

# The Role of the Endoscopy Nurse or Assistant in Endoscopic Sedation

Maya Voinarovska<sup>a</sup>, Lawrence B. Cohen, MD<sup>a,b,\*</sup>

## KEYWORDS

• ■ ■ ■ ■

During endoscopy, a number of personnel are used to assist the endoscopist with sedation-related tasks and procedure-related tasks. Endoscopy units differ widely both in the number of persons used and in the licensure of these persons.<sup>†</sup> Because procedure-related tasks are often minimal during endoscopy, it is common for one individual to perform both patient monitoring and simple procedure-related tasks, such as assisting with routine biopsy. The sedation-related responsibilities assigned to the endoscopy nurse<sup>‡</sup> within an endoscopy unit vary from one site to another, but may include preprocedure assessment, preparation and administration of medications, patient monitoring, post-procedure assessment, and discharge planning. Nurses should possess the education and training appropriate for the tasks assigned. Furthermore, successful performance of this role requires a spirit of cooperation and mutual respect between the endoscopist and the endoscopy assistant. This article reviews the role of the endoscopy nurse in the endoscopy unit with particular emphasis on issues related to sedation.

## GENERAL CONSIDERATIONS

The safe performance of endoscopic sedation requires a suitable environment. The endoscopy room should be large enough to accommodate a stretcher, personnel,

<sup>a</sup> New York Gastroenterology Associates, 311 East 79th Street, New York, NY 10021, USA

<sup>b</sup> Department of Medicine, The Mount Sinai School of Medicine

\* Corresponding address.

*E-mail address:* lawrence.cohen@nyga.md (L.B. Cohen).

<sup>†</sup> In many units, anesthesiologists or Certified Registered Nurse Anesthetists are used to provide sedation. However, this article discusses the circumstance in which sedation is given independent of an anesthesiologist.

<sup>‡</sup> In this article, the term "endoscopy nurse" will be used to describe the individual who performs primary patient monitoring during the procedure. This term may include registered nurses, endoscopy assistants, or licensed practical nurses.

45 endoscopy equipment, monitoring devices, and emergency resuscitative equipment.  
46 Furthermore, the room should have a reliable source of oxygen (including a spare tank  
47 and regulator when using oxygen cylinders), dual suction machines (providing suction  
48 capability simultaneously to the endoscope and patient), and a communication  
49 system for requesting assistance without having to leave the room.<sup>1</sup>

50 All nurses and technicians working in the endoscopy suite must receive task-  
51 specific training based on their responsibilities. In the authors' office-based endos-  
52 copy practice, endoscopy nurses and assistants undergo a period of training before  
53 they are permitted to work independently as members of the sedation team. Training  
54 takes place for a period of 4 to 6 weeks, depending on the individual's background  
55 and experience. The training program consists of didactic and practical components.  
56 During the first 2 weeks of training, a trainee is required to observe a minimum of 40 en-  
57 doscopic procedures and complete a series of didactic sessions on topics that  
58 include the continuum of sedation, pharmacology of sedation drugs and antagonists,  
59 patient monitoring, emergency drugs, informed consent, and the preprocedure  
60 assessment, post-procedure monitoring and discharge procedures. The trainee is  
61 mentored throughout this period of practical training by a senior endoscopy nurse.  
62 During weeks 3 to 6 of training, the trainee is permitted to assist with sedation under  
63 direct one-on-one supervision. On completion of training, trainees are required to pass  
64 a sedation qualifying examination. All nurse and endoscopy assistants authorized to  
65 assist with sedation must possess the ability to:

- 66 1. Understand the indications and contraindications for moderate sedation.
- 67 2. Monitor patients undergoing moderate sedation, recognize and diagnose compli-  
68 cations, and initiate interventions as directed by guidelines or the responsible  
69 physician.
- 70 3. Identify all medications used for sedation and reversal, their pharmacology and  
71 potential side effects, and administration guidelines.
- 72 4. Understand principles of respiratory physiology, oxygen delivery, airway assess-  
73 ment, and knowledge of airway equipment required for positive pressure  
74 ventilation.
- 75 5. Assess patients before and after sedation, including the recovery phase, and  
76 implement appropriate discharge criteria.
- 77 6. Acquire certification in basic cardiac life support. Endoscopy assistants are  
78 encouraged to complete training and acquire certification in advanced cardiac  
79 life support.
- 80

81 Most large endoscopy centers and hospital-based programs have developed their  
82 own guidelines and programs designed to train and credential endoscopy personnel.  
83 However, this is often not practical for smaller units. Alternative sources of sedation  
84 training include several regional and national programs sponsored by major profes-  
85 sional societies in gastroenterology, and commercial courses or training experiences  
86 that are available either through Web-based learning or in person.

#### 87 88 **PREPROCEDURE ASSESSMENT** 89

90 The preprocedure assessment should establish proper patient identification using  
91 data such as patient's name, date of birth, and unique patient identification number.  
92 An abbreviated medical history should include (1) active medical conditions (including  
93 history of cardiac pacemaker or implanted cardiac defibrillator), (2) current medica-  
94 tions (particularly those that could impact the conduct of the endoscopic procedure  
95 and time of last dose), (3) allergies to medications, foods, and/or latex, (4) fasting

[Q1]

96 status, (5) weight, (6) level of comfort, (7) history of alcohol, tobacco, or substance  
97 abuse, (8) prior endoscopic and sedation history (was the patient difficult-to-sedate),  
98 (9) response to bowel preparation (for patients undergoing colonoscopy), and  
99 (10) presence of physical appliances (glasses, dentures, hearing aids, and others).  
100 Women of childbearing age must be queried about pregnancy. Depending on state  
101 regulations and accreditation agency standards, some centers accept a “yes” or  
102 “no” response as sufficient proof, whereas others require pregnancy testing.

103 All patients undergoing endoscopy require a focused physical examination. It is  
104 usually the responsibility of the physician to perform an examination, although the  
105 nurse assistant is responsible for confirming that the evaluation has been completed  
106 before the endoscopic procedure. The essential elements of an examination include  
107 vital signs, airway, neck, lungs, and heart.

### 108 109 **INFORMED CONSENT**

110 The process of informed consent represents a discussion of treatment choices, includ-  
111 ing a right to refuse treatment. In general, experts have recommended that the endo-  
112 scopist obtain the informed consent, but in many endoscopy units the consent is  
113 performed by the endoscopy nurse. This discussion should convey as much informa-  
114 tion as a reasonable patient would wish to know, and involve a dialog between patient  
115 and provider.<sup>2,3</sup> With regard to sedation, the essential elements of the dialog must  
116 include a description of the proposed sedation, its risks and benefits, and alternatives.  
117 When moderate sedation is targeted, the patient should be informed that some discom-  
118 fort may be experienced during the procedure despite the administration of sedation.

119 A patient with capacity is entitled to withdraw consent at any time, including during the  
120 performance of a procedure, and the endoscopy nurse may be involved in this process.  
121 When a patient has been sedated, it is reasonable to expect that the patient’s capacity to  
122 make an informed decision may be impaired. What should be done if, during the proce-  
123 dure, a patient withdraws the previously given consent? Ward and colleagues<sup>4</sup> studied  
124 the views of gastroenterologists and patients on this subject by mailing questionnaires  
125 to 100 members of the British Society of Gastroenterology and to 100 patients who had  
126 undergone colonoscopy with intravenous (IV) sedation. Only 1 of the 59 eligible consul-  
127 tants who replied said they would stop the procedure after a single request, but 51 out of  
128 the remaining 58 said they would stop if repeatedly asked to do so. Of the remaining,  
129 7 who said they would complete the procedure, 1, nevertheless, believed that a sedated  
130 patient is capable of making a rational decision. Of the 51 patients who responded to the  
131 questionnaire, 25 thought that the procedure should be stopped immediately following  
132 a request, whereas 26 felt that the doctor should continue.

133 Assessing the capacity of a patient to withdraw consent during a procedure can be  
134 difficult. Therefore, the decision to stop the procedure is a matter of judgment. Often  
135 this judgment is made jointly by the endoscopist and the endoscopy nurse. In some  
136 instances, it is clear that the patient is delirious, confused, and without the capacity  
137 to make an informed decision to withdraw the consent. When a patient proclaims  
138 a desire to have the procedure stopped, it is generally advisable to interrupt the pro-  
139 cedure, assess the patient’s condition (are there valid reasons for the patient’s objec-  
140 tions?), try to engage the patient in dialog to ascertain the problem, and then make  
141 a judgment whether it is advisable to proceed with the examination.

### 142 143 **SEDATION AND MONITORING**

144 Sedation is a drug-induced alteration in the level of consciousness. The endoscopy  
145 nurse bears primary responsibility for monitoring the patient’s depth of sedation during  
146

[Q8] the procedure. The American Society of Anesthesiologists (ASA) defines four levels of sedation that occur along a continuum, ranging from minimal sedation to general anesthesia. The endoscopy nurse must be familiar with these definitions.<sup>5</sup> *Minimal sedation*, or anxiolysis, defines a state in which the patient responds normally to verbal commands. Airway, spontaneous ventilation, and cardiovascular function are unaffected. *Moderate sedation*, also referred to as conscious sedation, is characterized by purposeful responsiveness to verbal or light tactile stimulus. In other words, the patient responds to “shake or shout.” The purposeful response may be verbal (respond to name) or physical (“thumbs up”). Airway and spontaneous ventilation are unaffected and cardiovascular function is usually preserved. *Deep sedation* is defined by unresponsiveness to verbal or light tactile stimuli, but responsiveness to painful stimulus is preserved. Airway intervention may be necessary and spontaneous ventilation may be inadequate. *General anesthesia* is a deep hypnotic state in which a patient fails to respond to painful stimuli. Airway intervention is often necessary and spontaneous ventilation is frequently inadequate. Cardiovascular function may be impaired. A patient’s level of sedation may change during an examination, depending on the degree of stimulation. For example, a patient may be moderately sedated during intubation of the colon but become deeply sedated during scope withdrawal, when the bowel is straight and there is minimal painful stimulation. Consequently, an individual administering sedation should be prepared to rescue a subject from a level of sedation at least one stage deeper than that intended. For example, a physician targeting moderate sedation must be able to rescue a patient who is deeply sedated.

Several scales have been developed to assess a patient’s depth of sedation, and the endoscopy nurse should be familiar with the sedation scale used at his/her center. The Modified Observer’s Assessment of Alertness/Sedation (MOAA/S) scale is a validated instrument that is clinically useful for assessing a patient’s level of sedation during endoscopy.<sup>6</sup> The scale grades patients from 5 (fully alert) to 0 (general anesthesia) based on their level of responsiveness (**Table 1**). An MOAA/S level of 4, 3, or 2 is generally considered to be within the range of moderate sedation. In the author’s practice, the endoscopy nurse assesses the patient’s level of sedation using the MOAA/S every 2 minutes. Patient’s considered to be moderately sedated (MOAA/S 2–4) may receive additional sedation if otherwise indicated. Conversely, a sedation grade of 1 is a contraindication to further sedation. With regular use, it becomes habit to perform a quick MOAA/S rating before administering each dose of sedation.

Nursing staff have the responsibility to be attentive to the needs of the patient during the procedure and to monitor his or her comfort. The nurse should alert the endoscopist at once if the patient appears to be experiencing an unusual amount of discomfort or the physiologic parameters change. A nurse or assistant should be present in the

**Table 1**  
Modified Observer’s Assessment of Alertness/Sedation (MOAA/S) scale

Responsiveness	Score
Agitated	6
Responds readily to name spoken in normal tone (“alert”)	5
Lethargic response to name spoken in normal tone	4
Responds only after name is called loudly or repeatedly	3
Responds only after mild prodding or shaking	2
Does not respond to mild prodding or shaking	1
Does not respond to deep stimulus	0

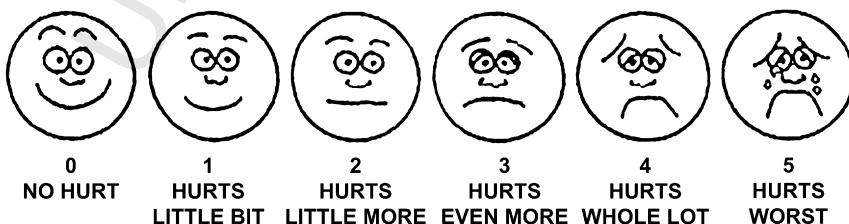
198 endoscopy room throughout the procedure. At no time should a sedated patient be  
 199 left unattended. During moderate sedation, the endoscopy assistant may also perform  
 200 brief, interruptible tasks (such as tissue biopsy or uncomplicated polypectomy). When  
 201 deep sedation is the intended target, a dedicated sedation nurse should be desig-  
 202 nated whose responsibility is limited to patient monitoring and drug administration.<sup>5</sup>

203 Patient monitoring includes both visual assessment and the use of devices to mea-  
 204 sure physiologic parameters. The assistant should be watchful for subtle indications of  
 205 distress, such as pallor, sweating, stridor, or confusion because these physical  
 206 changes may be visible before the development of physiologic changes. Similarly,  
 207 a patient in discomfort may grimace, moan, or curl his or her toes before expressing  
 208 verbally that he or she is uncomfortable. Patients undergoing gastrointestinal endos-  
 209 copy should be assessed for pain periodically throughout the procedure. The assess-  
 210 ment of pain in a sedated patient may be quite difficult due to an inability to report pain,  
 211 and sometimes requires a nurse to interpret subtle physical signs. One method of pain  
 212 assessment is the Wong-Baker FACES Pain Rating Scale that rates pain on a 0 to  
 213 5 scale (Fig. 1).

214 Guidelines for patient monitoring during endoscopic procedures have been devel-  
 215 oped by several professional medical societies.<sup>1,5</sup> Before sedating a patient, the nurse  
 216 should confirm that all monitoring and resuscitation equipment is functional. Baseline  
 217 physiologic values of heart rate, arterial oxygen saturation (SaO<sub>2</sub>), and blood pressure  
 218 should be recorded and monitored throughout an examination. The nurse should also  
 219 be able to trouble-shoot and resolve common causes of device malfunction. Because  
 220 the endoscopist's central focus of attention is the endoscopy monitor, the nurse is  
 221 responsible for recognizing changes in physiologic parameters. Therefore, the nurse  
 222 must be comfortable with interpreting data from the monitoring devices. The utility  
 223 of continuous electrocardiographic monitoring in a healthy patient undergoing an elec-  
 224 tive procedure with moderate sedation remains uncertain. It is advisable to monitor  
 225 electrocardiographic activity in patients with a history of cardiovascular disease or  
 226 dysrhythmia. A more detailed discussion of physiologic monitoring is presented in  
 [Q9] Chapter 3.

### 227 ROLE OF A NURSE IN GASTROENTEROLOGIST-DIRECTED PROPOFOL ADMINISTRATION

228 Historically, nurses have assisted with the administration of sedation medications  
 229 and patient monitoring during endoscopic procedures. In many endoscopy units  
 230 throughout the United States, nurses have considerable experience administering  
 231 benzodiazepines, opioids, diphenhydramine, and droperidol under the guidance of  
 232 endoscopists. Propofol is a hypnotic agent with little or no analgesic effect. The  
 233 benefits of propofol during endoscopy include its rapid onset of action, clinical effec-  
 234 tiveness in producing sedation and amnesia, ease of titration, and quick, clear-headed  
 235 recovery. Propofol improves patient and physician satisfaction with the endoscopic  
 236 recovery. Propofol improves patient and physician satisfaction with the endoscopic  
 237



243  
244  
245  
246  
247 Fig. 1. Wong-Baker FACES Pain Rating Scale.

248 experience. The administration of propofol by a registered nurse working under the  
249 supervision of a gastroenterologist, whether targeted for moderate or deep sedation,  
250 remains highly controversial. This practice is supported by the American Gastroenter-  
251 ological Association, the American College of Gastroenterology, and the American  
252 Society for Gastrointestinal Endoscopy.<sup>7</sup> The Society of Gastroenterology Nurses  
253 and Associates does not specifically address the issue of nurses administering propo-  
254 fol in its position statements; but, it indicates that “registered nurses ... can administer  
255 and maintain moderate sedation and analgesia by the order of a physician.” Regard-  
256 ing deep sedation, the Society of Gastroenterology Nurses and Associates recom-  
257 mends that “registered nurses and physicians involved in the administration of deep  
258 sedation have additional training with emphasis on advanced airway management  
259 and treatment of cardiorespiratory complications.”<sup>8</sup> Because nurse-administered pro-  
260 pofol remains controversial, the nurse and the physicians must decide which policy is  
261 most appropriate and acceptable for their practice. The regulations governing the ad-  
262 ministration of propofol by registered nurses vary from state to state and from institu-  
263 tion to institution, and nurses and physicians must be aware of applicable regulations  
264 regarding propofol administration.

265 From the endoscopy nursing standpoint, the administration of propofol differs in  
266 several important respects from the administration of benzodiazepines and opioids.  
267 Propofol is formulated in a lipid-based emulsion that contains soybean oil, egg lecithin,  
268 and glycerol, and it is supplied in 20-, 50-, and 100-mL vials. Sepsis and bacterial  
269 infection were complications with earlier formulations of propofol. Whereas newer for-  
270 mulations contain either ethylenediaminetetraacetic acid or sodium metabisulphite as  
271 a preservative, propofol emulsion still supports the growth of bacteria. Strict aseptic  
272 technique should always be observed when handling propofol, and syringes should  
273 be prepared for use just before administration. The rubber vial stopper should be  
274 wiped with an alcohol swab before inserting the needle. Once the vial of propofol  
275 has been opened, the contents should be used within 6 hours or the remainder dis-  
276 carded. Opened vials of propofol may not be stored overnight because of the risk  
277 of bacterial contamination.

278 Propofol's onset of action is 30 to 45 seconds, its peak effect occurs within  
279 90 seconds, and the duration of effect is 4 to 8 minutes. Body weight, gender, age,  
280 and concomitant disease also affect the response to drug. However, idiosyncratic  
281 responses are common, and cautious dose titration is always recommended when  
282 using propofol. The authors have seen very large patients become deeply sedated  
283 with small doses of propofol and conversely, smaller patients who have required  
284 a large dose. Extra care must be exercised when administering propofol in conjunction  
285 with an opioid or benzodiazepine, because of the drug–drug interactions and the  
286 synergistic effects of these drugs. Propofol should be avoided in patients with allergies  
287 to egg or soybean.

288 The major adverse effects of propofol include hypotension and respiratory depres-  
289 sion. Hypotension and bradycardia, both common cardiovascular complications  
290 observed with propofol, are dose-dependent effects. Pain at the injection site may  
291 be observed with the administration of IV propofol, although this effect is also dose-  
292 dependent and is nearly eliminated with the use of small bolus volumes (0.5–1.5 mL).

293 Several methods of propofol administration have been described in the endoscopic  
294 literature, including nurse-administered propofol sedation,<sup>9</sup> combination propofol  
295 (also referred to as balanced propofol sedation),<sup>10</sup> continuous infusion of propofol  
296 using an infusion system especially designed for propofol,<sup>11</sup> and patient-controlled  
297 sedation.<sup>12</sup> Nurse-administered propofol sedation and balanced propofol, the two  
298 methods that are based on bolus dosing, share several common principles: (1)

299 implementation of an established protocol for propofol administration, (2) establish-  
300 ment of a sedation team with appropriate education and training, (3) careful preproce-  
301 dure patient assessment, and (4) continuous patient monitoring throughout  
302 a procedure. However, several important differences between these two models do  
303 exist. A detailed discussion of these two methods is beyond the scope of this discus-  
304 sion and interested readers are referred to other references.<sup>9,10,13,14</sup> The remainder of  
305 this discussion will focus on the role of the endoscopy nurse using a protocol of  
306 balanced propofol sedation.

307 As a result of its ultra-fast onset of action that can result in rapid changes in the  
308 depth of sedation, propofol administration requires vigilance during administration.  
309 Before administering a bolus of medication, a patient's level of sedation is assessed  
310 using the MOAA/S scale and the hemodynamic and respiratory parameters are  
311 reviewed to confirm that additional dosing is appropriate and safe. The authors use  
312 capnography routinely in all cases, providing a noninvasive assessment of quantitative  
313 carbon dioxide in expired gases and visual feedback of ventilatory function (capno-  
314 graph). The authors have found that capnography is a more valuable measure of  
315 ventilation than pulse oximetry and have found its use invaluable for assessing the  
316 adequacy of ventilation.

317 The authors have developed a protocol for combination propofol administration in  
318 conjunction with an anesthesiologist (**Box 1**). When this program began, propofol  
319 was administered under the supervision of an anesthesiologist. Within 3 months,  
320 sedation protocol was established, nurses trained, and one physician within the prac-  
321 tice began using propofol independently. Two other endoscopists within the group  
322 adopted this practice during the next several years.

323 Patients receive an initial dose of fentanyl (25–75 µg), midazolam (0.5 mg), and pro-  
324 pofol (5–15 mg). A second dose of propofol is administered about 45 to 60 seconds  
325 later, and additional 5 to 10 mg doses are given at 20- to 30-second intervals until  
326 the patient reaches the desired level of sedation. The authors generally target an  
[Q14] MOAA/S of 3 for colonoscopy and an MOAA/S of 2 for esophagogastroduodeno-  
327 scopy. The cumulative dose of propofol required to achieve the desired level of seda-  
328 tion at the time of procedure initiation is termed the induction dose. The maintenance  
329 dose, the dosage administered throughout the examination, is 25% of the induction  
330 dose (to a maximum of 15 mg). Most patients receive an induction dose of 20 to  
331 60 mg so that their maintenance dose of propofol is 10 to 15 mg. The dose of fentanyl  
332 is reduced to 25 to 50 µg for patients 70 years of age and above. In very aged or frail  
333 patients, midazolam is usually withheld and fentanyl (25 µg) plus propofol is used. It  
334 should be emphasized that the pharmacodynamic activity of propofol is affected by  
335 age, weight, and comorbid disease, and dosing adjustments should be made accord-  
336 ingly. The mean doses of propofol administered during colonoscopy and esophago-  
337 gastroduodenoscopy are 119 and 93 mg, respectively.

338 To date, the authors have performed almost 20,000 endoscopic procedures using  
339 gastroenterologist-directed propofol (GDP). During this time, three patients received  
340 a pharmacologic antagonist (naloxone, flumazenil, or both), no patient required  
341 mask ventilation or tracheal intubation, and there have been no perforations, no  
342 unplanned hospitalizations, and no patient deaths.<sup>15</sup>

343

344

345

## RECOVERY AND DISCHARGE

346

347

348

On completion of endoscopy, patients receiving sedation require observation and  
monitoring, a function which is typically performed by the endoscopy nurse. The  
length of observation, types of monitoring devices used, and other parameters

**Box 1****[Q10] Protocol for administration of propofol during endoscopic procedures***Patient selection:*

- [Q11]**
1. Patients belong to ASA classes I–II. Patients in ASA class III may be included at the discretion of the endoscopist.
  2. Patients with a history of seizures or allergy to soybeans, eggs, or propofol are excluded.
  3. Patients with a history of sleep apnea, short thick neck, inability to widely open their mouth, or a prior history of difficult intubation are excluded.

*Patient monitoring:*

1. All patients receiving propofol should be monitored for oxygen saturation, heart rate, blood pressure, end-trial CO<sub>2</sub> levels, and respiratory rate. It is the responsibility of both the endoscopist and endoscopy nurse/assistant to monitor these physiologic parameters during the examination.
2. Chest excursion and respiratory effort will be monitored by the endoscopy nurse.
3. Supplemental oxygen is not routinely administered. If the SaO<sub>2</sub> drops below 90%, jaw or chin thrust should be performed. If the SaO<sub>2</sub> remains below 90% for 30 seconds despite these maneuvers, supplemental oxygen should be provided at 4 L/min.
4. Full resuscitation equipment must be available within easy reach in the endoscopy room.

*Protocol for sedation:*

1. Administration of fentanyl and midazolam:

**[Q12]** Age 70 years and under: fentanyl 75 µg and midazolam 0.5 mg IV

Age >70 years: fentanyl 25 to 50 µg and midazolam 0 to 0.5 mg IV

2. Administration of propofol:

Induction of sedation: Propofol (at a concentration of 10 mg/mL) should be drawn into a 5- or 10-mL syringe. In general, a 10-mL syringe is used for a healthy patient younger than 70 years of age and a 5-mL syringe for patients 70 years or older. An initial bolus of 10 mg (1 mL) IV is given 30 to 60 seconds after fentanyl and midazolam. Additional boluses of 5 to 10 mg may be given at 30- to 60-second intervals until an adequate level of sedation is achieved (eyes closed). In some instances, a 15-mg bolus may be given, based on the patient's previous response to a smaller size bolus (5–10 mg).

Maintenance of sedation: The maintenance dose of propofol should be no more than 25% of the propofol dose required for induction (but should not to exceed 15 mg).

Maintenance boluses of propofol may be given at 30- to 60-second intervals provided that the following parameters are satisfied:

SaO<sub>2</sub> > 90%

**[Q13]** TCO<sub>2</sub> < 47

The physician/nurse team is jointly responsible for dosing decisions for medication.

The physician may request that the nurse administer medication. When this has been performed, the nurse should confirm verbally that the medication has been given by stating aloud "10 mg of propofol given."

*Discharge criteria:*

1. Vital signs within 10% of baseline (pulse, blood pressure, and oxygen saturation)
2. Patient responds appropriately to questions.
3. Patient is able to sit upright for 1 minute.
4. Patient is able to dress independently.

400 required during recovery are dictated by the sedative drugs used, the patient's ASA  
401 status and age, and the regulations of the facility. Level of consciousness, cardiopul-  
402 monary parameters, pain/discomfort, and activity should be evaluated and docu-  
403 mented at regular intervals until these measures have all returned to baseline.  
404 Patients who have received a reversal agent (naloxone or flumazenil) require more  
405 extended monitoring (up to 2 hours) because of the risk of re sedation.

406 Typically, an endoscopy nurse performs discharge-related functions. It is desirable  
407 to establish standardized discharge criteria to assess recovery from sedation. Several  
408 recovery scales have been developed, most using similar criteria to assess eligibility  
[Q15] for discharge. One such example is the Aldrete scoring system (see Chapter 1) that  
409 evaluates 5 parameters: activity, respiration, oxygen saturation, blood pressure, and  
410 consciousness. In addition to a physiologic assessment, suitability for discharge  
411 includes an ability to dress and walk independently. Patients need not be assessed  
412 for their ability to tolerate fluids or solids before discharge home.

413 All patients should receive verbal and written instructions outlining diet, activity,  
414 medication, pathology follow-up, and further testing. Patients should be informed  
415 that they are not to drive or operate machinery on the day of the procedure. In  
416 some institutions, it is standard practice to discuss routine discharge instructions  
417 with the patient before the procedure (and sedation). Patients should sign the dis-  
418 charge sheet, indicating that instructions were received and understood. A contact  
419 person and telephone number with availability 24 hours/day should be provided to  
420 all patients in the event of a complication related to the endoscopic procedure. On dis-  
421 charge, a responsible individual should accompany the patient home.

422 What is the liability of an endoscopy center, nurse, or physician if a recalcitrant  
423 patient disregards nursing instructions and leaves the unit unaccompanied and/or pre-  
424 maturely? In *Young v. The Gastro-Intestinal Center, Inc.*,<sup>16</sup> Earnest Young refused to fol-  
425 low the directives of Diane Brown, a registered nurse employed by the Gastro-Intestinal  
426 Center, not to drive after being sedated for a colonoscopy. Ms. Brown attempted to  
427 persuade the patient to wait at the center until someone could drive him home, and  
428 she called the patient's wife to arrange for her to pick him up. When it became apparent  
429 that Mr. Brown intended to drive himself home, Ms. Brown had him sign a form indicat-  
430 ing that he understood that he should not drive and that he was leaving the center  
431 against medical advice. Mr. Young was severely injured in a 1-car collision while driv-  
432 ing home from his colonoscopy, and he later died. His wife filed a negligence action  
433 alleging that the center had failed to exercise the degree of skill and care required.  
434 The circuit court dismissed the case in summary judgment, the decision was reversed  
435 by the state Court of Appeals, and the decision of the Appeals Court was again re-  
436 versed by the Supreme Court of Arkansas. The court held that the center owed no legal  
437 duty to the patient to do more than warn him that he should not drive. Accordingly, any  
438 patient who receives sedation and refuses to be escorted home by a responsible indi-  
439 vidual or to not drive for at least 8 hours post-procedure should be asked to sign a re-  
440 lease of liability. The occurrence should also be fully documented in the medical record.

## 442 DOCUMENTATION

444 Documentation is an important element of patient care that is usually the responsibility  
445 of the endoscopy nurse or technician. This includes the preprocedure assessment,  
446 informed consent, intraprocedural monitoring, recovery, and discharge. The endos-  
447 copy nurse should confirm that the preprocedure assessment has been completed  
448 before sedation is initiated. If this assessment was performed in advance of the sched-  
449 uled examination, a brief review and re-confirmation is recommended just before

450 initiating sedation. A “time-out” is also required in many institutions to ensure “right  
451 patient, right procedure, right doctor.”

452 Documentation should be maintained throughout all phases of the endoscopic  
453 procedure. The chart should contain a time-based record of all drugs administered  
454 including name and dosage, the type and quantity of IV fluids, and whether oxygen  
455 was administered (and flow rate). A periodic assessment of the patient’s hemody-  
456 namic parameters, SaO<sub>2</sub>, respiration rate, level of sedation, and pain control should  
457 be indicated. During the recovery period, the vital signs, oxygen saturation, level of  
458 consciousness, motor activity, and the Aldrete recovery score should be documented  
459 at regular intervals. When a patient is ready for discharge, the patient’s condition and  
460 any specific discharge instructions should be noted. All adverse events and any  
461 corrective actions should be charted. The implementation of a structured procedural  
462 sedation record has been demonstrated to improve compliance with sedation guide-  
463 lines and reduce the risk of sedation-related complications.<sup>17</sup>

#### 465 SUMMARY

467 More than ever before in the history of endoscopy, nurses and technicians working in  
468 an endoscopy environment are playing an important role in the care of patients under-  
469 going an endoscopic examination. Endoscopy personnel assist with patient monitor-  
470 ing and the administration of medication, as well as the pre- and post-procedure  
471 assessment of patients. With the development of GDP administration, the role of an  
472 endoscopy nurse has been expanded still further. As a result of the expanded duties  
473 and responsibilities being placed on endoscopy personnel, task-specific training is  
474 critically important. Depending on training and previous experience, appropriate train-  
475 ing for an endoscopy technician will require a minimum of 2 to 6 weeks. Nursing com-  
476 petency should be demonstrated by the successful completion of a written  
477 examination specifically designed to assess the acquisition of knowledge in the  
478 area of moderate sedation. Additional training and competency assessment is  
479 required in those centers where GDP administration is being practiced. Continued  
480 education of nursing staff in the form of lectures as well as regional and national  
481 programs sponsored by various professional societies of gastroenterology should  
482 be mandated. Finally, every endoscopy unit should implement a performance  
483 improvement program designed to assess quality measures in the practice of endos-  
484 copy and sedation.

#### 486 REFERENCES

- 488 1. Cohen LB, DeLegge M, Kochman M, et al. AGA Institute review on endoscopic  
489 sedation. *Gastroenterology* 2007;133:675–701.
- 490 2. Feld AD. Informed consent: not just for procedures anymore. *Am J Gastroenterol*  
491 2004;99:977–80.
- 492 3. Zuckerman MJ, Shen B, Harrison M, et al. Informed consent for GI endoscopy.  
493 *Gastrointest Endosc* 2007;66(2):213–8.
- 494 4. Ward B, Shah S, Kirwan P, et al. Issues of consent in colonoscopy: if a patient  
495 says “stop” should we continue? *J R Soc Med* 1999;92:132–3.
- 496 5. Gross JB, Bailey PL, Connis RT, et al. Practice guidelines for sedation and anal-  
497 gesia by non-anesthesiologists. *Anesthesiology* 2002;96(4):1004–17.
- 498 6. Chernik DA, Gillings D, Laine H, et al. Validity and reliability of the observer’s as-  
499 sessment of alertness/sedation scale: study with intravenous midazolam. *J Clin*  
500 *Psychopharmacol* 1990;10(4):244–51.

- 501 7. Joint Statement of a Working Group from the American College of Gastroenterol-  
502 ogy tAGAatASfGE. Recommendations on the administration of sedation for the  
503 performance of endoscopic procedures. Available at: [http://www.gastro.org/  
wmepage.cfm?parm1=371](http://www.gastro.org/wmepage.cfm?parm1=371) 2004; Accessed August 14, 2006.
- [Q16] 8. Society of Gastroenterology Nurses and Associates I. Statement on the Use of  
Sedation and Analgesia in the Gastrointestinal Endoscopy Setting.
- [Q17] 9. Walker JA, McIntyre RD, Schleinitz PF, et al. Nurse-administered propofol seda-  
504 tion without anesthesia specialists in 9152 endoscopic cases in an ambulatory  
505 surgery center. *Am J Gastroenterol* 2003;98(8):1744–50.
- 506 10. Cohen LB, Dubovsky AN, Aisenberg J, et al. Propofol for endoscopic sedation:  
507 a protocol for safe and effective administration by the gastroenterologist. *Gastro-*  
508 *intest Endosc* 2003;58(5):725–32.
- 509 11. Campbell L, Imrie G, Doherty P, et al. Patient maintained sedation for colonos-  
510 copy using a target controlled infusion of propofol. *Anaesthesia* 2004;59(2):  
511 127–32.
- 512 12. Heuss LT, Drewe J, Schnieper P, et al. Patient-controlled versus nurse-adminis-  
513 tered sedation with propofol during colonoscopy. A prospective randomized trial.  
514 *Am J Gastroenterol* 2004;99(3):511–8.
- 515 13. Rex DK, Overley C, Kinser K, et al. Safety of propofol administered by registered  
516 nurses with gastroenterologist supervision in 2000 endoscopic cases. *Am J Gas-*  
517 *troenterol* 2002;97(5):1159–63.
- 518 14. Heuss LT, Schnieper P, Drewe J, et al. Risk stratification and safe administration of  
519 propofol by registered nurses supervised by the gastroenterologist: a prospective  
520 observational study of more than 2000 cases. *Gastrointest Endosc* 2003;57(6):  
521 664–71.
- 522 15. Dikman AE, Sanyal S, Aisenberg J, et al. Gastroenterologist-directed, balanced  
523 propofol sedation for EGD and colonoscopy: an analysis of safety in 15,286  
524 patients. *Gastrointest Endosc* 2008;67: AB84 [abstract].
- 525 16. Nurse had no responsibility for Pt.'s refusal to heed warnings. *Young v. Gastro-*  
526 *Intestinal Center, Inc.* 8622. *Nurs Law Regan Rep* 2005;46(4):4.
- [Q18] 17. Pitetti R, Davis PJ, Redlinger R, et al. Effect on hospital-wide sedation practices  
528 after implementation of the 2001 JCAHO procedural sedation and analgesia  
529 guidelines. *Arch Pediatr Adolesc Med* 2006;160(2):211–6.