**Clinical question.**
In victims with oral caustic substance poisoning, does the early administration of milk or water as compared to nothing by mouth, improve outcome?

**Is this question addressing an intervention/therapy, prognosis or diagnosis?** intervention/therapy

**State if this is a proposed new topic or revision of existing worksheet:** revision

**Conflict of interest specific to this question**
Do any of the authors listed above have conflict of interest disclosures relevant to this worksheet? No

**Search strategy (including electronic databases searched).**
PubMed "caustic" or "alkali" or "acid" and "poisoning" or "overdose" and "milk" or "dilution" or "therapy" text word in abstract
AHA EndNote Master library
Cochrane database for systematic reviews and Central Register of Controlled Trials
Hand searches of journals, review articles, and books

**State inclusion and exclusion criteria**
Only articles in the peer reviewed literature were included
No abstracts, only studies
Studies that do not specifically answer the question

**Number of articles/sources meeting criteria for further review:** 7
# Summary of evidence

## Evidence Supporting Clinical Question

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**Level of evidence**

Outcomes – Please define outcomes for this question, place them after letters below and use letters to identify studies which evaluate this outcome

A = C = E =

B = D = *Italics = Animal studies*
### Evidence Neutral to Clinical question

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Outcomes – Please use the same outcomes as defined for the Evidence Supporting table above

### Evidence Opposing Clinical Question

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Outcomes – Please use the same outcomes as defined for the Evidence Supporting table above
REVIEWER’S FINAL COMMENTS AND ASSESSMENT OF BENEFIT / RISK: (please include implementation considerations including at a minimum training, environment and availability):

Old:
The results of some animal studies suggest that dilution or neutralization of a caustic agent by water or milk after ingestion reduces tissue injury, but no human studies have demonstrated a clinical benefit of this practice. Administration of milk or water may be considered if a large amount of an industrial-strength caustic or a solid caustic has been ingested, but call the poison control center first.

New:
No human studies exist examining the treatment of oral caustic exposure with dilution therapy. An initial chemistry study by Maull (1985, LOE 5) demonstrated that large volumes of diluent caused little change in temperature or pH of either strong base or strong acid. Animal studies by Homann (1993, 1994, 1995 – LOE 5) demonstrated histological benefit to the esophagus following exposure to an alkali when saline dilution, milk, orange juice, and cola were administered. Animal studies by Homann (1995, LOE 5) also demonstrated benefit following acid exposure to esophagus when saline dilution or milk were administered. However, when extrapolating this to clinical practice, these studies do not address the issue of risk when these agents are administered to a person having ingested a caustic (i.e. re-exposure due to emesis, aspiration risk, interference with subsequent endoscopy).

Acknowledgements:

Citation List

Summary – This isolated esophageal study suggests limitation of injury with saline infusion as indicated by inflammatory cell migration. Level 5. Good

Summary – This study shows a benefit in isolated esophageal tissue to infusion of either water or milk. The difference between water and milk are minor and probably not clinically relevant. LOE 5 Good

Summary Study showed mild benefit from treating isolated esophageal tissue with early neutralization therapy. LOE 5 Good

Summary – This study demonstrates that ear dilutional therapy with either water or milk reduces acid injury in isolated esophageal tissue. LOE 5 Good

Summary – While not exclusively focusing on milk and water, this study does speak against the use of dilutional techniques. LOE 5 Fair