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Listening to Bowel Sounds: An Evidence-Based Practice Project

Nurses find that a traditional practice isn’t the best indicator of returning gastrointestinal motility in patients who’ve undergone abdominal surgery.

Overview: Nurses’ practice of listening to bowel sounds was first proposed in 1905 and continues today, largely unquestioned. The authors developed a project to determine whether any compelling evidence exists for using this method to assess for the return of gastrointestinal (GI) motility following abdominal surgery. Literature on the subject was evaluated and an assessment of nursing practice was conducted. Based on the literature review and the assessment, a nursing practice guideline was developed, implemented, and evaluated. (Note that the nursing practice guideline outlined in this article was evaluated for use with abdominal surgery patients only and hasn’t been evaluated in and may not be appropriate for other patient populations). The results were positive and indicate that clinical parameters other than bowel sounds, such as the return of flatus and the first postoperative bowel movement, are appropriate in assessing for the return of GI motility after abdominal surgery. Bowel sound assessment was discontinued and patient outcomes were evaluated to make sure that the practice change had no adverse effect on patients’ recovery.
What’s the best indication of returning gastrointestinal (GI) motility in patients who’ve undergone abdominal surgery? A century ago, nurses first began listening for bowel sounds as a sign of such recovery. Since then, the practice has persisted largely unquestioned and is supported more by tradition than by evidence.

It has become apparent, as nursing practice has evolved, that this is the case with many nursing activities. In order to improve the quality of care, it’s vital that nurses question their current practices to determine whether they’re based on evidence or merely on tradition.

The Iowa Model of Evidence-Based Practice to Promote Quality Care successfully promotes the integration of evidence into practice. The model outlines the implementation of an evidence-based practice project (see Figure 1, page 42). Identifying a practice problem or new knowledge triggers the evidence-based practice process. Leaders in the health care facility and on the nursing unit then review the proposal to determine what priority it should be given, and they assemble a team to carry it out.

The team selects, reviews, critiques, and synthesizes the evidence in the literature. If the research evidence is sufficient, the team initiates change. If the evidence is insufficient, the team reviews other evidence or suggests more research. The team then pilots and evaluates the practice change to determine whether revisions are needed before integrating and applying the change in other clinically appropriate areas. More evaluation and dissemination of results is essential to integrate the practice into daily care.

This article describes the results of an evidence-based practice project that began when one of us (DM), a staff nurse on a GI surgery unit, questioned the practice of listening to bowel sounds to assess for gastric motility. We followed the Iowa Model described above.

**CLINICAL ISSUE**

Our evidence-based practice project began with the identification of a clinical problem, which we framed in a series of questions that hadn’t been sufficiently addressed in the nursing literature:

- Why do we listen to bowel sounds?
- What evidence supports listening to bowel sounds?
- Are bowel sounds a valuable tool for determining the return of GI motility after abdominal surgery?
- Does bowel sound assessment promote early intervention, such as feeding, or recovery in abdominal surgery patients?

Alteration in GI motility following abdominal surgery was first documented with the introduction of X-rays in the 1890s, and in 1905 (as reported by Nachlas and colleagues) Cannon first proposed auscultation of bowel sounds to determine whether GI motility had returned after abdominal surgery. Nursing students are taught to listen for as long as five minutes in each of the four quadrants of the abdomen to determine whether bowel sounds are present; nurses may therefore spend up to 20 minutes per patient on one component of the nursing assessment. Given the imperative to improve patient outcomes and the pressure to use nursing time more efficiently, it’s necessary to question the validity of this traditional nursing practice.

**SYNTHESIS OF THE EVIDENCE**

Locating research evidence was a challenge. Literature searches were attempted with the help of other nurses and librarians, but with few results. The basic research in this area is old and in some cases wasn’t listed in Medline when this project began. To find the literature, we used a “snowball” method (meaning that an initial information source referred us to other sources); in this case, a surgical motility researcher shared his collection of articles and provided leads, resulting in a more effective literature retrieval.

*There are no nursing interventions associated with the presence or absence of bowel sounds.*

Published research on the correlation between bowel sounds and GI motility is sparse and dates to the 1960s. Recent research has focused on using pacemakers or drugs to speed recovery, with inconsistent findings that aren’t clinically useful. We looked for studies that involved the return of GI motility after abdominal surgery as well as the use of assessment for bowel sounds in abdominal surgery patients. Critique and synthesis of the evidence included primary findings from clinical research describing the pattern of returning GI motility, as well as secondary findings from research that
Figure 1. The Iowa Model of Evidence-Based Practice to Promote Quality Care

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addressed other questions. Several randomized, controlled trials; 15 experimental studies; and three systematic reviews were included in the evidence synthesis (see Table 1, page 46). More evidence from available research, expert opinion, and case studies report the practice of listening to bowel sounds to determine motility only as a matter of tradition.

The return of GI motility after abdominal surgery follows a predictable pattern, beginning with random electrical impulses, then random muscle contractions, eventually becoming coordinated myoelectrical activity, and then propulsion. The return of GI motility begins in the small intestine; it is then seen in the stomach and, finally, the colon (first on the right side, then on the left). The timing of the return of postoperative GI motility varies according to the surgical procedure and other clinical variables, but motility is usually seen in the small intestine in four to 24 hours, the stomach in two to four days, and the colon in three to seven days postoperatively (see Figure 2, at right).

Early postoperative bowel sounds probably don’t represent the return of normal GI motility; rather, they most likely represent uncoordinated early contraction in the small intestine. Therefore, auscultation of the abdomen during the early recovery phase after abdominal surgery isn’t a good assessment of the recovery of postoperative motility.

Preventing oral intake in the first days after abdominal surgery has been standard practice because of concern that complications such as anastomotic leakage, dehiscence, wound disruption, vomiting, and aspiration might arise, but recent research has questioned this tradition. Bufo and colleagues speculate that the tradition of prohibiting early feeding may be a holdover from a time when now-outdated anesthetics that were associated with more nausea and vomiting were in use. Recent research suggests that early feeding is, in fact, safe for patients, and bowel sounds do not indicate feeding tolerance. Patient outcomes of early feeding include tolerance of oral intake and improved patient comfort; early feeding may also reduce length of hospital stay and stimulate recovery of motility.

The primary markers for returning GI motility after abdominal surgery are the return of flatus and bowel movement, indicating recovery of the colon. Additional indications of recovery from postoperative ileus are the patient’s ability to tolerate oral intake without nausea or vomiting, the return of appetite, and an absence of other symptoms of ileus, such as distension, feeling bloated, and cramps. In addition to monitoring for returning GI motility, postoperative assessment should include pain assessment and the monitoring of vital signs and intake and output.

Interviewing patients can help reveal some of the important signs of returning GI motility. Instead of approaching patients with a stethoscope in hand, nurses can ask how they feel and whether flatus, bowel movements, and appetite have returned. There are additional benefits to this approach. Spending time with patients and listening to their needs—as well as allowing more time to answer questions—helps establish rapport and educate patients on postoperative preventive management.

**CURRENT PRACTICE**

We created questionnaires for practitioners that were designed to identify their understanding of GI motility.
motility and their current assessment practices after abdominal surgery (sample questionnaires are available from the authors). We solicited nurse practitioners (NPs) with wound, ostomy, and continence certification (n = 206) and selected nurse experts (who may not have had such certification) from our organization (n = 25). We also sent questionnaires on current practice to surgeons within our organization (n = 15). Return of the survey was considered an indication of consent to participate. Sixty-eight NPs (33%) and 19 staff nurse experts (76%) returned questionnaires. Of the 68 questionnaires from the NP group, only 54 (26%) were useable, because several respondents indicated that their clinical practice area didn’t include abdominal surgery. Nine (60%) of the 15 general surgeons responded.

The nursing questionnaires included six multiple choice questions, one item asking practitioners to rank the importance of clinical parameters, and two short answer items. The results showed that all nurses who responded to the questionnaire continued to listen to bowel sounds following abdominal surgery. Nearly 60% of NPs and 90% of the nurses at our organization auscultate in four quadrants every four to eight hours. Despite the fact that most nursing textbooks advise listening for up to five minutes in each of the four quadrants to determine whether bowel sounds are present, the majority of nurses actually listen for less time (see Figure 3, above). Nurses monitor a number of other clinical indicators of GI motility when caring for the patient who has undergone abdominal surgery. The indicators most often ranked as important were pain, distension, firmness, vomiting, and bowel sounds (see Figure 4, page 45). The nurse experts also listed the clinical parameters they used to monitor changes in the patient’s clinical condition and that would prompt notification of the surgeon (see Figure 5, page 45). Parameters listed most often were vomiting, distension, pain, wound drainage, and firmness.

The surgeon questionnaire included seven short-answer items on the physiology of bowel recovery, practice preferences, and key clinical parameters. The physicians reported that the three most important clinical parameters that indicate the return of GI motility are return of flatus (89%), bowel movement (44%), and appetite (44%). The majority of the surgeons (78%) reported that the monitoring of bowel sounds by nurses is not helpful to them in patient management. The five nursing assessments most valued by surgeons were the return of flatus (78%) and bowel movement (67%) (both of which are indicators of recovery), and distension (44%), nausea (44%), and vomiting (44%) (all three of which are negative indicators). Of interest are the differences between nurses and surgeons in their rankings of parameters indicating a need to notify surgeons.

There are no nursing interventions associated with the presence or absence of bowel sounds. Other assessments will reveal the absence of bowel motility and suggest appropriate interventions. For example, the nurse can ask the patient if he’s nauseated and, if so, treat the nausea. Similarly, the nurse may treat abdominal distension by inserting a nasogastric tube. If distension is present in a patient who already has a nasogastric tube, the nurse should check the tube’s placement and patency.

**CHANGING PRACTICE**

Based on our review of the growing body of evidence in the literature and the questionnaire results discussed here, we decided that a change in care was needed. We instituted a practice change in our organization, eliminating the practice of listening for bowel sounds after abdominal surgery. Prior to making the change, several things needed to happen. One step was to work with the nursing informatics group to change the online documentation system to allow the documentation of useful assessments rather than just listening for bowel sounds. Next, we developed a program on the practice change, to be led by two staff nurses who understood the evidence for not listening to bowel sounds, as well as the new documentation standards and who led change on the surgical unit.

Prior to the staff education from nurse leaders, we conducted a pretest to assess knowledge among surgical unit nurses. A poster displayed in the unit report room reviewed the literature on the history and physiology of bowel sound assessment and the
return of GI motility, as well as results from the questionnaires, which described the current practice patterns and preferences among the NP, staff nurse, and surgeon groups.

Using evidence helped us promote acceptance of the new protocol. Several nurses were selected to facilitate the change by training the trainers—working with small groups of nurses on the same shifts who would then educate other nurses. This arrangement allowed questions to be answered as nurses piloted the new guidelines and acted as role models and troubleshooters at the bedside. Another poster in the unit report room helped nurses use the revised online documentation. Additional assessment guides were placed at computers where nurses and other care providers document. Also, a pocket assessment guide was made available to each nurse to use when assessing patients. The guide included 10 assessment items written on one side and, on the reverse, questions to ask the patient. These tools helped remind nurses to comprehensively document each of the relevant assessment parameters.
### Table 1. Selected Studies Used in the Development of Guidelines for Nurse Monitoring of Patients

<table>
<thead>
<tr>
<th>Subjects and Procedure</th>
<th>Study Description and Relevant Findings</th>
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<tbody>
<tr>
<td>Benson MJ, et al. Gastroenterology 1994;106(4):924-36.</td>
<td>29 consecutive patients (23 patients were in sample) undergoing intra-abdominal surgery for sigmoid carcinoma; compared rectal cisapride with placebo on proximal small bowel migrating myoelectric complex (MMC), monitored with manometer.</td>
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<tr>
<td>Condon RE, et al. Dis Colon Rectum 1994;37(12):1260-5.</td>
<td>Randomized, placebo-controlled, double-blind study: 31 of 36 patients tolerated early feeding and had shorter mean length of hospital stay (5.7 days); patients with traditional, conservative treatment had, on average, an 8-day stay; patients with ileus had a 10.6-day stay. Most patients had return of flatus and bowel movement within 3 to 5 days (mean = 4.2 days). Neither bowel sounds nor flatus determined patients' tolerance of oral intake or was a good indicator of when to resume feeding.</td>
</tr>
<tr>
<td>Bufo AJ, et al. Dis Colon Rectum 1994;37(12):1260-5.</td>
<td>Experimental design with convenience sample: ileus resolved 3.8 days postoperatively (range, 2 to 6 days) as indicated by flatus and bowel movement (bowel sounds were not used as an indicator). Right colon returned before left colon. Ileus recovery was also indicated by flatus, defecation, and the ability to consume solids without nausea or vomiting. Normal colonic activity was seen after the seventh postoperative day.</td>
</tr>
</tbody>
</table>
| Benson MJ, et al. Gastroenterology 1994;106(4):924-36. | Randomized, placebo-controlled, double-blind study: bowel sounds and flatus were compared as indicators of motility, but flatus was the primary clinical indicator; both are insensitive and indirect indicators of motility. Clinical resolution of ileus (passage of flatus) preceded the complete recovery of small bowel motility (bowel sounds occurred even earlier). “Bowel sounds are thought to arise from the movement of an air–water interface in the upper gastrointestinal (GI) tract. Their return in the post-op state does not, judging from our data, correlate with the complete recovery of proximal small bowel motility.” (Bowel sounds returning before motility may allow a change in treatment or feeding.)

And finally, a resource manual helped orient new nurses. The manual is updated periodically and includes research articles, computer documentation guides, survey results, and project evaluation data.

**PROTOCOL LIMITATIONS**

The practice protocol was implemented and evaluated on a general surgery unit with abdominal surgery patients. The new protocol was limited to abdominal surgery patients, because the research in the literature review did not include other surgical procedures or patient populations. The protocol may not be appropriate for medical patients, because their impaired motility would probably not follow the same pattern seen with postoperative paralytic ileus, as described in the abdominal surgery research literature.

In the new protocol, assessing the unconscious patient for clinical indicators of GI motility is similar to assessing the conscious one. Regardless of the patient’s level of awareness, the return of bowel sounds after abdominal surgery represents the return of uncoordinated contractions in the small intestine, not propulsive contractions in the colon. The presence or absence of abdominal distension or firmness, vomiting, and bowel movements should be assessed to determine the status of GI motility in the unconscious patient. The signs that should trigger notification of the surgeon are nearly the same: vomiting, abdominal distension or firmness, and increased wound drainage.

Pain is an additional indicator to monitor in postoperative patients and may indicate impaired recovery of GI motility. The use of epidural analgesia has led to better pain management but requires pain assessment that’s tailored to the patient’s condition.
After Abdominal Surgery

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<tr>
<th>Subjects and Procedure</th>
<th>Study Description and Relevant Findings</th>
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Subjects exhibited the following pattern of return of motility: ileum at 48 hours; jejunum at 68 hours; small bowel at 92 hours; right colon at 126 hours; left colon at 144 hours. |
| Graber JN, et al. Surgery 1982;92(1):87-92. | Experimental design, random order of procedure with each monkey serving as its own control  
- 1st defecation occurred on postoperative day 2. |
- 11 patients undergoing colon surgery; recorded gastric myoelectric activity  
- Subjects were given clear liquid diet after passage of flatus or feces, followed by a regular diet when liquids were tolerated. |
19 patients undergoing left hemicolectomy, sigmoid resection, or primary anastomosis; monitored postoperative colonic tone barostat and manometry  
- 18 of 19 patients had their first stool on postoperative day 3; 1 had it on postoperative day 4. |
13 patients undergoing different surgical procedures; measured mechanical activity in the jejunum and compared patients’ mechanical return of motility by procedure and early feeding  
- Return of motility in the small intestine did not coincide with clinical recovery from postoperative ileus. |

EVALUATION OF OUTCOMES

The evaluation of evidence-based practice includes three components: nursing knowledge, the process of implementation, and patient outcomes.

Nursing knowledge. The pretest and posttest instruments were identical 10-item questionnaires that addressed those items of postoperative nursing knowledge deemed most critical in the literature we reviewed. We surveyed only nurses working on the general surgery pilot unit. Sixty-three percent of the preeducation group and 83% of the posteducation group responded to the questionnaires. Respondents showed improvement after the educational poster sessions; the pretest and posttest mean scores were 53% and 94% correct, respectively. One item on the questionnaire accounted for all but one of the wrong answers, indicating that the item probably should have been revised.

Implementation process. We evaluated the implementation process in two ways: at the time of the posttest, we asked the nurses to complete an additional questionnaire on the implementation process to find out whether facilitation of the new guideline was adequate, and we also audited the nursing charts to assess nurses’ compliance with the new guideline.

The rate of response to the implementation process questionnaire was 42%. Eighty-five percent of RN respondents agreed or strongly agreed (on a four-point Likert scale) that they felt prepared to implement the practice change. All of the RNs agreed or strongly agreed that they felt knowledgeable enough to carry out the new guideline. The majority of respondents (85%) agreed or strongly agreed that they were able to identify the postoperative signs of returning gastrointestinal motility. In addition, 85% of nurses reported using the guideline.
A New Practice Guideline
The following guideline on gastrointestinal (GI) assessment after abdominal surgery was developed as a result of the evidence-based practice project conducted by the authors.

Policy
After abdominal surgery, abdominal assessment is completed at least every eight hours until the patient experiences first flatus and first bowel movement, and then twice daily and as needed until discharge.

Procedure
1. **Explain** the procedure to the patient.
2. **Interview** the patient regarding the presence or absence of the following subjective symptoms indicative of postoperative ileus or return of GI motility:
   - abdominal pain, discomfort
   - flatus within the previous 8 hours
   - bowel movement within the previous 12 to 24 hours, stool
   - nausea, vomiting, or both
   - feeling bloated
   - return of appetite, feeling hungry
   - abdominal cramps
   - referred pain (for example, shoulder pain)
3. **Place** the patient in the supine position for assessment, and ensure comfort (for example, raise the head of the bed slightly).
4. **Inspect** the patient’s abdomen, including assessment of presence or absence of
   - distention.
   - drainage from the wound.
5. **Palpate** the patient’s abdomen, if it’s distended, in a systematic fashion, taking care not to cause discomfort. Palpation includes assessment of presence or absence of
   - abdominal firmness.
   - abdominal tenderness.

We evaluated nurses’ use of the new guideline by auditing the charts of consecutive admissions before and after implementation, with a preimplementation group of 32 patients and a postimplementation group of 49. The results indicated that nurses assessed for nausea, vomiting, and abdominal distention before and after the new guideline was implemented, and also assessed for flatus, bowel movement, and appetite. Nurses documented bowel movements before and after the new protocol was implemented as part of standard intake–output monitoring. But documentation of flatus (50% before implementation; 67% after implementation) and appetite (3% before implementation and 57% after implementation) both increased with use of the new practice protocol.

**Patient outcomes.** Monitoring of patient outcomes is essential when evaluating evidence-based practice. We monitored patient outcomes to determine whether discontinuing the monitoring of bowel sounds was detrimental to patients. The patient outcomes in the abdominal surgery population that are most relevant to the return of GI motility are paralytic ileus, bowel obstruction, and early feeding. Comparing the preimplementation and postimplementation patient groups revealed a higher rate of paralytic ileus in the preimplementation group (13%) than in the postimplementation group (4%). No bowel obstructions were documented in either of the two groups. We don’t attribute the lower rate of paralytic ileus in the postimplementation group to the introduction of the new practice guideline; rather, the lower rate demonstrates that eliminating the monitoring of bowel sounds wasn’t detrimental to patients and probably reflects other patient characteristics. Early feeding of abdominal surgery patients was not evaluated, but that may be the next project for the team.

**NURSING IMPLICATIONS**
This evidence-based practice project has significant implications for nursing. The first and most obvious implication concerns nurses’ time. Depending on how closely a nurse follows the textbook recommendations on assessing bowel sounds in postoperative abdominal surgery patients—for up to five minutes per quadrant—nurses could save as much as 20 minutes of nursing care time per patient and have time for more useful patient care activities.

This project also illuminated the importance of questioning traditions. Staff nurses can improve the quality of care by identifying important practice issues that can be addressed by examining the evidence. Evidence may be scarce, but being persistent and employing different strategies to locate it can be effective. For example, overcoming a dearth of available evidence may be possible by collaborating, as we did, with a researcher who knows about the issue and can identify or provide relevant articles to get the team started. As we learned from our experience, overcoming the initial difficulties and completing a project can be rewarding. Implementing evidence-based practice in our organization improved nursing knowledge, nursing process, and patient outcomes.

**REFERENCES**