

Systematic review and meta-analysis of the effects of high-protein oral nutritional supplements on healthcare use

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Previous systematic reviews suggest improvements in clinical outcome with oral nutritional supplements (ONS)⁽¹⁾, although the role of high-protein ONS has not been widely addressed. Thus, a systematic review has been undertaken to investigate the effect of high-protein ONS *v.* routine care on clinical outcomes. This review has already highlighted a significant reduction in complications with high-protein ONS⁽²⁾. However, the review also aimed to investigate the effect of high-protein ONS on healthcare use, including length of stay in acute and community settings and hospital readmissions.

A systematic review using searches of electronic databases and bibliographies (up to January 2007) identified twenty-seven randomised controlled trials (RCT; *n* 2730) of multi-nutrient high-protein ONS ($\geq 20\%$ total energy from protein⁽³⁾) used in addition to diet and compared with routine care. Seven RCT (*n* 968) reported length of stay in hospital, including acute and community-based rehabilitation hospitals but only five RCT (*n* 847) had full data (mean and SD) available for analysis. Only one RCT (*n* 445) had data on hospital readmissions. High-protein ONS (prescribed daily intake 624–4165 kJ (149–995 kcal) energy, 18–50 g protein, 28 d–6 months) were given to patients with hip fracture (four RCT) or acutely-ill elderly patients (one RCT) in hospital or in both hospital and community settings. Meta-analysis was performed on all length-of-stay data (five RCT, *n* 847), and separately for acute hospital stay (three RCT) and acute and community-based rehabilitation hospital stay (two RCT) using Comprehensive Meta-Analysis version 2 (Biostat Inc., Englewood, NJ, USA).

Outcome	Statistics	Significance (<i>P</i>)
Length of acute hospital stay (d; three RCT; <i>n</i> 725)	-0.55 (95% CI -1.66, 0.57)*	0.34
Length of acute + community hospital stay (d; two RCT; <i>n</i> 122)	-9.69 (95% CI -12.19, -7.19)*	<0.0005
Readmissions (one RCT; <i>n</i> 445)	OR 0.62 (95% CI 0.42, 0.93)	0.02

* Unstandardised difference in means.

Although meta-analysis of all trials combined suggested that high-protein ONS reduced length of stay compared with routine care (-2.05 (95% CI -3.07, -1.04) d), significant heterogeneity meant a separate analysis according to setting was more appropriate (Table). The reduction in acute hospital length of stay with high-protein ONS was <1 d (7% shorter than routine-care group) but there was a much greater (20%, about 10 d) difference when community-based hospital stays were considered. The RCT that had data on hospital readmissions showed a significant reduction with high-protein ONS given in hospital and after discharge (Table).

This systematic review and meta-analysis suggests that ONS high in protein (with $\geq 20\%$ total energy from protein) can significantly reduce both length of stay and hospital readmissions compared with routine care, with economic implications.

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2. Cawood AL, Elia M, Freeman R & Stratton RJ (2007) *Clin Nutr Suppl* 2 (2), 97.
3. Lochs H, Allison SP, Meier SP, Pirlich M, Kondrup J, Schneider S, van den Berghe G & Pichard C (2006) *Clin Nutr* 25, 180–186.