

Comment From the Editor

Production Pressure in Endoscopy: Balancing Quantity and Quality

“The best colonoscopist achieves effective and safe bowel preparation, and is sufficiently slow, careful, and compulsive during withdrawal to expose and scrutinize the maximum amount of colonic mucosa possible.”¹

Exhausted from a busy day in the endoscopy unit, Dr S, a 52-year-old gastroenterologist, begins the last of his daily scheduled procedures. After overcoming some difficulty intubating a tortuous sigmoid, he quickly reaches the ascending colon where he identifies a 1.2-cm polyp in the cecum. Upon further inspection, he affirms that the polyp is resectable. He hesitates momentarily and then, after reconsidering his decision, decides only to biopsy the lesion and to defer polypectomy until another session.

What factor(s) disinclined this seasoned endoscopist from performing polypectomy during the index examination? Perhaps he lacked adequate experience with advanced methods of polypectomy, or the endoscopy unit lacked the appropriate equipment, or maybe he wanted to confirm the benign nature of the lesion before proceeding to polypectomy. Alternatively, it is possible that work-related fatigue, a busy endoscopy schedule, or some other form of production pressure influenced his decision. Within nearly every work domain, systems that reward only productivity and fail to recognize quality are likely to result in increased output at the expense of safety, quality, and/or cost effectiveness.

Production Pressure: An Insidious Threat to Quality?

Production pressure may be defined as overt or covert pressure on individuals to place production, not quality or safety, as their top priority.² Modern industrial organizations must all address the challenge of establishing an appropriate balance be-

tween quantity and quality. Production pressure has been identified as an important factor affecting fields as diverse as aviation, long-haul trucking, mining, and international shipping. The adaptive behaviors that may evolve in response to production pressures fall into 1 of 3 categories. First, it may encourage personnel to discard standard processes. This would include deviations from routine operating procedures or practice guidelines that are designed to promote quality and safety. Second, production pressure can induce haste, which may increase the likelihood of errors in judgment or performance. And third, it can lead to fatigue—physical or mental—thereby further increasing the chance of an error. The impact of these forces on patient safety and the quality of endoscopy currently is unknown.

The Changing Landscape of Endoscopy in the United States

The volume of endoscopic procedures being performed by many gastroenterologists in the United States has increased dramatically as a result of greater demand for endoscopic services, rising practice expenses, stability in the size of the GI workforce, and shrinking reimbursement. Between 1989 and 2004, the average Medicare reimbursement for colonoscopy fell by >50%, and the average number of procedures performed by an endoscopist increased 2- to 3-fold.³ Strategies to improve endoscopic efficiency have evolved, such as the use of multiple procedure rooms and block scheduling with

procedures booked back to back. With such an emphasis on efficiency and throughput, we must ensure that the quality of endoscopic examinations is not being compromised.

Conceptually, production pressure could adversely affect the quality or safety of endoscopy in a variety of ways. A few examples of this include (1) administering sedation before the establishment of adequate monitoring, (2) bolus dosing rather than careful titration to effect, and (3) insufficient inspection of the colon wall during scope withdrawal. It is important to acknowledge that these behavioral changes may be subconscious, not volitional. An examination of recent studies on the outcomes of screening colonoscopy provides some insight into the potential impact of production pressures on endoscopic practices.

Colonoscopy Outcomes and the Potential Impact of Production Pressure

Millions of colonoscopies, costing several billions of dollars, are being performed each year in the United States. This cost, as well as the associated risk of endoscopic complications, is felt to be justified based on evidence that colonoscopy and the removal of all colon adenomas will reduce the incidence of large bowel cancer by up to 90%. Recent evidence, however, indicates that the impact of colonoscopy on colorectal cancer prevention has been less than anticipated with observed reductions in cancer risk ranging from 0% to 50%.^{4,5} Among the possible reasons for interval cancers is ineffective application of current colonoscopic technology (ie, suboptimal examination technique or withdrawal time). Does work-related pressure influence how much time and attention an endoscopist spends performing an endoscopy? A retrospective review of >2000 outpatient colonoscopies

demonstrated a higher rate of incomplete colonoscopies in the afternoon compared with morning procedures. Even after excluding incomplete colonoscopies owing to poor bowel preparation, incomplete rates were still higher in the afternoon. Six of 8 endoscopists in this study had higher incompleteness rates in the afternoon compared with the morning.⁶ It is tempting to speculate that physician fatigue may be a possible factor contributing to the higher failure rate during afternoon colonoscopies.

Higher adenoma detection rates have also been reported during morning colonoscopies compared with colonoscopies performed later in the day. In a prospective study of 500 colonoscopies, more polyps were found during the first colonoscopy of the day than the last colonoscopy.⁷ Similar results were observed in a retrospective study of 9063 colonoscopies, which found that more adenomas were detected during morning procedures than afternoon procedures, and this difference remained significant in multivariate analysis.⁸

Two population-based studies from Ontario examined factors associated with incomplete colonoscopy and missed colon cancers.^{9,10} They observed striking differences in rates based on the site of service, with higher incomplete rates and missed cancers observed for colonoscopies performed in office settings compared with academic hospitals or community hospitals. Although there are several potential reasons for these findings, it is possible that production pressure and practice demands may adversely affect the quality of office-based colonoscopy.

A community-based study designed to examine interindividual variation in colonoscopy practice observed marked differences in the mean scope withdrawal time and in the rates of adenoma detection among 12 gastroenterologists working within a single practice.¹¹ Those

with a mean withdrawal time of ≥ 6 minutes detected 2–3 times as many adenomas as endoscopists with a mean withdrawal time of < 6 minutes. How do we explain this marked variation in withdrawal time? The endoscopist with the fastest scope withdrawal time (3.1 minutes) performed 50% more colonoscopies annually than the endoscopist with the slowest withdrawal time (16.8 minutes). Once again, it is tempting to speculate that production pressure was at least partially responsible for the difference in scope withdrawal time, and consequently, the difference in adenoma detection rate.

And a retrospective study examining treatment patterns of sessile colon polyps in an academic outpatient practice found that only 66% of all sessile polyps were removed in a single session. Even small polyps (≤ 1 cm in diameter) required a repeat procedure for removal 19.5% of the time.¹² Although the reasons for this were not examined, it is likely that scheduling pressures were at least partially responsible for postponing polypectomy. Although these studies do not prove that increased output leads to substandard performance during colonoscopy, they do raise an important issue that requires further investigation to understand fully the impact of productivity on the quality of services.

Minimizing the Impact of Production Pressure on Endoscopic Outcomes

One solution to this problem is to provide endoscopists with sufficient time to perform a thorough examination with careful, meticulous inspection of the mucosa during scope withdrawal and, when necessary, biopsy or polypectomy. In smaller endoscopy units serving only a few endoscopists, it is usually possible to implement a standardized schedule that allocates identical blocks of time per procedure type for

all physicians. In larger units, however, a flexible scheduling system—one that varies the allotted time per procedure based on the time requirements of individual endoscopists—is often more time efficient. For instance, some endoscopists may be comfortable scheduling colonoscopies every 30 minutes, whereas others may prefer 45 or 60 minutes.

Endoscopists should document the quality of their colonoscopies and compare their results to national benchmarks. Among quality indicators that have been proposed or endorsed by the GI professional societies are (1) appropriate intervals for screening and surveillance, (2) documentation of informed consent, ASA physical status class, airway assessment, and preprocedure time out, and (3) cecal intubation rate. In addition to procedure-specific criteria, sedation-specific measures that reflect both patient safety and satisfaction should be developed and assessed. The measurement and benchmarking of these indicators should be accompanied by a performance improvement program to implement strategies designed to strengthen areas of weakness.^{13–15}

Allocating an adequate amount of time per procedure and measuring outcomes against benchmarks will not be sufficient to improve the quality of endoscopy, however, if it is not accompanied by a realignment of our current compensation system so that physicians are rewarded appropriately for quality as well as quantity. Interest in the idea of tying reimbursement to quality standards, described as value-based purchasing, is growing.¹⁶ In such a system, health care purchasers attempt to measure and improve the quality of care that is received by rewarding physicians who reach or exceed threshold levels of performance. Pay for performance is among the emerging programs in this area. In contrast with a traditional health care system that compensates the provider based on the

number of patient encounters, without any attention to the quality of care being provided, pay-for-performance programs provide differential rewards that are based on the efficiency and the quality of care provided. Most of the early initiatives to pay physicians based on performance were narrowly focused on readily quantified indicators and provided nominal incentive payments. True value-based purchasing, with meaningful financial incentives, might reward those endoscopists whose adenoma detection rate is higher than average, or those performing advanced methods of polypectomy, or those with a superior safety record. It will take time and effort to demonstrate convincingly that providing financial incentives for quality care can also be cost effective. Nonetheless, we must continue to support these efforts. In the meantime, however, although value-based purchasing has not yet arrived in most US markets, we should begin to measure and document the quality of our endoscopic services to identify and improve areas of relative weakness. Hopefully, the day will soon arrive when payers reward quality, not just quantity.

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