40,42,48,49,51). Although this research has focused predominantly on substitution in primary care, many MLPs work in collaboration with physicians (52), in both primary-care and specialty-care settings such as nephrology (53), dermatology (54), cardiology (55), and neurosurgery (56). A smaller number of empirical studies have assessed the effectiveness of these collaborative-practice models across a range of conditions, including coronary artery disease (57), rheumatoid arthritis (58), HIV (59), epilepsy (60), medically unexplained symptoms (61), and diabetes mellitus (41). In sum, this research has demonstrated that collaborative practice is typified by increased provider adherence to clinical guidelines, similar or improved health outcomes (26), and increased patient satisfaction at equal or lower costs and with shorter waiting times (52).

The positive experience from other health-care fields suggests that MLPs may be valuable providers of digestive-disease care. Although precise estimates of their level of involvement do not yet exist, several academic (62) and private gastroenterology practices (63) have reported successful incorporation of MLPs. Additionally, I surveyed 12 of the nation's largest private gastroenterology practices (each with 20 or more gastroenterologists). Overall, these practices employed 435 gastroenterologists (range 20–75), 49 NPs (range 0–15), and 48 PAs (range 0–9). Across individual practices the prevalence of MLPs ranged from zero to 49% of all providers. This suggests that, at least in very large practices, MLPs have already become integrated into gastroenterological practice, albeit to a varying degree. Furthermore, the prevalence of MLPs in gastroenterology practices will probably increase. According to the American Gastroenterological Association (AGA), MLPs "increasingly provide routine care in many private and academic practices" and in the future "will provide much of the routine care of patients with chronic GI illnesses" (1,3,64).

Although MLPs are already practicing within gastroenterology and will probably play an increasing role in the future, their roles have yet to be defined. In general, as in other fields

of practice, they may complement their supervising gastroenterologists by providing more extensive patient education (65,66) and supporting patient self-management. While these tasks may often fall within the realm of registered nurses or licensed practical nurses, given their more advanced skill set, MLPs may also assume routine follow-up care, perform uncomplicated procedures, and help provide urgent and inpatient care (sometimes in a role similar to that of a gastroenterology fellow). In doing so, they may accommodate increased patient demand, limit costs of care, and improve the quality of care. More specifically, the AGA envisions MLPs as members of digestive-health-care teams that are integrated around specific clinical areas (3). A number of clinical areas seem to fit well into this integrated model, including functional gastrointestinal disorders, inflammatory bowel disease, viral hepatitis, liver transplantation, and routine endoscopy. Given that MLPs may be better suited for practice in one or more of these areas, further investigation in each of these specific areas is necessary.

**Functional gastrointestinal disorders.** The functional gastrointestinal disorders (FGIDs) affect a large proportion of the US population (67) and account for 35% of gastroenterology visits (68). A close patient–provider relationship that emphasizes education (69,70), careful attention to psychosocial factors (71), and close follow-up is considered the cornerstone of treatment (72). Unfortunately, these activities require training (30), time (7,73), and financial incentives (74) that many gastroenterologists lack. Consequently, diagnostic testing tends to be overemphasized, and, when no “organic” cause is identified, patients are left feeling unsatisfied and their gastroenterologists feeling “drained” (75). As a result, costs for FGIDs are high (76,77) and outcomes typically subpar (78).

In response to this situation, the use of MLPs in FGIDs is particularly attractive. As has been mentioned, MLPs are more likely to attend to psychosocial factors (37), provide longer consultations (36), and better educate patients (35,40) and—given their lower salaries—are better insulated from the reimbursement pressures that discourage these activities. Thus, incorporating MLPs into the care-delivery framework for patients with FGIDs may be quite beneficial.

**Inflammatory bowel disease.** Given that the inflammatory bowel diseases are chronic conditions that often follow an unpredictable course and require increasingly complicated treatment regimens (79), detailed patient education and close patient follow-up and monitoring for adverse drug reactions are essential. Again, MLPs seem poised to help fill this need. For example, consider a study by Ryan *et al.*, in which patients with rheumatoid arthritis starting new disease-modifying therapy (a situation that is quite similar to inflammatory bowel disease) were randomized to care by either a rheumatologist alone or a rheumatologist–NP collaborative practice. At 1 year, those randomized to the collaborative-care arm were more knowledgeable about their illness and more satisfied with their care and had lower pain scores (58).

**Chronic viral hepatitis.** Chronic viral hepatitis infection may result in serious health deterioration and impaired quality of life. These effects may be limited by antiviral therapy, but the decision to initiate therapy can be quite complicated (80). First, outcomes are limited by low treatment adherence. For this reason, therapy should be offered only to patients who are most likely to adhere to the treatment regimen. Given the high association between hepatitis infection and psychosocial distress, identifying candidates who are most likely to adhere to therapy requires a thorough psychosocial assessment. Second, patients are often confused by their diagnosis with hepatitis and their treatment options (81). Thus, in order to ensure that their decisions regarding therapy are properly informed, treatment candidates must be provided with a detailed explanation of the treatment regimen, its potential benefits, and anticipated side effects (82). Finally, those who are offered therapy and decide to start must be closely monitored and supported in staying on their treatment regimen to completion. Unfortunately, current practice often falls well short of this ideal. Treatment is not always offered to potentially appropriate candidates (83), and treatment decisions are frequently hindered by poor communication. For instance, in one tertiary-care outpatient hepatitis clinic, 41% of patients reported difficulty communicating with their physicians (84). Again, this communication gap may be bridged by MLPs, who, when talking to patients about hepatitis C, are much more likely than physicians to take the patient’s perspective and to encourage the patient to express his or her own concerns (82).

**Transplant hepatology.** Under the supervision of a transplant hepatologist, MLPs may be key players in all aspects of liver transplantation. Before the transplantation, the MLP may help educate the patient and his or her family, provide psychosocial support, coordinate the pre-transplantation evaluation, and monitor the patient’s health status. Following the transplantation, the MLP may coordinate care among a diverse group of providers, assess liver function, monitor treatment adherence, check for potential medication toxicities, and perform periodic telephone and office-based assessments (85).

**Endoscopy.** Several studies suggest that, compared with diagnostic endoscopies performed by gastroenterologists, those performed by nurse endoscopists are equivalent in terms of effectiveness (e.g., adenoma detection rate) and safety (i.e., complication rate) and are superior in terms of patient satisfaction (86–88). Importantly, nurses can be trained to become proficient endoscopists just as quickly as internal medicine residents (89). As new technologies such as computed tomographic colonography, wireless capsule endoscopy, and the self-propelling colonoscope emerge, the role of MLPs in routine endoscopy may expand (3).

### Challenges and conclusion

Although the potential role of MLPs in gastroenterology warrants considerable enthusiasm, several challenges exist. Perhaps most important, MLP practice prerogatives (90) and reimbursement schedules (17) vary across states. Thus, one size will not fit all:

practice models will need to evolve in line with local regulations. With that in mind, several other challenges must be considered. First, collaboration between all multidisciplinary team members is essential (20,91). This requires team members to trust, respect (91), and effectively communicate with one another (21). Barriers such as physician misperception of MLPs as competitors rather than collaborators must be corrected (16,17). Second, although flexibility is important, unclear roles may lead to confusion and duplication of work. Therefore, in order to maximize efficiency, MLP roles should be explicitly defined (20,92). This requires MLPs to know their limits and their supervising gastroenterologists to delegate responsibility (93). Third, on the basis of these role definitions and patient needs, the optimal skill mix (i.e., the number of MLPs, other non-physician providers, and gastroenterologists) for a given practice must be determined (94). Fourth, as Cooper stated, “there is a danger that, in an era of efficiency and shared responsibility, physicians will rely on others to dispense the time, sympathy, and understanding that are central to their relationships with their patients” (19). Thus, irrespective of any possible MLP role expansion, gastroenterologists must continue to work both early on (i.e., during the diagnostic work-up and initial treatment plan) and throughout the course of care to maintain their role as central figures in the lives of their patients.

In conclusion, MLPs have assumed an increasingly important role in health-care delivery, and their involvement will probably continue to increase. Within multidisciplinary health-care teams, MLPs complement physicians by assuming tasks for which physicians lack the time or skills to do well, such as supporting patient self-management and performing routine follow-up care. Incorporating MLPs into gastroenterology practices has great potential for increasing gastroenterologist and patient satisfaction, reducing costs, enhancing quality, and ultimately improving health outcomes. Many gastroenterologist have already begun to incorporate MLPs into their practices, but a number of challenges exist. Most important, the specific roles of MLPs in gastroenterology must be defined and evaluated.

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## CONFLICT OF INTEREST

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