Living FRIendly Summary of the Body of Evidence using Epistemonikos

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

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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 a 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 propulsory 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**

<table>
<thead>
<tr>
<th>What is the evidence. See evidence matrix in Epistemonikos later</th>
<th>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.</th>
</tr>
</thead>
<tbody>
<tr>
<td>What types of patients were included</td>
<td>Twenty studies evaluated patients undergoing colorectal surgery, 15 cesarean section, three appendectomy, four holecystectomy, 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.</td>
</tr>
<tr>
<td>What types of interventions were included</td>
<td>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).</td>
</tr>
<tr>
<td>What types of outcomes were measured</td>
<td>Time to flatus, time to have a bowel movement, time to first bowel movement, length of stay, complications, tolerance of chewing gum, costs.</td>
</tr>
</tbody>
</table>
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.

<table>
<thead>
<tr>
<th>Patients Intervention Comparison</th>
<th>Outcomes</th>
<th>Absolut effect*</th>
<th>Relative effect (95% CI)</th>
<th>Certainty of the evidence (GRADE)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>WITHOUT chewing gum</td>
<td>WITH chewing gum</td>
<td>DM -0.58 (-0.84 to -0.53)</td>
</tr>
</tbody>
</table>
|                                  |          | Average stay was 6.8 days | Average stay was 6.12 days | Difference: 0.68 days less (17 hours approx) (Margin of error: 0.53 to 0.84 days less) |}

MD: Mean difference. Margin of error = 95% confidence interval (CI). GRADE: evidence grades of the GRADE Working Group (see later in this article).

The risk WITHOUT chewing gum is based on the risk in the control group of the trials. The risk WITH chewing gum (and its margin of error) is calculated from relative effect (and its margin of error).

1 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.

2 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 (I²=84%).
Other considerations for decision-making

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.

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.

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.

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.

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.

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.

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.

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.
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.
References

49. Garvin R, McCormick JT, Read TE, Papasavas PK, Caushaj PF. Gum chewing accelerates recovery of


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