

Medical Policy Review -- Publication Summary Index

Tab #	Topic	Citation	Primary Author	Summary of Findings
Validity of BIS Measurement of Lymphedema				
1	Early diagnosis of lymphedema using MFBIA	Lymphology, 34: 2-11 2001	Cornish	MFBIA detected lymphedema up to 10 months earlier than circumferential methods, with 100% sensitivity.
2	Is BIS ready for prime time as the gold standard measurement?	Journal of Lymphoedema, 2009, Vol 4, No 2	Ward	Makes the case that BIS technology now warrants consideration as the reference method for LE assessment based on specificity, accuracy, precision, repeatability both within and between centers, limits of detection, sensitivity and practicability and applicability under normal conditions of use (Wood et al, 1998).
3	Quantitative bioimpedance spectroscopy for the assessment of lymphoedema	Breast Cancer Research and Treatment, DOI 10.1007/s10549-008-0258-0	Ward	Total arm volume was highly correlated (r = 0.80–0.90) with arm fluid volumes predicted by BIS and the proportional increase in arm size predicted by BIS was not significantly different to that measured by perometry
4	Bioelectrical impedance for monitoring the efficacy of lymphoedema treatment programmes	Breast Cancer Research and Treatment , 38, 169-176, 1996	Cornish	The results demonstrate that MFBIA is significantly more sensitive than circumferential measurement both in the early diagnosis of lymphoedema and in monitoring change.
5	Current concepts and future directions in the diagnosis and management of lymphatic vascular disease	Vascular Medicine, 15(3), 223-231, 2010 DOI: 10.1177/1358863X10364553	Rockson	A review of lymphatic biology and pathology and evolving concepts about the diagnostic and therapeutic approaches. Discusses the capacity of BIS for early disease detection.
6	Single frequency versus bioimpedance spectroscopy for the assessment of lymphedema	Breast Cancer Research and Treatment , 2008 DOI 10.1007/s10549-008-0090-6	York	Bioimpedance (single frequency or BIS) is able to distinguish limbs with lymphedema from limbs without lymphedema.
7	Bioelectrical impedance for detecting upper limb lymphedema in nonlaboratory settings	Lymphatic Research and Biology, 7: 1-15, 2009	Ridner	The use of impedance ratios can be useful markers for the assessment of lymphedema in a nonlaboratory setting
8	MFBIA augments the diagnosis and management of lymphedema in post-mastectomy patients	European Journal of Clinical Investigation, 22, 751-754, 1992	Ward	Use of R-zero and its specificity to extracellular fluid makes MFBIA a superior testing method for early detection of lymphedema.
9	Bioelectrical Impedance Analysis: Proven Utility in Lymphedema Risk Assessment and Therapeutic Monitoring	Lymphatic Research and Biology, Volume 4, Number 1, 2006, pp 51-56	Ward	Review of principles of bioimpedance analysis as applied to detection of lymphedema
10	Bioimpedance Analysis in the Assessment of Lymphoedema Diagnosis and Management	Journal of Lymphoedema, Vol 2, No 1, 2007	Rockson	MFBIA in analysis of lymphedema has been proven to be fast, accurate and well accepted by patients. Will provide good standard for lymphedema detection and tracking
11	Measuring lymphedema in patients with breast cancer: go with the flow?	Breast Cancer Research and Treatment, DOI 10.1007/s10549-009-0320-6	Hunt/Cormier	Invited editorial commentary discusses recent advancement of bioimpedance spectroscopy in the evaluation of lymphedema.

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12	Preoperative Assessment Enables the Early Diagnosis and Successful Treatment of Lymphedema	Cancer, Volume 112, Issue 12, Pages 2809-2819, 15 June 2008	Gergich	NIH prospective study: A short intervention with off the shelf compression sleeves was effective in bringing all patients with subclinical lymphedema back to a pre-surgical baseline
13	Chapter 104 - Lymphedema	Kuerer's Breast Surgical Oncology (textbook) Published by McGraw-Hill. ISBN 978-0-07-160178-8 Copyright 2010	Norton	Chapter dedicated to lymphedema identification and treatment. Refers to BIS as an emerging, affordable, portable technology widely available in clinical settings to support lymphedema diagnosis. List BIS with optoelectronic volumetry as sensitive to subtle changes above baseline of 3-5% allowing earlier diagnosis.
14	Edema Volume, Not Timing, is the Key to Success in Lymphedema Treatment	American Journal of Surgery, Vol. 178, October 1999	Ramos	Initial volume of fluid edema in the tissues was key to predicting the success of therapy. Patients having the lowest volume of initial edema have the best chance for a successful outcome.
15	Time Course of Mild Arm Lymphedema After Breast Conservation Treatment for Early Stage Breast Cancer	International Journal Radiation Oncology – Biology – Physics, Vol. 76, No. 1, pp 85-90, 2010 DOI:10.1016/j.ijrobp.2009.01.024	Bar	Looks at time to progression of mild arm lymphedema to more severe stages. Stresses importance of ongoing, objective measurement. Once advanced, normal limb volume and lymphatic function cannot be restored. Reinforces NIH findings of preventing progression to even mild lymphedema.
16	Lymphedema: A primer on the identification and management of a chronic condition in oncologic treatment	Cancer, CA Cancer J Clin 2009;59:8-24	Lawenda	Supports the importance of pre-surgical assessment of monitoring of patients at risk of developing lymphedema. Early detection and treatment are critical. Supports BIS as being reliable and accurate.
17	Effectiveness of early physiotherapy to prevent lymphoedema after surgery for breast cancer: randomised, single blinded, clinical trial	BMJ 2010;340:b5396 doi:10.1136/bmj.b5396	LaComba	Randomized Control Trial comparing pre-emptive treatment and education versus education only. Found significantly lower rate of LE in the treatment arm. Supports the importance and efficacy of early intervention.
18	Minimal limb volume change has significant impact on breast cancer survivors	Lymphology 42 (2009) 161-175	Cormier	Symptom reporting are detectable at 5% limb volume change (LVC) differences. Supports Gergich 2008 that 5-8% LVC be threshold for mild LE and that detectable differences in symptoms may exist at subclinical changes of >3%.
19	Upper extremity impairments in women with or without lymphedema following breast cancer treatment	Journal of Cancer Survivor, Feb 2010 DOI 10.1007/s11764-010-0118-x	Smoot	Women with lymphedema have greater upper extremity impairment and limitation in activities than women without. Many of these impairments are amenable to prevention measures or treatment, so early detection by health care providers is essential.
20	Breast cancer-related lymphedema	Canadian Family Physician, VOL 5: February 2005	McLean	Themes evolving out of interview of 22 women with BCRL. Patients were poorly informed of risk. Symptoms and triggers varied. Access to treatment is poor and expensive. Effect of BCRL on daily life is profound. If diagnosed, BRCL should be managed aggressively to minimize the severe effect it has on the lives of breast cancer patients.
21	Treatment for upper-limb and lower-limb lymphedema by professionals specializing in lymphedema care	European Journal of Cancer Care, 2008 DOI: 10.1111/j.1365-2354.2007.00878.x	Langbecker	Survey based study of LE healthcare professionals. Supports importance of early intervention.

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Importance of Early Identification and Treatment, continued				
22	The Psychosocial Effects of Cancer-Related Lymphedema	Journal of Palliative Care; Autumn 2008; 24, 3, p134	Towers	Qualitative analysis of distress of patients with lymphedema. Suggests increase awareness of lymphedema is needed in healthcare workers, health insurance policy makers and government.
23	Incidence and risk of arm oedema following treatment for breast cancer: a three-year follow up study	Quarterly Journal of Medicine, 2005; 98:343-348	Clark	Prospective observational study looking at risk factors and incidence rates of lymphedema after pre-surgical assessment and post surgical surveillance for 36 months. Repeated postsurgical monitoring is recommended.
24	Arm lymphoedema in a cohort of breast cancer survivors 10 years after diagnosis	Acta Oncologica, 2010; 49: 166-173	Johansson	Supports the importance of early detection and intervention. Data also shows that using a traditional definition of lymphedema (>5% difference between arms) patients could be treated for up to 10 years but still not brought back to a pre-surgical baseline.
Comparison of Measurement Methods				
25	Segmental measurement of breast cancer-related arm lymphoedema using perometry and bioimpedance spectroscopy	Support Care Cancer, May 2010 DOI 10.1007/s00520-010-0896-8	Czerniec	Comparison of 29 women with mild to severe LE to 11 women without LE utilizing both BIS and optoelectronic volumetry (perometry). Because it is specific to extracellular fluid, BIS is more sensitive to localised lymphoedema than perometry.
26	Assessment of Breast Cancer-Related Arm Lymphedema—Comparison of Physical Measurement Methods and Self-Report	Cancer Investigation, 28:54-62, 2009 DOI: 10.3109/07357900902918494	Czerniec	Patient self assessment is only moderately reliable. Perometry comparisons were limited since the method could not measure the whole arm in many patients. BIS detected fluid changes in lymphedema patient undetected by total arm volume metrics suggesting that "BIS may be particularly useful in the detection of early lymphedema, prior to arm volume changes."
27	Lymphedema Secondary to breast cancer: how choice of measure influences diagnosis, prevalence, and identifiable risk factors	Lymphology, Vol 26, No 21, July 2008	Hayes	Use of BIS as a detection method of lymphedema was able to detect more lymphedema earlier than common methods (SOAC and self report).
28	Comparison of upper limb volume measurement techniques and arm symptoms between healthy volunteers and individuals with known lymphedema.	Lymphology, 40, 35-46, 2007	Ridner	Compares correlation between whole arm volume methods (perometry and circumference) with impedance.
29	Operational Equivalence of Bioimpedance Indices and Perometry for the Assessment of Unilateral Arm Lymphedema	Lymphatic Research and Biology, Volume 7, Number 2, 2009, pp 81-85	Ward	BIS provides a measurement index that is highly correlated with quantitative measurements of the volume increase in limb size seen in lymphedema.
30	A Comparison of Four Diagnostic Criteria for Lymphedema in a Post-Breast Cancer Population	Lymphatic Research and Biology, Volume 3, Number 4, 2005	Armer	Compares perometry, tape measure and self report for diagnosis lymphedema. Underscores the importance of comparing post-surgical assessment to a pre-surgical baseline.
Health Economics of Lymphedema After Breast Cancer				
31	Incidence, Treatment Costs, and Complications of Lymphedema After Breast Cancer Among Women of Working Age: A 2-Year Follow-Up Study	Journal of Clinical Oncology, DOI 10.1200/JCO.2008.18.3517	Shih	Based on actual claims data review, breast cancer patients with lymphedema incurred significantly higher medical costs (\$14,877 to \$23,167) than those without lymphedema. These patients were twice as likely to have lymphangitis or cellulitis.
Guidelines				
32	Guidelines for the diagnosis, assessment and management of lymphoedema	Clinical Resource Efficacy Support Team (CREST), www.crestni.org.uk (public domain) 2008		