Reflux in the ICN- pH Studies Critically Appraised Topic (CAT)

PICOT Question:
For infants in the ICN, does a pH study assist in diagnosing gastroesophageal reflux?

Clinical bottom line based on literature appraisal below:
A pH probe with impedance measurement, which detects both acid and non-acid reflux, is preferred over conventional pH probe testing. At CMH, both pH and impedance are measured. Even with the impedance measurement, diagnosis of GER is problematic.

Search strategy implemented:
Pub Med and OVID  pH studies, impedance, gastroesophageal reflux, infant

Search outcome: Two cohort diagnosis studies.

Synthesis of relevant studies:

<table>
<thead>
<tr>
<th>Author, date, country, and industry of funding</th>
<th>Patient Group</th>
<th>Level of Evidence (Oxford) / Strength of Evidence (GRADE)</th>
<th>Research design</th>
<th>Significant results</th>
<th>Limitations</th>
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<tr>
<td>Condino, A.A., Sondheimer, J., Pan, Z., Gralla, J., Perry, D., &amp; O’Connor, J.A., (2006). Evaluation of Infantile acid and nonacid gastroesophageal reflux using combined pH monitoring</td>
<td>Children aged 2 weeks to 12 months. N= 34. Symptoms of GER included Cough, burping, arching, choking, gagging, breathing problems</td>
<td>1b</td>
<td>The gold standard pH monitoring was compared to multichannel intraluminal impedance to detect both acid and nonacid reflux</td>
<td>34 patients 20 female 14 male Median age 7 months (range 2-11 months) 1890 reflux events were detected by pH-MII. 588 were detected by pH probe, but not by impedance. More reflux events were detected by the MII. 53 events were detected by MII but not pH. Of the 1890 events detected by pH-MII, 888 events were characterized as acid (47%) and 1002 events were characterized as nonacid (53%) The proportion of nonacid reflux decreased from 61% during the first hour from the 1st meal to 39% between the first and second hours postprandial and finally to 29% when</td>
<td>Pre selected infants—already been on treatment for GERD</td>
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Upon completion of the CAT please forward to Jackie Bartlett, EBPC Program Manager, at jbartlett@cmh.edu
EBP@EBPC@/EBP Core/Toolkit/LiteratureSynthesis
Reviewed/Revised: 10/08; 2/09
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<th>and impedance measurement. <em>Journal of Pediatric Gastroenterology and Nutrition</em>, 42, 16-21.</th>
<th>greater than 2 hours postprandial. Non acid reflux decreased with age. 54% were no acid in infants 2-3 months and only 45% were nonacid in infants aged 8-11 months (p&lt;0.0001 by Pearson $\chi^2$)</th>
<th>Tolia, V., Wuerth, A. &amp; Thomas, R. (2005). <em>Diagnostic interpretation of extended pH monitoring: Is there a single best method? Digestive Diseases and Sciences, 50(1), 94-99.</em></th>
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<td>The population included 117 infants &lt; one year old, with pathologic GER, (presenting symptoms were - vomiting, gagging, nasopharyngeal reflux, or burping of gas, Respiratory symptoms, choking, coughing, wheezing, raspy breathing or ALTE Non specific symptoms - arching, stiffening or unexplained irritability</td>
<td>Prospective investigation of extended pH monitoring Compared three measures to identify pathologic reflux. Reflux index, Euler &amp; Byrne score and Area under the curve (AUC). Hypothesis: the analysis of AUC data could decrease the number of false negative results.</td>
<td>The specificity and sensitivity of the RI score were 97.8 and 93% respectively. The specificity and sensitivity of the EBS were 100 and 94.4% respectively. The specificity and sensitivity of the AUC were 100 and 94.4% respectively. The ROC curves indicated the highest overall test accuracy occurred using the AUC. The proposed cut off variables for RI of 2.1% for diagnosing pathologic reflux using formula feeding The proposed cut off variable for EBS of 49 is close to the original cut off of 50%. The new cut off for distinguishing between normal and abnormal reflux in infants on formula feeding was &gt; 21.3 pH min for AUC at pH &lt; 4.0 using ROC curves. Since it is unethical to do pH monitoring in asymptomatic infants, there are no normal values.</td>
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References:
