Assessing Gastric Residual Volumes

What is the protocol for assessing gastric residual volumes? How often? Do we use the residual volume? What volume indicates that feedings should be withheld? Do we restart feedings at the same rate? What evidence supports the recommendations?

Andrea D. Johnson, MPH, RD, LD, replies:

Monitoring gastric residual volumes (GRVs) to assess the safety of enteral tube feeding has been a routine practice in many intensive care units. This practice, however, has never been standardized. Protocols for monitoring have been incorporated into standards of care because high GRVs are thought to be due to delayed gastric emptying caused by intolerance to enteral formula that may result in aspiration of gastric contents. Most clinicians agree that large GRVs are dangerous and predispose patients to aspiration, but little agreement exists on the definition of large. Elevated GRVs are not always a sign of intolerance to enteral formula, and low GRVs are not always proof that there is no risk of aspiration. In a prospective study of 206 critically ill patients receiving gastric enteral tube feeding, Metheny et al. found no consistent relationship between aspiration and GRVs. In their sample, aspiration occurred fairly often when GRVs were consistently low and significantly more often when GRVs were high. In a study of 40 critically ill patients, McClave et al. stated that their results did not support the use of GRV as a marker for the risk of aspiration. “No appropriate designated RV [residual volume] level to identify aspiration could be derived as a result of poor sensitivity over a wide range of RV.”

No agreement has been reached about the acceptable level of GRVs for monitoring tube feeding. The designated cutoff in published reports varies from 200 to 500 mL of GRV (see Table). Use of a low cutoff point is based on the assumption that all GRVs are aspirated. The results of a study by McClave et al. suggest otherwise. More than 90% of patients assessed had GRVs of 150 mL or less. Cessation of tube feeding due to GRVs can lead to patients receiving insufficient calories. This problem can occur early in nutrition treatment because GRVs tend to be higher at the start of tube feeding.

A review of the literature indicates that it may be appropriate to monitor GRVs closely at the start of enteral tube feeding, but to avoid stopping feedings unless other signs of intolerance such as bloating, abdominal pain, emesis, or nausea appear. Questions about when to restart feedings after cessation of enteral tube feeding and use of residual volumes have not been addressed. Protocols should include an appropriate GRV for the specific population of patients, specific responses to that GRV, and when it is appropriate to stop monitoring GRVs. According to Parrish and McClave in Nutrition Issues in Gastroenterology, Until better data is available, it may be appropriate to check GRVs in the critically ill patient when initiating delivery of enteral nutrition. After 48-72 hours of successful feeding, if GRVs are consistently low, it may be
Table

<table>
<thead>
<tr>
<th>Who:</th>
<th>What:</th>
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<tbody>
<tr>
<td>Metheny et al⁴</td>
<td>Measure gastric residual volumes at 4-hour intervals, use large-bore multipot tubes during the first few days</td>
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<tr>
<td>Kattelmann et al⁵</td>
<td>Accepting an isolated gastric residual volume of 250 mL and evaluating the clinical situation with 2 or more consecutive volumes of 250 mL before stopping/withholding the feeding is associated with greater delivery of formula (grade III evidence)</td>
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<tr>
<td>Stroud et al⁶ British Society for Gastroenterology</td>
<td>For patients who have questionable gastrointestinal motility, measure gastric residual volume every 4 hours and review policy if the volume exceeds 200 mL</td>
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<tr>
<td>Heyland et al⁷ Canadian clinical practice guidelines</td>
<td>Support a residual volume of 250 mL for gastric feedings to improve enteral delivery if a feeding protocol is implemented</td>
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<tr>
<td>McClave et al⁸ Society of Critical Care Medicine and American Society for Parenteral and Enteral Nutrition</td>
<td>Withholding feedings for gastric residual volumes &lt;500 mL in the absence of other signs of intolerance should be avoided (grade B evidence)</td>
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appropriate to stop checking GRVs.

According to the ASPEN Guidelines: Access for Administration of Nutrition Support,⁶ it is recommended that GRVs be monitored every 4 to 5 hours until a plateau of less than 50 mL is achieved.⁴,¹¹ One event of elevated GRV should not prompt cessation of enteral tube feeding but instead should prompt staff to monitor for signs and symptoms of intolerance.¹²

Aspiration is understandably one of the most feared and possibly the most serious complication of enteral tube feeding. Monitoring of GRVs should not be the only tool used to monitor and decrease risk of aspiration. According to the guidelines for nutrition support therapy,⁴ patients given enteral nutrition should be assessed for risk of aspiration. Measures such as elevating the head of the bed to 30º to 45º, changing to a continuous infusion for those at high risk or with intolerance, using medications to promote motility, and postpyloric feeding should be considered to decrease the risk of aspiration.⁴

References

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