

## Modifications in endoscopic practice for the elderly

*This is one of a series of statements discussing the use of GI endoscopy in common clinical situations. The Standards of Practice Committee of the American Society for Gastrointestinal Endoscopy (ASGE) prepared this text. This guideline updates a previously issued guideline on this topic.<sup>1</sup> In preparing this guideline, a search of the medical literature was performed using PubMed. Additional references were obtained from the bibliographies of the identified articles and from recommendations of expert consultants. When limited or no data exist from well-designed prospective trials, emphasis is given to results from large series and reports from recognized experts. Guidelines for appropriate use of endoscopy are based on a critical review of the available data and expert consensus at the time the guidelines are drafted. Further controlled clinical studies may be needed to clarify aspects of this guideline. This guideline may be revised as necessary to account for changes in technology, new data, or other aspects of clinical practice. The recommendations were based on reviewed studies and were graded on the strength of the supporting evidence (Table 1).<sup>2</sup> The strength of individual recommendations is based on both the aggregate evidence quality and an assessment of the anticipated benefits and harms. Weaker recommendations are indicated by phrases such as “we suggest,” whereas stronger recommendations are typically stated as “we recommend.”*

*This guideline is intended to be an educational device to provide information that may assist endoscopists in providing care to patients. This guideline is not a rule and should not be construed as establishing a legal standard of care or as encouraging, advocating, requiring, or discouraging any particular treatment. Clinical decisions in any particular case involve a complex analysis of the patient's condition and available courses of action. Therefore, clinical considerations may lead an endoscopist to take a course of action that varies from these guidelines.*

The use of GI endoscopy in geriatric patients is increasing as a larger proportion of the population is reaching an advanced age. In the year 2010, 40.3 million people (13.0% of the total population) were 65 years of age

and older, and 5.5 million were aged 85 years of age and older in the United States.<sup>3</sup> The number of individuals 65 years and older is expected to increase to more than 20% of the total U.S. population by 2030, with individuals 85 years and older representing the fastest growing segment of this group. This guideline is intended to provide guidance regarding endoscopic practice issues in the elderly. Previous guidelines have defined geriatric patients as those 65 years of age and older, and patients of advanced age as those 80 years of age and older.<sup>1</sup> Because physiologic age is a continuum, this guideline is not intended to apply to rigidly defined age ranges.

### PREPROCEDURE PREPARATION

Preparation for endoscopy in the elderly differs little from that for other adults. For upper endoscopic procedures, the recommendations for cessation of ingestion of solids and liquids are the same as for younger patients.<sup>4</sup> Colonoscopy preparations are broadly classified into 2 categories: electrolyte-balanced polyethylene glycol-based preparations and sodium phosphate solutions. Earlier studies demonstrated similar tolerability and efficacy of the 2 regimens in the elderly.<sup>5,6</sup> However, sodium phosphate works by an osmotic mechanism of action, resulting in fluid and electrolyte shifts that can result in hyperphosphatemia, hypernatremia, hypokalemia, and worsening kidney function.<sup>5-8</sup> These combinations are potentially fatal in the elderly, therefore, sodium phosphate should be avoided as a colonoscopy preparation in the elderly, particularly those with renal disease or cardiac dysfunction.<sup>9,10</sup> Magnesium-based cathartics have been demonstrated to cause life-threatening hypermagnesemia in elderly patients, including those without preexisting renal disease.<sup>11</sup> Consequently, the use of magnesium-based bowel preparations as a sole colonoscopy preparation should generally be avoided in the elderly. As with any bowel preparation, it is important to maintain adequate hydration throughout the bowel preparation process to reduce the risk of dehydration-related adverse events in the elderly.<sup>12</sup>

Adequate colonoscopy preparation remains a concern in the elderly. Patients of advanced age are less likely to tolerate high-volume oral preparations.<sup>13</sup> As a result, the rates of poor colonic preparations in the elderly may be as high as 16% to 21%, which is much higher than other age groups.<sup>14-16</sup> Poor colonic preparation has been noted to be the single most important impediment to adequate colonoscopy.<sup>15</sup> Although outcomes data with colonoscopy

**TABLE 1. GRADE system for rating the quality of evidence for guidelines**

Quality of evidence	Definition	Symbol
High quality	Further research is very unlikely to change our confidence in the estimate of effect.	⊕⊕⊕⊕
Moderate quality	Further research is likely to have an important impact on our confidence in the estimate of effect and may change the estimate.	⊕⊕⊕○
Low quality	Further research is very likely to have an important impact on our confidence in the estimate of effect and is likely to change the estimate.	⊕⊕○○
Very low quality	Any estimate of effect is very uncertain.	⊕○○○

Adapted from Guyatt et al.<sup>2</sup>

preparations in the elderly are lacking, the use of split-dosage preparations should be considered for elderly patients.

Preprocedure assessment of elderly patients for endoscopic procedures should be similar to that for all patients, with particular attention to the patient’s cardiopulmonary status and comorbid conditions that may affect sedation or performance of the procedure. Elderly patients are more likely to have underlying heart disease and implanted cardiac devices and recommendations should be followed according to the ASGE technology status report for these devices.<sup>17</sup> Similarly, guidelines regarding the management of antithrombotic or antiplatelet agents have been published, but the continued use or discontinuation of these agents should be individualized based on the clinical scenario.<sup>18,19</sup> Prophylactic antibiotics are not recommended for most routine endoscopic procedures.<sup>20</sup> There are no specific changes for the use of prophylactic antibiotics in the elderly. Recent guidelines on the optimal geriatric preoperative assessment recommend additional evaluation of the patient’s cognitive ability and capacity to understand the anticipated surgery/procedure, screening for depression, and documenting the patient’s baseline functional status.<sup>21</sup> Patients with cognitive impairment, signs or symptoms of depression, or functional limitations should be referred to their primary care physician or geriatrician for further evaluation.<sup>21</sup>

## SEDATION AND ANALGESIA

Most GI endoscopy is performed by using moderate sedation. Guidelines regarding conscious sedation and

monitoring of adult patients have been previously published.<sup>22</sup> Monitoring procedures for the elderly are the same as the standard procedures used for all patients including monitoring devices, resuscitative equipment, and pharmacologic agents. Sedation in the elderly requires awareness of this population’s increased response to sedatives. A variety of physiologic processes contribute to the increase in sensitivity and sedation risk in geriatric patients.<sup>23</sup> Arterial oxygenation progressively deteriorates with age and has been attributed to a mismatch of ventilation and perfusion.<sup>24</sup> Cardiorespiratory stimulation in response to hypoxia or hypercarbia is blunted and delayed. Narcotic and non-narcotic central nervous system depressants produce greater respiratory depression and a greater incidence of transient apnea and episodic respirations. The risk of aspiration also increases as a result of a significant increase in the sensory stimulus threshold required for reflexive glottic closure.<sup>25</sup>

The age-related increase in lipid fraction of body mass yields an expansion of the distribution volume for pharmacologic agents that are highly lipid soluble, including benzodiazepines. In conjunction with reduced hepatic and renal clearance mechanisms, this can prolong recovery for elderly patients after sedation. Finally, a complex interplay among heightened central nervous system sensitivity and alterations in drug receptors, volumes of distribution, and intercompartmental transfer contributes to the reduced dose requirements of all standard sedative agents. Nevertheless, age alone is not a major determinant of morbidity. Rather, age-related diseases and rapid or excessive dosing contribute more to the cardiopulmonary adverse events of sedation than dose itself.<sup>23</sup> One prospective cohort study of patients of advanced age undergoing colonoscopy with standard moderate sedation demonstrated a higher rate of oxygen desaturation compared with younger adults (27% vs 19%,  $P = .0007$ ).<sup>15</sup>

The primary modification in sedation practices required in the geriatric population is administration of fewer agents at a slower rate and with lower initial and cumulative doses.<sup>26,27</sup> Doses based solely on milligram per kilogram of body weight may produce profound respiratory depression and hypotension. As in younger adults, midazolam and/or narcotics are generally used. Fentanyl may have an advantage over meperidine in the elderly because of its faster onset of action and shorter half-life, thereby allowing faster recovery from sedation.<sup>28</sup> Propofol has a narrower margin of safety in elderly patients, but has been shown to be safe when used in elderly patients with continuous monitoring.<sup>29-32</sup> Minimizing the use of sedation or no sedation is an option for reducing anesthesia-related adverse events during endoscopic procedures.

## PROCEDURAL INDICATIONS AND OUTCOMES

For patients in any age group, endoscopy should be performed only when the results will influence clinical

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