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CMS Alliance to Modernize Healthcare



Specialty Payment Model Opportunities and Design

Environmental Scan for
Gastroenterology (Task 2):
Final Version

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1. Introduction

Increasing concern over the cost and quality of health care in the United States has led to growing interest in payment reforms that can support innovative approaches to care that can improve health while lowering costs. Stakeholders have identified significant potential within gastroenterology for payment reforms to support both improved care coordination and more appropriate utilization of services (1, 2). The current payment structure in gastroenterology encourages high-cost, procedure-based services that are often independent of the emerging evidence on patient outcomes and quality of care (3). Additionally, in important respects, the current system does not adequately support practice changes that enhance quality of care provided, which can reduce unnecessary services and total cost of care (2). Furthermore, costs for the same procedure vary dramatically across sites of service and geography (3-6). Recently, health care reform discussions have centered on shifting payments away from purely fee-for-service (FFS) models that promote high volume toward a payment system that rewards high-quality, high-impact services.

Gastroenterology accounts for a significant portion of total health care spending and health burden in the United States. The National Institutes of Health estimates that gastrointestinal diseases impact 60-70 million people in the United States, amounting to approximately \$141.8 billion in health care costs in 2004 (7). Due to an aging population, the total disease burden in the Medicare population is likely to increase, placing upward pressure on the demand for all gastroenterological services. In 2009, the most frequent types of surgery conducted at ambulatory surgical centers (ASC) were endoscopic procedures. Moreover, gastroenterology services accounted for 33% of total ASC claims (8). Although many technological advances in the field of gastroenterology have decreased total cost of gastroenterology care and increased quality of care (9), significant variations in quality and cost remain (6).

Implementing a payment structure that helps realign payments to produce the maximum quality of care for patients is timely and essential. The majority of stakeholders interviewed for this report underscored the need for physician payment in gastroenterology to move toward value-based reimbursement. While the complexity and degree to which potential new payment models transition away from FFS vary, each model aims to promote care coordination, increase quality of care, and reduce the unnecessary use of services.

This environmental scan identifies and describes potential alternative payment models in gastroenterology. The alternative payment models may apply broadly to gastroenterology as a whole or more narrowly to specific conditions or episodes of care within the specialty. The environmental scan further intends to highlight specific areas of care where alternative payment and delivery models are currently being tested and theorized, as well as consider potential outcomes from implementing these alternative payment models. The environmental scan is the first stage in this project and will act to inform the technical expert panel, the model design plan, and model simulation phase.

The methodology for the literature review and stakeholder engagement is described in Section 2. Section 3 discusses opportunities for improved gastroenterology care and outlines the current cost drivers related to service delivery in the field. Section 4 sets out potential delivery and payment reform

structures, including the data infrastructure required and potential unintended consequences for each of the illustrative models –bundled payments, coordinated care for chronic diseases with a multidisciplinary care team, and population health with advanced mixed payment models. This section includes a summary of stakeholder perspectives for each model. Section 5 reviews current gastroenterology performance measures along with areas for future measurement development. Finally, Section 6 delineates the feasibility for each model described in Section 4.

2. Methodology

The project team conducted a comprehensive environmental scan that included: 1) a literature review of the existing peer-reviewed and gray literature as well as popular media, and 2) semi-structured interviews of 30 key stakeholders.

2.1 Literature Review

The project team conducted a semi-structured literature review using Medical Subject Headings search terminology to gain the maximum number of relevant citations compiled by PubMed, Academic Ovid, EconLit, Google Scholar, and LexisNexis. Additionally, relevant articles were identified from bibliographies of returned articles. Articles published in English since 1999 were included.

The search stems used in the above databases are listed below:

- 1.1.1. Gastroenterology *or* GI *or* colon *or* inflammatory bowel disease *or* Crohn’s disease *or* colitis *or* ulcerative colitis *or* hepatitis C
- 1.1.2. 1.1.1 *and* payment *or* payment model *or* finance *or* incentive *or* compensation
- 1.1.3. 1.1.1 *and* prospective payment system *or* PPS
- 1.1.4. 1.1.1 *and* capitation *or* salary *or* per member per month *or* PMPM *or* full capitation *or* partial capitation
- 1.1.5. 1.1.1 *and* episode payment *or* episode-based payment *or* case payment *or* case-based payment
- 1.1.6. 1.1.1 *and* retrospective payment
- 1.1.7. 1.1.1 *and* bundle *or* bundled payment *or* aggregate payment
- 1.1.8. 1.1.1 *and* medical home *or* patient-centered medical home *or* medical neighborhood
- 1.1.9. 1.1.1 *and* accountable care organization *or* accountable care *or* care coordination *or* ACO
- 1.1.10. 1.1.1 *and* shared savings *or* risk sharing *or* integrated delivery system
- 1.1.11. 1.1.1 *and* fee-for-service *or* fee for service *or* FFS
- 1.1.12. 1.1.1 *and* value-based *or* value-based care *or* pay for performance *or* P4P
- 1.1.13. 1.1.1 *and* competitive bidding
- 1.1.14. 1.1.1 *and* Competitive Acquisition Program *or* CAP
- 1.1.15. 1.1.1 *and* pathways *or* clinical pathways *or* value-based pathways

2.2 Stakeholder Interview Methodology

The project team identified a list of potential stakeholders and thought leaders spanning the gastroenterology space. From this list, 30 one-hour, semi-structured, strategic interviews were conducted. The group of selected stakeholders included academic researchers, providers in community and academic settings, commercial payers, patient advocates, practice administrators, leaders of companies that offer services and commodities to gastroenterologists and health systems, and heads of specialty organizations. While all attempts were made to ensure the environmental scan was comprehensive and representative of the gastroenterology field, there is potential for selection bias due to the survey methods used and the stakeholders selected. This should be taken into account when interpreting this report.

Following each recorded interview, one research team member transcribed comprehensive notes that were later summarized. Stakeholder responses were consolidated by stakeholder category and incorporated into a conceptual framework used to present each alternative model.

3. Opportunities for Better Care and Lower Costs

3.1 Common Stakeholder Themes

There are a number of specific issues that need to be raised when designing any new payment methodology. As such, stakeholder perspectives relating to the design of new payment methodologies are embedded in the description of each payment model in Section 4. The majority of stakeholders interviewed indicated that value-based payment is a necessary next step in gastroenterology. In particular, stakeholders suggested that the most feasible payment methodology for CMS to adopt would be bundled payments around episodes of care, most notably in colonoscopies for colorectal cancer (CRC) screening. Some stakeholders also highlighted opportunities for savings through payment reforms that encourage the most efficient site-of-service.

In addition to comments provided on specific payment models, stakeholders also addressed the issues of data infrastructure and quality measurement. All stakeholders interviewed described the need for augmented data systems to help them succeed in a value-based system. To truly understand the cost and quality of care delivered and make appropriate adjustments, providers need close to real-time access to combined clinical and claims data. Such data loops between the payer and provider would enable greater success in these models. Stakeholders generally agreed that existing endorsed quality metrics could be rolled out for use in value-based payment models. Further work should be targeted to develop patient-centered outcomes measures that are meaningful to those providing and receiving care.

3.2 Payments

Significant technological innovation in procedure-based services and drug therapy treatments in gastroenterology have worked together to shorten the duration of an episode and reduce the cost of care. However, the current FFS model encourages high-volume, procedure-driven care, thereby promoting the overuse of billable procedures and drug therapy at greater rates than evidence-based

guidelines suggest. This creates an environment that leads to unnecessary referrals and procedures without adequately supporting the use of low-cost, high-impact services such as care coordination. Therefore, while billable services may be overused, non-billable services that can improve quality of care and decrease costs may be underutilized. Additionally, similar procedures are being reimbursed in vastly different amounts. This cost differential is partially due to site-of-service payment differentials; the facility fee for the same colonoscopy procedure performed at a hospital outpatient department (HOPD) is over 150% more than if the colonoscopy were performed at an ASC (4). Another aspect that can drastically alter costs is the personnel who administers anesthesia for a procedure. As a result of FFS payment incentives and site of service payment differentials, there is upward pressure on total costs and opportunity for payment reform in gastroenterology.

3.3 Resource Allocation and Cost Drivers

Medicare spends approximately \$1.5 billion in gastroenterology annually (10). This expenditure is much higher if ancillary services related to gastroenterology diseases are taken into account. For example, in 2010, CRC cost Medicare \$14.14 billion (11). The top cost drivers in gastroenterology in the United States across all payers are displayed by procedure in Figure 1. A total of 54% of the costs in gastroenterology are due to CRC screening and surveillance, with colonoscopy making up as much as 60% of gastroenterologists' revenue (12). In 2010, providers furnished 3.3 million CRC screening and surveillance colonoscopies to Medicare beneficiaries (13). Colorectal cancer is one of the leading causes of cancer in the United States, killing nearly 50,000 people every year (1). Detecting and removing pre-cancerous adenomatous colon polyps, or even early carcinoma, can drastically reduce both colorectal cancer incidence and mortality (14).

Although a significant portion of gastroenterological work is screening and diagnostic, gastroenterologists also see patients with major chronic diseases that require long term care and would benefit from increased care coordination and patient-level focus of a multidisciplinary care team model. Of the top ten gastroenterology cost drivers, two are chronic diseases with high burdens in the American population. Responsible for 25% of total reimbursement in gastroenterology, inflammatory bowel disease (IBD) affects 1.4 million people in the United States and includes Crohn's disease and ulcerative colitis (7, 15, 16). Although these diseases are typically diagnosed in younger patients, IBD persists as patients age and enter the Medicare population. A study found that 8-16% of IBD diagnoses occur in the Medicare population(17). Additionally, a stakeholder indicated that approximately 20% of IBD diagnoses in their practice occur among the Medicare population. Crohn's disease accounts for the majority of IBD costs and represents a \$1.07 billion in direct annual costs in the United States (18). Gastroenterologists, who are the primary managers of the condition, only receive 10% of professional fees paid for Crohn's disease, and only 3.5% of total payments made for care of Crohn's disease (12). Based on claims collected between 2000 and 2004, a patient with Crohn's disease accrues approximately \$13,500 – \$17,500 a year more in medical costs than a typical person without the disease (19).

Another major chronic condition in gastroenterology, gastroesophageal reflux disease (GERD), affects about 20% of the U.S. population and is the leading gastroenterology-related diagnosis in outpatient visits and accounts for 9% of gastroenterology costs (7, 13, 18). Additionally, although not one of the top

ten cost drivers, Hepatitis C affects approximately three to four million Americans (20) and is the leading cause of liver transplant in the United States (7, 20). With improvements in available treatments, Hepatitis C is likely to become a larger part of gastroenterology practice in the next few years and certainly a potential cost driver given the expense of recent drug therapies.

According to stakeholders, endoscopic procedures account for the majority of gastroenterologists' time and revenue. Many of those procedures can be performed at multiple locations, including a procedure room in a physician's office, an ASC, or a HOPD. Depending on the site-of-service, payment for the same procedure can differ by hundreds of dollars (21). This is partly due to differences in one of the three components of care – work expenses, practice expenses and malpractice expenses – that the Resource Base Relative Value Scale uses to establish fees. Of those components, practice expense is dependent on the professional fee and the location where the procedure is performed. The professional fee for each site-of-service is roughly equivalent; however, facility fees increase as the procedure moves from the physician's office to an ASC to a HOPD. The facility fee of an ASC is approximately 56% of the facility fee for an HOPD (4). Currently, site-of-service fees are statutory, and thus reducing the gap in site-of-service cost variation would be challenging. Nevertheless, multiple stakeholders and MedPAC have noted that the gap is problematic (22). Some private sector employers are beginning to implement pilots intended to encourage shifts to lower-cost sites of service while maintaining or improving quality.

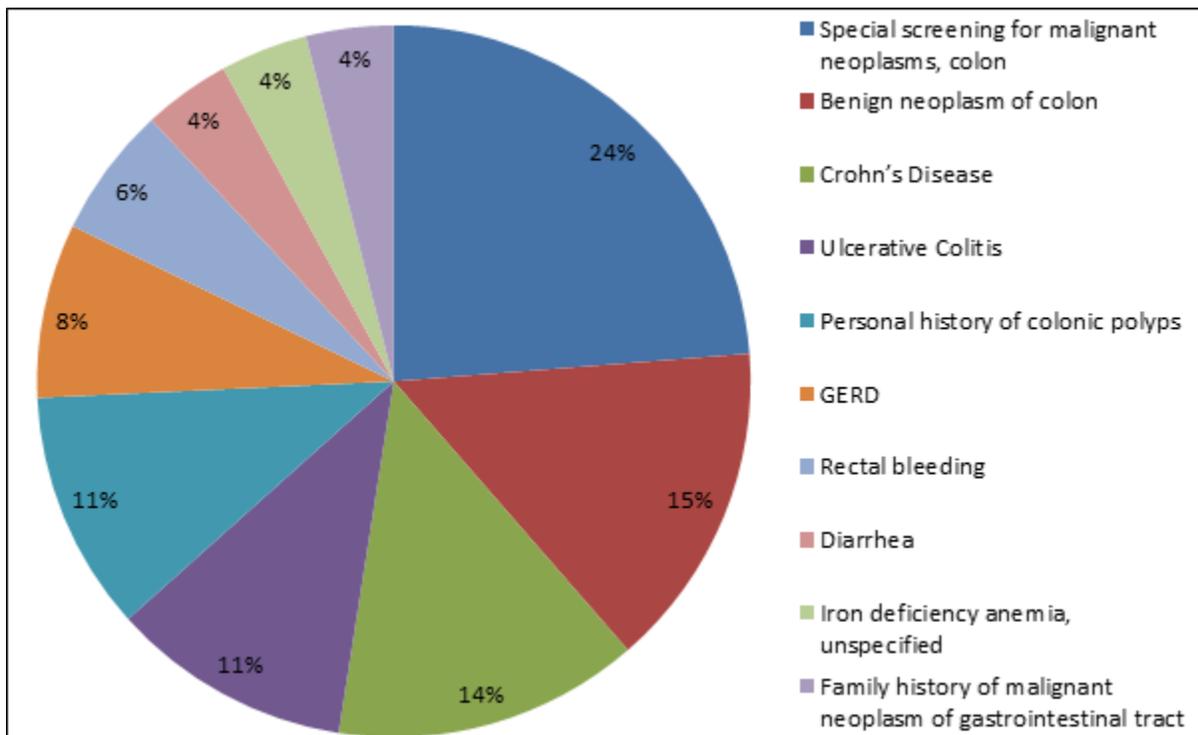
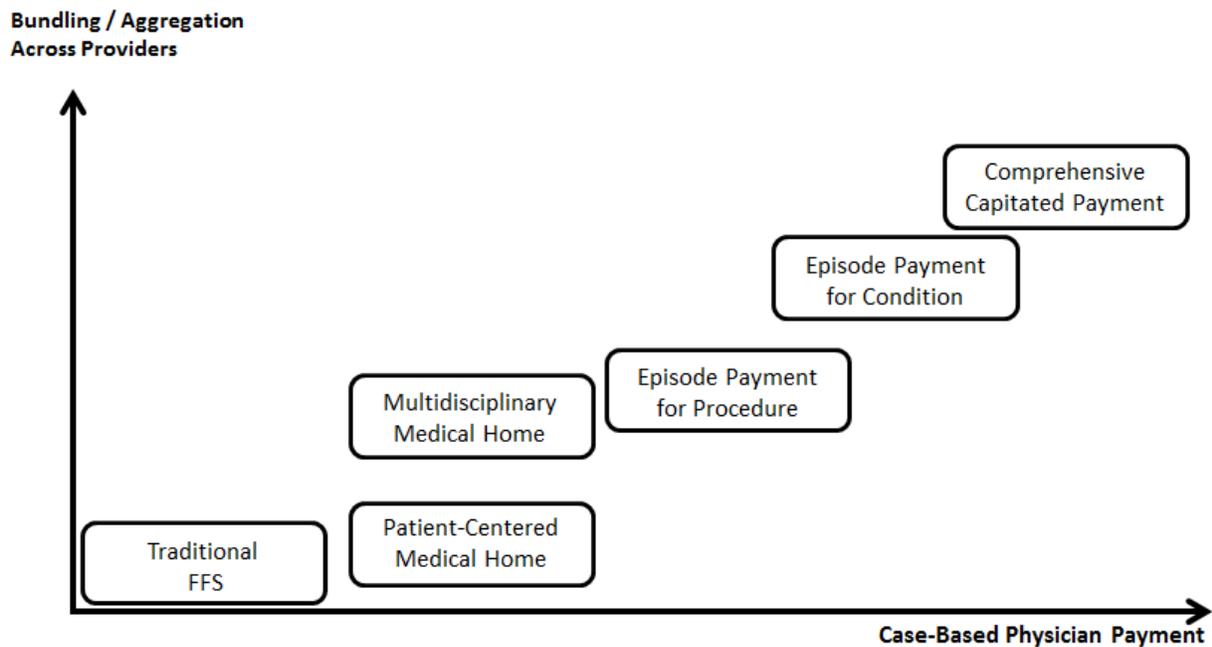


Figure 1: Top Ten Gastroenterology Cost Drivers by Procedure. Source: Kosinski, L. R. (2014). Building Your Nonprocedural Business Lines. AGA Roadmap to the Future of GI Practice.

4. Model Opportunities

The opportunities for alternative payment models in gastroenterology, which are described in detail in this section, move away from traditional FFS towards more value-based payment systems that are outcomes-oriented and population-focused. The models represent predominant alternatives to the current payment system found in the literature and discussed during stakeholder interviews. Various forms of each model differ according to level of aggregation across providers and the comprehensiveness of the payment. Figure 2 depicts where various forms of each model fits along this continuum of care.

Figure 2: Model Progression by Case-based Physician Payment and Bundling/Aggregation across Providers. *Source:* The Brookings Institution, 2014.



Key questions regarding the implications of each payment model, along with how each model may relate to changes in care delivery include the following:

1. *How does the payment reform relate to the traditional payment method? Does it add onto the existing FFS structure or does it shift away from FFS?*

Each model includes an aspect of payment that is not based on service volume or intensity. However, models differ in whether this payment is in addition to existing FFS payments or if it represents a shift away from traditional FFS payments. Additionally, the degree of financial risk that gastroenterologists take on is dependent on how far the payment model shifts away from traditional FFS payment methods. The amount of risk placed on the provider affects the strength of the incentives providers face to modify current practices.

2. *What is the size and scope of the case/person-level payment?*

The size and scope of these payments relates to how accountable the gastroenterology practice becomes for delivering quality care for all types of services. Furthermore, the larger the payment, the greater the number of services included within it. Larger payments can expand the care team beyond the immediate gastroenterologist or practice. As payments shift to include additional aspects of care, greater incentives exist to limit costs and shift care delivery.

3. *Are savings accrued to both physicians and Medicare included on care outside the case or episode payment?*

Models may offer providers an opportunity to share in savings accrued through the implementation of these models if costs are lower than a set target. These models may include symmetrical risk, which places a limited financial risk to providers if total payments exceed the target price. Alternatively, some models only offer the asymmetrical, positive incentive of sharing in cost savings without the risk of a penalty for exceeding the target. The strength of the incentive for providers to modify current practices is dependent on the level of risk they take on.

Each alternative payment model varies in the data infrastructure required for success, the incentives generated for providers to adopt new approaches to care, and in its potential undesirable consequences resulting from implementation. The proposed payment models – bundled payment, multidisciplinary care teams for chronic care, and an advanced mixed payment model for population health – are described in detail below. Each model discussion includes care delivery structure, payment structure, infrastructure requirements, and potential undesirable consequences. To help promote quality care, each model includes reporting requirements for performance measures that can be linked to payments. Potential measures are outlined in Section 5.

4.1 Bundled Payment Model

4.1.1 Care Delivery Structure

In a bundled payment model, provider reimbursements are determined by the expected cost of a group – ‘bundle’ – of healthcare services surrounding an episode of care. Bundled payments move toward case-based payment as providers are paid a lump sum for all services provided during an episode of care. Under this system, providers assume risk for providing effective and efficient care at a set price. This risk encourages providers to carefully consider care options, use lower-cost, equally effective treatment options, and coordinate care. The Centers for Medicare and Medicaid Services (CMS) Innovation Center initiated the Bundled Payments for Care Improvement Initiative, piloting inpatient bundled payments for 48 different episodes of care including gastrointestinal hemorrhage, gastrointestinal obstruction, and digestive disorders.

Additional opportunities for bundled payment models exist in gastroenterology, particularly in the outpatient setting. Depending on the episode of care that is bundled, a gastroenterology bundled payment model may include services provided by gastroenterologists, pathologists, primary care physicians (PCP), nutritionists, and anesthesiologists, as well as care provided in outpatient and inpatient facilities. Numerous stakeholders have indicated that bundled payments offer the most promising

opportunity for new reimbursement mechanisms in gastroenterology. Payers and providers alike suggested that a bundled payment can be a positive step toward standardizing care and increasing shared risk, which can result in eventual downstream cost savings and decreasing cost variation. Specifically, stakeholders supported bundles around high-cost procedures, such as CRC screening and surveillance, because of the comparative ease of bundling these procedures over other, less discrete services as well as the potential cost savings that could be gained from this type of bundle. Optimus Healthcare Partners, an ACO based in New Jersey, recently partnered with Digestive Healthcare Center and a commercial payer to operationalize a retrospective bundled payment for colonoscopy. The Yale Medical Group has also worked with a commercial payer to develop a colonoscopy bundle with a shorter post-episode period than the Optimus bundle. Although chronic diseases are more challenging to bundle, a payer and a provider suggested that a bundled payment could be applied to IBD, Hepatitis C and GERD in the future. However, another stakeholder indicated that given the long-term nature of IBD, bundled payments are not the best method.

One method to drive efficiency gains and high quality care in a bundled payment environment is through the use of clinical guidelines and pathways. While each patient's condition is different, certain aspects of gastroenterological care have a typical progression and therefore lend themselves to evidence-based treatment guidelines. Coupled with improved data collection, these guidelines can be used to develop a clinical pathway – a set of pre-defined, evidence-based steps to be taken for specific aspects of gastroenterological care. Clinical pathways standardize decision-making and aim to give patients the highest quality, most cost-effective course of treatment. Although fewer well-established clinical pathways exist in gastroenterology compared to other specialties, research has demonstrated pathways can significantly improve performance on process measures and reduce costs (23, 24). However, studies to date have shown that there is an insignificant impact on outcome measures and mixed results regarding reductions in length of stay (23-25).

Aspects of the pathway can be organizational – establishing easy to use, workflow documentation – or clinical – outlining step-by-step intervention guidelines (26). Importantly, providers who use the pathway need strong education on the pathway use during the testing and implementation phase (25-27). Part of the effectiveness of clinical pathways is the physician practice culture it enforces; providers are educated as to best practices and have readily available tools to help with decision making (23). The most common clinical pathways in gastroenterology address nutrition management, pain management, mobilization, and education of patients and relatives. Other clinical pathways outline endoscopy documentation (26) and steps to gastroenterological diagnosis upon presentation to a hospital (24). The majority of evidence supporting the use of pathways in gastroenterology surrounds CRC care, including colonoscopy, chemotherapy and surgical procedures. Fewer studies have analyzed pathways for other gastroenterological conditions, although some studies show potential care improvements (24).

4.1.1.1 Considerations for a Bundled Payment in CRC Screening and Surveillance

For most individuals over the age of 50, regular screening for CRC is recommended. Guidelines suggest that for adults with no evidence of polyps, CRC screening colonoscopies should be performed once every 10 years (28, 29). For those who have had a polyp previously removed, surveillance colonoscopies should be performed every 3 to 5 years (21, 30). For most gastroenterologists, colonoscopy—the most

common method in the United States for CRC screening and surveillance — accounts for a plurality of the services they deliver. One stakeholder indicated that over 50% of gastroenterologist reimbursement is derived from three CPT codes, all for colonoscopy. There is significant variability in the cost of screening colonoscopies that many stakeholders and literature suggested was independent of quality (3). Therefore, stakeholders advocated most strongly for a bundled payment approach for CRC screening and surveillance using colonoscopy.

Colonoscopy screening and surveillance is the most costly routine CRC screening test ; over \$10 billion in health care spending is spent on approximately 10 million colonoscopies per year (3). There are a number of benefits to a colonoscopy bundled payment. First, the procedure is a relatively easily defined episode of care with a clear beginning and end point and has predictable services included in those episodes of care. Second, colonoscopy is not well standardized, with variations in site-of-service, preparatory methodology, sedation, and follow-up intervals. Currently, payment for colonoscopy services vary radically across the country and even within the same metropolitan region (5, 6). This high cost and high variability within colonoscopy has caused public criticism (3, 5).

The expansion of Medicare reimbursement for CRC screening and surveillance using colonoscopy in 1998, and even further in 2001, helped to increase the probability of early stage detection of CRC (31). However, there is discordance between treatment practices and the American Gastroenterology Association (AGA) medical guidelines indicating how often the procedure should be performed. This discordance results in both underutilization and overutilization of colonoscopy. African Americans are less likely to have regular CRC screening, which leads to later stage detection of CRC (32). In addition, patients for whom a five-year follow up colonoscopy is indicated are less likely to have the repeat exam (33). Conversely, a study that reviews the effects of repeat colonoscopy found the following results. First, 46% of patients with negative first colonoscopies have repeat exams within seven years, half of which (24% overall) had no additional indications for shorter repetition time. Additionally, a peak in the number of non-medically indicated repeat colonoscopies performed five years after the initial colonoscopy suggests that these non-indicated exams were routinely scheduled. Furthermore, non-medically indicated repeat colonoscopies were performed on one third of patients over 80 years, which is particularly concerning due to increased risk of complications. Lastly, older patients with three or more co-morbidities were more likely to undergo early repeated colonoscopy (1).

As several stakeholders described, another issue with colonoscopy exists around a statutory requirement on copayments or coinsurance for polyp removal. The Patient Protection and Affordable Care Act (ACA) waives the coinsurance/copay and deductible on many cancer screening tests, including a colonoscopy for CRC screening. Approximately 25% to 35% of CRC screening colonoscopies in the Medicare population involve the removal of a polyp (34). Under Medicare coding, if a polyp is discovered during a screening colonoscopy and subsequently removed, the procedure becomes therapeutic and the patient is required to pay a copay. Therefore, patients may begin the procedure believing that they are receiving a screening with no out-of-pocket expenses, only to later find out that because a polyp was removed, the free screening procedure was reclassified as a diagnostic procedure for which they have a fee. The AGA and numerous other organizations have stated that this discourages patients from undergoing necessary screening (35) and some members of Congress have proposed

legislation to waive coinsurance for these colonoscopies under Medicare (36). However, waiving the coinsurance would require a statutory change, indicating that this may not be a feasible option for CMS.

Many stakeholders noted that a substantial amount of the variation in colonoscopy costs is due to the type of anesthesia administered and the provider that administers the anesthesia. Sedation is routinely used by 98% of all endoscopists for both upper and lower endoscopies, including colonoscopies (37). Traditional sedation (an opioid and midazolam) is administered by the gastroenterologist performing the procedure, with no extra fee for the anesthesia services (38). However, many providers have recently shifted to using propofol (38), a more potent general anesthetic that requires monitored anesthesia care (MAC), which means personnel trained in anesthesia must be present during the sedation regardless of depth of sedation.

Anesthesiologist involvement in colonoscopy services has increased dramatically over the past decade and varies considerably across regions. One stakeholder suggested that many providers use propofol in 100% of their procedures, while other providers may use the traditional two-drug combination. Colonoscopies that include MAC are around 20% more expensive than those without anesthesiologist involvement (38). Multiple gastroenterological associations released a joint statement supporting the use of propofol administered by non-anesthesiologist clinicians (39). Additionally, studies have shown that both nurse-administered propofol sedation (NAPS) and endoscopist-administered propofol sedation are as safe, or safer than, as the traditional drugs currently used during gastroenterologist-led sedation (39-41). One stakeholder, a patient advocate, noted that for complex cases it is important to still allow for access to anesthesiologists.

Some stakeholders described issues related to referral to gastroenterology for screening colonoscopy. Specifically, multiple providers and practice managers indicated that they receive referrals from PCPs for screening colonoscopy for patients who are not eligible for the procedure. One stakeholder described an initiative within his practice that aims to control for this problem without adding pre-procedure clinic visits. This stakeholder has trained a non-clinical employee (i.e., a medical assistant, or similar educational level) to conduct in-depth telephone interviews with potential referrals to ensure that screening colonoscopy is appropriate and indicated for the patient. Removing the pre-colonoscopy visits promotes a more streamlined and efficient process and therefore has the potential to reduce Medicare costs. Such an initiative could be funded within a bundled payment system, although current reimbursement rules provide no support for this type of pre-screening coordination.

Other stakeholders have expressed major problems with documentation of colonoscopy results. With no standards for documentation, physicians who read colonoscopy results frequently struggle to interpret and translate them into clinical action. In addition, since procedural specifics of colonoscopies vary widely between providers, there is a potential quality gap. One stakeholder expressed interest in having all colonoscopies filmed for quality assurance, as this practice has been shown to augment quality (42), and would allow for a permanent record of the examination. Downstream costs could be saved from fewer complications, and with more flexible bundled reimbursement, this type of quality initiative could be implemented.

Finally, site-of-service choices impact the cost variation in colonoscopy. Colonoscopies were primarily performed in physician offices when widespread screening was first advocated; however, they are increasingly being moved to ASCs and HOPDs. Although cases with a high risk for complication may be medically indicated to take place in a hospital setting, agreement among stakeholders and literature suggest that routine colonoscopies are safe and effective outside HOPDS. ASCs were initially created to help curtail the high costs of HOPD colonoscopy without compromising the quality of care. However, moving from the physician's office to the ASC substantially increases the cost of the procedure due to high facility fees. The variation in facility fees also contributes to a significant gap between the ASC and the HOPD, increasing the cost of procedure by over 150% (4). The AGA has remarked on the need to reform the equations determining site-of-service payment differentials. One stakeholder suggested that a bundle may be a good way to close the gap in payment between sites-of-service by providing a flat rate, with an added percentage for HOPD care due to higher operating costs. Another payer indicated the importance of expanding the number of gastroenterology services that can be safely performed outside of the hospital setting to reduce costs. However, any changes in actual cost differences between sites-of-service would be difficult to implement via Medicare due to statutory requirements that establish fees.

Several stakeholders discussed possible ways to reduce the per-beneficiary cost of CRC screening and surveillance by expanding beyond colonoscopy. Some suggested better use of Fecal Immunochemical Tests (FITs), a low-cost laboratory test that can provide quick feedback on CRC risk. Many patients for whom colonoscopy is recommended do not receive the procedure and thus might benefit from greater use of alternative screening methods. However, these alternative tests are required annually for proper screening, and some stakeholders worried that widespread use of FITs would reduce overall screening rates. In addition, several stakeholders described other methods of intestinal imaging, including double contrast barium enema and CT Colonography. CT Colonography has, by and large, replaced double contrast barium enema since it offers less radiation and better resolution for detection of polyps. Although CT Colonography is a less invasive and less costly CRC screening modality than colonoscopy with a similar detection profile (43-46), payers do not reimburse CT Colonography services as frequently as colonoscopies and Medicare does not cover CT Colonography. Multiple stakeholders noted that there is a common perception that the two tests are contradictory to one another. However, two stakeholders asserted that they are complementary. One pilot project at the University of Wisconsin uses CT Colonography and colonoscopy in tandem for CRC screening and surveillance. In this program, CT Colonography is the primary screening tool, and if a polyp is detected, the gastroenterology service holds daily spaces so that patients can be immediately taken for colonoscopy. This example drives efficiency by preventing the need for repeated bowel cleansing, ensures necessary colonoscopies are received in a timely manner, and utilizes a non-invasive procedure as the primary screening tool. One stakeholder noted that about 10% of cases are converted to colonoscopy, a number supported by literature (43, 46), and that the radiologist is the primary manager for these patients. Another stakeholder asserted that the less invasive CT Colonography may help to increase screening rates overall by using a less invasive procedure, with literature supporting positive patient experiences (47).

4.1.1.2 Considerations for a Bundled Payment in Other Gastroenterological Disorders

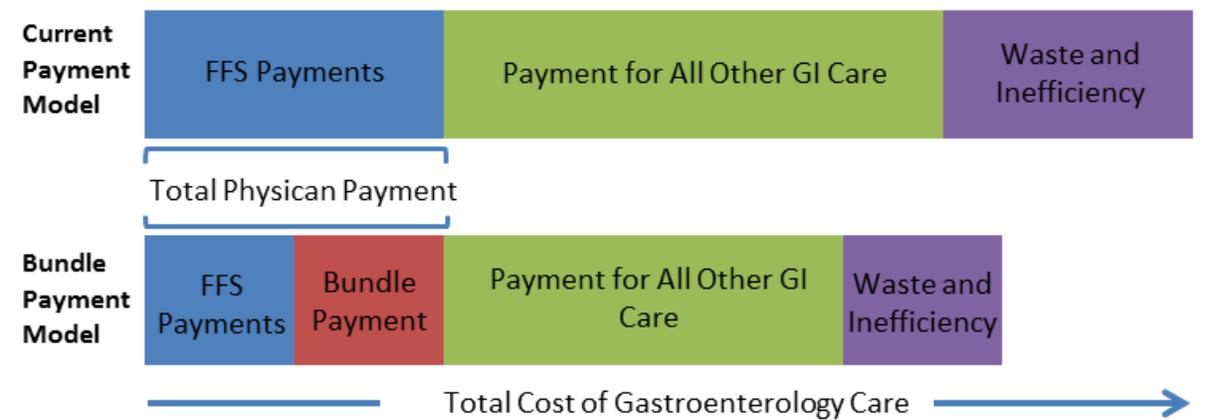
Stakeholders have also mentioned the possibility of bundled payment arrangements for other disorders and episodes of care within gastroenterology including IBD and GERD. There are numerous opportunities for better management and coordination of care and ancillary support services for patients with both conditions. Stakeholders have said that many chronic IBD and GERD patients could be effectively managed in primary care settings, but there is no incentive for this to occur. In addition, patients with these conditions frequently do not see providers until they require an emergency room visit or hospitalization. Better coordination and care management could potentially prevent such complications.

The costs for the treatment and management of GERD are high and variable. Endoscopy utilization and medication management are also highly variable for these patients. One stakeholder mentioned that the percent of patients receiving endoscopy for GERD in a given region ranges from approximately 20 to 990 per 1000 patients. This high regional variability is an indication of possible unnecessary or inadequate testing across regions and could potentially be addressed with bundled payment methods with payment tied to quality, rather than volume and intensity.

While certainly feasible, bundled payments for the provision of chronic care, such as IBD and GERD, are more difficult to define than for the discrete set of services generally associated with colorectal cancer screening. In contrast to easily defined procedures, chronic care is ongoing, with no self-contained episode of care with clear triggers or end points. Although stakeholders mentioned that opportunities exist to pursue bundled payments for GERD, there was no mention of intended plans from any provider or payer organizations. However, one stakeholder described early-stage efforts in designing a bundled payment approach to IBD.

4.1.2 Payment Structure

Figure 3: Schematic of the bundled payment model contrasted with the current payment model. Source: The Brookings Institution, 2014.



Bundled payments aim to realign payment incentives to facilitate coordination of quality care by paying providers a global payment for a bundle of services previously reimbursed in a FFS manner. A bundled payment model is outlined in Figure 3 and shows bundled payments replacing some of the services currently reimbursed in a FFS manner. Although providers are still paid based on services provided, bundled payments reward providers for efficient, high quality, coordinated care instead of emphasizing the quantity of services provided within an episode of care. A provider receives a global payment, either prospectively or retrospectively, based on a target price for an episode of care. In prospective payments, a single, global payment is made to the provider organization to cover all future services relating to the defined episode of care (48). In retrospective payments, providers are initially paid on a discounted or regular FFS basis and total payments are compared to the target price at the completion of the episode of care (48). If the cost of care is greater than the target price, the organization may be responsible for paying money back to the payer. Several organizations have developed bundled payment pilots for CRC screening and surveillance colonoscopy. As such, colonoscopy will be discussed as an illustrative example of a procedure-based bundled payment. However, this framework could also be applied to other procedural services in gastroenterology that have clear beginning and end points such as CT Colonography or endoscopic procedures.

The basic framework for a bundled payment for colonoscopy includes services that are provided in typical CRC prevention programs such as screening patients, diagnosing patients who were found to have an abnormality during CRC screening with another test, and surveillance of patients who have previously undergone screening and are returning for follow-up colonoscopy (49). Generally, colonoscopy for therapeutic procedures, on pediatric patients, on asymptomatic patients with premalignant conditions, or for patients with other high-risk conditions are excluded from the bundle (49). The AGA developed a framework for CRC screening and surveillance colonoscopy bundle that can serve as a detailed outline for future bundle models (49). Several stakeholders advocated for the inclusion of measures of mucosal inspection during the colonoscopy as part of the bundle as a quality check, in addition to the other quality measures currently reported for CRC screening. Stakeholders also noted the importance of including patient-centered outcome measures to make reimbursement clinically relevant and ensure the provision of high-quality care.

Incorporated into a CRC screening and surveillance colonoscopy bundle are services provided in the pre-procedure period, the procedure period, and the post-procedure period. The pre-procedure period includes all services that need to be performed prior to screening colonoscopy. Typically, the pre-procedure period lasts three days and services include a telephone assessment to ensure the procedure is appropriate for the patient or an office visit for a physician or other care team staff consultation as well as bowel preparation and patient instruction (49, 50). The one-day procedure period includes all services billed during the colonoscopy procedure such as the professional fee, sedation, intraoperative devices to improve the bowel preparation, diagnostic and therapeutic procedures and biopsies, as well as pathology (49, 50). The post-procedure period includes post-operative follow-up with the patient, communication regarding the final procedure performed and pathology results, and complications directly related to the index colonoscopy. Covering complications during the post-operative phase, including repeat colonoscopy due to post-procedure bleeding or poor preparation/inadequate

visualization of the lumen, provides a type of warranty on the procedure (49, 50). This ‘warranty’ period gives stronger financial encouragement for avoiding repeat procedures and complications since providers will pay for these services from the bundled price rather than receiving additional payment (49, 50). This period can last from one week to two weeks (49, 50), with most stakeholders recommending that the appropriate post-procedure period is around 10 days. Some models have extended the warranty on repeat colonoscopies up to one year post procedure (49).

For services with substantial obstacles for fully bundled payments, a partially bundled payment could be an alternative. This type of model could vary depending on implementation challenges and could involve bundling specific services, a portion of overall costs, or a portion of costs up to a pre-defined cap. This type of partial bundled payment may be appropriate for diseases, such as IBD, that have substantial variations in type and costs of care required for each patient. Alternatively, private payers have successfully piloted a reference price where they pay a defined contribution toward covering the full price and the patient is responsible for covering the rest. This model encourages patients to seek out lower cost providers. Safeway instituted reference pricing for screening colonoscopy in a region where costs varied from \$900 to \$7,200 (51). The company set a reference price at \$1,250 and within the first year saw movement toward lower-cost providers without a drop in the population screening rate(51). Preliminary results suggest quality of care was not negatively affected.

4.1.3 Infrastructure Requirements

The most vital infrastructure requirement for a bundled payment model is appropriate and timely data. In the design phase of the bundle, providers and payers must have accurate data on cost and utilization of services to be able to set an appropriate target price. Additionally, clinical and claims data must be integrated in a timely manner so that providers have appropriate feedback about their practice patterns and costs to alter their behavior accordingly. Ideally, this could be accomplished through an interoperable electronic medical record (EMR) system that allows for providers to input performance and outcomes data that can be analyzed and coded for payers. However, some bundles have been implemented in the absence of a fully-integrated EMR.

Several stakeholders described payers’ difficulty with developing a system to support the bundled payment. In particular, they noted that designing and implementing bundled payment sorting is essential so that services that should be included in the bundle are sorted correctly and billed appropriately. Without a properly functioning data sorting system, claims that should be included in the bundle might be reimbursed on a FFS basis, and those that should not be included in the bundle may not be reimbursed at all. Furthermore, some stakeholders indicated that current software makes it difficult to include data for the colonoscopist, the site of service, and the patient in each code.

4.1.4 Potential Undesirable Consequences

Bundled payments increase provider risk by holding providers responsible for cost-effective, quality care. Potentially, providers may feel constrained due to the single payment rate and therefore skip necessary services that could add to their cost. However, including quality of care measures such as guideline adherence, post-operative outcomes, and procedural complications in the bundled payment can ensure that patients are receiving quality care. Clinical data registries and the AGA’s Digestive Health

Recognition Program already exist, allowing providers to report the quality of colonoscopy. These types of quality benchmark measures should be incorporated into the bundled payment model.

One issue that several stakeholders raised with regard to providers taking on a substantial amount of risk is that there would need to be a minimum number of providers in a model to ensure a large enough risk pool so that a few outlier patients would not be financially detrimental to the practice. One stakeholder asserted that a minimum of 25 or 30 providers would be necessary. Other mechanisms such as outlier payments or risk corridors could also limit these financial risks.

Table 1: Advantages and Disadvantages of a Bundled Payment Model

	Advantages	Disadvantages
Delivery	<ul style="list-style-type: none"> Flexibility in services provided in the bundle Inclusive of other specialties and domains 	<ul style="list-style-type: none"> Potential for inappropriate treatment or mistreatment
Payment	<ul style="list-style-type: none"> More-global payment, encouraging efficiency and flexibility in adjusting services to needs of patient Stronger provider incentives to improve performance measures and reduce costs Tied to quality and performance 	<ul style="list-style-type: none"> Perception of constrained resources Does not support coordination of care outside the bundle
Quality	<ul style="list-style-type: none"> Clinical data registries and potential sets of quality measures already exist 	<ul style="list-style-type: none"> Requires establishing data infrastructures to be able to collect and measure quality benchmarks

4.2 Chronic Disease Management: Multidisciplinary Care Team Model

4.2.1 Care Delivery Structure

The multidisciplinary care team model centers around a physician-led, multi-disciplinary care team that works to improve physician and patient engagement to increase quality of care. The practice promotes care coordination through shared decision making, adherence to best practice guidelines, appropriate diagnostics and follow-up, as well as access to non-specialty care that could aid in patient treatment and improve patient outcomes. The team is based around a small core group that meets with the patient regularly and works together to identify patient needs and develop a care plan, pulling in other specialist services depending on need. Care should include the use of clinical pathways where appropriate to ensure best practices are followed. A patient-centered medical home (PCMH) is one example of a medical care team model with specific practice characteristics required to reach a formal PCMH status including extended hours, emergency availability, extended staff disciplines, and on-call staff, along with other traditionally non-billable services. Other multidisciplinary care teams may utilize many, although not all, of the same types of practice features found in a PCMH.

A multidisciplinary care team model naturally fits into care of chronic conditions such as Hepatitis C, GERD, and IBD. The coordinated care found in a multidisciplinary care team can aid patients in working through complex issues associated with their condition. One stakeholder cited potential long-term cost savings from treating lifestyle diseases, particularly GERD, that may be associated with obesity and psychological stress. Additionally, complex care, such as that required for Hepatitis C, can benefit from a multidisciplinary care team model. Hepatitis C requires a complicated drug regimen that includes careful monitoring for adverse events. Promising drug advancements in the past few years with direct acting antivirals (DAA) have helped to shorten the course of treatment and improve cure rates. However, these new DAAs increase potential side effects, negative drug interactions, and further obscure an already

complicated treatment regimen. A brand new DAA, Sovaldi, significantly diminishes adverse effects; however, the drug is approximately \$300,000 more expensive for each additional patient achieving sustained virological response than the traditional Hepatitis C treatment (40).

Perhaps more than any other condition in gastroenterology, IBD requires an integrated approach that spans a wide range of clinicians. IBD patients experience the best outcomes when referred to a gastroenterologist within a year of diagnosis (52), making IBD a natural condition for a gastroenterology-led medical care team. Other important members of the team include physician specialists versed in IBD care such as radiologists, endoscopists, surgeons, and pathologists. Additionally, non-medical specialties, such as nutrition and psychosocial services, are vital to IBD care. Nutrition has been shown to play a role in the pathogenesis and relapse trigger of IBD as well as in treatment outcomes (53). Around 15% of Crohn's patients and 6% of ulcerative colitis patients are malnourished (53). In addition, anxiety and depression rates are high among IBD patients and can increase the perception of pain and symptoms. Multiple stakeholders noted the benefit of psychosocial care in reduction of both psychological and physical symptoms. Stakeholders explained that even with clinical evidence of improvement, such as inflammation reduction and mucosal healing, patients with anxiety and depression can continue to experience physical IBD symptoms. One stakeholder described anecdotal evidence work at the University of California, San Diego that following psychosocial support interventions, patients had fewer ER visits and hospitalizations, improved quality scores, decreased psychiatric symptoms, and increased patient compliance. This stakeholder is developing a study to further investigate these improvements. Social care is also beneficial in identifying and understanding patients' barriers to care and in aiding with appropriate use of services. Social services can help patients begin and continue complicated treatment regimens, seek out support networks, and avoid costly emergency visits stemming from anxiety rather than medical necessity.

Gastroenterology practices employing these types of more coordinated care initiatives have generally not included all of the specific characteristics needed for formal designation as a PCMH. However, some forward-thinking practices are utilizing multidisciplinary care teams to provide better care for their patients with promising results. One stakeholder noted that on average, practices engaging in this type of model are saving 5-10% on total costs, although this is being driven by a small group of high-performing practices.

One care team model involves implementing multidisciplinary Clinical Service Lines (CSL), workflow tools that combine evidence-based guidelines with practice management tools and links to outcome registries. The AGA has CSLs in IBD, Hepatitis C, and CRC. Structurally, CSLs can support a team of physicians and other non-physicians within a specialized clinic, create innovative forms of communication to enhance quality of care and provide performance improvement programs to staff to promote continuous learning. This network of clinical and non-clinical staff would have access to national outcome registries and other data. (52). The teams utilize various specialist-specific resources to treat a particular chronic condition, such as IBD. For example, an IBD CSL would provide access to radiologists who understand the need to minimize radiation, pathologists specializing in IBD to interpret biopsies, and surgeons trained in laparoscopic bowel-saving techniques.

A more robust multidisciplinary care team model is exemplified in Project SONAR, a model that combines proactive patient outreach to monitor performance status with clinical decision support (CDS) tools. The model centers on Crohn's disease patients and checks-in – 'pings' – with patients at regular intervals through an online patient portal that scores and tracks symptoms. The goal is to predict the need for care and prevent hospitalizations through early intervention. This regular 'ping' system could also be accomplished through other technology such as mobile phone applications or through a nurse care manager reaching out directly to patients. In addition to regular patient status updates, the practice utilizes a complex set of CDS tools that are housed within the electronic medical records (EMR). Moving forward, the stakeholder expressed an interest in making all CDS tools available in an online platform. With this intervention, the practice has seen greater than a 15% reduction in hospitalizations.

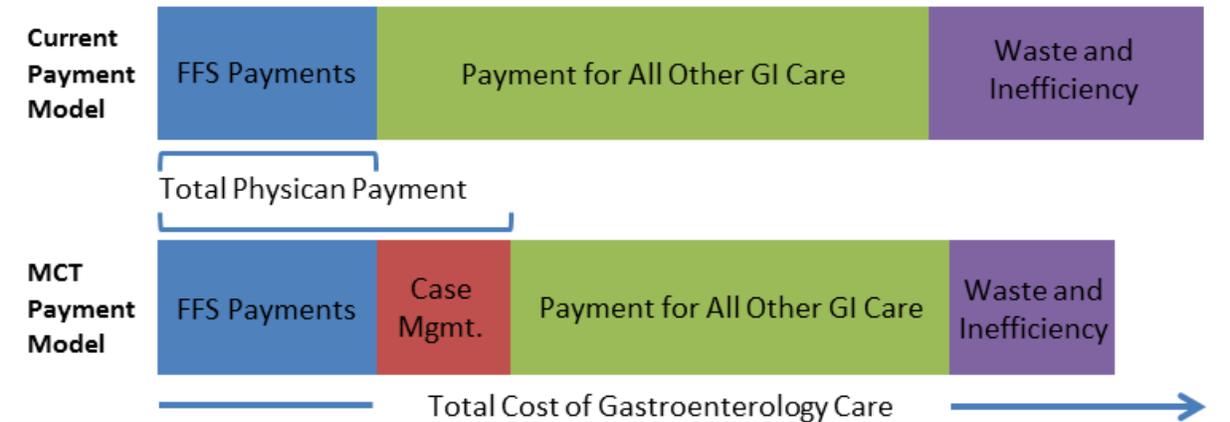
In the same vein as Project Sonar, one stakeholder described a robust effort coordinated through Mt. Sinai Hospital in New York involving eight academic medical centers for the management of IBD. The project coordinates proactive outreach to patients with hovering tools, or cloud-based support tools, to ascertain a patient's day-to-day management of IBD symptoms. The project has an associated mobile and web-based application linked to the EPIC EMR system to records metrics such as number of stools, patient-defined outcomes measures, patient-reported quality measures, and measures on the management of prevalent symptoms. The goal is to collect enough data to predict when a patient's symptoms indicate a need for intervention and avoid emergency room visits or hospitalizations. One stakeholder noted a similar approach that uses a complex set of CDS tools, using EMR, to tailor risk management and avoid complications could be used for patients with functional bowel disease, hepatitis, colitis, GERD, and nutritional disorders.

In areas with limited gastroenterologists, such as rural communities, multidisciplinary care team models can help empower the PCP to provide high quality gastroenterological services to patients. The Extension for Community Healthcare Outcomes (ECHO) project reaches a broader range of patients who may experience geographical barriers to Hepatitis C treatment. In this system, a primary care team in an underserved area receives training, advice, and support in delivering best-practice care through telehealth technology. Through this project, patients who were previously unable to access Hepatitis C treatment, often due to geographic barriers in visiting specialists, receive Hepatitis C treatment from their PCPs and a virtual network of specialty providers. Preliminary results from Project ECHO indicate Hepatitis C cure rates equal to those at a specialty facility (20). In Project ECHO, community providers have weekly telephone meetings with specialists such as gastroenterologists to present cases. Together, PCPs and gastroenterologists work to develop a patient care plan according to evidence-based protocols. In these virtual meetings, PCPs can obtain specialist advice for any difficulties that may arise. In addition, specialists provide short tutorials on various aspects of care. These meetings could include non-physician specialties such as psychosocial care and nutrition that are often important in gastroenterological care. Currently, Project ECHO is funded through a grant and thus does not have an applicable payment system that could be utilized in traditional payer-provider relationships. One stakeholder noted an interest in taking these community-based principles for efficient Hepatitis C treatment and applying them to care for Medicaid beneficiaries in an academic medical center setting, with a risk stratification component that is not currently supported through traditional payment

systems. Similarly, the pillars of this model could be applied to the Medicare population with appropriate risk stratification.

4.2.2 Payment Structure

Figure 4: Illustrative schematic of the multidisciplinary care team (MCT) payment model contrasted with the current payment model. Source: The Brookings Institution, 2014.



Payment for a multidisciplinary care team is generally provided as a supplementary per member per month (PMPM) case management fee on top of existing FFS payments, with the expectation that the fee will enable care reforms that lower overall costs, as seen in Figure 4. These PMPM fees help to support the care expansion and coordination found in the multidisciplinary care team model. Project Sonar, for example, receives a PMPM to contribute to infrastructure required in the model. In one multidisciplinary care team pilot for gastroenterology, the PMPM is currently set at \$46.00, and if cost savings become more substantial, the PMPM will increase. This is one possible mechanism for providers and payers to share in the savings generated by this model. This particular contract is initially three years in duration.

To receive payment, providers would document and submit use of best-practice guidelines and care expansion. Payers would analyze and return the rate of adherence by the provider. This type of system limits variability in treatment so that providers are using evidence-based practice guidelines to improve the quality of care provided and appropriately expanded services are being utilized. For chronic gastroenterological diseases, a multidisciplinary care team model can address all aspects of patient need to ensure patients achieve the best outcomes. In addition, a stakeholder indicated that frequently monitoring patient conditions to catch problems early, having emergency expert advice available, and addressing psychosocial needs can decrease emergency department visits and hospital admissions (52, 53). Physicians would be paid a PMPM upon exceeding a pre-selected rate of adherence and quality measures.

In one multidisciplinary care team pilot, patients are attributed to provider organizations through the payer’s creation of a list of high-risk patients. This list is then vetted by the provider organization, and a final list of patients participating in the model is generated.

4.2.3 Infrastructure Requirements

Data is a major requirement for the success of this model. Ideally providers can input procedure and outcome data into EMR and export this data to payers who can run analyses and return the results to the providers. In addition, electronic capabilities must be sufficient for telehealth conferences and proactive, frequent patient outreach. For certain multidisciplinary care team models that employ proactive patient outreach procedures or use clinical decision support tools, designing patient portals and online, cloud-based access platforms or other mechanisms to provide data access to all team members is necessary. Not all providers have EMRs that are compatible with all decision support tools. Providing data access at the least common denominator for most practices, such as through a cloud-based internet tool, will ensure the majority of providers can use the software.

A multidisciplinary care team model requires the assembly of care teams as well as significant time and coordination. Both the primary care team and the specialists invest in staff members who must take time out of their schedules for weekly meetings and care coordination. This is a crucial support mechanism for the successful implementation of a multidisciplinary care team approach.

4.2.4 Potential Undesirable Consequences

The primary potential undesirable consequence of a multidisciplinary care team model is the possibility of providers not saving money because of the expansion of services required. This is especially true for IBD care, as emergencies are a normal part of the disease course. One of the main benefits of bio-psychosocial care, however, is the improvement in clinical symptoms as well as the avoidance of unnecessary emergency hospital visits. Stakeholders have suggested that emergency visits are costly enough that even limited reductions in such complications could cover the costs of the added team members. In addition, ensuring sufficient PMPM payments can help to offset increased expenses for extra services.

Table 2: Advantages and Disadvantages of a Multidisciplinary Care Team Model

	Advantages	Disadvantages
Delivery	<ul style="list-style-type: none"> • Patient-centered, coordinated care of medical and non-medical services relevant to treatment • Accessible to traditionally underserved populations • Includes use of pathways • Incorporates quality benchmarks 	<ul style="list-style-type: none"> • Potential administrative burden • Moderate structural changes with higher implementation costs
Payment	<ul style="list-style-type: none"> • Tied to quality and performance • Case-based payment • Payment for infrastructure and organizational transformations 	<ul style="list-style-type: none"> • Payments overlay on FFS • Minimal change in provider incentives
Quality	<ul style="list-style-type: none"> • Promotes the use of evidence-based guidelines to improve quality of care 	<ul style="list-style-type: none"> • Requires procedural and outcomes data, which may be difficult to obtain

4.3 Population Health: Advanced Mixed Payment Model

4.3.1 Care Delivery System

The payment reform models described in this paper can be coupled with shared savings to create an advanced mixed payment model that focuses on population health. Current population health models,

including the Medicare Shared Savings Program (MSSP) and Pioneer Accountable Care Organizations (ACO), use an additional shared savings component to hold providers accountable for providing low-cost, high-quality health care to a population. While current gastroenterology applications of this model exist within the ACO setting, reimbursement can be tied to shared savings in a variety of practice settings, such as specialty groups. Furthermore, as ACOs are a nascent model within the field of gastroenterology, the MSSP program would not be applicable to most GI care, limiting overlap with CMS' current payment and delivery models.

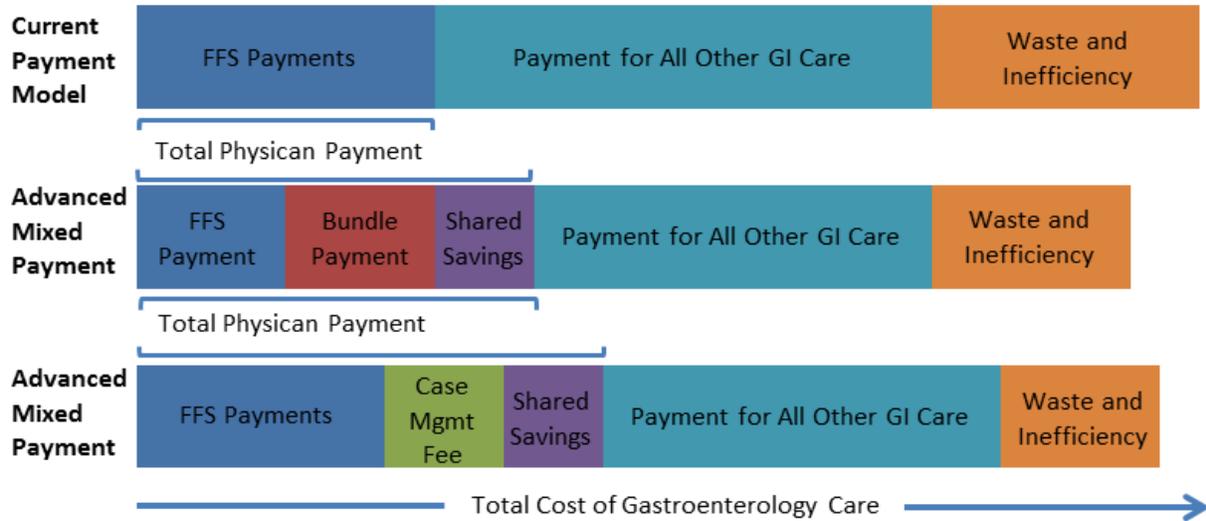
Commercial payers are working specifically with gastroenterologists and other specialists on payment models with this feature. One group of payers has developed separate bundled payments that have been presented to the AGA with Optimus Health ACO and Digestive HealthCare Center¹. One model is a prospective bundled payment with a shared savings component; the other is a retrospective add-on to FFS that is based on savings accrued during the episode of care. The payer involved with the retrospective model suggested that while the payment only includes one-sided risk, they are considering transitioning toward a two-sided risk approach in the future. These models exemplify how shared savings could be added to a bundled payment for gastroenterology to produce an advanced mixed payment system.

Shared savings can also be applied in settings outside of the ACO context. Project Sonar, described fully in the multidisciplinary care team section 4.2, is an example of an advanced mixed payment method outside of the ACO setting. Project Sonar utilizes regular patient outreach to track patient symptoms and predict need for medical care. In addition, decision support tools are integrated into the EMR. In addition to the PMPM found in all multidisciplinary care team models, Project Sonar evaluates the annual savings accrued across the project population and shares the savings between the payer and the provider. One stakeholder noted that the PMPM only covers the changes in infrastructure required for the model while the shared savings will act to increase the payments that physicians receive.

¹ Dr. Charles Accurso has led the bundled payment work at the Digestive HealthCare Center in New Jersey.

4.4.2 Payment Structure

Figure 5: Schematic of two iterations of advanced mixed payment models contrasted with the current payment model. Source: The Brookings Institution, 2014



The advanced mixed payment model adds a savings component to existing payment changes from the foundational reform models as outlined in Figure 5. Since only a few examples currently exist within gastroenterology, the following payment structures remain largely theoretical. Importantly, this model aims to show how shared savings may be implemented outside of an ACO setting, thereby reducing overlap with current shared savings programs including the MSSP Program.

Various methods exist to share in accrued savings. Overall, a target cost based on past spending and forecasted growth is negotiated with the payer. The gastroenterologist would continue to receive FFS reimbursement and any savings below the target cost are shared between the provider and the payer. The manner in which savings are shared is dependent on the type of risk the provider is willing to take on. In an asymmetric, one-sided risk approach, the provider receives a smaller proportion of shared savings but incurs no penalties if the cost is above the target value. Alternatively, in a symmetric, two-sided risk model, the provider shares a larger proportion of cost savings but risks penalties if spending exceeds the target cost. A symmetric model provides more incentive to improve quality and reduce costs.

Although not specifically shared savings, one stakeholder described a similar model described in which 5% of physician RVU reimbursement is given to the medical care team organization to support population health infrastructure in place of a PMPM. Physicians in the medical care team are evaluated annually based on health metrics of their defined population, and the highest achieving physicians receive a 5-10% increase in their RVU fee schedule payments. The stakeholder believed that upfront pay increases allowed for flexibility and innovation in care delivery that retrospective shared savings cannot.

4.3.3 Infrastructure Requirements

The main additional component of an advanced mixed payment model is coordinated care within the organization. As such, EMR infrastructure across providers involved in patient care is vital. In addition, data must be submitted to the payer, ideally through a two way sharing system based in the EMR, similar to those described in the other models. If providers are contracting with an ACO, data on costs are necessary to help the ACO determine lowest costs sites.

4.3.4 Potential Undesirable Consequences

There is a possibility in an advanced mixed payment model to have misaligned incentives to provide lower quality care in order to keep costs to a minimum. However, using quality metrics to ensure providers are adhering to performance standards can ensure patients are receiving quality care.

Table 3: Advantages and Disadvantages of Advanced Mixed Payment Model

	Advantages	Disadvantages
Delivery	<ul style="list-style-type: none"> • Increased provider accountability • Can be multispecialty • Comprehensive delivery model 	<ul style="list-style-type: none"> • Difficult to create provider networks • Potential for inappropriate treatment or mistreatment
Payment	<ul style="list-style-type: none"> • Potential for global payment • Potential for high provider risk • Flexibility in payment arrangement • Tied to quality and performance 	<ul style="list-style-type: none"> • Perception of constrained resources
Quality	<ul style="list-style-type: none"> • Use of quality metrics can support provider adherence to guidelines 	<ul style="list-style-type: none"> • Quality may decrease if incentives are misaligned

5. Performance Measures

Any payment model relies on performance measures to link quality and payment. Immense development has taken place in the past decade with regard to quality measures in gastroenterology. In 2005 the AGA published its Task Force on Quality in Practice and Recommendations (54, 55). That same year the American College of Gastroenterology (ACG) and the American Society for Gastrointestinal Endoscopy jointly formed the Task Force for the Development of Gastrointestinal Endoscopy Quality Indicators (54, 56). Additionally, the AGA developed a physician-led network of performance improvement strategies – the Roadmap for the Future of GI Practice – to create an infrastructure that promotes continuous quality improvement. Elements within this framework include the AGA digestive Health Outcomes Registry and other health IT systems, quality measures to appropriately evaluate performance, and electronically based support tools (57). In addition, the ACG’s GIQuIC is a national gastrointestinal endoscopy reporting repository for storage and maintenance of endoscopy quality data. Among other data, the program provides benchmarking reports and identifies gaps in care.

The AGA developed the following principles to guide the development of performance measures: (1) evidence-based, (2) representative of opportunity areas, (3) outcomes-oriented instead of process-oriented, (4) risk-adjusted, (5) consensus-based targets for standardized care, (6) assessed for potential

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implementation risks, (7) transparent definitions and methods, (8) clinically-based instead of process-based, (9) validated, (10) subject to audit, (11) timely and accurate feedback, (12) set targets for performance, (13) have positive financial implications, and (14) performance attribution (58). Many of the measures that the AGA has developed are included in the proposed AGA bundled payment for colonoscopy. Furthermore, a stakeholder indicated that the AGA is in the process of developing GERD measures.

The measures in the following tables are listed by measure type and by condition.

Patient Experience Measures: all conditions	
Measure Title	Source
CAHPS Clinician/Group Surveys - (Adult Primary Care, Pediatric Care, and Specialist Care Surveys) (NQF #5)	AHRQ
Patient Satisfaction Survey: Outpatient Office	AGA
Patient Satisfaction Survey: Endoscopy	AGA

Efficiency and Structure Measures	
Condition: Colorectal Cancer Screening and Surveillance	
Measure Title	Source
Rate utilization of anesthesia professional to administer sedation for colonoscopy in ASA class I-II patients undergoing screening examination	AGA
Performance of Upper Endoscopic Examination After Colonoscopy	AGA
Hospital Visit Rate After Outpatient Colonoscopy	AGA
Participation by a Hospital, Physician or Other Clinician in a Systematic Clinical Database Registry that Includes Consensus Endorsed Quality (PQRS #321)	AGA

Outcome Measures	
Condition: Colorectal Cancer Screening and Surveillance	
Measure Title	Source
Colonoscopy Assessment (Cecum reached) – Cecal Intubation/Depth of Intubation	AGA
Colonoscopy Assessment (Procedure adequacy) - Assessment of Bowel Preparation	AGA
Rate of potentially avoidable complications during the “colonoscopy episode” (seven days pre-colonoscopy and 14 days post-colonoscopy)	AGA
Average Withdrawal Time	CORI
Polyp Retrieval Rate	CORI
Effectiveness of narcotic assessed on visit following prescription	ASCO QOPI
Condition: General	
Gastrointestinal Hemorrhage Mortality Rate (NQF #2065)	AHRQ

Process Measures	
Condition: Colorectal Cancer Screening and Surveillance	
Measure Title	Source
Colonoscopy interval for patients with a history of adenomatous polyps - avoidance of inappropriate use (NQF #659; PQRS #185)	AGA
Appropriate Follow-Up Interval for Normal Colonoscopy in Average Risk Patients. (NQF#658; PQRS #320)	AMA/PCPI
Preventive Care and Screening: Unhealthy Alcohol Use – Screening (PQRS #173)	AGA
Preventive Care and Screening: Screening for High Blood Pressure and Follow-Up Documented (PQRS #317)	AGA
Screening Colonoscopy Adenoma Detection Rate (PQRS #343)	AGA
Non-Recommended Colorectal Cancer Screening in Older Adults	AGA
BMI screening and follow-up (NQF #421; PQRS 128)	AGA
Tobacco user – screening and cessation intervention (PQRS #226)	AGA

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Performance of colorectal cancer screening test(s) in eligible population (50-75) (NQF #34)	AGA
Comprehensive Colonoscopy Documentation	AGA
Polyp Detection Rate	CORI
Description of Polyp Characteristics	AGA
Assessment of Polyp Removal	AGA
Pathology results present and reviewed	AGA
Communication of results and follow-up interval to PCP	AGA
Communication of results and follow-up interval to referral source	AGA
Communication of results and follow-up interval to patient	AGA
Preventive Care & Screening: Tobacco use: Screening & cessation intervention (NQF #28)	ASCO QOPI
Oncology: Plan of care for pain (NQF #383)	ASCO QOPI
Oncology: Pain intensity quantified (NQF #384)	ASCO QOPI
Pathology report confirming malignancy	ASCO QOPI
Constipation assessed at time of narcotic prescription or following visit	ASCO QOPI
Documented plan for chemotherapy	ASCO QOPI
Chemotherapy intent (curative, palliative) documented	ASCO QOPI
Chemotherapy intent discussion with patient documented	ASCO QOPI
Number of chemotherapy cycles documented	ASCO QOPI
Chemotherapy planning completed appropriately	ASCO QOPI
Signed patient consent for chemotherapy	ASCO QOPI
Patient consent documented in practitioners note	ASCO QOPI
Chemotherapy treatment summary completed within 3 months of chemotherapy end	ASCO QOPI
Chemotherapy treatment summary provided to patient within 3 months of chemotherapy end	ASCO QOPI
Chemotherapy treatment summary provided or communicated to practitioner within 3 months of chemotherapy end	ASCO QOPI
Chemotherapy treatment summary process completed within 3 months of chemotherapy end	ASCO QOPI
Patient emotional well-being assessed by 2 nd office visit	ASCO QOPI
Action taken to address problems with emotional well-being by 2 nd office visit	ASCO QOPI
Documentation of patient's advance directives by 3 rd office visit	ASCO QOPI
Height, weight, BSA documented prior to curative chemotherapy	ASCO QOPI
Condition: Hepatitis C	
Ribonucleic acid (RNA) testing before initiating treatment (PQRS #84)	AGA
HCV genotype testing prior to treatment (PQRS #85)	AGA
Antiviral treatment prescribed (PQRS #86)	AGA
HCV ribonucleic acid (RNA) testing at week 12 of treatment (PQRS #87)	AGA
Counseling regarding risk of alcohol consumption (PQRS #89)	AGA
Counseling regarding use of contraception prior to antiviral therapy (PQRS #90)	AGA
BMI screening and follow-up (NQF #421; PQRS #128)	AGA
Hepatitis A vaccination in patients with HCV (NQF #635; PQRS #183)	AGA
Hepatitis C: hepatitis B vaccination in patients with HCV (PQRS #184)	AGA
Discontinuation of Antiviral Therapy for Inadequate Viral Response	AGA
Sustained Virological Response	AGA
HCV RNA Testing at Week 24 of Treatment	AGA
Condition: Inflammatory Bowel Disease	
Tobacco user – screening and cessation intervention (PQRS #226)	AGA
IBD Type, Anatomic Location, Disease Activity, and External Manifestations Assessed (PQRS #269)	AGA
Corticosteroid-Sparing Therapy Prescribed (NQF #2059; PQRS #270)	AGA
Bone Loss Assessment for Patients Receiving Corticosteroid Therapy (PQRS #271)	AGA
Influenza immunization (PQRS #272)	AGA
Pneumococcal immunization (PQRS #273)	AGA
Testing for latent TB before initiating anti-TNF therapy (PQRS #274)	AGA
Assessment of hepatitis B status prior to initiating anti-TNF therapy (PQRS #275)	AGA

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Testing for Clostridium difficile in IBD patients who develop diarrhea	AGA
Testing for Clostridium difficile – inpatient measure	AGA
Prophylaxis for venous thromboembolism — inpatient measure	AGA

Stakeholders emphasized the importance of holding physicians accountable for providing quality care. One stakeholder indicated that a possible starting point for gastroenterology was using 8 to 10 PQRS measures along with the AGA’s Bridges to Excellence metric portfolio. Multiple stakeholders supported the use of adenoma detection rate as an outcomes measure that can be quantified easily and is used frequently. At the same time, stakeholders raised concerns over the need for performance measures to capture accurate and meaningful data that accounts for the plurality of gastroenterology diseases.

Two stakeholders highlighted that psychosocial measures are critical to alleviate patient concerns during treatment and post-therapy recovery. Despite interest amongst physicians to integrate psychosocial care into their practice, very few physician groups and hospitals offer psychosocial care, which has also limited the development of psychosocial metrics. To date, most psychosocial measurement work in IBD care has occurred abroad and is just beginning to happen domestically. For example, recent industry grants are intended to create training manuals to assist centers in incorporating psychosocial care into a treatment computer-based algorithm.

For CRC screening and surveillance using colonoscopy, numerous stakeholders discussed the absence of measures of mucosal tissue inspection during the colonoscopy procedure. Published literature outlining bundled payment options for screening colonoscopy do not include this as a quality measure (17, 49). Several stakeholders advocated for this as an essential measure in any payment model for CRC screening using colonoscopy.

Overall, stakeholders identified measurement gaps related to long-term follow-up, patient preferences, behavioral health, and psychosocial support.

6. Feasibility

Each model varies in the level of payment aggregation across providers and in the comprehensiveness of payment, influencing the feasibility of implementation. Table 4 describes the features encompassed by the models and the degree to which each takes on valuable attributes of future payment models.

Table 4: Comparison of Model Approaches by Delivery Structure, Payment Structure, and Comprehensiveness

Domain	Model Features	Bundled Payment Model	Multidisciplinary Care Team	Advanced Mixed Savings
Delivery	Evidence-based pathways use	✓	✓	✓
	Use of quality and performance standards	✓	✓	✓
	High level of provider accountability	✓	✓	✓
	Patient-centered focus		✓	✓
	Care coordination focus	✓	✓	✓
	Structural transformation required		✓	✓
	Encourages careful provision of care	✓	✓	✓
	Low administrative burden			
	Potential inclusion of other specialties/areas		✓	✓
Payment	Shifts current FFS codes into case payments	✓	✓	✓
	Existing pilots in progress		✓	✓
	Potential for continued savings over time	✓	✓	✓
	Case management fee		✓	
	Care coordination/Infrastructure development fee		✓	
	Potential for global payment	✓		✓
	Level of provider risk	Moderate	Minimal	Moderate
Quality	Payment tied to quality and performance	✓		✓
	Standardized Patient-Reported Outcomes			
Comprehensiveness	Level of shift from current system	Moderate	Moderate	High
	Level of comprehensiveness of model	High	Moderate	High

A bundled payment model is the most widely proposed reform measure in both the literature and the stakeholder interviews. Bundled payments can represent a dramatic shift away from traditional FFS, with the potential for providers to face substantial risk for implementing low-cost, quality care. Large-scale, condition-based bundled payments have low feasibility since the cost of care and services included may vary widely between patients. A less comprehensive procedural bundle, such as has been proposed for CRC screening and surveillance colonoscopies, limits variation in services and cost of care. These procedural bundles that limit the scope of services included in the bundle are more feasible. The CRC colonoscopy bundle has widespread support from most stakeholders involved. These limited/partial bundles incentivize coordination and provision of quality care within the services included in the bundle. Nevertheless, it may be harder to define the trigger and end of an episode for gastroenterology bundled payments than with other specialties of care. Additionally, stakeholders noted that bundled payments are still a form of FFS and so have minimal impact on changing incentives outside the bundle.

The multidisciplinary care team, on the other hand, adds additional case-based payments onto an underlying FFS structure. This limits providers risk while incentivizing quality improvement. The smaller shift away from traditional payment structure improves the feasibility of a multidisciplinary care team model. However, the model provides a smaller incentive to address changes in care delivery.

Advanced mixed payment models in gastroenterology are currently in their infancy, and therefore the short-term feasibility of implementation is low. However, advanced mixed payment models represent the most dramatic shift from traditional FFS payment, placing greater risk on providers. Additionally, as

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this model builds off of other care delivery reforms, the advanced mixed payment model could be implemented in a second reform step.

Appendix A: Stakeholders

Organization	Stakeholder Type
Aetna The Physicians Foundation	Payer
Allina Health	Patient Experience, Research and Quality
Apollo Endosurgery	Industry (Device)
Banner Medical Group	Patient Experience, Research and Quality
Blue Cross Blue Shield of Illinois	Payer
Blue Cross Blue Shield of Michigan	Payer
Blue Shield of California	Payer
Borland-Groover Clinic Baptist Medical Center	Care Delivery/Provider
Bristol-Myers Squibb	Industry (Pharma)
Colon Cancer Alliance	Advocacy/Patient Experience
Digestive Health Center of Michigan	Care Delivery/Provider
Digestive Health Services	Payment Policy
Digestive Health Specialties	Payment Policy
Fusion Healthcare Management LLC Downey Regional Medical Center-Hospital Inc. Downey Regional Medical Center (PIH Health Hospital)	Payment Policy
Gastro Health	Provider Organization and Networks
Gastroenterology Associates of North Texas, Fort Worth Surgical Care Affiliates Fort Worth Endoscopy Center Southwest Fort Worth Endoscopy Center Sandlot Solutions	Care Delivery/Provider
Global Colon Cancer Association Colon Cancer Alliance	Advocacy/Patient Experience
Horizon Healthcare Innovations (Horizon Blue Cross Shield of New Jersey)	Payer
Humana	Advocacy/Patient Experience
IBD Support Foundation	Advocacy/Patient Experience
Illinois Gastroenterology Group American Gastroenterology Association	Care Delivery/Provider
Improve Care Now University of Vermont	Provider Organization and Networks
Indiana University Medical Center Indiana University Hospital	Care Delivery/Provider
Johnson & Johnson	Industry (Pharma)
Magna Care American College of Physicians American College of Rheumatology	Provider Organization and Networks
Optimus Healthcare Partners Digestive Health Care Center	Care Delivery/Provider

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Organization	Stakeholder Type
Predictive Health LLC FAIR Health, Inc. University of Arizona College of Medicine	Provider Organization and Networks
San Francisco VA Medical Center University of California, San Francisco	Care Delivery/Provider
Sutter Health	Care Delivery/Provider
Thompson Cancer Survival Center University of Tennessee	Care Delivery/Provider
University of California, San Diego School of Medicine University of California, San Diego Health System	Patient Experience, Research and Quality
University of New Mexico Hospitals University of New Mexico Health Sciences Ashoka	Care Delivery/Provider
University of New Mexico School of Medicine	Advocacy/Patient Experience
University of Wisconsin School of Medicine and Public Health	Patient Experience, Research and Quality
Yale Medical Group	Patient Experience, Research and Quality

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