CRD summary
The review evaluated interventions for prevention and treatment of incontinence-associated dermatitis and recommended structured regimes, which included: skin cleansing (using perineal skin cleansers and not soap and water); use of skin protectants (no-sting barrier film, moisturisers); and proper use of diapers or underpads. Limitations of the available evidence indicate a cautious interpretation of the authors’ conclusions.

Authors’ objectives
To evaluate interventions for the prevention and treatment of incontinence-associated dermatitis and formulate recommendations for clinical practice and research.

Searching
PubMed, EMBASE, CINAHL and Cochrane Central Register of Controlled Trials (CENTRAL) were searched to September 2008 for publications in English, Dutch, French and German. Conference proceedings of European Pressure Ulcer Advisory Panel, European Wound Management Association, European Tissue Repair Society and International Continence Society were handsearched from 2001 to 2008. The bibliography of each retrieved article was handsearched. Some search terms were reported.

Study selection
Studies of any type of design that described interventions to prevent or treat incontinence-associated dermatitis in adults (over 18 years) were eligible for inclusion. Patients in included studies were in both chronic and acute care; no details were provided of their age and sex. Definitions of incontinence-associated dermatitis in the included studies included: incontinence dermatitis; dermatitis due to the physical stress of incontinence; perineal rash; perineal dermatitis; perineal skin wetness; pressure rash; pressure ulcer; nappy rash; diaper dermatitis; incontinence damaged skin; skin breakdown relating to incontinence; perineal skin breakdown; excoriation due to incontinence; skin problems; and moisture-related skin problems. Included studies used skin protectants (zinc oxide-based products, no-sting barrier film), moisturisers, perineal skin cleansers, use of diapers and/or underpads or assessed specific skin care regimens and/or incontinence care regimens (such as incontinence care versus usual care). Median study period was 42 days (range seven to 420 days). The primary outcomes were occurrence and incidence of incontinence-associated dermatitis and skin conditions.

Two independent researchers were involved in the literature search and study selection. Any disagreements resolved by consensus after seeing the full text of the articles.

Assessment of study quality
Methodological quality was assessed by two reviewers independently using the Research Appraisal Checklist with 51 assessment criteria in 10 categories. Scores were added to give a total score for methods and analysis and a total overall score for the study. Data were reported for the included studies relevant to the following criteria: baseline comparison of patient characteristics; randomisation procedure; presence of a power analysis; observation scale tested for validity; and inter-observer reliability.

Data extraction
Data were extracted using a prespecified standardised table of evidence. Relevant significant outcomes of each individual study were extracted in a narrative form.

The authors did not report how many reviewers performed the extraction.

Methods of synthesis
A narrative synthesis was provided due to methodological heterogeneity.

**Results of the review**

Twenty five relevant studies (n=2,822) were identified: nine randomised controlled trials (RCTs) (n=881) (three were double blind); one cross-over study (n=12); five pre-post studies (n=356); one retrospective pre-post study (n=64); four observational comparative studies (n=352); one observational study (n=92); one prospective descriptive study (n=32); one post test only study (n=19); and two descriptive studies (n=1014).

The mean Research Appraisal Checklist score of the included studies was relatively high; details were reported in the review. Five studies had no control group (two pre-post studies, one observational comparative study, one post test only study and one descriptive study). In half of the studies a baseline comparison of patient characteristics was performed. A prospective power analysis was carried out in three RCTs. Randomisation procedure was not described in one RCT.

**Zinc oxide-based products (six study arms):** One RCT found that a topical zinc oxide preparation with antiseptic properties (Sudocrem) was superior to traditional zinc cream for the treatment of incontinence-associated dermatitis.

**No-sting barrier film (eight study arms):** Two studies (one observational comparative and one descriptive) compared a no-sting barrier film with a petrolatum-based ointment in patients with incontinence-associated dermatitis and found a reduction in erythema, skin maceration and stripping with the no-sting film. One RCT found reduced erythema and denudation with barrier film compared to zinc oxide. One retrospective pre-post study found a statistically significant reduction in pressure ulcer incidence in incontinent patients when a skin protectant (thick disposable washcloth with the active agent, dimethicone 3% incorporated into it) was used.

**Moisturisers (one study):** An RCT found a reduction in erythema, roughness and desquamation of the skin with use of a hydrogel/barrier repair cream versus a petrolatum-based moisturising cream in the treatment of incontinence-associated dermatitis.

**Perineal skin cleansers (seven studies):** Two studies (one RCT and one cross-over study) found skin cleansers were more effective than soap and water in preventing incontinence-related skin problems. Four studies (including one RCT) found reduced skin erythema with the combined use of a perineal skin cleanser and a skin protectant compared to controls. The result was not confirmed in the results table for one observational comparative study.

**Use of specific skin care and/or incontinence care regime (three studies):** A pre-post study found that the use of a structured skin care protocol combined with a pressure ulcer prevention protocol versus an unstructured protocol gave a statistically significant lower incontinence-associated dermatitis incidence (4.7% versus 25.3%), fewer grade 1 pressure ulcers and reduced severity of skin lesions. An RCT with an exercise and incontinence intervention gave a significant improvement in urinary and faecal incontinence and skin wetness (limited to the back distal perineal area) when compared to usual care.

**Use of diapers and/or underpads (three studies):** One RCT compared non-polymer diaper/underpads versus polymer diaper/underpads for the outcome perineal dermatitis. There were no statistical differences in skin alteration (colour, integrity or symptoms) between patients wearing diapers and those managed with underpads. Polymer products were more effective in preventing skin breakdown (skin colour change, tingling, itching, burning, pain) than non-polymer products. Another RCT found that underpads with a more absorbent capacity and a higher ability to keep the skin dry improved skin condition when compared to underpads with low absorbance.

**Cost information**

Eleven studies contributed data for a cost evaluation. A cost evaluation was reported for five studies on the use of a no-sting barrier film in the treatment and prevention of incontinence-associated dermatitis: four out of five studies reported a reduction in product costs; four out of four studies reported a reduction in nursing time; and two out of two studies reported a reduction in total costs. No other study reported on total costs for an intervention. Two studies reported reduced product cost and nursing time individually for the use of aerosol mousse and cleanser protectant lotion. Two studies reported higher product cost and reduced nursing time individually for the use of a structured protocol and polymer diaper/underpads. Two studies reported reduced product cost individually for use of petrolatum
ointment and a disposable washcloth with dimethicone.

**Authors’ conclusions**

Incontinence-associated dermatitis can be prevented and treated with timely and appropriate skin cleansing and skin protection and proper use of incontinence containment materials. There was a need for further research to evaluate the safety and effectiveness of the different interventions.

**CRD commentary**

The review addressed a well-defined question in terms of participants, interventions, study design and relevant outcomes. Relevant databases were searched in a range of languages and efforts were made to find unpublished studies. The authors did not report the start date for searches. Publication bias was not assessed. Study quality was assessed using suitable criteria. Some efforts were made to reduce error and bias in the review process. Some relevant study details were reported, but no details of the age or sex of the patients was provided. The significant outcomes of studies were described, but no other relevant data were provided. There were differences between the results reported in the text and those in the tables. A narrative synthesis was provided due to study heterogeneity. The authors reported that in general methodological quality of included studies was poor, effect sizes were not reported, studies were small and length of follow-up was short. Additionally, a wide range of definitions and observational instruments were used for incontinence-associated dermatitis. In view of the limitations of the available evidence, the authors’ conclusions should be interpreted with caution.

**Implications of the review for practice and research**

**Practice:** The authors stated a number of recommendations for management of patients with incontinence, including a need for clear differentiation between incontinence-associated dermatitis and pressure ulcers. The authors suggested that caregivers and patients should be informed of costs of the different interventions to enable them to make an appropriate choice.

**Research:** The authors identified a need for development of a uniform instrument and method to study incontinence-associated dermatitis prevalence and management strategies across different patient groups. Research was needed to find prevalence and incidence of incontinence-associated dermatitis and on the numerous factors that influence development of incontinence-associated dermatitis. Further research was needed on safety and effectiveness of commonly used products and procedures.

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Record Status
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.