Introduction:
Intermittent catheterization (IC) is an accepted means of maintaining bladder and renal health in individuals with incomplete bladder emptying due to neurogenic bladder. Urinary tract infections (UTIs) are common. Two different catheter products are available for IC: - Polyvinyl chloride (PVC) catheters - Hydrophilic coated PVC catheters. Proposed advantages of hydrophilic catheters: - Reduction of urethral irritation or trauma - Reduction of symptomatic UTIs.
Current evidence is inadequate for decision making.

Objectives:
To compare the incidence of symptomatic UTIs in children with spina bifida using single use hydrophilic or multiuse PVC catheters for IC.

Methods:
Randomized crossover two arm trial at 4 Western Canada pediatric sites. 24 week arms of IC using: - Single use hydrophilic (SpeediCath®, Coloplast) - Multiuse PVC catheter (Standard of care).
Symptomatic UTI = pyuria on UA plus ≥ 1 fever (≥38C), flank pain, suprapubic pain, malaise, increased urinary incontinence, cloudy or malodorous urine requiring antibiotics.
Inclusion criteria: - Community-dwelling child with spina bifida on IC - IC performed by child or consistent person - English-speaking
Exclusion criteria: - PVC allergy - Diabetes mellitus - Urethral or bladder pathology - Bladder augmentation

Patient Demographics
Mean age: 10.6 years (SD 6.2)
21 males and 25 females
All performed IC ≥ 3 /day:
52% self
48% parent/caregiver
PVC catheter used at least 5 times.

Primary Outcome:
Number of symptomatic UTIs.

Secondary Outcomes:
Weekly urinalysis
Antibiotic use
Physician visits
Days missed of school or activities
Subject/caregiver satisfaction with study catheter
Completion of study.

Total sample size needed: 97.

Statistical analysis:
Mixed Within-Subjects Between-Subjects Analysis of Variance
SPSS Version 20.

Results:

Randomized N=68
Withdraw from study N=14

Potential subjects N=54
Did not meet inclusion criteria N=4

Potential subjects N=50
Incomplete data N=4

Complete 48 week date N=46

Reasons for dropout N=22
- Hydrophilic too slippery 15%
- Refused PVC arm 5%
- Urinary diversion 4%
- Other 8%

Patient Demographics
Mean age: 10.6 years (SD 6.2)
21 males and 25 females
All performed IC ≥ 3 /day:
52% self
48% parent/caregiver
PVC catheter used at least 5 times.

Mean number of weeks (of 24) with Symptoms

<table>
<thead>
<tr>
<th>Possible symptoms of UTI</th>
<th>Hydrophilic Single use</th>
<th>PVC Multiuse</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>UA Leukocytes</td>
<td>50 8.46</td>
<td>52 10.10</td>
<td>&gt;0.05</td>
</tr>
<tr>
<td>UA Hematuria</td>
<td>50 2.64</td>
<td>52 3.15</td>
<td>&gt;0.05</td>
</tr>
<tr>
<td>Fever</td>
<td>50 0.04</td>
<td>49 0.06</td>
<td>&gt;0.05</td>
</tr>
<tr>
<td>Other symptoms (no fever)</td>
<td>50 3.50</td>
<td>49 2.22</td>
<td>&gt;0.05</td>
</tr>
<tr>
<td>Antibiotic use</td>
<td>50 0.80</td>
<td>49 0.55</td>
<td>&gt;0.05</td>
</tr>
<tr>
<td>Days Missed Activities</td>
<td>50 0.40</td>
<td>52 0.13</td>
<td>&gt;0.05</td>
</tr>
</tbody>
</table>

Catheter Satisfaction

<table>
<thead>
<tr>
<th>Catheter Satisfaction</th>
<th>Hydrophilic Single Use</th>
<th>PVC Multiuse</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Convenience</td>
<td>49 81.6</td>
<td>48 81.3</td>
<td>&gt;0.05</td>
</tr>
<tr>
<td>Comfort</td>
<td>48 87.5</td>
<td>47 95.7</td>
<td>&gt;0.05</td>
</tr>
<tr>
<td>Ease of handling</td>
<td>49 59.2</td>
<td>48 95.8</td>
<td>&lt;0.05</td>
</tr>
<tr>
<td>Continue to use?</td>
<td>49 57.1</td>
<td>48 91.7</td>
<td>&lt;0.05</td>
</tr>
<tr>
<td>Overall satisfaction</td>
<td>48 72.9</td>
<td>48 87.5</td>
<td>&gt;0.05</td>
</tr>
</tbody>
</table>

Conclusions:
A hydrophilic catheter does not appear to reduce febrile UTI or antibiotic use in community dwelling children with spina bifida using IC.
Consistent with the existing Cochrane Review:
There is a lack of evidence to state that the incidence of UTI is affected by hydrophilic or multiuse catheters.

References: