TITLE: Serum Albumin Testing for Wound Healing Potential and Nutritional Status: Clinical Effectiveness

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RESEARCH QUESTIONS:

1. What is the clinical effectiveness of serum albumin testing as an indicator of wound healing potential?

2. What is the clinical effectiveness of serum albumin testing as an indicator of nutritional status?

METHODS:

A limited literature search was conducted on key health technology assessment resources, including PubMed, the Cochrane Library (Issue 3, 2009), University of York Centre for Reviews and Dissemination (CRD) databases, ECRI, EuroScan, international health technology agencies, and a focused Internet search. The search was limited to English language articles published between 2004 and September 2009. Filters were applied to limit the retrieval to health technology assessments, systematic reviews, meta-analyses, randomized controlled trials, controlled clinical trials, and observational studies, and guidelines. Internet links were provided, where available.

The summary of findings was prepared from the abstracts of the relevant information. Please note that data contained in abstracts may not always be an accurate reflection of the data contained within the full article.

RESULTS:

HTIS reports are organized so that the higher quality evidence is presented first. Therefore, health technology assessment reports, systematic reviews, and meta-analyses are presented first. These are followed by randomized controlled trials, controlled clinical trials, observational studies, and evidence-based guidelines.
Three observational studies and one evidence-based guideline were identified pertaining to clinical effectiveness of serum albumin testing as an indicator of wound healing potential. Five observational studies and one evidence-based guideline were identified with respect to the clinical effectiveness of serum albumin testing as an indicator of nutritional status. No relevant health technology assessments, systematic reviews, meta-analyses, randomized controlled trials, or controlled clinical trials were identified. Additional information that may be of interest has been included in the appendix.

OVERALL SUMMARY OF FINDINGS:

Wound Healing

With regard to wound healing, three observational studies were identified that used serum albumin levels as an indicator of wound healing.1-3 All three found that low serum albumin levels were associated with slower healing or poor prognosis of wound healing.1-3 One study found that low serum albumin (under 35 g/L) was significantly associated with a prognosis of poor leg ulcer healing.1 A second study found that low serum albumin levels (<4g%) were associated with decreased skin graft uptake2 and the third study found that wound healing in open fractures of the lower limb was delayed when serum albumin levels were low.3 A 2007 American guideline for the rehabilitation of lower limb amputation suggests serum albumin testing as a measure of malnutrition and decreased capacity for wound healing.10

Nutritional status

Five observational studies were identified pertaining to the use of serum albumin testing as an indicator of nutritional status.4-8 Three of the studies5-7 came to the conclusion that serum albumin levels may not be a precise method for testing nutritional status, especially in dialysis patients5,6 and adolescents.6 This lack of precision may be due to the fact that albumin concentrations can be affected by processes not related to nutritional status.6 In fact, a 2007 guideline on the risk assessment and prevention of pressure ulcers states that low serum albumin could reflect the state of chronic disease rather than nutritional status.9

In a study that compared the accuracy of commonly used indices of nutritional status and tools to predict death, infection, and hospital length of stay, serum albumin was the strongest predictor for death and hospital infection.4 Authors concluded that the presence of low serum albumin (<3.5 g/dL) helps to identify the effect of nutritional status on clinically relevant outcomes.4 With respect to patients undergoing cardiac surgery, both BMI and serum albumin were used as markers of malnutrition in order to predict mortality and frequency of infection.8 They found that low serum albumin increased the risk for infection, but not death.8

Serum albumin testing as an indicator of wound healing potential has been shown to be useful in three observational studies,1-3 and is indicated in a 2007 guideline for healing lower limb amputations10 but evidence from randomized controlled trials and systematic reviews is lacking. With regard to nutritional status, the evidence reported is variable. Some studies concluded that serum albumin is not a good indicator of nutritional status5-7 and a guideline on pressure ulcer healing suggests it is perhaps a better indicator of chronic disease state9 whereas others found that low serum albumin is a good indicator of malnutrition and clinically relevant outcomes.4,8
REFERENCES SUMMARIZED:

Health technology assessments
No literature identified.

Systematic reviews and meta-analyses
No literature identified.

Randomized controlled trials
No literature identified.

Controlled clinical trials
No literature identified.

Observational studies

Wound Healing


Nutritional status


**Guidelines and recommendations**


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See section A-10.1 Determine the Appropriate Level of Surgery, 3. Potential for wound healing

**PREPARED BY:**
Kristen Moulton, BA, Research Assistant
Emmanuel Nkansah, MLS, MA, Information Specialist

**Health Technology Inquiry Service**
Email: [htis@cadth.ca](mailto:htis@cadth.ca)
Tel: 1-866-898-8439
APPENDIX – FURTHER INFORMATION:

Observational studies


Review articles

See pg 5, Safety and Effectiveness issues