

# Conscious Sedation: Is It Always Needed for Endoscopy?

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**Conscious sedation is an anesthesia technique frequently used to facilitate endoscopic procedures. This form of anesthesia provides a calming influence to diminish pain and it induces amnesia for the event. Conscious sedation is especially useful in children and for complicated procedures. Yet, it yields sedative effects, escalates procedural costs, and temporarily renders the patient temporarily non-decisional. In routine adult cases, however, the sedation can be omitted, thus reducing complications, financial expenses, and shortening recovery times. By not utilizing such anesthesia, patients may immediately resume routine activities, drive a car, remain fully decisional, and be available for health care discussion with their physician. It may be advantageous to educate patients on the benefits of sedationless endoscopy and to provide sedating medications only as needed.**

## INTRODUCTION

**C**onscious sedation is a technique used to facilitate the performance of endoscopies or various other diagnostic and brief medical or surgical procedures. Benzodiazepines and narcotics are the primary drugs administered intravenously to achieve conscious sedation. Once under a moderate level of anesthesia, pain and anxiety are diminished, but patients maintain a degree of consciousness such that they do not need airway assistance. Swallowing, gag, and cough reflexes remain functional and patients are able to talk and respond to physical stimulation and verbal commands.

Midazolam is the most frequently prescribed drug for conscious sedation; however, its use during endoscopy has been subject to recent debate. This techni-

que does yield a calmative effect, but it can result in over-sedation in up to 50% of all cases<sup>1</sup>, potential for more complications, and increased procedural costs. Using anesthesia adds to the risk for additional side effects, unrelated to the endoscopy itself. Controversy focuses on safety issues, added financial expense for the anesthesia management, and whether the risks outweigh the benefits.

In the United States conscious sedation is almost universally utilized during endoscopy, but this is not true outside of this country, where such techniques are more sparingly employed. Many routine examinations are successfully performed without such anesthesia. After understanding the advantages and disadvantages of conscious sedation during uncomplicated endoscopies, physicians and patients who are educated about the procedure may beneficially elect to omit this anesthesia. A patient, who is well -informed by their gastroenterologist about the risks and benefits of conscious sedation, can make an independent personal decision about the use of anesthesia or its exclusion during the endoscopy. There is no concern about using sedation for pediatric cases or during long, painful, or difficult interventions,

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when its utilization is globally recognized as very effective in safely providing comfort.

## CONSCIOUS SEDATION

In preparation for conscious sedation, the patient should undergo a history and physical examination with appropriate laboratory tests, especially to identify liver dysfunction, respiratory problems such as sleep apnea or emphysema, and significant cardiac disease<sup>2</sup>. A 12-hour fast is conventionally recommended before induction, although endoscopies can be performed safely four hours after liquid ingestion in persons without gastroparesis. The sedation should be performed in a setting where resuscitation, intubation, monitoring equipment, and personnel are available. Most facilities require that conscious sedation be done only by individuals with appropriate credentialing and in specified locations.

During the conscious sedation process, close and consistent observation by a trained health care professional is required. This staff member's sole role is to administer the conscious sedation drugs and monitor the patient's response to those medications. The vital signs, respiratory function, and degree of consciousness are observed, especially when the dose of the medicine increases. Continuous pulse oximetry readings of oxygen saturation are maintained. Induction should be done slowly, in measured increments, so as to avoid over-sedation, since additional drug can be added whenever indicated.

Post-procedure observation continues until the patient is alert and physically stable. Until fully recovered, sedation recipients should not make important decisions, receive medical instructions, drive, or operate machinery; a 24-hour delay for such activities is suggested. Patients must always be accompanied by a responsible adult once discharged from the medical facility. This can be accomplished by the patient's driver or significant other, who will remain with them to assist them until they are completely alert.

## MIDAZOLAM

Midazolam is a water soluble, short acting benzodiazepine frequently used for its anxiolytic and amnestic properties. Benefits include sedative characteristics

and skeletal muscle relaxation. It is often selected as the drug of choice also due to relatively its brief analgesic effects and short recovery times, which decrease length of stay following the procedure. Physicians and patients like the calmative and amnestic aspects; patients experience great satisfaction with the technique<sup>3</sup>. Allergic reactions are documented on rare occasions<sup>4</sup>. Side effects with midazolam anesthesia are uncommon. The benzodiazepine antidote flumazenil should be routinely available in endoscopy units if needed for emergency drug reversal.

Midazolam use results in central nervous system depression and enhances the activity of gamma amino butyric acid (GABA), which explains how it calms, relaxes musculature, and induces sleep<sup>5</sup>. Once sedation is terminated, many people will advantageously experience short-term memory loss, often being unable to remember even uncomfortable aspects of the procedure<sup>6</sup>.

Respiratory side effects of midazolam include a decrease in the rate and tidal volume, which can lead to apnea, hypoxic encephalopathy, and even an anoxic fatality, if not properly managed<sup>7</sup>. Aspiration is a risk during sedation due to potential suppression of swallowing, cough, and gag reflexes. Cardiovascular complications occur primarily in older individuals and may include hypotension, arrhythmias, cardiac arrest, and very rarely even death<sup>7</sup>. Although co-administration of benzodiazepines with narcotics may facilitate sedation, a higher risk of medication-related side effects can arise<sup>8</sup>. Patients undergoing upper gastrointestinal endoscopy have more pulmonary complications, than for those undergoing colonoscopies<sup>9</sup>.

Neurological problems with midazolam include sedation, confusion, disorientation, dizziness, slurred speech, blurred vision, and discoordination with dyspraxia<sup>5</sup>. Impairment in psychomotor skills or over-sedation can occur. Patients should not drive, make critical decisions, or operate machinery until medicinal effects have dissipated. People are not considered to be of decisional capacity during or for hours after receiving this sort of anesthesia. While under the influence of the drugs, the making of medical decisions, or signing legal or informed consent documents must be postponed. Physicians often recommend delaying such matters to the day after the procedure, following full recovery.

#### NARCOTIC ANALGESICS

Endoscopists commonly add a narcotic analgesic agent to the sedation process. The most frequently used agents include fentanyl and meperidine. Both come in water soluble/water-soluble formulations for intravenous administration, but they possess significantly different metabolic profiles. Fentanyl is a synthetic narcotic, which is approximately 100 times more potent than morphine<sup>10</sup>. Fentanyl provides pain relief through interaction with central nervous system  $\mu$  opioid receptors. Both have a rapid onset of action (<5 minutes), but fentanyl has a faster onset of action than meperidine due to its rapid penetration of the central nervous system. The half-life of intravenous fentanyl is 2–4 hours, compared to 3–5 hours for meperidine<sup>11</sup>. The active metabolite of meperidine, normeperidine, has a half-life of 15–30 hours<sup>11</sup>. Meperidine acts primarily via interaction with the  $\kappa$  opioid receptor. Although the longer half-life provides a potential benefit over fentanyl during prolonged procedures such as endoscopic retrograde cholangiopancreatography (ERCP) and endoscopic ultrasound (EUS), meperidine has fallen out of favor with many endoscopists due to a longer recovery time compared to fentanyl, as well as an increased risk of inducing a seizure at higher meperidine doses<sup>11</sup>. The addition of a narcotic agent to the sedation regimen carries an increased rate of various sedation related complications, such as respiratory depression, hypotension, and aspiration. Over sedation related to narcotic use can be reversed by the administration of naloxone, an opioid receptor antagonist. Since competitive inhibition can be reversed over time, apply caution when monitoring patients after administering naloxone to reverse the drug effect of meperidine.

#### SEDATION DURING ENDOSCOPY

Colonoscopies are most often performed in individuals 50 years of age or older. Short procedures, such as flexible and even rigid sigmoidoscopies, were for years completed without sedation. Upper gastrointestinal endoscopies are generally less uncomfortable and less complicated procedures, and can frequently be done with or without conscious sedation. Patients avoiding sedation generally undergo topical treatment

with one of a variety of topical anesthetics. Routine colonoscopies also do not consistently require anesthesia, although very few patients ask for their procedure to be performed without sedation.

However, several recent examples from our clinic demonstrate that patients may choose to undergo endoscopy without conscious sedation. One request for sedation free colonoscopy was by a nursing student desiring to better witness the endoscopy, so that she could explain it to her own patients more clearly. Another involved a company president wanting to remain completely awake with full functional capacity during and after the procedure, and a third wanted to be awake for his son's performance in a basketball tournament. Some people are uncomfortable with the short term memory losses; certain others worry that physicians might use sedation to hide something from them<sup>12</sup>. These patients and others who forego conscious sedation say that the endoscopic procedure is not very painful; however, they usually report it as being transiently uncomfortable. Many patients simply ask for conscious sedation, "to put me out." Physicians typically comply with this request without hesitation.

When faced with the fact that the use of midazolam increases the risk of side effects such as hypotension, short term memory loss, respiratory depression or more rarely apnea,<sup>7</sup> adds additional cost, and prolongs recovery time, sedation free endoscopy becomes more attractive. Endoscopy without conscious sedation has fewer complications. Other, less well characterized benefits of sedationless endoscopy include retained decision-making capacity throughout the procedure and immediately thereafter, ability to drive home after the procedure, and lack of restrictions on work or signing legal documents. Because of these benefits, there are a number of people who prefer not to undergo conscious sedation. Having full capacity for medical decision-making throughout the whole procedure and immediately thereafter is a potential benefit to the physician, also, especially when diagnostic or treatment plans require physician-to-patient discussion. In one investigation, among non-sedated cases only two of the 22 subjects studied experienced a decrease in oxygen saturation below 90%; however, in those receiving

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midazolam, the procedure was more comfortable, but a decrease in blood pressure, heart rate, or oxygen saturation was noted in nine out of 23 cases<sup>13</sup>. Although these episodes are generally treatable with routine interventions, such as stimulation, increased flow rates of oxygen therapy or intravenous fluids, they still disrupt the progress of the procedure and place patients at risk of more significant complications. A recent review comparing midazolam plus narcotic analgesic versus propofol, documented hypoxic events with oxygen saturation levels falling lower than 90% in 8–57% of cases using midazolam plus a narcotic, while drops in systolic pressure to levels lower than 75% of baseline occurred in 2–19% of subjects receiving combination therapy<sup>1</sup>.

Too few physicians consider the possibility of educating their patient that conscious sedation could be avoided, especially when there are specific medical indications of a higher risk of complications from sedation. Midazolam use prior to endoscopies may lead to increased rates of aborted procedures; however, without light anesthesia another study documented that pain, anxiety, colon sensitivity, or anatomic variations led to procedure intolerance and more cancellations<sup>1</sup>. Due to these factors, some doctors and a portion of the general population electively favor tightening indications for this sedation method.

Some studies support eschewing indiscriminant conscious sedation for all endoscopic procedures. In a series of 258 non-sedated subjects at a U.S. military hospital, 61% had little or no pain and 92% of them reportedly preferred a non-sedation approach<sup>9</sup>. Another study, done in different practice settings, reported that increased patient counseling and education improved willingness to omit conscious sedation; 20% of 434 subjects expressed willingness to undergo procedures without pharmaceutical induction, and persons educated about the anesthesia options had the least anxiety about its omission<sup>14</sup>. In one investigation, 106 of 120 subjects (88%) completed colonoscopy without sedation. The mean pain score in non-sedated subjects was 2.0, which was significantly lower than the mean pain score of 3.8 in sedated subjects ( $p < 0.05$ )<sup>15</sup>. The mean PaO<sub>2</sub> of the non-sedated group was 96.5 versus a PaO<sub>2</sub> of 93.9 in those choosing conscious sedation ( $p < 0.05$ )<sup>15</sup>. Of the participants in this

survey, 88% expressed willingness to undergo colonoscopy in the future without light anesthesia. Many people said that they liked having procedures completed without pharmaceutical assistance. Endoscopies are routinely performed without conscious sedation throughout much of the world. The same increasingly even applies in the United States, especially among health care professionals.

The option of “sedation on demand” reduced the need for conscious sedation in one retrospective review. In this research, 44 veterans were offered a choice to have sedation before colonoscopy or to start without it and to receive such anesthesia on demand if they required or desired medication. Of those choosing to receive sedation only when they requested it, only 48% actually asked for the medication during the procedure<sup>16</sup>. In another study where subjects were given an option of using conscious sedation, a total of 74% of subjects completed colonoscopy without sedation<sup>17</sup>. According to the subjects, 5% experienced no pain, 75% felt moderate discomfort, and 20% complained of severe pain<sup>17</sup>. Only 6% required “on demand” sedation. When asked, 72% of these individuals were willing to consider a repeat procedure without sedation, but 18% said they would request anesthesia, and 10% were undecided. These data suggest that many people can undergo colonoscopy without pharmacologic assistance, while a smaller number are best served by administration of such anesthesia. Additional research providing methods for pre-selecting the 20–30% who would best benefit from conscious sedation would be beneficial to practitioners.

## COMMENTARY

Although endoscopies can be uncomfortable, they are not tremendously painful. Nevertheless, almost all patients receive some form of conscious sedation, with midazolam being the most frequently utilized anesthetic. Parenteral benzodiazepines may suppress breathing, lower blood pressure, and cause over-sedation, which may in some cases require urgent resuscitation. Since 80% of endoscopies performed without conscious sedation are conducted uneventfully, omission of this form of anesthesia should be considered for all routine cases<sup>18</sup>.

Before undergoing conscious sedation, patients are always provided with education about the risks and benefits. Besides a careful review of potential problems during a routine informed consent session, physicians have an opportunity to also stress the benefits of “sedationless endoscopy” when it is not medically required. Clinicians should assure an open discussion regarding sedationless endoscopy, by illustrating the advantages of being decisional during the procedure. Patients should be informed about the rapid recovery period in the absence of sedation, which will allow them to immediately drive themselves, resume their work or other activities, and even be alert enough to discuss medical information with their doctor. People should be educated regarding the option of “on demand sedation” if they still need it during a procedure. Well-informed, decisional patients can elect how to receive their care. With fewer complications and lower cost, routine endoscopies can be accomplished more quickly and cheaply without conscious sedation. Routine conscious sedation might be best reserved for pediatric endoscopies, or for adults anticipating complicated or particularly painful procedures. Ultimately, patient counseling by physicians offers the most effective mechanism to overcome the preconceived notion held by most patients that every endoscopic procedure requires sedation. Decisions about the use of conscious sedation should be determined clinically by the physician, with patient input. ■

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