

## Living FRIendly Summary of the Body of Evidence using Epistemonikos

Medwave 2015;15(Suppl 1):e6162 doi: 10.5867/medwave.2015.6162

# Does chewing gum improve recovery after an abdominal surgery? –First update

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**Citation:** Rada G, Viñuela J. Does chewing gum improve recovery after an abdominal surgery? –First update. *Medwave* 2015;15(Suppl 1):e6162 doi: 10.5867/medwave.2015.6162

**Publication date:** 18/6/2015

## Resumen

Este resumen Epistemonikos (Living FRISBEE: Living FRIendly Summary of the Body of Evidence using Epistemonikos) es una actualización del resumen publicado en Noviembre de 2014, basado en 4 nuevas revisiones sistemáticas aparecidas con posterioridad. El íleo postoperatorio es una condición común que retrasa la recuperación luego de una cirugía abdominal. El uso precoz de goma de mascar, como método de alimentación fingida, estimularía la peristalsis permitiendo una alimentación más precoz. Utilizando la base de datos Epistemonikos, la cual es mantenida mediante búsquedas en 30 bases de datos, identificamos 18 revisiones sistemáticas que en conjunto incluyen 81 estudios aleatorizados. Realizamos un metanálisis y tablas de resumen de los resultados utilizando el método GRADE. Concluimos que la goma de mascar probablemente disminuye el tiempo de hospitalización luego de una cirugía abdominal.

## Abstract

This Living FRISBEE (Living FRIendly Summary of the Body of Evidence using Epistemonikos) is an update of the summary published in November 2014, based on four new systematic reviews published since then. Postoperative ileus is common condition that delays recovery after an abdominal surgery. Early use of sham feeding with chewing gum stimulates peristalsis and would allow an earlier nutrition. Searching in Epistemonikos database, which is maintained by screening 30 databases, we identified 18 systematic reviews including 81 randomized trials. We combined the evidence using meta-analysis and generated a summary of findings following the GRADE approach. We concluded that chewing gum probably reduces the length of hospital stay after an abdominal surgery.

## About the update

This article updates the November 2014 Living FRISBEE (Living FRISBEE: Living FRIendly Summary of the Body of Evidence using Epistemonikos) (doi: 10.5867/medwave.2014.11.6058) by including four new systematic reviews appeared after publication of the original summary, including a Cochrane review that brings 58 randomized controlled trials not previously identified by the existing reviews.

The new evidence incorporated in this summary led to an upgrade in the certainty of the evidence for the main outcome from low to moderate, and a small increase in the estimate of the magnitude of effect with the corresponding changes on key messages and considerations for decision-making.

La nueva evidencia incorporada en este resumen lleva a un aumento en la certeza de la evidencia para el desenlace principal de baja a moderada, y a una estimación levemente mayor de la magnitud del beneficio, con la consecuente modificación en los mensajes clave y las consideraciones para la toma de decisión.

## Problem

Postoperative ileus is a common complication in patients undergoing abdominal surgery. This condition is due to a

transient functional intestinal obstruction secondary to impaired propulsive activity.

Most cases resolve within a few days but some can evolve to a state known as postoperative paralytic ileus which is associated to nausea, vomiting, abdominal distension and pain, and also to an increase in time of hospitalization and costs.

Early use of chewing gum as a sham feeding method would stimulate peristalsis and decrease postoperative ileus recovery time and postoperative paralytic ileus, allowing earlier feeding and shortening hospitalization time.

## Methods

We used Epistemonikos database, which is maintained by screening more than 30 databases, to identify systematic reviews and their included primary studies. With this information we generated a structured summary using a pre-established format, which includes key messages, a summary of the body of evidence (presented as an evidence matrix in Epistemonikos), meta-analysis of the total of studies, a summary of findings table following the GRADE approach and a table of other considerations for decision-making.

### Key messages

- Chewing gum probably reduces the length of hospital stay after an abdominal surgery.
- Considering it is a low-cost intervention without side effects, the benefit/risk and benefit/cost ratio of chewing gum for abdominal surgery are probably favorable.

### About the body of evidence for this question

What is the evidence. See evidence matrix in Epistemonikos later	We found 18 systematic reviews [1-18] that overall identified 83 studies (reported in 98 references [19-116]) including 81 randomized controlled trials. This table and the summary in general are based on the latter.
What types of patients were included	Twenty studies evaluated patients undergoing colorectal surgery, 15 cesarean section, three appendectomy, fourolecystectomy, and the remaining 39 included patients with other abdominal surgeries or were not restricted to a single type of surgery. All studies except two [22,24] evaluated adult population.
What types of interventions were included	Chewing gum was administered for five minutes to one hour (median 20 minutes). The frequency was 12 times a day for seven studies, eight times a day in two, six times a day in three, four times a day in 11, three times a day in 55 studies and in one study it was administered once (median three times a day).
What types of outcomes were measured	Time to flatus, time to have a bowel movement, time to first bowel movement, length of stay, complications, tolerance of chewing gum, costs.

## Summary of findings

The information on the effects of chewing gum is based on 81 randomized controlled trials, from which 56 report length of hospitalization outcome, including 5,278 patients.

- Chewing gum probably reduces the length of hospital stay after an abdominal surgery. The certainty of the evidence is moderate.

<b>Chewing gum for improving recovery after an abdominal surgery</b>				
<b>Patients</b>	Abdominal surgery			
<b>Intervention</b>	Chewing gum			
<b>Comparison</b>	"Placebo" procedure or no treatment			
Outcomes	Absolute effect*		Relative effect (95% CI)	Certainty of the evidence (GRADE)
	WITHOUT chewing gum	WITH chewing gum		
	Difference: patients per 1000			
Length of hospitalization	Average stay was 6.8 days	Average stay was 6.12 days	DM -0.68 (-0.84 to -0.53)	⊕⊕⊕○ <sup>1,2</sup> Moderate
	Difference: 0.68 days less (17 hours approx) (Margin of error: 0.53 to 0.84 days less)			
<p>MD: Mean difference. Margin of error = 95% confidence interval (CI). GRADE: evidence grades of the GRADE Working Group (see later in this article).</p> <p>The risk <b>WITHOUT chewing gum</b> is based on the risk in the control group of the trials. The risk <b>WITH chewing gum</b> (and its margin of error) is calculated from relative effect (and its margin of error).</p> <p><sup>1</sup>Most studies have high risk of bias. The main limitation is they are not blinded. It is particularly relevant that in most studies the provider or researcher deciding on discharge moment was not blinded. <sup>2</sup>Even though the results are heterogeneous and studies show different magnitude of benefit, the direction of effect is relatively consistent among studies. We did not downgrade the certainty of the evidence for inconsistency in spite of statistical heterogeneity (<math>I^2=84%</math>).</p>				

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## Other considerations for decision-making

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### To whom this evidence does and does not apply

- Since studies evaluated different types of abdominal surgery this evidence is applicable to a wide group of patients.
- Even though it can be posed there is not enough direct evidence for most evaluated surgeries and it has not been tested in several surgical procedures, it is reasonable to think the effect will be larger in surgeries with longer postoperative recovery, based on clinical and pathophysiological arguments.

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### About the outcomes included in this summary

- This summary considers the time of hospitalization as the only critical outcome for decision making. This is based on the opinion of the authors because we haven't found studies that have determined the relative importance of the outcomes after surgery, or some other method of establishing what outcomes are more relevant for decision making.
- Other outcomes of less importance to the patient have not been considered, including time to eliminate gas or stool, assuming its importance derives from their impact on time of hospitalization.

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### Balance between benefits and risks, and certainty of the evidence

- It is difficult to make a proper risk/benefit balance, because although the risks are few or nonexistent, there is low certainty about the benefits. [11]
- It is reasonable to anticipate the benefits outweigh the risks, although the magnitude of benefit can be considered more or less important in different circumstances.

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### What would patients and their doctors think about this intervention

- Since this is an acceptable and inexpensive measure, it is likely that most patients and their attending physicians will be inclined to use the intervention despite the low certainty of the evidence.

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### Resource considerations

- Two studies reported costs but the certainty of the evidence is too low to make any conclusion [35],[41]. Considering the low cost of the intervention and the absence of important complications, it is probably a cost-saving intervention.

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### Feasibility and implementation

- The fact that it is not a drug can make the intervention not available, at least initially, in hospital pharmacies, making it necessary to ask to relatives or find another delivery mechanism.
- Considering how entrenched is the concept of avoiding food by mouth in the postoperative period (chewing increases saliva production that reaches the stomach), there may be resistance in the different health professionals integrating health teams.

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### Differences between this summary and other sources

- The key messages of our summary are consistent with the conclusions of individual systematic reviews identified.
- We haven't found clinical guidelines used in this area that mention this intervention.

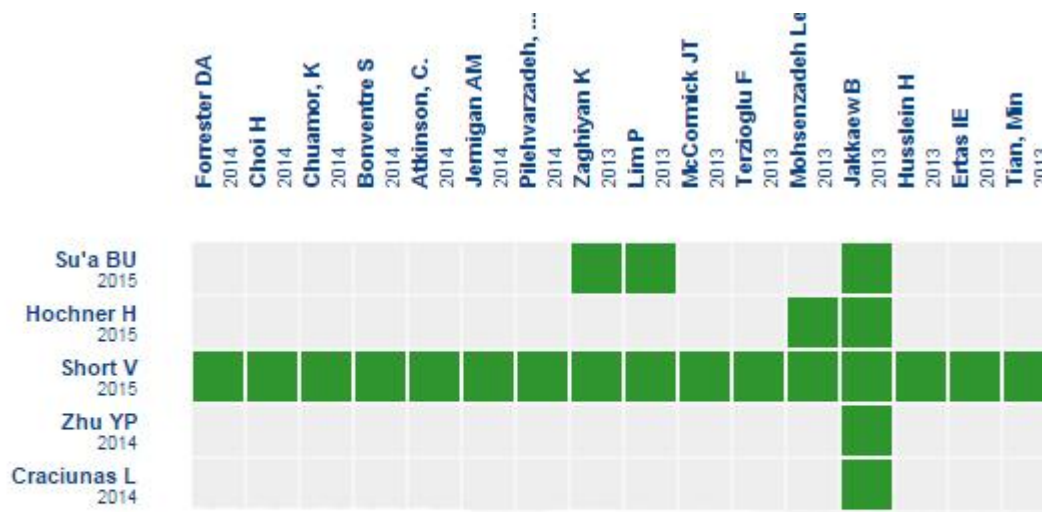
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### Could this evidence change in the future?

- There is a high probability that future evidence change what we know about the benefits of chewing gum in postoperative abdominal surgery, especially in relation to the magnitude of benefit and the effect on specific subgroups.
  - There are many ongoing studies evaluating this intervention in different types of surgery, either as isolated or as a component intervention of rapid recovery protocols.
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## How we conducted this summary

Using automated and collaborative means, we compiled all the relevant evidence for the question of interest and we present it as a matrix of evidence



Starting from any systematic review, Epistemonikos builds a matrix based on existing connections in the database (the review from which the matrix is built, appears highlighted).

The author of the matrix can select relevant information for a specific health question (typically in PICO format) in order to display the information set for the question.

The rows represent systematic reviews that share at least one primary study, and columns display the studies. The boxes in green correspond to studies included in the respective reviews.

Follow the link to access the interactive version [Chewing gum for the amelioration of postoperative ileus](#)

### About the certainty of the evidence (GRADE)\*

⊕⊕⊕⊕

**High:** This research provides a very good indication of the likely effect. The likelihood that the effect will be substantially different† is low.

⊕⊕⊕○

**Moderate:** This research provides a good indication of the likely effect. The likelihood that the effect will be substantially different† is moderate

⊕⊕○○

**Low:** This research provides some indication of the likely effect. However, the likelihood that it will be substantially different† is high.

⊕○○○

**Very low:** This research does not provide a reliable indication of the likely effect. The likelihood that the effect will be substantially different† is very high.

\*This concept is also called 'quality of the evidence' or 'confidence in effect estimates'.

† Substantially different = a large enough difference that it might affect a decision.

## Notes

The upper portion of the matrix of evidence will display a warning of “new evidence” if new systematic reviews are published after the publication of this summary. Even though the project considers the periodical update of these summaries, users are invited to comment in *Medwave* or to contact the authors through email if they find new evidence and the summary should be updated earlier. After creating an account in Epistemonikos, users will be able to save the matrixes and to receive automated notifications any time new evidence potentially relevant for the question appears.

The details about the methods used to produce these summaries are described here

<http://dx.doi.org/10.5867/medwave.2014.06.5997>.

Epistemonikos foundation is a non-for-profit organization aiming to bring information closer to health decision-makers with technology. Its main development is Epistemonikos database ([www.epistemonikos.org](http://www.epistemonikos.org)).

These summaries follow a rigorous process of internal peer review.

## Conflicts of interest

The authors do not have relevant interests to declare.

## References

- Chan MK, Law WL. Use of chewing gum in reducing postoperative ileus after elective colorectal resection: a systematic review. *Dis Colon Rectum*. 2007 Dec;50(12):2149-57. | [PubMed](#) |
- Craciunas L, Sajid MS, Ahmed AS. Chewing gum in preventing postoperative ileus in women undergoing caesarean section: a systematic review and meta-analysis of randomised controlled trials. *BJOG*. 2014 Jun;121(7):793-9; discussion 799. | [CrossRef](#) | [PubMed](#) |
- de Castro SM, van den Esschert JW, van Heek NT, Dalhuisen S, Koelemay MJ, Busch OR, et al. A systematic review of the efficacy of gum chewing for the amelioration of postoperative ileus. *Dig Surg*. 2008;25(1):39-45. | [CrossRef](#) | [PubMed](#) |
- Fitzgerald JE, Ahmed I. Systematic review and meta-analysis of chewing-gum therapy in the reduction of postoperative paralytic ileus following gastrointestinal surgery. *World J Surg*. 2009 Dec;33(12):2557-66. | [CrossRef](#) | [PubMed](#) |
- Ho YM, Smith SR, Pockney P, Lim P, Attia J. A meta-analysis on the effect of sham feeding following colectomy: should gum chewing be included in enhanced recovery after surgery protocols? *Dis Colon Rectum*. 2014 Jan;57(1):115-26. | [CrossRef](#) | [PubMed](#) |
- Hochner H, Tenfelde SM, Abu Ahmad W, Liebergall-Wischnitzer M. Gum chewing and gastrointestinal function following caesarean delivery: a systematic review and meta-analysis. *J Clin Nurs*. 2015 Apr 7. | [CrossRef](#) | [PubMed](#) |
- Li S, Liu Y, Peng Q, Xie L, Wang J, Qin X. Chewing gum reduces postoperative ileus following abdominal surgery: a meta-analysis of 17 randomized controlled trials. *J Gastroenterol Hepatol*. 2013 Jul;28(7):1122-32. | [CrossRef](#) | [PubMed](#) |
- Noble EJ, Harris R, Hosie KB, Thomas S, Lewis SJ. Gum chewing reduces postoperative ileus? A systematic review and meta-analysis. *Int J Surg*. 2009 Apr;7(2):100-5. | [CrossRef](#) | [PubMed](#) |
- Parnaby CN, MacDonald AJ, Jenkins JT. Sham feed or sham? A meta-analysis of randomized clinical trials assessing the effect of gum chewing on gut function after elective colorectal surgery. *Int J Colorectal Dis*. 2009 May;24(5):585-92. | [CrossRef](#) | [PubMed](#) |
- Purkayastha S, Tilney HS, Darzi AW, Tekkis PP. Meta-analysis of randomized studies evaluating chewing gum to enhance postoperative recovery following colectomy. *Arch Surg*. 2008 Aug;143(8):788-93. | [CrossRef](#) | [PubMed](#) |
- Short V, Herbert G, Perry R, Atkinson C, Ness AR, Penfold C, et al.. Chewing gum for postoperative recovery of gastrointestinal function. *Cochrane Database Syst Rev*. 2015 Feb 20;2:CD006506. | [CrossRef](#) | [PubMed](#) |
- Su'a BU, Pollock TT, Lemanu DP, MacCormick AD, Connolly AB, Hill AG. Chewing gum and postoperative ileus in adults: a systematic literature review and meta-analysis. *Int J Surg*. 2015 Feb;14:49-55. | [CrossRef](#) | [PubMed](#) |
- Vásquez W, Hernández AV, Garcia-Sabrido JL. Is gum chewing useful for ileus after elective colorectal surgery? A systematic review and meta-analysis of randomized clinical trials. *J Gastrointest Surg*. 2009 Apr;13(4):649-56. | [CrossRef](#) | [PubMed](#) |
- Wallström A, Frisman GH. Facilitating early recovery of bowel motility after colorectal surgery: a systematic review. *J Clin Nurs*. 2014 Jan;23(1-2):24-44. | [CrossRef](#) | [PubMed](#) |
- Wang XJ, Chi P. [Effect of chewing gum on the promotion of intestinal function recovery after colorectal surgery: a meta-analysis]. *Zhonghua Wei Chang Wai Ke Za* | [PubMed](#) |
- Yin Z, Sun J, Liu T, Zhu Y, Peng S, Wang J. Gum chewing: another simple potential method for more rapid improvement of postoperative gastrointestinal function. *Digestion*. 2013;87(2):67-74. | [CrossRef](#) | [PubMed](#) |
- Yuan Y, Zhao H, He J, Gong D. [Chewing Gum in Promoting Bowel Recovery after Cesarean Section: A Systematic Review]. *Chin J Evidence-Based Med*. 2011;11(4):427-432
- Zhu YP, Wang WJ, Zhang SL, Dai B, Ye DW. Effects of gum chewing on postoperative bowel motility after caesarean section: a meta-analysis of randomised controlled trials. *BJOG*. 2014 Jun;121(7):787-92. | [CrossRef](#) | [PubMed](#) |
- Chewing gum aids recovery after colon resection. *OR Manager*. 2005;21(12):11.
- Chewing gum after colectomy. *American Journal of Nursing*. 2006;106(9):72JK-L. English.

21. Gum chewing reduces ileus after colectomy. *OR Manager*. 2006;22(4):32.
22. Postop bowel function: chewing gum may speed recovery. *Nursing Administration Quarterly*. 2006 2006;36(5):34.
23. Abd-El-Maeboud KH, Ibrahim MI, Shalaby DA, Fikry MF. Gum chewing stimulates early return of bowel motility after caesarean section. *BJOG*. 2009 Sep;116(10):1334-9. | [CrossRef](#) | [PubMed](#) |
24. Abdollahi AA, Yazdi K, Behnampour N, Niazi M. The effect of chewing gum on bowel movements after appendectomy. *Arak Medical University Journal*. 2011;13(4):38-43.
25. Abdollahi AA, Yazdi K, Behnampour N, Niazi M. Effect of gum-chewing on the movement of intestines after abdominal resection and length of hospital stay. *Int J Hosp Res*. 2013 2013;2(3):125-9.
26. Akhlaghi F, Pourjavad M, Mansouri A, Tara F, Vahedian M. Effect of Gum Chewing on Prevention of Post Cesarean Ileus. *Hayat*. 2009 2009;14(2):35-40.
27. Allen G. Evidence for practice. Effect of gum chewing on postoperative ileus. *AORN Journal*. 2003 2003;77(2):461.
28. Asao T, Kuwano H, Nakamura J, Morinaga N, Hirayama I, Ide M. Gum chewing enhances early recovery from postoperative ileus after laparoscopic colectomy. *J Am Coll Surg*. 2002 Jul;195(1):30-2. | [PubMed](#) |
29. Askarpour S, Shoushtari M, Saadati M. Study of the effect of early feeding, chewing gums, and laxative on ileus in patients who underwent open cholecystectomy. *The Internet J Surg*. 2009;22(2).
30. Atkinson C, Penfold C, Ness A, Longman R, Thomas S, Hollingworth W, et al. LB024-MON: a randomised trial of chewing gum to reduce post-operative ileus. *Clin Nutr*. 2014 2014;33:S260. | [CrossRef](#) |
31. Bahena-Aponte JA, Cárdenas-Lailson E, Chávez-Tapia N, Flores-Gama F. [Usefulness of chewing gum for the resolution of postoperative ileus in left colon resections]. *Rev Gastroenterol Mex*. 2010 Oct-Dec;75(4):369-73. Spanish. | [PubMed](#) |
32. Bonventre S, Inviati A, Di Paola V, Morreale P, Di Giovanni S, Di Carlo P, Schifano D, Frazzetta G, Gulotta G, Scerrino G. Evaluating the efficacy of current treatments for reducing postoperative ileus: a randomized clinical trial in a single center. *Minerva Chir*. 2014 Feb;69(1):47-55. | [PubMed](#) |
33. Cabrera GTO, Justiniano K, Herrera L, Ortiz MV, Vargas VC. [Effectiveness of chewing gum in restoring intestinal transit for postoperative paralytic ileus: a prospective randomised study]. *Panam J Trauma, Crit Care Emerg Surg*. 2012;1(3):193-7.
34. Cao R, Zuo Y, Chen H, Zhu X, Kang Z. Colorectal cancer patients chewing gum on intestinal function. *Today Nurse*. 2008;11:45-6.
35. Cavuşoğlu YH, Azili MN, Karaman A, Aslan MK, Karaman I, Erdoğan D, et al. Does gum chewing reduce postoperative ileus after intestinal resection in children? A prospective randomized controlled trial. *Eur J Pediatr Surg*. 2009 Jun;19(3):171-3. | [CrossRef](#) | [PubMed](#) |
36. Chen L, Xie S, Xiao Y, Dan Y. Early chewing gum on the bile duct exploration postoperative recovery of bowel movements. *Journal of Nurses Training*. 2011;26(11):1046-7.
37. Chen X, Sun D. Influence of chewing gum on recovery of gastrointestinal function after gastric resection. *West China Med J*. 2012;24(10):2003-4.
38. Chen Y, Ma Z, Lu R, Yao H, Peng N. Clinical Effects of Early Chewing Gum in Promoting Recovery of Gastrointestinal Function. *Nur J Chin People's Liberation Army*. 2010;27(16):1275-6.
39. Choi H, Kang SH, Yoon DK, Kang SG, Ko HY, Moon du G, Park JY, Joo KJ, Cheon J. Chewing gum has a stimulatory effect on bowel motility in patients after open or robotic radical cystectomy for bladder cancer: a prospective randomized comparative study. *Urology*. 2011 Apr;77(4):884-90. | [CrossRef](#) | [PubMed](#) |
40. Choi H, Kim JH, Park JY, Ham BK, Shim Js, Bae JH. Gum chewing promotes bowel motility after a radical retropubic prostatectomy. *Asia Pac J Clin Oncol*. 2014 Mar;10(1):53-9. | [CrossRef](#) | [PubMed](#) |
41. Chou SJ, Lin CH, Hsieh HF, Yu JC, Chen TW, Chan DC. Gum chewing in patients with subtotal gastrectomy. *Chir Gastroenterol*. 2006 2006;22(4):269-71. | [CrossRef](#) |
42. Chuamor K, Thongdonjuy J. Effectiveness of standard nursing care with gum chewing to reduce bowel ileus in post-operative gynecologic patients: randomized controlled trials. *Siriraj Medical Journal*. 2014;66(2):33-8. | [Link](#) |
43. Crainic C, Erickson K, Gardner J, Haberman S, Patten P, Thomas P, Hays V. Comparison of methods to facilitate postoperative bowel function. *Medsurg Nurs*. 2009 Jul-Aug;18(4):235-8. | [PubMed](#) |
44. Doyle-Munoz J, Forrester DA, McTigue T, D'Andrea S, Natale-Ryan A. The efficacy of gum chewing in reducing postoperative ileus. *J Wound Ostomy Continence Nurs*. 2014 May-Jun;41(3):227-32. | [CrossRef](#) | [PubMed](#) |
45. Ertas IE, Gungorduk K, Ozdemir A, Solmaz U, Dogan A, Yildirim Y. Influence of gum chewing on postoperative bowel activity after complete staging surgery for gynecological malignancies: a randomized controlled trial. *Gynecol Oncol*. 2013 Oct;131(1):118-22. | [CrossRef](#) | [PubMed](#) |
46. Fan Q, Geng X, Chen H, Yu J, Hu M, Yi J. Effects of chewing gum on recovery of gastrointestinal motility in patients undergoing total resection of colorectal cancer. *Med J National Defending Forces in Southwest China*. 2009;19(12):1240-1.
47. Forrester DA, Doyle-Munoz J, McTigue T, D'Andrea S, Natale-Ryan A. The efficacy of gum chewing in reducing postoperative ileus: a multisite randomized controlled trial. *J Wound Ostomy Continence Nurs*. 2014 May-Jun;41(3):227-32. | [CrossRef](#) | [PubMed](#) |
48. Garshasbi A, Behboudi S. The effect of Gum chewing on postoperative ileus after cesarean section. *Society for Obstetric Anesthesia and Perinatology (SOAP) 42nd Annual Meeting*; 2011.
49. Garvin R, McCormick JT, Read TE, Papasavas PK, Caushaj PF. Gum chewing accelerates recovery of

- bowel function after intestinal resection: Multi-institutional prospective randomized trial. *American J Gastroenterol.* 2005;100(9):S269. | [CrossRef](#) |
50. Ghafouri A, Soroush AR, Moeini N, Hedayat A, Khourgami ZH. The efficacy of sugar free gum chewing after upper gi tract operation on ileus: a clinical trial. *Iranian Journal of Surgery.* 2008;16(1):79-84. | [Link](#) |
  51. Gong L. Chewing gum on gastrointestinal surgery patients after bowel function. *Chin J Aesthetic Med.* 2011;20(Z2):325-6.
  52. Guangqing Y, Xiaomei Y, Chunlan W. Influence of chewing gum on gastrointestinal function of postoperative patients in obstetrics and gynecology department after undergoing minimally invasive surgery. *Chinese Nurs Res.* 2011;25(4):311-2. | [Link](#) |
  53. Han Z, Zhao H, Liu C, Jin Q. Randomized controlled study on the role of chewing gum in bowel function recovery for patients with leiomyoma after surgery. *China Medical Herald.* 2011;8(28):37-9.
  54. Harma MI, Barut A, Arikan, II, Harma M. Gum-chewing speeds return of first bowel sounds but not first defecation after cesarean section. *Anatol J Obstet Gynecol.* 2009;1:1-3.
  55. Hirayama I, Suzuki M, Ide M, Asao T, Kuwano H. Gum-chewing stimulates bowel motility after surgery for colorectal cancer. *Hepatogastroenterology.* 2006 Mar-Apr;53(68):206-8 | [PubMed](#) |
  56. Huang W, Yu X. Influence of gum chewing on gastrointestinal function of patients after undergoing laparoscopic appendectomy. *Chinese Nursing Research.* 2012;26(23):2153-4. | [Link](#) |
  57. Huang Y, Ling Y, Huang Q, Huang M. Three different methods of care for elderly postoperative gastrointestinal function recovery of gastrointestinal comparison. *J Youjiang Medical University for Nationalities.* 2012;34(3):442-4.
  58. Huang Y, Ling Y, Huang Q, Huang M. Influence of chewing gum on recovery of gastrointestinal function in elder patients after gastrointestinal operation. *Chinese Journal of Misdiagnostics.* 2012;12(17):4500-2.
  59. Husslein H, Franz M, Gutsch M, Worda C, Polterauer S, Leopold H. Postoperative gum chewing after gynecologic laparoscopic surgery: a randomized controlled trial. *Obstet Gynecol.* 2013 Jul;122(1):85-90. | [CrossRef](#) | [PubMed](#) |
  60. Jakkaw B, Charoenkwan K. Effects of gum chewing on recovery of bowel function following cesarean section: a randomized controlled trial. *Arch Gynecol Obstet.* 2013 Aug;288(2):255-60. | [CrossRef](#) | [PubMed](#) |
  61. Jernigan AM, Chen CC, Sewell C. A randomized trial of chewing gum to prevent postoperative ileus after laparotomy for benign gynecologic surgery. *Int J Gynaecol Obstet.* 2014 Dec;127(3):279-82. | [CrossRef](#) | [PubMed](#) |
  62. Jin Q, Huang J, Songlin Y, Wang C, Yin X. Chewing gum for kidney patients after recovery of gastrointestinal function. *Chinese Journal of Modern Nursing.* 2010;16(23):2833-4.
  63. Kafali H, Duvan CI, Gözdemir E, Simavli S, Onaran Y, Keskin E. Influence of gum chewing on postoperative bowel activity after cesarean section. *Gynecol Obstet Invest.* 2010;69(2):84-7. | [CrossRef](#) | [PubMed](#) |
  64. Kouba EJ, Wallen EM, Pruthi RS. Gum chewing stimulates bowel motility in patients undergoing radical cystectomy with urinary diversion. *Urology.* 2007 Dec;70(6):1053-6. | [PubMed](#) |
  65. Ledari FM, Barat S, Delavar MA. Chewing gums has stimulatory effects on bowel function in patients undergoing cesarean section: a randomized controlled trial. *Bosn J Basic Med Sci.* 2012 Nov;12(4):265-8. | [PubMed](#) |
  66. Lee DDK, Runowicz CD, Chambers JT, Langer O. Efficacy of gum chewing in improving the recovery of bowel function after major gynecologic surgery. *Obstetrics and Gynecology.* 2004;103(4):21S.
  67. Li L, Cai L. Observation on effect of chewing gum in mouth care for patients after underwent gastrointestinal operation. *Chinese Nursing Research.* 2007;21(5):417-8.
  68. Li M. [Chewing gum can promote the recovery of intestinal function]. *Chinese Manipulation & Rehabilitation Medicine.* 2012;3(11):89-90.
  69. Li Y. [Chewing gum on the impact of early postoperative gastrointestinal function in patients with colon cancer]. *World Health Digest.* 2012;41:69-70.
  70. Liang J-h, Gao T, Han W-w, Zhang Y, Liu S-l, Dai Q-l. The clinical observation of enhancing recovery of gastrointestinal function after cesarean section by gum chewing. *Journal of Tongji University(Medical Science).* 2007;28(2):81-3.
  71. Lim P, Morris OJ, Nolan G, Moore S, Draganic B, Smith SR. Sham feeding with chewing gum after elective colorectal resectional surgery: a randomized clinical trial. *Ann Surg.* 2013 Jun;257(6):1016-24. | [CrossRef](#) | [PubMed](#) |
  72. Lu D, Liu Q, Shi G. Gum chewing stimulates early return of bowel motility after gynecologic laparoscopic surgery. *Fertility and sterility.* 2011;96(3 SUPPL. 1):S32.
  73. Lu L, Zhao A. "False eat" diet promote cesarean section with recovery of gastrointestinal function and clinical studies lactation. *Journal of Nurses Training.* 2010;25(23):2158-9.
  74. Lu Q, Wu W, Yang L, Zhao X, Zhong Z, Wang HY, et al. The effect of gum chewing on bowel motility in patients after radical cystectomy with urinary diversion. *China Journal of Modern Medicine.* 2011;21(10):1255-7.
  75. Luo S-q, Wu C-l, Yang X-m, Lei L-x, Deng H-r, Li H. Effect of chewing gum after cesarean section on restoration of gastrointestinal function. *Chinese Journal of Modern Nursing.* 2010;16(24):2948-9.
  76. Marwah S, Singla S, Tinna P. Role of gum chewing on the duration of postoperative ileus following ileostomy closure done for typhoid ileal perforation: a prospective randomized trial. *Saudi J Gastroenterol.* 2012 Mar-Apr;18(2):111-7. | [CrossRef](#) | [PubMed](#) |
  77. Matros E, Rocha F, Zinner M, Wang J, Ashley S, Breen E, Soybel D, Shoji B, Burgess A, Bleday R, Kuntz R, Whang E. Does gum chewing ameliorate



- postoperative ileus? Results of a prospective, randomized, placebo-controlled trial. *J Am Coll | PubMed |*
78. McCormick JT. Gum in the postoperative setting: something to chew on. *Dis Colon Rectum*. 2013 Mar;56(3):273-4. | [CrossRef](#) | [PubMed](#) |
  79. McCormick JT, Garvin R, Caushaj P, Simmang C, Gregorcyk S, Huber P, et al. The effects of gum chewing on bowel function and hospital stay after laparoscopic vs open colectomy: a multi-institution prospective randomised trial. *Journal of the American College of Surgeons*. 2005;201(3):S66-S7. | [CrossRef](#) |
  80. Mohsenzadeh Ledari F, Barat S, Delavar MA, Banihosini SZ, Khafri S. Chewing sugar-free gum reduces ileus after cesarean section in nulliparous women: a randomized clinical trial. *Iran Red Crescent Med J*. 2013 Apr;15(4):330-4. | [CrossRef](#) | [PubMed](#) |
  81. Ngowe MN, Eyenga VC, Kengne BH, Bahebeck J, Sosso AM. Chewing gum reduces postoperative ileus after open appendectomy. *Acta Chir Belg*. 2010 Mar-Apr;110(2):195-9. | [PubMed](#) |
  82. Park SY, Chung M. Can gum chewing reduce postoperative ileus after open abdominal surgery? *Journal of the Korean Surgical Society*. 2009;77(5):206-9. | [CrossRef](#) |
  83. Pilehvarzadeh M, Shamsi A, Salari S, Rafeti F, Hosseinzadeh H, Ebadi A. Effect of gum chewing in the reduction of paralytic ileus following cholecystectomy. *Journal of Qazvin University of Medical Sciences*. 2014;17(6):24-9. | [CrossRef](#) |
  84. Qiao J-j. Clinical observation of chewing gum in promoting the recovery of gastrointestinal function after gastrointestinal disease surgery. *Journal of Clinical Medicine in Practice*. 2011;15(14):45-6.
  85. Qiu F, Ren X. Chewing gum after abdominal surgery in gynecologic patients with gastrointestinal function recovery application. *Modern Nursing*. 2006;12(17):1624-5.
  86. Quah HM, Samad A, Neathey AJ, Hay DJ, Maw A. Does gum chewing reduce postoperative ileus following open colectomy for left-sided colon and rectal cancer? A prospective randomized controlled trial. *Colorectal Dis*. 2006 Jan;8(1):64-70. | [PubMed](#) |
  87. Rashad WAE, Yousef S. Effect of sugarless gum chewing on intestinal movement after cesarean section. *Life Science Journal*. 2013;10(4):3257-61. | [Link](#) |
  88. Ray KL, Estes JM, Huh WK. Prospective, randomized trial of postoperative gum-chewing and return of bowel function in gynecology. *Obstetrics and Gynecology*. 2008;111(4):7S-8S.
  89. Ren Y, Qin X. Effect of chewing gum on the time of anal exhaust after laparoscopic cholecystectomy. *Journal of Qilu Nursing*. 2010;16(20):4-5.
  90. Ren Y, Qin X, Dai X. Effect of chewing gum on gastrointestinal function after laparoscopic abdominal surgery. *Chinese Journal of Practical Nursing*. 2010;26(26):68-70.
  91. Rocha FG, Matros E, Ashley SW, Breen E, Shoji BT, Soybel DI, et al. Does gum chewing ameliorate postoperative ileus? Results of a prospective, randomized placebo-controlled trial. *Gastroenterology*. 2005;128(4):A800.
  92. Safdari-Dehcheshmehi F, Salehian T, Parvin N, Akbari N. Comparison of the effects of gum chewing with those of early initiation of oral feeding and routine regimen on recovery of bowel function in primiparous women after cesarean section. *Scientific Journal of Kurdistan University of Medical Sciences*. 2011;16(2):Pe9-Pe15.
  93. Satij B. Evaluation of gum chewing on the return of bowel functions in cesarean-delivery patients. *Obstetrics and gynecology*. 2006;107(4 Suppl):10S.
  94. Schluender SS, Gurland BHG, Divino CD, Horovitz JH, Adler HA, Chernobelsky LC, et al. Gum chewing does not enhance the return of bowel function in patients undergoing elective colon resection in a randomized blinded pilot study. *Colorectal disease*. 2005;7(Suppl 1):92.
  95. Schuster R, Grewal N, Greaney GC, Waxman K. Gum chewing reduces ileus after elective open sigmoid colectomy. *Arch Surg*. 2006 Feb;141(2):174-6. | [PubMed](#) |
  96. Schweizer W, Häne R. Sham-feeding of patients with chewing gum after abdominal operations. *British Journal of Surgery*. 2010 2010;97(S3):8.
  97. Shang H, Yang Y, Tong X, Zhang L, Fang A, Hong L. Gum chewing slightly enhances early recovery from postoperative ileus after cesarean section: results of a prospective, randomized, controlled trial. *Am J Perinatol*. 2010 May;27(5):387-91. | [CrossRef](#) | [PubMed](#) |
  98. Smith SR, Lim P, Draganic B. Effect of gum chewing on gastrointestinal recovery after laparoscopic colorectal resectional surgery: a prospective randomized clinical trial. *Royal Australasian College of Surgeons Annual Scientific Congress, Perth, Western Australia* (Published in: *ANZ journal of surgery*); 2010: A17.
  99. Sun L, Gong S, Gong H, Zhang Y. Chewing gum used in abdominal surgery and postoperative care observation. *Today Nurse*. 2005 2005;7:11-2.
  100. Tan Y, Tang X. [Chewing gum after abdominal surgery for gynecological promote recovery of gastrointestinal function]. *Today Nurse*. 2011;10:47-8.
  101. Terzioglu F, Şimsek S, Karaca K, Sariince N, Altunsoy P, Salman MC. Multimodal interventions (chewing gum, early oral hydration and early mobilisation) on the intestinal motility following abdominal gynaecologic surgery. *J Clin Nurs*. 2013 Jul;22(13-14):1917-25. | [CrossRef](#) | [PubMed](#) |
  102. Tian M. Effect of chewing gums on gastrointestinal function of rectal cancer patients undergoing surgical operations. *Modern Clinical Nursing*. 2013;12(2):45-7.
  103. Wang H. Chewing gum to promote recovery of bowel movement after abdominal surgery observation. *Journal of Qiqihar Medical College*. 2009;30(4):492.
  104. Wang S, Hou Y, Dong S, Liu B, Zhang K. A randomized controlled trial of chewing gum to promote postoperative bowel recovery for patients

- with rectal cancer. *Sichuan Medical Journal*. 2011;32(12):1956-8.
105. Wang X, Liao H, Gao L, Ma Y, Zhang L. Chewing gum on recovery of gastrointestinal function after abdominal surgery impact. *Journal of Nurses Training*. 2008;23(10):938-9.
106. Wang X, Ren Y, Qin X, Dai X. Influence of sham feeding on motilin and evacuating time after accepting cesarean section. *Chinese Nursing Research*. 2011;25(8):682-3.
107. Watson H, Griffiths P, Lamparelli M, Watson M. Does chewing (gum) aid recovery after bowel resection? A randomised controlled trial (RCT). *Colorectal Disease*. 2008;10:6.
108. Webster B, Corcoran A, Smaldone M, Morrisroe S, Stockton B, Jackman S, et al. Does gum chewing reduce postoperative ileus following urologic laparoscopy? A prospective randomized controlled trial. *J Endourol*. 2007;21(Supp 1):A137.
109. Yang H. Influence of gum-chewing on recovery of intestinal motility after ephyadectomy surgery in children. *Journal of Nursing Science*. 2011 ;26(6):23.
110. Yazdi K, Abdollahi AA, Behnampour N, Niazi M, Arya B, Azadrah M. Effect of chewing gum on the bowel motility after cholecystectomy. *Zahedan Journal of Research in Medical Sciences*. 2011;13(3):20-4.
111. Yi Y, Guo H, Xian W, Chen Y. Bile duct exploration postoperative recovery chewing gum promote peristalsis clinical observation. *Laboratory Medicine and Clinic*. 2013;10(10):1270-1.
112. Zaghiyan K, Felder S, Ovsepyan G, Murrell Z, Sokol T, Moore B, Fleshner P. A prospective randomized controlled trial of sugared chewing gum on gastrointestinal recovery after major colorectal surgery in patients managed with early enteral feeding. *Dis Colon Rectum*. 2013 Mar;56(3):328-35. | [CrossRef](#) | [PubMed](#) |
113. Zamora BBB, Kalalo RE. Gum chewing versus traditional feeding on the early return of bowel motility after cesarean delivery: A prospective randomized controlled trial. *Int J Gynaecol Obst*. 2012;119:S525.
114. Zhang Q, Zhao P. Influence of gum chewing on return of gastrointestinal function after gastric abdominal surgery in children. *Eur J Pediatr Surg*. 2008 Feb;18(1):44-6. | [CrossRef](#) | [PubMed](#) |
115. Zhao P, Zhang Q-m. The influence of chewing gum on the return of intestinal motility after abdominal surgery in children and its mechanism of action. *Journal of Clinical Pediatric Surgery*. 2008;7(3):24-6.
116. Zhong Z, Ye F, Lin J. study on how chewing action promotes gastrointestinal functions recovery after colorectal cancer surgery. *Chinese Journal of Gastrointestinal Surgery*. 2009;12(6):632-3.

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