

Preventing physician quality of life from impinging on patient quality of care: Weakening the weekend effect

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Received: 2007-06-07 Accepted: 2007-06-20

Abstract

Imprecise or delayed care can reflect many factors, including straightforward difficulties in physician judgment and false negative tests. However, the movement toward decreasing physician work hours also leads to delays in care caused by inadequate staffing or inadequate communication between staffing, which must be addressed if quality of care is to remain high. The demonstration of delays in the management of anastomotic leaks over weekends or in association with false positive radiologic studies exemplifies this challenge.

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Key words: Anastomosis; Communication; Contrast; Delay; Hand-off; Intestine; Staffing; Weekend

Basson MD. Preventing physician quality of life from impinging on patient quality of care: Weakening the weekend effect. *World J Gastroenterol* 2007; 13(27): 3667-3670

<http://www.wjgnet.com/1007-9327/13/3667.asp>

See original article in *World J Gastroenterol* 2007; 13(27): 3721-3725

INTRODUCTION

Doeksen and colleagues describe an anastomotic leak rate of 12.5% in a mixed series of 289 patients with handsewn or stapled colorectal anastomoses in a variety of positions^[1]. Based upon a series of classical, but non-specific, warning signs, they describe onset of warning signs at a median of 4 d after surgery, and a median "delay" of 3.5 d between the first sign and eventual reoperation.

They further demonstrated statistically significant increases in delay in the face of a false-negative radiologic procedure or an intervening weekend. Although Doeksen and colleagues were not able to define an impact of such delay on the patients' subsequent hospital course or mortality, their numbers are too low to expect statistical significance for such analyses, as they themselves acknowledge.

The finding of a relatively high 12.5% anastomotic leak rate seems surprising, but is difficult to interpret given the mixed nature of the series. Recently reported anastomotic leak rates range widely, varying with anatomic position, technique, and the clinical condition of the patient. It should be pointed out that the leaks reported here presumably represent clinically significant leaks. One would expect that routine surveillance of difficult anastomoses for research purposes would yield a higher number, including some leaks that are self-sealing and never become clinically apparent^[2].

The reported median 4 d delay between the first sign of leak and reoperation is also of concern, but may be attributed to the relatively non-specific nature of some of the signs of leakage studied. A postoperative fever may certainly be the first sign of a leak, for instance, but may also commonly reflect a urinary tract, pulmonary, or wound infection, phlebitis, or even atelectasis. Similarly broad differential diagnoses could be generated for the authors' other signs of anastomotic leakage, including tachycardia, leukocytosis, ileus, and delayed gastric emptying. It would have been interesting in this regard to know the frequency of these putative signs of anastomotic leakage among those patients whose anastomoses did not leak. The lack of specificity of these signs does not reflect adversely on the study design, but rather suggests the difficulty of making the diagnosis of anastomotic leakage at the present time. Notably, the mean delay in operation after the development of peritoneal signs appears to have been only 0.8 d in this series, more consistent with what one would seek in clinical practice, although still longer than one might like.

It is interesting to note that time to definitive management in this series was defined as time to reoperation. In the future, it is possible that an increasing number of these patients may be managed by endoscopic means, including stenting, plugging, and/or endoluminal repair^[3-14]. However, until experience with such techniques evolves further and indications and outcomes are clarified, most surgeons will still prefer the transabdominal approach with which they have the most experience. Endoscopic repair

of acute tears in healthy tissue after colonoscopy may also prove much easier than endoscopic closure or repair at an inflamed anastomosis that has been leaking for several days.

Difficulty in identifying anastomotic leaks from clinical presentation has led some surgeons to pursue radiologic studies, whether by fluorography or CT scanning, with contrast administered by mouth or by rectum. In this series, the authors used such studies in 21 patients with a startlingly high 43% apparent false negative rate. Since the series has been censored to only include patients who actually had anastomotic leaks, the actual false negative rate may be somewhat lower if there were also false positive radiologic examinations, and we cannot discern the false positive rate from this report. The series includes a mixture of various radiologic studies. There is considerable controversy over whether oral or rectal contrast with fluorography, or CT scans are preferable for the detection of anastomotic leaks, and this is likely to vary with local expertise and the site of the anastomosis^[15-17].

The authors describe a striking mean 4.6 d difference in time to operation between those patients who had a false negative radiologic study and those who had a true positive study or none at all. This number may also be difficult to interpret. Since the radiologic studies were not performed on protocol, they were most likely ordered in those patients in whom the diagnosis was difficult. A positive radiologic finding would presumably have accelerated the decision to operate on such patients, while a false negative finding would have been expected to delay it. Thus, while it would be satisfying to argue for the primacy of clinical acumen by referring to the apparent delay in management of patients with false negative radiologic testing, it would be erroneous to do so without knowing how long it would have taken to operate upon these presumably more difficult patients without any radiologic testing and without considering the potentially beneficial impact of true positive radiologic testing in this setting. In addition, the utility of radiologic testing in difficult patients may be considerably higher in institutions in which the false negative rate is lower than 43%.

A more striking finding is the apparent 4 d increase in delay in operating upon patients whose postoperative course spanned a weekend. The impact of weekends on health care has previously been examined in other settings. For instance, difficulties in weekend coverage have been implicated as a primary cause of delay in obtaining accurate radiologic interpretations^[18]. Others have pointed to weekend hospital staffing by cross covering physicians as contributing to lack of a plan of management and impairment for complex decision-making such as code-status decisions, and have proposed a standard form to improve communication and influence the quality of inpatient care^[19].

The impact of a "weekend effect" upon clinical care has also been demonstrated. For instance, hospital discharges were significantly lower on Sundays and Mondays in a British study, suggesting that management was less efficient over the weekend, although it remained unclear to what extent this prolongation in care reflected impaired decision-making and to what extent it reflected

decreased availability of required hospital services during the weekend^[20]. A 1400 bed hospital in Singapore has also reported prolongation of hospital stay for patients admitted on weekends, holidays, or after hours^[21], while a similar Spanish study also documented an association between increased days of hospitalization that did not meet utilization criteria and weekends^[22].

Epidemiologic evidence suggests decreased compliance with guidelines for the management of acute cerebrovascular accidents over the weekend in the United Kingdom^[23]. In another particularly telling study, patients admitted to the hospital over the weekend with acute myocardial infarction in the state of New Jersey in the United States were not demographically different from their weekday counterparts. However, the weekend patients were statistically significantly less likely to have invasive procedures performed over the weekend and had a significantly higher mortality rate. The effect of the weekend stay on mortality disappeared in multivariate analysis adjusted for utilization of invasive procedures, suggesting that weekend patients were more likely to die because they were less likely to have such invasive procedures. Whether this reflected the availability of staff to do these procedures or impaired decision-making by physicians not ordering the procedures could not be discerned from this epidemiologic study^[24].

A University of Maryland study suggested similar increases in mortality for all patients admitted through emergency rooms on weekends compared with patients admitted on weekdays, with logistic regression suggesting that this increase in mortality correlated with longer delays between presentation to the emergency room and admission to an inpatient unit, where presumably more aggressive treatment might be administered^[25]. Similar observations have been made for 48 h mortality after admission to the hospital on weekends in comparison to patients admitted on weekdays in Spain^[26].

The weekend effect may not be universal, however. Several studies have failed to define a weekend effect. At the most trivial, hospital diet tray assembly appears equally accurate during the week as on weekends^[27]. This may reflect the relative simplicity of the task, as well as stability of staffing. More importantly, there was no association between hospital mortality and the day of ICU admission in a study from Peking Union Medical College^[28]. Similar studies on mortality after ICU admission from Saudi Arabia^[29], of hospital mortality after Emergency Room admission from The Royal Infirmary of Edinburgh^[30], and from the University of Michigan on mortality after trauma admissions^[31] have all reported no weekend effects. In each case, authors attributed their success to consistent dedicated staffing of the appropriate hospital units.

Importantly, ICU care, emergency room admissions, and trauma management are all acute events that may lend themselves to quantization into discrete episodes of care by fresh providers. The postoperative care of a convalescing surgical patient and detection of postoperative complications may require more attention to continuity of care. Indeed, it is incontrovertible that maintaining staffing without inducing undue fatigue requires the hand-off of responsibility to new health care

providers. The recent movement in the United States to limit the work-hours of trainees in order to minimize fatigue-induced errors has led to increasing concern over errors induced by inadequate communication of patient details. A survey of United States trainees specifically identified communication during hand-offs as a target for preventing errors^[32]. Various groups have proposed mechanisms to systematize such hand-offs to make sure that information is actually passed^[33-37], and at least one study suggests faster hand-offs, more full information hand-off, and increased provider satisfaction using such a system^[38]. However, no study has demonstrated any improvement in patient outcomes with these systems, and this remains an important target for future study. In the particular case of the postoperative patient with a potential anastomotic leak, much of the prompt suspicion and detection of anastomotic leakage rests less on the factual information of yesterday's temperature and leukocyte count than on the less tangible perception of the patient's overall condition, attitude, and exam, and changes thereof. Such information may be less easy to transmit than quantitative data. Moreover, several authors^[19,37,39-41] have alluded to the potential importance of active engagement by the cross-covering caretaker in pushing forward with care plans, rather than maintaining the status quo through the night or weekend coverage. Such professional engagement is likely to be at least as important in the management of the postoperative patient.

The study by Doeksen and colleagues may be an important harbinger of things to come in the surgical arena, as surgeons' work-hours are steadily reduced around the world to minimize the (perceived or real) impact of surgeon fatigue. If we are to preserve our quality of care, it will be important to not only maintain adequate numbers of equivalently trained staff present over the weekend, but also to effectively transfer both quantitative and qualitative data, impressions, and plans, as well as the dedication to the care of our patients which is the hallmark of our profession. The effective and efficient management of this transfer may be the greatest challenge posed by work-hour restrictions, so that attention to physician quality of life does not impair that of our patients.

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