Duration of short-term indwelling catheters: a systematic review of the evidence

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CRD summary
This review assessed the effect of different durations of catheterisation. The authors concluded that there were no significant differences in outcomes as a result of the different durations employed, and that infection avoidance should be balanced against voiding dysfunction in determining the duration of catheterisation. These conclusions are likely to be reliable.

Authors' objectives
To assess the effect of duration of catheterisation on urinary retention.

Searching
The Cochrane Incontinence Group's specialised register was searched to May 2004. The references of potentially relevant trials were checked, and experts, pharmaceutical companies and investigators were contacted. No language restrictions were applied.

Study selection
Randomised controlled trials (RCTs) and quasi-randomised trials that evaluated different durations of catheterisation prior to removal of short-term indwelling urethral catheters were eligible for inclusion. All of the included studies were RCTs, and a range of durations of catheterisation were compared: the shortest interval was 24 hours and the longest 14 days. Studies of suprapubic catheters, intermittent catheterisation, or removal of nephrostomy and suprapubic tubes were excluded from the review. Studies of patients of any age in any setting were eligible. Studies of patients with genitourinary congenital anomalies were excluded from the review. The patients in the included studies had undergone a variety of surgical procedures on the genitourinary system, or had acute urine retention. Studies were required to report at least one of the following outcomes: objective or subjective measures of patient comfort, patient satisfaction, quality of life, length of hospitalisation, incidence of urinary retention, adverse effects, cost-effectiveness. Other relevant outcomes such as recatheterisation were also reported in the included studies.

Two reviewers independently assessed studies for inclusion in the review.

Assessment of study quality
Two reviewers independently assessed the validity of the studies using the following criteria: reporting of inclusion and exclusion criteria; allocation concealment, methods of outcome assessment and potential for bias in those methods; and description of withdrawals and drop-outs. Any disagreements were resolved by discussion with a third reviewer. Agreement between assessors was assessed using the $\kappa$ statistic.

Data extraction
Two reviewers independently extracted the data using a pre-piloted data extraction tool designed specifically for the review. Any disagreements were resolved through discussion. In addition to outcome measures, data were extracted on operation categories, follow-up period and reasons for withdrawals or drop-outs. Relative risks (RRs) with 95% confidence intervals (CIs) were calculated for dichotomous data, and weighted mean differences (WMDs) with 95% CIs for continuous data. Where only $p$-values were reported, the generic inverse method was employed to permit pooling.

Methods of synthesis
The authors planned to pool RRs or WMDs in meta-analyses using a fixed-effect model, unless statistically significant heterogeneity was detected by a $\chi^2$ test, in which case a random-effects model would have been considered. However, clinical heterogeneity was such that a narrative synthesis with illustrative forest plots was presented instead. Planned subgroup analyses based on catheter size were not undertaken because there were insufficient data.
Results of the review
Eight RCTs (n=816) were included in the review.

The methodological quality of the trials was mixed. Only 2 trials reported clear inclusion and exclusion criteria, three reported appropriate randomisation methods, and two had adequate allocation concealment. One trial used an intention-to-treat analysis. Descriptions of withdrawals and drop-outs, or lack thereof, was reported by all trials.

Short-term urinary retention and delayed voiding (4 RCTs): 3 RCTs found no difference between the different duration groups, while one found that fewer patients in the 1-day group developed acute retention of urine compared with the 5-day group (p<0.05; RR not reported). This result was highly significant for a subgroup of patients who had undergone mesorectum excision (RR 3.29, 95% CI: 1.17, 9.26), but was not significant for those with rectal excision.

Chronic urinary retention (2 RCTs): no significant differences were found between 1 and 5 days' duration or between 24 and 48 hours versus over 48 hours' duration.

Requirement for recatheterisation (3 RCTs): none of the studies found a statistically significant difference between the groups.

Urinary tract infection (5 RCTs): 4 trials found no difference between groups in the incidence of urinary tract infection, although in one there was a trend towards a greater incidence in patients catheterised for a longer period (RR 0.55, 95% CI: 0.30, 1.03), while a fifth small trial found a significantly greater incidence in patients catheterised for 5 days compared with those catheterised for 1 day (RR 0.48, 95% CI: 0.27, 0.85).

Length of hospitalisation (3 RCTs, 4 analyses): hospitalisation was found to be significantly shorter in patients with shorter catheterisation duration in 2 RCTs (p<0.001 in both instances); the third trial found no difference between the groups (p=0.10).

Other complications: no statistically significant differences between the groups were reported for secondary haemorrhage, deep vein thrombosis, urethral pain and discharge, epididymitis or recurrence of strictures.

Patient satisfaction (1 RCT): there was no statistically significant difference between patients catheterised for 1 day and those catheterised for 14 days (RR 0.72, 95% CI: 0.45, 1.17).

Cost information
The authors sought but did not find data on cost-effectiveness. They stated that a detailed assessment of the cost-effectiveness of different catheterisation durations is desirable.

Authors' conclusions
There were no significant differences in patient outcome as a result of different catheterisation durations, although shorter durations appeared to reduce mean length of hospital stay. Timing of catheter removal is a balance between infection avoidance (shorter durations) and voiding dysfunction (longer durations).

CRD commentary
The review question and the inclusion criteria were clear. The search was adequate and the lack of publication or language restrictions reduced the risk of relevant studies not being included in the review. The authors reported the use of methods designed to reduce bias and error in all aspects of the review process. An appropriate validity assessment was conducted. The decision to employ a narrative synthesis was an appropriate response to clinical heterogeneity. The authors' conclusions are based on the results of this well-conducted review and are likely to be reliable.

Implications of the review for practice and research
Practice: The authors did not state any implications for practice without an assessment of cost-effectiveness.

Research: The authors stated that future trials of the duration of catheterisation should use appropriate and well-defined outcomes such as those sought in this review; should report patient variables such as hydration status and anesthesia method; and greater generalisability should be achieved.
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This is a critical abstract of a systematic review that meets the criteria for inclusion on DARE. Each critical abstract contains a brief summary of the review methods, results and conclusions followed by a detailed critical assessment on the reliability of the review and the conclusions drawn.