Urinary incontinence can affect 40% to 60% of people admitted to hospital after a stroke, with 25% still having problems on hospital discharge and ≈15% remaining incontinent at 1 year.

**Objectives**
The objective of the review was to determine the optimal methods for prevention and treatment of urinary incontinence after stroke in adults.

**Search Strategy**
We searched the Cochrane Incontinence and Stroke Groups specialized registers (searched December 15, 2004 and October 26, 2004, respectively), CINAHL (January 1982 to November 2004), national and international trial databases for unpublished data, and the reference lists of relevant articles.

**Selection Criteria**
Randomized or quasi-randomized controlled trials evaluating the effects of interventions designed to promote continence in people after stroke.

**Data Collection and Analysis**
Data extraction and quality assessment were undertaken by 2 reviewers working independently. Disagreements were resolved by a third reviewer.

**Main Results**
Seven trials with a total of 399 participants were included in the review. Participants were from a mixture of settings, age groups, and phases of stroke recovery. No 2 trials addressed the same comparison.

Four trials tested an intervention against usual care, including acupuncture, timed voiding, and 2 types of specialist professional intervention. One crossover trial tested an intervention (estrogen) against placebo. One trial tested a specific intervention (oxybutynin) against another intervention (timed voiding), and 1 trial tested a combined intervention (sensory-motor biofeedback plus timed voiding) against a single component intervention (timed voiding alone).

Reported data were insufficient to evaluate acupuncture or timed voiding versus usual care, oxybutynin versus timed voiding, or sensory motor biofeedback plus timed voiding versus usual care. Evidence from a single small trial suggested that structured assessment and management of care in early rehabilitation may reduce the number of people with incontinence at hospital discharge (1 of 21 versus 10 of 13; relative risk [RR], 0.06; 95% CI, 0.01 to 0.43) and have other benefits. Evidence from another trial suggested that assessment and management of care by continence nurse practitioners in a community setting may reduce the number of urinary symptoms (48 of 89 versus 38 of 54; RR, 0.77; 95% CI, 0.59 to 0.99) and increase satisfaction with care.

**Reviewers’ Conclusions**
There was suggestive evidence that specialist professional input through structured assessment and management of care and specialist continence nursing may reduce urinary incontinence after stroke. Data from trials of other physical, behavioral, complementary, and anticholinergic drug interventions are insufficient to guide continence care of adults after stroke.

**Implications for Practice**
There is very little evidence from stroke-specific studies to guide practice. The lack of trials testing the same category of intervention means that recommendations for practice are based on the results of single, usually small, trials. Two trials provide some evidence to suggest that specialized professional input using systematic methods to assess and manage continence problems may improve some outcomes. The limited evidence suggests that the greatest impact on urinary incontinence may be in the acute phase of rehabilitation after stroke. However, specialist input and individualized care management may im-
prove the number of symptoms of urinary incontinence even in the longer term.

**Implications for Research**

There is a need for larger trials, in particular of the use of individualized assessment and goal setting to tailor interventions to neurological and functional problems.

As well as the need for trials of methods to promote continence, methods of managing continuing urinary incontinence such as intermittent catheterization or the use of catheter valves are also needed.

There is a need for more well-designed studies. For example, further research should use standardized definitions and classification systems to record details of the type and severity of stroke and the type and severity of urinary incontinence. Specific details of structured assessment and intervention protocols need to be given, with standardization of treatment, measures of between groups contamination or differences, and tailoring of intervention to the early or later phases of rehabilitation. Outcome measures of urinary incontinence and of urinary symptoms should be standardized, with attention to their validity and reliability and the blinding of outcome assessment. The time periods for review should be standardized for the acute, early, and later phases of rehabilitation. Finally, sample size calculations and securely concealed randomization at either the cluster or individual patient level should be used appropriately and reported accordingly.


**Acknowledgments**

This work was supported by the University of Central Lancashire (£10 000). The review was conceived and designed by L.T. Searching was completed by B.F. Trials were considered for inclusion independently by 2 reviewers (L.T. and B.F.). Data extraction and review of the methodological quality of the eligible studies were then independently conducted by 2 reviewers for each study (C.S., M.L., S.C., and B.F.). Extracted data and quality assessment were cross-checked and any disagreements discussed and, if necessary, resolved by L.T. L.T. and B.F. wrote the text of the review. J.B. and C.W. acted as external reviewers and contributed to constructing the implications for practice and research.

**Key Words:** cerebrovascular accident urinary incontinence
Prevention and Treatment of Urinary Incontinence After Stroke in Adults
Graeme J. Hankey, Lois H. Thomas, James Barrett, Stephen Cross, Beverley French, Michael Leathley, Christopher Sutton and Caroline Watkins

Stroke. 2006;37:929-930; originally published online February 2, 2006; doi: 10.1161/01.STR.0000204113.54907.79

Stroke is published by the American Heart Association, 7272 Greenville Avenue, Dallas, TX 75231
Copyright © 2006 American Heart Association, Inc. All rights reserved.
Print ISSN: 0039-2499. Online ISSN: 1524-4628

The online version of this article, along with updated information and services, is located on the World Wide Web at:
http://stroke.ahajournals.org/content/37/3/929

Permissions: Requests for permissions to reproduce figures, tables, or portions of articles originally published in Stroke can be obtained via RightsLink, a service of the Copyright Clearance Center, not the Editorial Office. Once the online version of the published article for which permission is being requested is located, click Request Permissions in the middle column of the Web page under Services. Further information about this process is available in the Permissions and Rights Question and Answer document.

Reprints: Information about reprints can be found online at:
http://www.lww.com/reprints

Subscriptions: Information about subscribing to Stroke is online at:
http://stroke.ahajournals.org/subscriptions/