

## Special topics in procedural sedation: clinical challenges and psychomotor recovery

Akira Horiuchi, MD,<sup>1</sup> David Y. Graham, MD<sup>2</sup>

Komagane, Japan

GI endoscopy is often performed by using procedural sedation to reduce patient anxiety, discomfort, and memory of what is at best an unpleasant experience. When the patient is comfortable, nurses can focus on patient safety while the endoscopist focuses on the technical details of the procedure, which together likely improve the overall outcome. With sedation, the procedure also is associated with greater patient and doctor satisfaction and with greater patient compliance with endoscopic screening programs. However, sedation is not without costs for the endoscopy unit and for society. Societal costs in part relate to the psychomotor effects of sedation, which include impaired physical and mental abilities (eg, to drive a car or make important decisions). These impairments often require that the patient be accompanied and also take time off from work until the results of sedation have abated. The duration of impairment is a function of the agents used for sedation as well as the underlying condition of the patient. The choice of agent for procedural sedation involves trade-offs in terms of effectiveness, safety, and monitoring during the procedure and during recovery time. An ideal agent would provide good sedation, have a good margin of safety, and be followed by rapid psychomotor recovery. Here, we review current knowledge concerning psychomotor recovery after sedated GI endoscopy and make recommendations for modern sedation. Among the currently available agents, propofol comes closest to being ideal.

The increased use of GI endoscopy in the diagnosis and treatment of benign and malignant GI diseases has resulted in an ever-increasing number of endoscopic procedures being performed. The majority of procedures are done with moderate sedation. Moderate sedation is associated with an increased willingness of patients to undergo GI

endoscopic procedures and with patient satisfaction with the procedure. However, sedation carries costs and risks, and the current requirements that the patient be accompanied and be prohibited from driving or returning to work after the procedure likely represent a barrier to endoscopy, especially in relation to colonoscopic screening for colorectal cancer prevention.<sup>1</sup> For example, a study of the time burden associated with screening and surveillance colonoscopy by using sedation with the combination of midazolam and fentanyl found that the time required for full recovery and return to normal activity was 17.7 hours.<sup>2</sup> Importantly, the time after colonoscopy before resuming normal activities averaged 15.8 hours, and 57% of patients lost at least 1 day of work.

After the procedure, the individual may feel well and often believe that they have no functional impairments. In contrast, studies of psychomotor effects show that the effects can extend for 3 to 12 hours from the end of the procedure until clinical recovery.<sup>3-5</sup> Significant economic advantages would accrue if the time of impairment could be shortened or eliminated so that healthy individuals could drive home unaided or return to work soon after their sedated endoscopies. Here, we discuss the impediments to a policy of routine discharge to normal activity after sedated endoscopy. Among the considerations are the age of the patient and possible metabolic impairments such as the presence of chronic liver disease. Although deep sedation or even general anesthesia may be preferred for therapeutic procedures, screening and surveillance endoscopy such as routine EGD, colonoscopy including polypectomy, and EUS are relatively brief and typically uncomplicated routine procedures that are especially amenable to efforts to promote early discharge and return to normal duties. The aim of this review is to provide the reader with an overview of the current knowledge concerning assessing and enhancing psychomotor recovery related to sedated GI endoscopy.

### PROCEDURAL SEDATION AND PSYCHOMOTOR RECOVERY

Until recently, most studies of procedural sedation have focused on comparing agents in terms of efficacy and

*DISCLOSURE: D. Graham is supported in part by the Office of Research and Development Medical Research Service Department of Veterans Affairs, Public Health Service grants DK062813 and DK56338, which funds the Texas Medical Center Digestive Diseases Center. The contents are solely the responsibility of the authors and do not necessarily represent the official views of the U.S. Department of Veterans Affairs or the National Institutes of Health. All other authors disclosed no financial relationships relevant to this article.*

Copyright © 2014 by the American Society for Gastrointestinal Endoscopy  
0016-5107/\$36.00

<http://dx.doi.org/10.1016/j.gie.2014.04.063>

adverse events. The introduction of screening colonoscopy as part of colon cancer detection and prevention programs has refocused interests to include the societal costs associated with the requirement that the patient be accompanied as well as a delay before the patients can safely return to work or make important decisions. Typically, after an endoscopic procedure the patients are transferred to a recovery room for monitoring of vital signs, consciousness, psychomotor functions such as level of consciousness (fully awake and responding to questions from the recovery room nurse), and ability to walk alone without instability. After recovery is adequate to permit patients to leave the endoscopy unit, the patients are cautioned to refrain from driving or the unescorted use of public transport for 24 hours. These recommendations are based on the fact that the rate of psychomotor recovery depends on the drugs used (eg, duration, metabolism, half-life) and the physical condition of the individual.<sup>3-5</sup>

In addition, the financial balance of sedation depends on the drugs used. Even if sedation is safe, it requires an extra nurse and a team educated for monitoring, resulting in higher costs. Generally, the social costs of conventional sedation with the combination of midazolam and fentanyl, such as increased recovery time, inability to drive home or return to work, and need for a companion may be higher than those of propofol sedation. On the other hand, propofol sedation requires increased monitoring and manpower costs of anesthesia providers where required by law.

### Legal issues related to psychomotor recovery from sedation

Important medical and legal issues regarding sedation have been raised in recent years. The medicolegal issues include informed consent regarding the drugs used and their duration of effect, the difficulties in assessing withdrawal of consent in a sedated patient, and the type of sedation monitoring required. Recently, there has been considerable controversy about the increasing use of propofol sedation by gastroenterologists.<sup>6,7</sup>

The characteristics of the agents commonly used for procedural sedation in GI endoscopy are shown in [Table 1](#). In European countries and Australia, driving after sedated endoscopy is prohibited by traffic regulations ([Table 2](#)). Various professional associations also recommend that driving a vehicle or unescorted use of public transportation be prohibited for 24 hours.<sup>3,4</sup>

Opioid users may be at an increased risk of traffic accidents; however, the experimental evidence is limited in relation to the effects of opioid use and driving. There is, however, epidemiologic evidence among chronic users and in experimental studies showing that benzodiazepine use is associated with a significant increase in the risk of traffic accidents.<sup>8</sup> Nonetheless, the current recommendations of various professional associations do not appear to be strongly evidence-based with regard to the length

of time in which driving and use of public transportation should be prohibited. A recent German consensus article based on the pharmacologic action of sedative agents recommended that these guidelines be reviewed in terms of evidence of impairment to provide better guidance to patients and endoscopists.<sup>3</sup>

### Measuring psychomotor recovery

The Aldrete score<sup>9</sup> is a measure of physiologic recovery after anesthesia and includes gauging consciousness, activity, respiration, and blood pressure. Development of this scoring system resulted in formalization of criteria for discharge after anesthesia.<sup>9</sup> Since that time, a number of psychomotor tests have been evaluated to assess discharge readiness after anesthesia.<sup>10</sup> In the late 1960s, a modified Gestalt test (the Trieger dot test) was proposed to assess recovery. In this test, patients demonstrate recovery by connecting a series of dots on paper to form a pattern. The more dots the patient misses, the lower their recovery score.<sup>10</sup> Other psychomotor tests used include reaction time tests, driving simulator tests, and a Maddox wing test, which involves a device to test extraocular balance.<sup>10</sup>

Willey et al<sup>5</sup> conducted the first assessment of psychomotor recovery in patients undergoing endoscopy. They used a battery of psychomotor function tests in participants undergoing elective outpatient upper endoscopy with meperidine and midazolam sedation. By using the Aldrete score<sup>9</sup> to judge the threshold for discharge, the authors found that those judged ready for discharge had achieved an average psychomotor recovery that was 86.5% of baseline. Among the tests they used, the letter cancellation and multiple-choice reaction time tests exhibited the highest sensitivity in detecting decreased psychomotor function. Their report focused attention on the issue of psychomotor recovery after sedation for endoscopic procedures.

### Effect of type of sedation on psychomotor recovery

Currently, there is no standard sedation regimen, and even within the same institution the choice of sedation may depend on endoscopist preference and the procedure being performed. Procedural sedation by using midazolam and an opioid is commonly used for screening endoscopy. Midazolam is often considered the benzodiazepine of choice because of its shorter duration of action and better pharmacokinetic profile compared with diazepam ([Table 1](#)). Among opioids, pethidine and fentanyl are the most popular, but they have relatively longer durations of action. Endoscopist-directed propofol sedation is increasingly being used in many countries. Of interest, propofol sedation has a lower mortality rate than that reported in published data on endoscopist-delivered benzodiazepines and opioids, but randomized, controlled trials are lacking.<sup>11</sup> One advantage of propofol alone is its favorable pharmacokinetic profile with both rapid onset and

Download English Version:

<https://daneshyari.com/en/article/3303205>

Download Persian Version:

<https://daneshyari.com/article/3303205>

[Daneshyari.com](https://daneshyari.com)