

# The effectiveness of trace element supplementation following severe burn injury: a systematic review

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## Abstract

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Trace elements have an important physiological role following severe burn injury with patients routinely receiving supplementation. Although trace element supplementation is commonly prescribed after burn injury, variations exist between supplement composition, frequency and the dosage administered. This objective of this research was to identify, assess and synthesise the available evidence on the effectiveness of trace element supplementation on clinically meaningful outcomes, including mortality, length of stay, rate of wound healing and complications in patients who have sustained a severe burn injury.

Following development of an *a priori* protocol, the effectiveness of selenium, copper and zinc supplementation, either alone or combined, compared to placebo or standard treatment, was investigated via systematic review and meta-analysis. A comprehensive search strategy was designed and employed to identify published and unpublished research. Methodological quality of eligible studies was critically appraised and relevant data extracted for synthesis.

Eight studies were included in the review: four randomised controlled trials and four non-randomised experimental trials, representing 398 participants with an age range of six to 67 years.

Results of this research indicate that the use of parentally-administered combined trace elements following burn injury confers positive effects in decreasing infectious complications. Combined parenteral trace element supplementation and combined oral and parenteral zinc supplementation have potentially clinically significant implications on reducing length of stay. Oral zinc supplementation shows possible beneficial effects on mortality. Further studies are required to accurately define optimal trace element supplementation regimens, dosages and routes, and to determine cost-effectiveness.

## Declaration

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I, Rochelle Kurmis, certify that this work contains no material which has been accepted for the award of any other degree or diploma in my name, in any university or other tertiary institution and, to the best of my knowledge and belief, contains no material previously published or written by another person, except where due reference has been made in the text. In addition, I certify that no part of this work will, in the future, be used in a submission in my name, for any other degree or diploma in any university or other tertiary institution without the prior approval of the University of Adelaide and, where applicable, any partner institution responsible for the joint-award of this degree.

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Rochelle Kurmis

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