Encouraging research into lymphoedema

A register of lymphoedema research

Prepared by:

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Background

In February 2000, the Encouraging research into lymphoedema summit was held in Adelaide with the aim of the fostering high quality research into lymphoedema in Australia. One of the objectives of the summit was to establish a register of lymphoedema research. Researchers who participated in the summit were encouraged to lodge a summary of their research with the National Breast Cancer Centre. The following document provides a comprehensive listing of all the lymphoedema research projects identified by the summit. Projects have been grouped into key topic areas, as listed in the Table of Contents.

To assist in fostering a network of lymphoedema researchers this register will be regularly revised to incorporate new research projects. Any lymphoedema researchers who would like to have their research included in the register are encouraged to forward details of their projects to the Centre. Appendix 1 provides a form to register new research projects on lymphoedema. The National Breast Cancer Centre’s web page http://www.nbcc.org.au will also include up-to-date details of the lymphoedema research register. In future, any information on new or existing lymphoedema projects will be updated on the web-based register.
1 Diagnosis

NAME OF PROJECT: Reference: 1
DETERMINATION OF OBJECTIVE CRITERIA FOR EARLY IDENTIFICATION OF SECONDARY ARM LYMPHOEDEMA AFTER BREAST CANCER SURGERY

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Research Status:
In preparation ☑ In progress ☐ Completed ☐

Research Funding:
Yes ☐ No ☑ Funding body: being sought.

BRIEF SYNOPSIS OF PROJECT:
Collection of data over a 12 month period from a population sample of women within the age group diagnosed with breast cancer. Data analysis to determine normal differences between the arms and its variability over 12 months. Methods of measurement are circumferential, volumetry (water displacement) and multi-frequency bio-impedance analysis.
NAME OF PROJECT: Reference: 2
DETECTION OF PRE-LYMPHOEDEMA STATES

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Research Status:
In preparation ☐ In progress ☑ Completed ☐

Research Funding:
Yes ☐ No ☑ Funding body: being sought.

BRIEF SYNOPSIS OF PROJECT:
Clinical study to determine whether bio-impedence (which measures tissue ICF and ECF as well as FFM and fibrosis) in association with Tonometry can act as a predictor for lymphoedema. The objective is through early detection of tissue changes before the limb becomes swollen, to draw the patients attention to the fact that they are at risk of getting lymphoedema so that necessary life style changes can be made and conservative treatment initiated. The outcome is expected to be a reduced risk of getting lymphoedema and ultimately a reduced incidence of lymphoedema.
2 Impact of Lymphoedema

NAME OF PROJECT: The Experience of Living with Lymphoedema

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Research Status:
In preparation ☐ In progress ☑ Completed ☐

Research Funding:
Yes ☑ No ☐ Funding body: NSW Nurses Registration Board

BRIEF SYNOPSIS OF PROJECT:
This research is in the form of an almost completed doctoral thesis which incorporates:

1. An analysis of the physical, psychosocial and health care needs of people with lymphoedema who live in the Sydney metropolitan basin.

2. The experience of living with secondary lymphoedema. This stage explores at a deeper level, individual’s experiences and uses existential phenomenology as a philosophical framework.
NAME OF PROJECT: Reference: 4
LIMITATIONS IN UPPER-BODY FUNCTION AMONG BREAST CANCER SURVIVORS: A LONGITUDINAL STUDY

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Research Status:
In preparation ☑ In progress □ Completed □

Research Funding:
Yes □ No ☑ Funding body: being sought.

BRIEF SYNOPSIS OF PROJECT:
The proposed project involves the measurement of upper body dysfunction and lymphoedema among women recently diagnosed with breast cancer. The purpose is to assess the impact on usual activities and quality of life for these women and in subgroups at potentially higher risk.
NAME OF PROJECT: Reference: 5
SURVEY OF THE MEMBERSHIP OF THE LYMPHOEDEMA ASSOCIATION OF QUEENSLAND

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Research Status:
In preparation ☐ In progress ☑ Completed ☐

Research Funding:
Yes ☑ No ☐ Funding body: Lymphoedema Association of Queensland

BRIEF SYNOPSIS OF PROJECT:
A survey of the membership of the Lymphoedema Association of Queensland (LAQ) has been carried out using a questionnaire distributed with the association’s quarterly newsletter. The survey aimed to provide feedback about member’s views and use of the association’s services, to document the impact of the condition on individual lives, members’ experiences of treatment provision and the extent of self-treatment. One hundred and seventy-five members returned completed questionnaire (44% of the membership in November 1993), 137 had lymphoedema, and all except 11 were female. The benefits of membership, details of treatment obtained, self-treatment and costs to members are mapped out in the analysis of response to a set of open-ended and closed questions. The impact of the condition as reflected in answers to an open-ended question, varies from minor inconvenience to ‘devastation’ and affects many dimensions of life. The role of LAQ in the provision of information, enabling contact between people with the condition and advocating for services is seen as very important.
NAME OF PROJECT: Reference: 6
FIVE YEAR FOLLOW-UP OF PHYSIOTHERAPY MANAGEMENT OF ALL PATIENTS HAVING BREAST CANCER SURGERY AT ROYAL BRISBANE HOSPITAL

PRINCIPAL RESEARCHERS:
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Research Status:
In preparation ☐  In progress ☑  Completed ☑

Research Funding:
N/A ☑  Yes ☐  No ☐  Funding body:

BRIEF SYNOPSIS OF PROJECT:
A prospective quality data management improvement project monitoring the outcome of secondary arm lymphoedema, shoulder restriction and functional activities following breast cancer surgery.
NAME OF PROJECT: Reference: 7
INFORMATION NEEDS OF WOMEN AT RISK OF SECONDARY LYMPHOEDEMA

PRINCIPAL RESEARCHERS:
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Research Status:
In preparation ☐ In progress ☑ Completed ☐

Research Funding:
Yes ☑ No ☐ Funding body: NWAHS CDRC Scholarship

BRIEF SYNOPSIS OF PROJECT:
A 12-month Masters Thesis investigating the educational and information needs of women who are at risk of developing secondary lymphoedema after breast cancer related to surgery. This project utilises detailed questionnaires and focus group interviews with women at risk, suffered of secondary lymphoedema, and health professionals to determine the timing, extent and format preventative education should be provided to reduce the occurrence and impact of secondary lymphoedema.
3 Measurement

NAME OF PROJECT: Reference: 8
BIOELECTRICAL IMPEDANCE FOR MONITORING THE EFFICACY OF LYMPHOEDEMA TREATMENT PROGRAMMES

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Research Status:
In preparation □ In progress □ Completed ☑

Research Funding:
N/A ☑ Yes □ No □ Funding body:

BRIEF SYNOPSIS OF PROJECT:
The treatment of lymphoedema includes a combination of massage, compression bandaging and exercise. To date the most common technique of assessing the efficacy of treatment has involved estimating the total limb volume from circumferential measurements at fixed intervals along the limb. This investigated the application of multiple frequency bioelectrical impedance analysis, MFBIA, to monitor the volume of lymphoedema in the upper limb of patients who developed this disorder following surgery for cancer of the breast. Daily measurements of both circumference and impedance of both the affected and unaffected limbs were recorded for 20 patients throughout their 4 week treatment programmes. Twenty control subjects were also monitored daily over a similar 4 week period. Prior to the commencement of treatment the bioimpedance technique detected a significant (P<.01) asymmetry between the two limbs of the control subjects, associated with handedness (P<.001). Circumferential estimates of limb volumes in the control group detected no asymmetry. Impedance measures of extracellular fluid showed all of the patients trends of the impedance measures and the circumferential estimates of volume throughout the 4 week program were found to be significantly different P<.05); MFBIA exhibiting a greater sensitivity in
the detection of lymphoedema. The results demonstrate that MFBIA is significantly more sensitive than circumferential measurement in both the diagnosis of lymphoedema and in monitoring change.

Publications:
NAME OF PROJECT: Reference: 9
QUANTIFICATION OF LYMPHOEDEMA USING MULTI-FREQUENCY BIOIMPEDANCE

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Research Status:
In preparation □ In progress □ Completed ☑

Research Funding:
N/A ☑ Yes □ No □ Funding body:

BRIEF SYNOPSIS OF PROJECT:
ABSTRACT:
A method for the routine quantification (in vivo) of tissue changes associated with lymphoedema is not currently available. Lymphoedema is a high protein oedema cause by lymphatic transport insufficiency and is a common sequelae of surgical and/or radiotherapeutic interventions for different types of malignancies. Lymphoedema normally occurs in the limbs, frequently only in one limb, with the lymphoedematous limb being enlarged and distorted due to an increase in extracellular fluid volume. Combined with this increase in volume is an increase in proteins and fibrosis, alterations in body tissues and proliferations of blood and lymph vessels.

At present, the most commonly used method of assessing the degree of lymphoedema is by volume measurement: either total limb volume (by anthropometry), or extracellular fluid volume (by multiple frequency bioimpedance analysis MFBIRA)¹. The authors have previously shown that by applying the principles of the Cole-Cole bioimpedance plot, to analyse MFBIA measurements recorded over a range of frequencies, (4kHZ to 1MHZ), the extracellular fluid volume can be accurately and reliably predicted¹. This procedure has been successfully used in the estimation of unilateral lymphoedema and has resulted in a four-fold increase in sensitivity over the more common anthropometric methods using total limb volume¹. However as emphasised by many clinicians,
lymphoedema is not simply an increase in extracellular fluid volume, but also [and as suggested by some], more importantly it is an increase in protein concentration accompanied by an alteration in tissues including the dermis and subcutaneous tissue layers².

By using a novel approach to the measurement of bioimpedance the authors have established a techniques to reliably measure the impedance of the skin and subcutaneous tissue alone. A pilot study was conducted in which the impedance and phase of the dermis and subcutaneous tissues was measured in 10 patients with unilateral grade 2 lymphoedema; ten healthy control subjects were also measured using the same protocol. The impedance of the dermal/subcutaneous tissues was expressed as a ration of measurements from the two limbs (affected/unaffected for patients; non-dominant/dominant for controls). The impedance ratios obtained from the ventral aspect of the forearm clearly demonstrate a significant difference between measurements from the control and patient groups (P=2.76 x 10⁻⁸).

This study has demonstrated that bioimpedance measurements of the skin and subcutaneous tissue may provide a very reliable and precise technique for evaluating tissue changes commonly associated with lymphoedema. The technique promises to provide the clinician with an accurate, precise and objective measure of the degree of lymphoedema.

Publications:
NAME OF PROJECT: Reference: 10
EARLY DIAGNOSIS OF LYMPHOEDEMA USING MULTIFREQUENCY BIOELECTRICAL IMPEDANCE MEASUREMENTS

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Research Status:
In preparation ☐ In progress ☑ Completed ☐

Research Funding:
Yes ☑ No ☐ Funding body: The Wesley Research Institute

BRIEF SYNOPSIS OF PROJECT:
The sensitivity demonstrated by the MFBIA technique suggested that the procedure may be useful in assisting the diagnosis of the disorder during the early stages of its progression. To test this hypothesis a recent study was designed to monitor patients diagnosed with breast cancer for a period of two years with the initial measurements being recorded pre-surgery. Over 100 patients were recruited into the study and a group of 60 female volunteers, in a similar age range (40-60 years), acted as a control group. Both MFBIA and circumferential measurements were recorded in a similar manner to that described earlier.

In the group of patients the above measurements were recorded prior to surgical intervention, one month post surgery, then every two months up to 24 months. At each measurement time the patient’s ECW ratio and limb volume ration were compared with the 99% confidence interval determined in the control group. A ratio value outside this 99% interval was deemed predictive of the onset of lymphoedema and the patient was referred to her physician for clinical confirmation and possible treatment.

A “work in progress” report has been accepted for publication:
NAME OF PROJECT: Reference: 11
RELIABILITY AND VALIDITY OF UPPER LIMB CIRCUMFERENCE AS A MEASURE OF ARM SWELLING

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Research Status:
In preparation ☐ In progress ☑ Completed ☐

Research Funding:
N/A ☑ Yes ☐ No ☐

Funding body:

BRIEF SYNOPSIS OF PROJECT:
Lymphoedema is a swelling of the arm caused by damage to or removal of the lymph vessels or lymph nodes in the armpit. There has been a lack of agreement about a standardised approach and/or measurement tool for defining and measuring arm swelling due to lymphoedema. Occupational therapists trained in lymphoedema management are frequently required to assess, provide intervention and make recommendations regarding long term management of this chronic condition. A reliable and valid tool is required for defining and measuring lymphoedema. Subjects will be assessed to determine the reliability and validity of arm circumference as an objective measure of arm lymphoedema.
This study will examine the reliability and validity of upper limb circumference measurements. More specifically, the inter-rater reliability, intra-rater reliability, construct and concurrent validity will be determined for circumferential measurement of the upper limb in comparison to volume measurement. The results from this study will be then used to investigate the prevalence of lymphoedema as well as future studies determining the outcomes of lymphoedema treatment and its relationship to functional status.
NAME OF PROJECT: Reference: 12
SETTING OF A NATIONAL STANDARD FOR THE OBJECTIVE DETERMINATION OF SECONDARY ARM LYMPHOEDEMA

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Research Status:
In preparation ☑ In progress ☐ Completed ☐

Research Funding:
Yes ☐ No ☑ Funding body: In preparation.

BRIEF SYNOPSIS OF PROJECT:
This project aims to record currently used measurement and reporting protocols of those dealing with patients with chronic secondary lymphoedema of the arms. These will be grouped and calibrated for sensitivity and specificity against a verified gold standard of perometry. A standardised reporting protocol using the optimal measurement regimen will be created and tested using a sample group of those dealing with lymphoedema. National acceptance of the standard will be advocated through presentations and workshops nationally.
NAME OF PROJECT: Reference: 13
MULTI-FREQUENCY BIOELECTRICAL IMPEDANCE AUGMENTS THE DIAGNOSIS AND MANAGEMENT OF LYMPHOEDEMA IN POST-MASTECTOMY PATIENTS

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Research Status:
In preparation ☐ In progress ☐ Completed ☑

Research Funding:
N/A ☑ Yes ☐ No ☐ Funding body

BRIEF SYNOPSIS OF PROJECT:

ABSTRACT:
The value of multiple frequency bioelectric impedance analysis (MFBIA) in the monitoring and management of post-mastectomy lymphoedema of the arm was evaluated in both patients and controls. Using a group of 15 patients being treated for lymphoedema, MFBIA detected an increase in ECW volume in the affected limb (mean increase 21%). While in a group of 15 healthy control subjects there was no significant difference between estimates of ECW of the limbs. The technique was found to produce quantitative agreement with a clinical diagnosis of lymphoedema and with the currently used measure (limb volume calculated from circumferential measurements) of limb size. The significance of this finding lies in MFBIA being diagnostically informative: it indicates when an observed change in limb volume is directly, albeit theoretically. Attributable to accumulation of extracellular fluid. MFBIA potentially offers the means for earlier definitive diagnosis and more accurate monitoring of extracellular fluid changes during and after treatment.

Publication:
4 Physiology

NAME OF PROJECT: Reference: 14
AQUAPORINS IN THE LYMPHATIC SYSTEM

PRINCIPAL RESEARCHERS:
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Research Status:
In preparation □ In progress ☑ Completed □

Research Funding:
Yes ☑ No □ Funding body: Flinders University.

BRIEF SYNOPSIS OF PROJECT:
Aquaporins are water channels through cellular membranes. They may play a role in the exchange of fluids between tissue compartments and within organ systems, such as the lymphatics. This study is identifying the type and nature of aquaporins within the lymphatic system of experimental animals, prior to determining their functional significance.
NAME OF PROJECT: Basic Biology of Lymphatic Function  
Reference: 15

PRINCIPAL RESEARCHER:
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Research Status:
In preparation □  In progress ☑  Completed □

Research Funding:
Yes ☑  No □  Funding body: multiple sources

BRIEF SYNOPSIS OF PROJECT:
The basic physiology of tissue fluid exchange and lymphatic function is being investigated using a range of experimental systems from the cellular to the organismal level.
NAME OF PROJECT: Reference: 16
EFFECT OF DAFELON ON AN EXPERIMENTAL MODEL OF LYMPHOEDEMA

PRINCIPAL RESEARCHER:
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Research Status:
In preparation □ In progress ☑ Completed □

Research Funding:
Yes ☑ No □ Funding body: Servier Pharmaceutical Co.

BRIEF SYNOPSIS OF PROJECT:
The effect of Daflon (Servier) on an experimental model of lymphoedema is being assessed at the ultrastructural and physiological level. Daflon appears to stimulate the macrophage system to improve resolution of experimental induced lymphoedema.

Research is in progress and nearing completion.
NAME OF PROJECT: MAPPING GENES FOR PRIMARY LYMPHOEDEMA

PRINCIPAL RESEARCHERS:
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Research Status:
In preparation ☑ In progress ☐ Completed ☐

Research Funding:
Yes ☐ No ☑ Funding body: being sought

BRIEF SYNOPSIS OF PROJECT:
This project aims to map the genes for primary lymphoedema using linkage methods to provide chromosomal map position of one or more primary lymphoedema genes. Three large families have been identified with autosomal dominant primary lymphoedema, which are suitable for gene mapping. This research will open the way to an improved understanding of the aetiology and pathogenesis of this group of disorders.
NAME OF PROJECT: Reference: 18
EFFECT OF DAFLON ON RAT ACUTE LYMPHOEDEMA WITH AND WITHOUT FUNCTIONAL MACROPHAGES

PRINCIPAL RESEARCHERS:
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Research Status:
In preparation ☐ In progress ☑ Completed ☐

Research Funding:
Yes ☑ No ☐ Funding body: Servier; France.

BRIEF SYNOPSIS OF PROJECT:
This study aims to observe the effect of Daflon on a model of acute lymphoedema and tests the hypothesis that Daflon reduces it by stimulation of the proteolytic action of the macrophages. The effect of the agent on tissue hydrostatic pressure, skin perfusion and haemoglobin saturation was also tested.

Results show to date that Daflon significantly decreased the fluid content of the lymphoedematous limbs as a result which was reversed when the macrophage population was destroyed by silica.
NAME OF PROJECT: Reference: 19
A CLINICAL AND EXPERIMENTAL EVALUATION OF THE EFFECT OF LOW LEVEL LASER ON LYMPHOEDEMA

PRINCIPAL RESEARCHERS:
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Research Status:
In preparation □    In progress √    Completed □

Research Funding:
Yes √    No □    Funding body: Aus-Industry/Rian Corp.

BRIEF SYNOPSIS OF PROJECT:
In this project existing spot laser technology will be experimentally and clinically investigated with respect to its actions at the cell and tissue levels, examining specific actions on fibroblasts and macrophages on the lymph and blood flow and on the body's defence system. The research is based on an animal model followed by a double blind crossover study of the impact of laser on a range of clinical parameters assessed by commonly used testing equipment such as bio-impedance meters, tonometers and perometry. The aim will be to add clarity to the currently existing confusion about the multi modal action of lasers as a treatment strategy for chronic lymphoedema, other oedemas and in wound healing.
5 Prevalence

NAME OF PROJECT: Reference: 20
PREVALENCE OF ARM MORBIDITY IN THE POPULATION BASED AUSTRALIAN BREAST CANCER FAMILY STUDY

PRINCIPAL RESEARCHERS:
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Research Status:
In preparation □ In progress ☑ Completed □

Research Funding:
Yes ☑ No □ Funding body: Within context of US NIH Grant

BRIEF SYNOPSIS OF PROJECT:
Lymphoedema of the ipsilateral arm may occur following treatment for breast cancer. As the definition of lymphoedema by objective criteria has not been consistent, as estimates of its prevalence have been derived mainly from case series and vary widely, as arm swelling has been more common when defined by self-report than by objective measures, a survey of a population-based cohort of women with breast cancer was carried out to determine the self-reported frequency of arm morbidity. Women from NSW and Victoria with breast cancer diagnosed in 1996-98 who participated in the Australian Breast Cancer Family Study were mailed a brief questionnaire in December 1999 or January 2000 seeking information about self-reported arm swelling, shoulder stiffness, numbness in the arm of pain/ache in the arm following their treatment for breast cancer. Symptoms during the 6-month period after diagnosis of breast cancer will be excluded. It is expected that all questionnaires will have been returned by the end of March and that data analysis will be carried out in April 2000.
NAME OF PROJECT: ROYAL AUSTRALIAN COLLEGE OF SURGEONS’ (RACS) NATIONAL BREAST AUDIT

PRINCIPAL RESEARCHERS: Ms Sarah Tyson

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Research Status: In progress ✔ Completed □

Research Funding: Yes ✔ No □ Funding body: NBCC, RACS, Commonwealth Department of Health and Aged Care

BRIEF SYNOPSIS OF PROJECT:
The aim of the surgical audit is to measure and monitor the activities and treatment outcomes of the surgical management of primary breast cancer. A review of current literature indicates that surgical audit is routinely conducted in a variety of non-standard ways throughout the surgical community.

The current audit coordinates the collection of data from member of the Section of Breast Surgery (1998) as they were considered likely to represent the majority of breast surgeons in Australasia. It pools surgical data, and enables the exchange of standardised epidemiological data. The program provides surgeons with a template for recording clinical notes. The incidence and severity of lymphoedema has been included in this data collection.

The breast audit database has been distributed to all members of the (RACS) Section of Breast Surgery. The 450 participating surgeons treat about 70% of new breast cancers annually.
6 Prevention

<table>
<thead>
<tr>
<th>NAME OF PROJECT:</th>
<th>Reference: 22</th>
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<tbody>
<tr>
<td>EVALUATION OF PHYSIOTHERAPY CARE PLAN FOR WOMEN UNDERGOING BREAST CANCER SURGERY</td>
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</tbody>
</table>

**PRINCIPAL RESEARCHERS:**
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**Research Status:**
In preparation ☐
In progress ☑
Completed ☑

**Research Funding:**
N/A ☐ Yes ☑ No ☐ Funding body: 1 Royal Brisbane Research Foundation
2 Aust. Physiotherapy Association
3 Physiotherapy Research Foundation

**BRIEF SYNOPSIS OF PROJECT:**
NAME OF PROJECT: Reference: 23
SURGICAL TREATMENT FOR EARLY BREAST CANCER AND LYMPHOEDEMA: THE APPLICATION OF NURSING BASED PATIENT EDUCATION AND EARLY DETECTION TECHNIQUES TO REDUCE SEVERITY AND OPTIMISE QUALITY OF SURVIVAL.

PRINCIPAL RESEARCHERS:
Ms Stephanie Daly, Sr Janet Rice, and A/Prof Neil Piller

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Research Status:
In preparation ☐    In progress ☐    Completed ☒

Research Funding:
Yes ☒    No ☐    Funding body: Nurses Education Research Fund.

BRIEF SYNPÖSIS OF PROJECT:
This project has indicated that through training of specialised nursing staff in quantitative (objective) and qualitative (subjective) assessment of the patient who is at risk of developing lymphoedema, and through the introduction of a patient education and awareness program that problems which are the precursors of chronic lymphoedema can be detected and appropriate management and treatment strategies initiated. As yet there has been no analysis of the incidence of lymphoedema in the cohorts who had early assessment and the education programs. A five-year minimum period is required to assess if there is any real impact on incidence in the cohorts but short term results are promising.
NAME OF PROJECT: RISK REDUCTION STRATEGIES & COMMUNITY BASED SELF-MANAGEMENT FOR POST MASTECTOMY LYMPHOEDEMA: A DEMONSTRATION PROJECT

PRINCIPAL RESEARCHERS:
A/Prof Neil Piller, Ms Gay Greenwood, Ms Sigrida Kerr

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Research Status:
In preparation □ In progress ☑ Completed □

Research Funding:
Yes ☑ No □ Funding body: South Australian Health Commission.

BRIEF SYNOPSIS OF PROJECT:
This project aims to assess the impact that lymphoedema has on the quality of life of the lymphoedema sufferer and their partner. It also will evaluate the information and services available to those in need. As well it will assess the knowledge base and ability of health professionals to deal with those at risk of Lymphoedema as well as those already with it. An educational and training program will be created based on this information. Once the program has been discussed with the stakeholders it will be run and impact evaluation conducted.
7 Risk Factors

NAME OF PROJECT: Reference: 25
POSSIBLE TRIGGERS FOR LYMPHOEDEMA FOLLOWING TREATMENT FOR BREAST CANCER

PRINCIPAL RESEARCHERS:
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Research Status:
In preparation ☑ In progress ☐ Completed ☐

Research Funding:
N/A ☑ Yes ☐ No ☐ Funding body:

BRIEF SYNOPSIS OF PROJECT:
In the planning stage of a project following women through their treatment for breast cancer by taking objective measures, ie body weight, volumetry, circumferential measures of both arms, at set time points (pre-operative, post-operative 1, 3, 6, 12 months, and then 6 monthly intervals for five years post-operative. Hope to develop multi-centre project. Project initiated by Lymphoedema Practitioner Group of Victoria.
### Sentinel Node Biopsy

**NAME OF PROJECT:** MULTINATIONAL CO-OPERATIVE STUDY IN SENTINEL LYMPH NODE BIOPSY IN VULVAR CANCER

**PRINCIPAL RESEARCHERS:**
Dr Margaret Davy

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**Research Status:**
In preparation ☐ In progress ☑ Completed ☐

**Research Funding:**
N/A ☒ Yes ☑ No ☐

**BRIEF SYNOPSIS OF PROJECT:**
Women with vulvar cancer who will undergo primary surgery may take part. Technetium labelled radio-colloid is injected into the tumour pre-operatively and the sentinel node(s) are identified by gamma camera. At the time of surgery, a few hours later, a hand held probe is used to identify and remove the labelled node. A formal inguinal lymphadenectomy is then undertaken.

**END POINTS:**
1. can the surgeon identify and remove only sentinel nodes?
2. is the “background noise” then enough to determine that the radio-labelling is concentrated in sentinel node(s)?
3. can histological examination confirm that the sentinel node is representative for the metastatic status of each patient?
4. ultimately , is it safe and reliable to remove the sentinel node only to determine the status of a patient’s disease. Can we therefore omit the formal lymphadenectomy in favour of sentinel nodes.
9 Treatment

NAME OF PROJECT: Reference: 27
LASER TREATMENT FOR LYMPHOEDEMA

PRINCIPAL RESEARCHERS:
Ms A Angel, Mr R Walsmsley, A/Prof N Piller, Dr C Carati and A/Prof B Gannon

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Research Status:
In preparation □ In progress ☑ Completed □

Research Funding:
Yes ☑ No □ Funding body: START grant between DISR, RIAN Corp, and Flinders University.

BRIEF SYNOPSIS OF PROJECT:
Low level laser treatment (LLLT) has a beneficial effect in lymphoedema, and a number of other conditions. This study will determine the best clinical protocol for the use of LLLT, including development of a small inexpensive laser system supplied by RIAN Corp.
NAME OF PROJECT: Reference: 28
EFFECTIVENESS OF STRATEGIES FOR LYMPHOEDEMA PREVENTION AFTER BREAST CANCER SURGERY

PRINCIPAL RESEARCHERS:
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Research Status:
In preparation ☑ In progress ☐ Completed ☐

Research Funding:
Yes ☐ No ☑ Funding body: being sought.

BRIEF SYNOPSIS OF PROJECT:
Extension of early findings of the effectiveness of Physiotherapy Management Care Plan. Investigating which components of lymphoedema prevention strategies and early intervention are effective in reducing incidence and/or progression of secondary arm lymphoedema.
NAME OF PROJECT: Reference: 29
EFFECT OF LOW LEVEL LASER ON TISSUES AND ORGANS

PRINCIPAL RESEARCHERS:
A/Prof B Gannon, Dr Merrill Jones, Dr C Carati and A/Prof N Piller

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Research Status:
In preparation ☐ In progress ☑ Completed ☐

Research Funding:
Yes ☑ No ☐ Funding body: funded by various sources

BRIEF SYNOPSIS OF PROJECT:
Low level laser LLL application appears to have a biological effect at the cellular, tissue and organ and organismal level. This study is investigating the effect of LLL on cells, tissues and organs systems implicated in lymphatic function, with a view to understanding the basic mechanisms by which LLL may be used clinically.
NAME OF PROJECT: TRUNK MASSAGE AND EXERCISE ROUTINE (TMER)

PRINCIPAL RESEARCHERS:
Mr Michael Mason

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Research Status:
In preparation □ In progress ☑ Completed □

Research Funding:
Yes □ No ☑ Funding body: being sought.

BRIEF SYNOPSIS OF PROJECT:
Conventional complex physical therapy (CPT) stimulates mainly the superficial central (trunk) and peripheral (LIMBS) lymphatic drainage. This clinical research is being carried out to determine the effect of including measures to stimulate the deep trunk lymphatic drainage in the treatment of lymphoedema by CPT.

These measures include diaphragmatic breathing and gentle abdominal exercise to vary the intra-thoracic and abdominal pressure as well as active exercises of muscles at the base of the affected limb to activate the lymphatic muscle pump.
NAME OF PROJECT: Reference: 31
VIBRATIONAL TREATMENT FOR LYMPHOEDEMA

PRINCIPAL RESEARCHERS:
A/Prof N Piller, Dr C Carati and A/Prof B Gannon

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Research Status:
In preparation ☑ In progress ☐ Completed ☐

Research Funding:
Yes ☐ No ☑ Funding body: being sought.

BRIEF SYNOPSIS OF PROJECT:
Lymphatic function is enhanced by activity, such as exercise or massage. Other physiological parameters also can be altered by vibration or applied ‘stress’ to all or parts of the body. This study will investigate the effect of vibration of moderate frequency on lymphoedema, using a Sun Ancor massage device (Hsin Tin Corp).

Research is in preparation, due to commence mid 2000, if funded.
NAME OF PROJECT: Reference: 32
LYMPHOEDEMA MANAGEMENT: THE BENEFITS OF CARER TRAINING IN CONSERVATIVE MANAGEMENT OF LYMPHOEDEMA

PRINCIPAL RESEARCHERS:
A/Prof Neil Piller, Ms Sabine Swagermakers, Ms Rosy Packer

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Research Status:
In preparation ☐ In progress ☐ Completed ☑

Research Funding:
Yes ☑ No ☐ Funding body: Part funded by Jobst Beiersdorf

BRIEF SYNOPSIS OF PROJECT:
Patients and carers are trained by and educated by physiotherapists over 5 week period to bandage, massage and care for the limb. Outcomes were evaluated by objective measurements of limb circumference, tonometry bio-impedence and through patient and carer interview. Patients and their partners were able to have a significant impact on the measured parameters.
NAME OF PROJECT: Reference: 33
EFFECT GALLIUM ARSENIDE INFRA RED AND HELIUM NEON LASER ON
CHRONIC POST MASTECTOMY LYMPHOEDEMA

PRINCIPAL RESEARCHERS:
A/Prof Neil Piller and Ms Anne Thelander

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Ms Anne Thelander - Physiotherapist
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Research Status:
In preparation ☐ In progress ☑ Completed ☐

Research Funding:
Yes ☑ No ☐ Funding body: Flinders Foundation and URB

BRIEF SYNOPSIS OF PROJECT:
Clinical study to confirm clinically, experimental findings which showed laser treatment
to reduced oedema. The experimental mode of action of laser is to facilitate the
regrowth of small blood and lymphatic vessels. In the study of patients with long
standing chronic post mastectomy lymphoedema received a series of 16 laser
treatment sessions over a period of ten weeks. Effectiveness of the treatment was
assessed by volume and circumference measurement as well as by tonometry and bio-
impedence. All subjective and objective parameters showed improvement. Laser is
now used in the clinical setting in the Lymphoedema Assessment Clinic, although
investigations about its mode of action continues. To date over 700 patients have been
given laser in association with other therapies. Analysis continues.
NAME OF PROJECT: Reference: 34
EFFECT OF SHORT TERM MANUAL LYMPH DRAINAGE, TREATMENT AND MAINTENANCE THERAPY FOR POST MASTECTOMY LYMPHOEDEMA

PRINCIPAL RESEARCHERS:
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Research Status:
In preparation □ In progress ☑ Completed □

Research Funding:
Yes ☑ No □ Funding body: Part funding by Swedish National Cancer Fund in initial stages

BRIEF SYNOPSIS OF PROJECT:
This trial is part of an ongoing international study with the Red Cross Hospital, Stockholm. In view of the often high cost of lymphoedema treatment the study aims to discover whether after a short period of intensive treatment patients can be taught self care and massage effectively so they can take control of the treatment of their oedematous limb in terms of facilitating the reduction in the amount of oedema. This program aims to train and educate the lymphoedema sufferer and their carer so that together they may better care for and manage the lymphoedematous limb.
NAME OF PROJECT: Reference: 35
EVALUATION OF THE EFFECT OF LASER ON POST-OPERATIVE OEDEMA

PRINCIPAL RESEARCHERS:
Ms Ann Thelander and Mr Tony Moore

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Research Status:
In preparation ☐ In progress ☑ Completed ☐

Research Funding:
Yes ☐ No ☑ Funding body: being sought

BRIEF SYNOPSIS OF PROJECT:
Patients who have had plastic surgery develop post-operative oedema. Laser has speeded up the resolution of the oedema in many patients. This study will compare the treated and no-treated areas.
NAME OF PROJECT:  Reference: 36
THE NATURE OF LOWER-LIMB LYMPHOEDEMA FOLLOWING TREATMENT FOR GYNAECOLOGICAL CANCER

PRINCIPAL RESEARCHERS:
Ms Mary Ryan, Ms Sally Watts, Dr M. Colleen Stainton, Ms Carmel Jaconelli,
Ms Patricia McKenzie, Ms Tamar Mansberg

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Ms Sally Watts – Nurse Unit Manager, Gynaecology/Oncology Unit
Ms Patricia McKenzie – Clinical Nurse Consultant - Gynaecology/Oncology
Dr M. Colleen Stainton – Professor and Chair - Centre for Women's Health Nursing
Ms Tamar Mansberg – Physiotherapist
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Ph: 02 9382 6739, Fax: 02 9382 6444

Research Status:
In preparation ☐  In progress ☑  Completed ☐

Research Funding:
Yes ☑  No ☐  Funding body: Patient’s Relative Donation

BRIEF SYNOPSIS OF PROJECT:
Aim:
To determine the cumulative incidence and nature of lower-limb lymphoedema (LLL) in a population of women who have been treated for gynaecological cancers in one large tertiary referral centre.

Women who have had major surgery for gynaecological cancers in the Gynaecology/Oncology unit at the Royal Hospital for Women in the past two years will be surveyed to determine the cumulative incidence of LLL in this population.
Appendix 1: Register of research form

NAME OF PROJECT:

PRINCIPAL RESEARCHERS:

CONTACT DETAILS:

Research Status:

In preparation ☐ In progress ☐ Completed ☐

Research Funding:

Yes ☐ No ☐ Funding body: __________________________

BRIEF SYNOPSIS OF PROJECT: