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Catheter valves for indwelling urinary catheters: a systematic review

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CRD summary	This review compared catheter valves with free drainage into a bag in patients with indwelling urinary catheters. The authors found little evidence of the superiority of catheter valves over catheter bags, although patients may prefer catheter valves. There were a number of methodological limitations and possible sources of bias and error, therefore the authors' conclusions should be viewed with caution.
Authors' objectives	To evaluate the effect of catheter valves compared with free drainage into a bag in patients with indwelling urinary catheters.
Searching	MEDLINE, British Nursing Index, CINAHL, AMED, EMBASE and EBM Reviews were searched in early 2005 and again in February 2006; the search terms were reported. Additional searches were also run on MEDLINE. The reference lists of relevant papers were checked. Papers in English, Dutch and German were included.
Study selection	<p>Studies of adults, defined as 16 years or older, in any care setting were eligible for inclusion. Of the two included studies, one was of only males (mean age 71.4 years) and the other of males (mean age 72.3 years) and females (mean age 72.8 years). In one study patients were recruited when they attended the urological department with acute urinary retention; in the other, the recruitment site was not reported but the participants were assessed in the hospital or at home.</p> <p>Any design of catheter valve was eligible for inclusion if the purpose of the valve was the intermittent release of urine from either a suprapubic or urethral catheter. The comparators eligible for inclusion were any catheter drainage systems that allowed free and continuous drainage of urine (usually consisting of a bag strapped to the leg day and night with an additional bag connected to the leg at night).</p> <p>The authors did not specify any inclusion criteria relating to the outcomes. The outcomes assessed in the included studies were prevalence of urinary tract infection (UTI) as indicated by significant bacteriuria in a urine specimen, patient satisfaction, bladder spasm (measurement not clearly defined), patient preference, patient satisfaction (measurement not clearly defined) and positive urine cultures ($>10^3$ organisms/mL).</p>

	<p>Randomised controlled trials (RCTs) and quasi-RCTs that reported a follow-up of 80% or more participants were eligible for inclusion. The included studies were a prospective RCT (method of randomisation unclear) and a crossover RCT, which had follow-up durations of 3 months and 3 weeks, respectively. Neither study was blinded.</p> <p>A single reviewer selected the papers and a second reviewer checked the decisions.</p>
Validity assessment	The authors did not state that they assessed validity.
Data extraction	<p>The outcomes extracted were: the number of positive urine specimens, systemic illness, UTI risk reduction, bladder spasm and related pain, the number of episodes of leakage per day, incontinence, patient preference and satisfaction scores.</p> <p>One reviewer extracted the data, which a second reviewer validated.</p>
Methods of synthesis	The studies were grouped narratively by similar outcomes. Between-study differences were deduced through examination of the text and tables.
Results of the review	<p>Two RCTs (n=121) were included in this review: one prospective (n=99) and one crossover (n=22).</p> <p>The crossover study reported a statistically significant preference among patients for the catheter valve compared with the catheter bag ($p < 0.05$). The prospective RCT reported that more patients were 'happy' or 'satisfied' with the catheter valve compared with the catheter bag; this was also statistically significant ($p < 0.05$).</p> <p>The difference in UTI risk in the catheter bag group compared with the catheter valve group was not statistically significant in either study. The crossover RCT evaluated the difference in bladder spasms and related pain, episodes of leakage and the occurrence of moderate to severe incontinence, between the catheter bag and catheter valve groups; there was no statistically significant difference between the groups on any of these outcomes.</p>
Authors' conclusions	There was little evidence of the superiority of catheter valves over catheter bags when using clinical criteria. However, the evidence suggests that patients may prefer catheter valves.
CRD commentary	The review question was well-defined. Although the inclusion criteria were clear with regard to the participants, intervention and study design, there were no inclusion criteria to define the outcomes; this might have led to subjective decisions about study inclusion. The authors searched relevant databases but only sought papers in English, Dutch and German, so relevant papers might have been missed. The authors did not report any attempts to obtain unpublished studies, which might have introduced publication bias into the review. The selection and extraction of data were performed by one reviewer and checked by another, thereby reducing the potential for errors. The validity

	of the primary studies was not assessed, so the results of the included studies may not be reliable. As only two small studies were included in this review, reliable conclusions cannot be drawn and the results may not be generalisable to certain population groups, for instance women and those with poor mobility. Also, some potentially important details were poorly reported in the primary studies, such as the setting in which the participants were followed up. Given the methodological limitations of this review and the possibility of bias and error, the authors' conclusions should be viewed with caution.
Implications of the review for practice and research	<p>Practice: The authors stated that an individual assessment of each patient is needed to support the decision to use a catheter valve or a bag. Dexterity, cognition and bladder conditions that would contraindicate the use of a catheter valve require assessment.</p> <p>Research: The authors stated that further research into catheter valves with larger study groups, including housebound male and female patients, and with a longer follow-up period is needed.</p>
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