

# Review: Some but not all topical antimicrobial agents improve the rate of healing of chronic wounds

O'Meara SM, Cullum NA, Majid M, Sheldon TA. Systematic review of antimicrobial agents used for chronic wounds. *Br J Surg.* 2001 Jan;88:4-21.

## QUESTION

Are systemic and topical antimicrobial agents effective for healing chronic wounds (venous leg ulcers, pressure ulcers, diabetic foot ulcers, and pilonidal sinuses)?

## DATA SOURCES

Studies were identified by searching 19 electronic databases, including MEDLINE and CINAHL, from their inception to January 2000. Conference abstracts, journals, and bibliographies of included studies were hand searched, and experts were contacted.

## STUDY SELECTION

Randomized controlled trials (RCTs) and nonrandomized trials with a control group were selected if patients had or were at risk for developing diabetic foot ulcers, pressure ulcers, chronic leg ulcers, pilonidal sinuses, nonhealing surgical wounds, or chronic cavity wounds; systemic or topical antimicrobial preparations (antibiotic, antifungal, or antiviral agents) intended to prevent or heal wounds were studied; and objective measurement of wound healing, change in skin condition, or development of new lesions was reported.

## DATA EXTRACTION

Data were extracted on study quality and characteristics, participants, interventions, outcomes, and adverse events.

## MAIN RESULTS

30 trials (25 RCTs) met the inclusion criteria. Trials were grouped according to wound type (Table); data were not combined because of study differences. For topical agents for venous ulcers, allopurinol powder, dimethyl sulfoxide powder, silver impregnated charcoal dressing, and tripeptide-copper or silver sulfadiazine improved complete healing of the ulcer area more than did placebo or other topical agents. Oxyquinolone ointment improved complete healing of pressure ulcers. Excision with insertion of a gentamicin-impregnated sponge and pressure dressing

also showed improvement in wound healing for pilonidal sinuses.

## CONCLUSION

Healing of chronic wounds is improved by some topical antimicrobial agents, but few systemic agents show improvements.

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**Treatment of chronic wounds or ulcers with systemic antimicrobial or topical agents\***

Wound type	Intervention	Studies	Number of patients	Healing
Venous ulcers	Systemic agents	2 RCTs	84	No improvement
	Topical agents	5 RCTs, 2 nRCTs	449	3 of 7 improved
Mixed causes	Systemic agents	2 RCTs	85	Both improved
	Topical agents	3 RCTs, 2 nRCTs	128	3 of 5 improved
Pressure ulcers	Topical agents	3 RCTs	169	1 of 3 improved
Diabetic ulcers	Systemic agents	2 RCTs	104	No improvement
	Topical agents	1 RCT	29	Improvement
Pilonidal sinuses	Systemic agents	2 RCTs, 1 nRCT	190	2 of 3 improved
	Topical agents	3 RCTs	198	1 of 3 improved

\*RCTs = randomized controlled trials; nRCTs = nonrandomized controlled trials.

## COMMENTARY

Chronic wounds are a common cause of morbidity, and their cost of care is high. For example, the annual incidence of foot ulcers in patients with diabetes is about 6%, and 16% of these patients require amputation (1). The incidence of pressure sores in a well-staffed internal medicine ward was 4% (2). The role of infection and colonization in preventing wound healing is uncertain, and so is the role of antimicrobial agents in promoting recuperation.

The systematic review by O'Meara and colleagues on antimicrobial agents for treatment of chronic wounds is excellent, with a well-defined clinical question, a comprehensive search strategy, and unambiguous criteria for inclusion of studies. The included studies are well described, which allows readers to form their own opinion. The discussion is relevant and comprehensive for both methods and pathophysiologic content. Unfortunately, the review offers few recommendations to change clinical practice because little can be learned from the original studies. Most of them had a small sample size, weak methodology, and unclear biologic hypotheses. The abstract cannot do justice to the review by enumeration of positive and negative results. To gain a true insight, the review itself should be read.

Nevertheless, several messages can be highlighted. Overall, systemic antibiotics did not promote healing. However, an effect of antibiotic treatment on healing might have been missed because of a small sample size in some studies. Given the potential to induce resistance, the possible adverse effects, and the lack of evidence for effect, systemic antibiotic treatment should be given only for clear indications of a systemic or local infection.

Topical antimicrobial agents show more promise, but the trial results are inconsistent and the trials have the same methodologic problems as do the trials of systemic agents. RCTs of topical antimicrobial agents that use clinically relevant outcomes, a sufficient sample size, and correct methods are urgently needed.

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## References

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