

Standard Operating Procedure (SOP) Outpatient Service

USE OF DELFIN LYMPHSCANNER SUPPLIED BY HADDEN HEALTHCARE.

SETTING	UHBW/South West Regional Late Effects Service (SWRLES)
FOR STAFF	Radiographers involved with Radiotherapy Late Effects Service.
ISSUE	Guidance required for use of the LymphScanner device on patients attending the Radiotherapy Late Effects Service.

Background & Purpose of the Lymph Scanner:

- The LymphScanner is an all in one measurement unit composed of an integrated probe, a built-in contact pressure sensor and a display screen.
- The LymphScanner is a device to measure the local and regional tissue water.
- The OLED display shows measured values in percentage of local tissue water (0-99%) down to an effective depth of 2.5mm.

How the LymphScanner works :

- The LymphScanner generates a high frequency, low power electromagnetic (EM) wave (300MHZ) which the tissue is exposed to.
- The reflected EM wave is registered and the obtained value is a dielectric constant, which is proportional to the water content of the measured tissue.
- The tissue dielectric constant (TDC) value is converted to water percentage and displayed on the screen. TDC =1 for no water (0% of water) TDC = 80 for pure water (100% of water)
- The value increases with increased water content and oedema.
- The LymphScanner display is Percentage water content (PWC) 0-100%
- Large macromolecules are not measured as they are too large to rotate the EM waves.
- Tissue electrolytes have no effect as they cannot rotate and absorb energy.

LymphScanner calibration

- Calibrated at factory, Valid for 2 years.
- Check tool available to ensure calibration is valid.
- Memo acceptance sticker to be applied.

LymphScanner User Training

- User to complete Lymph scanner in Clinical Practice Training from Haddenhealth [Lymphscanner in Clinical Practice - Haddenham Training](https://haddenham.thinkific.com/courses/take/lymphscanner/lessons/14139635-research-design-and-development) ([thinkific.comhttps://haddenham.thinkific.com/courses/take/lymphscanner/lessons/14139635-research-design-and-development](https://haddenham.thinkific.com/courses/take/lymphscanner/lessons/14139635-research-design-and-development))

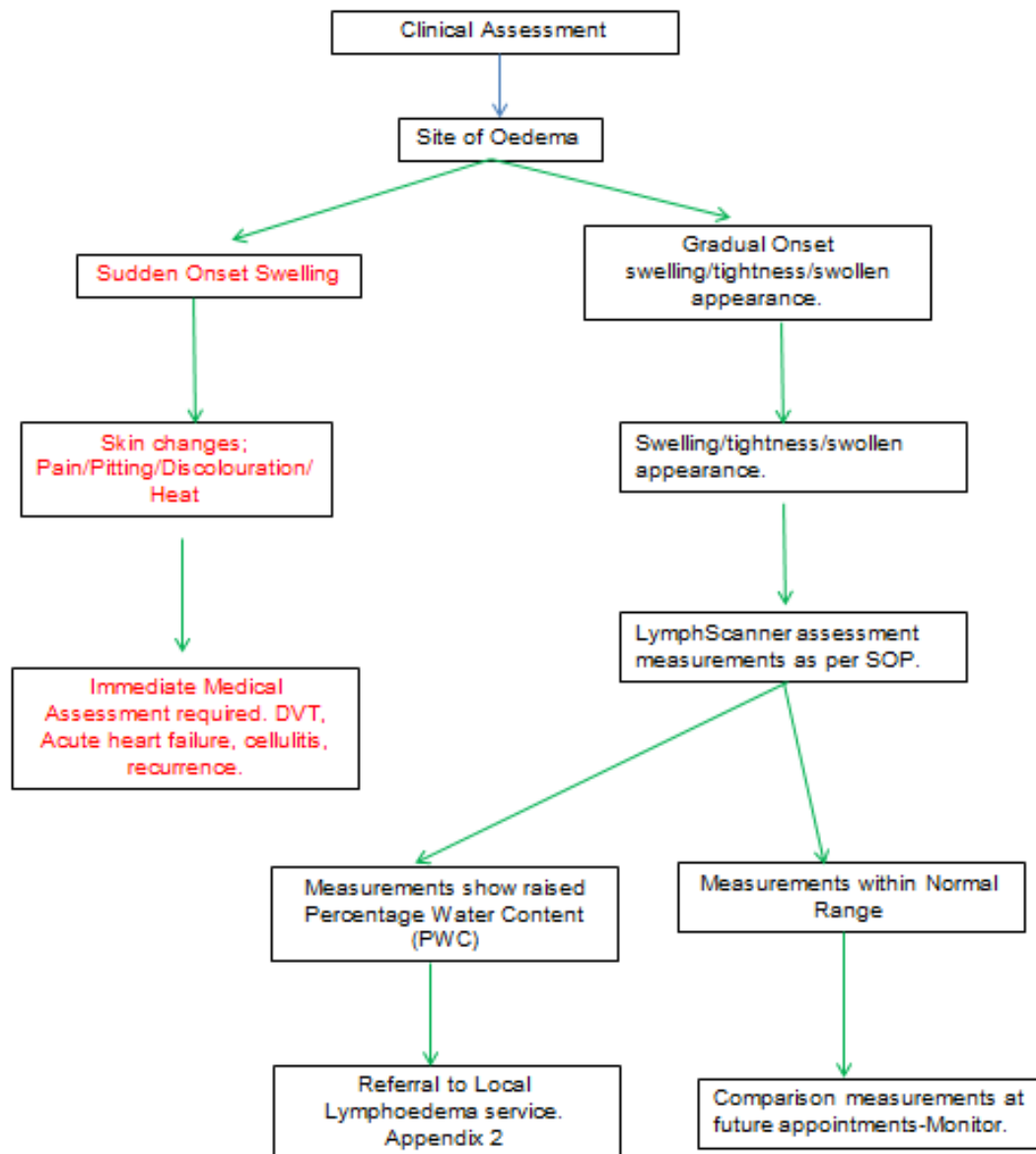
LymphScanner Clinical Pathway.

The cause(s) of chronic oedema can usually be identified on the basis of the history and an examination. As appropriate, investigations may be necessary.

An understanding of the underlying cause(s) is important in determining the best treatment.

Keeley V. Drugs that may exacerbate and those used to treat lymphoedema. J. Lymphoedema 2008; 3(1): 57-65.

LymphScanner Use – Guidance for User



LymphScanner Patient preparation

- No smoking or vaping one hour before.
- No alcohol the day of the measurements.
- No carrying of heavy items prior to the measurement appointment.
- No heavy gym training before measurement appointment.
- Removal of compression devices 10-15 minutes before measurement appointment.

User Guidance

- Ideally use on soft tissue sites.
- Avoid area where there are superficial bones and tendons.
- Avoid measurement over large veins.
- Avoid very hairy skin.

Patient position and contraindications.

- Patient should be sitting or lying down.
- No need to remove jewellery, watches, gloves, socks or shoes.
- No effect on pacemaker.

LymphScanner Modes

- Spot Mode (Local measurement of interstitial fluid); results expressed as PWC. (%), Each anatomical skin site has it own PWC. Typical value 25-40%.
- Scan mode (regional Assessment of lymphodema using a user-selected contralateral site as reference); results expressed as a ratio. Reference site, anatomically equivalent on the contralateral side.

RELATED DOCUMENTS

Haddenhealth LymphScanner Training

[https://haddenham.thinkific.com/courses/take/lymphscanner/texts/14140813-introductionl Practice - Haddenham Training \(thinkific.com\)](https://haddenham.thinkific.com/courses/take/lymphscanner/texts/14140813-introductionl Practice - Haddenham Training (thinkific.com))

Haddenhealth LymphScanner Forms (appendix 1)

[Haddenham LymphScanner \(hadhealth.com\)](https://haddenham.thinkific.com/courses/take/lymphscanner/texts/14140813-introductionl Practice - Haddenham Training (thinkific.com))

Record Keeping in Health Records Policy

[REDACTED]

Macmillan Cancer Support

<https://www.macmillan.org.uk/cancer-information-and-support/after-treatment/late-effects-of-treatment>

Introduction of New Techniques/New ways of working into the Radiotherapy department.

[REDACTED]

Mayrovitz, H. N., Somarriba, C., & Weingrad, D. N. (2022). Breast tissue dielectric constant as a potential breast edema assessment parameter. *Lymphatic Research and Biology*, 20(1), 33-38.

Mayrovitz, H. N., Patel, A., Kavadi, R., Khan, Z., & Bartolone, S. (2021). An approach toward assessing head-and-neck lymphedema using tissue dielectric constant ratios: method and normal reference values. *Lymphatic Research and Biology*, 19(6), 562-567.

AUTHORISING BODY

South West Regional Late Effects Service Committee.

SAFETY

Risk assessment completed

QUERIES

[REDACTED]

APPENDIX 1: RADIOTHERAPY LATE EFFECTS REFERRAL FORM

Breast Tissue Measurement Form



Client's name _____

LymphScanner

PERCENTAGE WATER CONTENT - BREAST MEASUREMENT FORM

F0047AUS-002

<p>Date _____</p> <p>RIGHT</p>	<p>Date _____</p> <p>LEFT</p>
<p>Date _____</p> <p>RIGHT</p>	<p>Date _____</p> <p>LEFT</p>

Arm Tissue Measurement form



LymphScanner

PERCENTAGE WATER CONTENT - ARM MEASUREMENT FORM

Using 10cm measurements taken from the ulnar styloid process.

Client's name _____

F0041AUS-003

Date _____

RIGHT		LEFT	
40cm		40cm	
30cm		30cm	
20cm		20cm	
10cm		10cm	
ulnar styloid process		ulnar styloid process	

Date _____

RIGHT		LEFT	
40cm		40cm	
30cm		30cm	
20cm		20cm	
10cm		10cm	
ulnar styloid process		ulnar styloid process	

Date _____

RIGHT		LEFT	
40cm		40cm	
30cm		30cm	
20cm		20cm	
10cm		10cm	
ulnar styloid process		ulnar styloid process	

Date _____

RIGHT		LEFT	
40cm		40cm	
30cm		30cm	
20cm		20cm	
10cm		10cm	
ulnar styloid process		ulnar styloid process	

Leg Tissue Measurement Form



LymphScanner

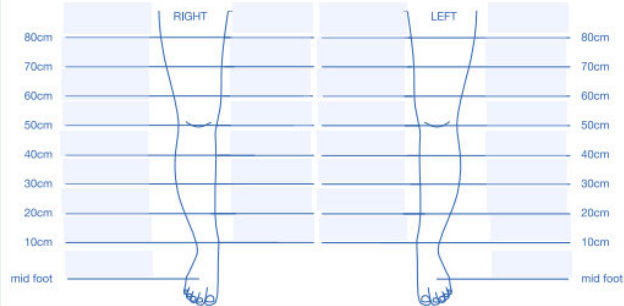
PERCENTAGE WATER CONTENT - LEG MEASUREMENT FORM

Using 10cm measurements taken from the base of foot

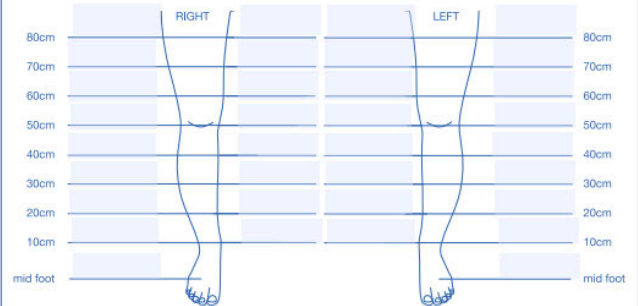
Client's name _____

F0043AUS-003

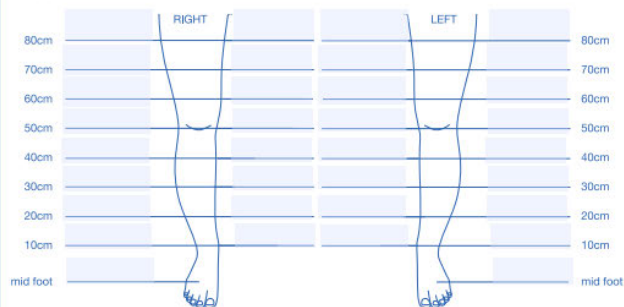
Date _____



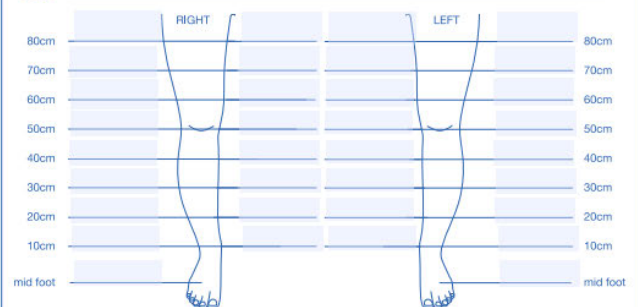
Date _____



Date _____



Date _____



Head and Neck Measurement Form



LymphScanner

PERCENTAGE WATER CONTENT - HEAD AND NECK MEASUREMENT FORM

Follow the contours to mark the measurement points

Client's name _____

F0042AUS-003

<p>Date _____</p>	<p>Date _____</p>
<p>Date _____</p>	<p>Date _____</p>

References - Mayrovitz, Patel, Kavadi, Khan & Bartolone, An approach toward assessing head and neck lymphedema using Tissue Dielectric Constant Ratios: Method and Normal Reference Values, Lymphatic research and Biology, 2021, Pg. 1-6
Purcell, A., Nixon, J., Fleming, J., McCann, A. and Porceddu, S. (2015), Measuring Head and Neck lymphedema: the "ALPHA" Trial, Head & Neck, 38(1), pp.79-84.

APPENDIX 2: SIRONA LYMPHODEMA REFERRAL FORM.

Urgent/ Routine

Lymphoedema referral form

Referrer information			
Referring clinician and job role		Referral date	
Department and Organisation		Referrer contact Number	
Address		Referrer email address (please ensure a secure email address)	

Patient Details			
NHS Number:		Name:	
D.O.B:	23/5/75	Address:	
Gender			
Ethnicity			
Religion:			
Tel:		Other:	
Mobile:			
NOK Name & contact details:			

Key Dataset	
Primary Reason for Referral:	
Expected Outcome:	
Specialty:	Lymphoedema
Is the patient vulnerable or do they need help with their booking? Yes <input type="checkbox"/> No <input type="checkbox"/> details:	

NOTES:

Referrals are normally seen within 6 weeks of the referral being received. If the patient requires a more urgent assessment please highlight why this may be required and include a contact number so this can be discussed

Provisional Diagnosis and Examination Findings (including any red flags), investigations, results:

Problems

Investigations

History of Problem/Social Circumstances:

Previous conservative management to date and effect:

Medication and Concordance:

N/a

Previous Medical History (including relevant family and investigations history): Hodgkins lymphoma, Colitis (has ileostomy)

Staff Safety – Are there any issues that we should be aware of which staff should be aware: - YES/NO
If yes, please give details of infection risk, patient or family history:

i.e. Lone working/Safeguarding issues

Special needs of patient – Are there any issues that we should be aware of regarding patient communication
eg interpreter, disability, carer support?

By submitting this form, I confirm that there is a legitimate/lawful basis to the disclosure of the information contained on the form for the purpose of direct care and consent has been given or is strongly implied.

Please send completed forms to: [REDACTED]