

# Enhanced supportive care in the management of radiotherapy induced fibrosis

## for patients living with head and neck cancer

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### Introduction

The head and neck cancer population often have unmet needs as a consequence of their treatment which can lead to significant impairment and disability<sup>1</sup>. Radiation Induced Fibrosis (RIF) is a progressive sclerotic unintended disorder of radiotherapy treatment. Despite advances in planning and treatment delivery, this debilitating consequence leads to a reduced quality of life with poor physical and psychological function.

The Nottingham Late Effects Clinic is such a service that offers collaborative multi-disciplinary support throughout the survivorship trajectory to manage this long term condition using novel treatments such as photobiomodulation therapy (PBM). Since 2013 618 patients living with HNC have been reviewed in the clinic for support and management for the physical and psychological consequences from cancer treatment.

#### Photobiomodulation Therapy

The application of near infra red light that causes a biological cascade effect reducing oxidative stress within cells. Endorsed by NICE (2018) and MASCC (2023) to reduce oral mucositis and radiation dermatitis.

#### Proactive Prevention and Early Management

Early identification of external and internal swelling and lymphoedema caused by RIF is critical if long term function is to be maintained<sup>2</sup>. When left undetected patients experience a decreased range of motion in the mandible, neck and shoulders, skin tightening and pain. Continued progression of RIF can also contribute to dysphagia, deterioration in speech and risk of aspiration.

Proactive management using Enhanced Supportive Care (ESC) provides the opportunity for multi disciplinary management, prospective follow up of late radiation associated side effects enabling early identification and ultimately improved quality of life for the patient.

### Methods

118 patients were assessed and offered ESC to manage RIF along with the use of bi weekly PBM therapy for a schedule of six weeks.

The multi disciplinary team consisted of Consultant Therapeutic radiographer, Dietitian and Speech and Language Therapist. Support and guidance from the Lymphoedema Team with direct access for extensive cases was available.

ESC included a home exercise management programme and if appropriate targeted speech and swallow therapy and lymphoedema management. Holistic assessment was carried out and psychological support was also offered to ensure all patient needs were addressed.

Outcomes collected included change in neck rotation (degrees), change in neck extension (cm), change in mouth opening as a result of radiation induced trismus (mm), patient reported pain scores and distress thermometer (1-10). Clinical photographs and patient quality of life testimonials were also obtained.

#### Home Exercise Program

Collaboratively designed to increase blood flow, flexibility, range of cervical motion promote lymphatic drainage and reduce late radiation associated dysphagia, trismus and musculoskeletal problems. Patients are encouraged to follow for life and the collaborative approach helps to ensure compliance<sup>3</sup>.

#### Lymphoedema Management

Provided by the Consultant Therapeutic Radiographer under the guidance of the Lymphoedema Team. This included Simple Lymphatic Drainage with the use of moldable beaded collars, rollers and Kinesio tape. Compression was applied using Kinesio correction strips.

### Results

Outcomes observed included changes in appearance, improved range of movement and decreased psychological distress. There was a significant improvement in quality of life with 74% of patients reporting a reduction in distress along with 52% of patients reporting a decrease in pain. This is clinically significant when no other treatments have ever shown such benefits.

Outcome	Avg. Change	Max Change
RT Neck Rotation degrees	15	50
LT Neck Rotation degrees	11	60
Neck Extension cm	2	4.5
Trismus mm	5	16
Pain Score 0-10	-1.2	-6
Distress Thermometer 0-10	-2	-10
Time From Treatment months	44	215

Figure 1. Measured Outcomes



Figure 3. Before PBM



Figure 4. After PBM

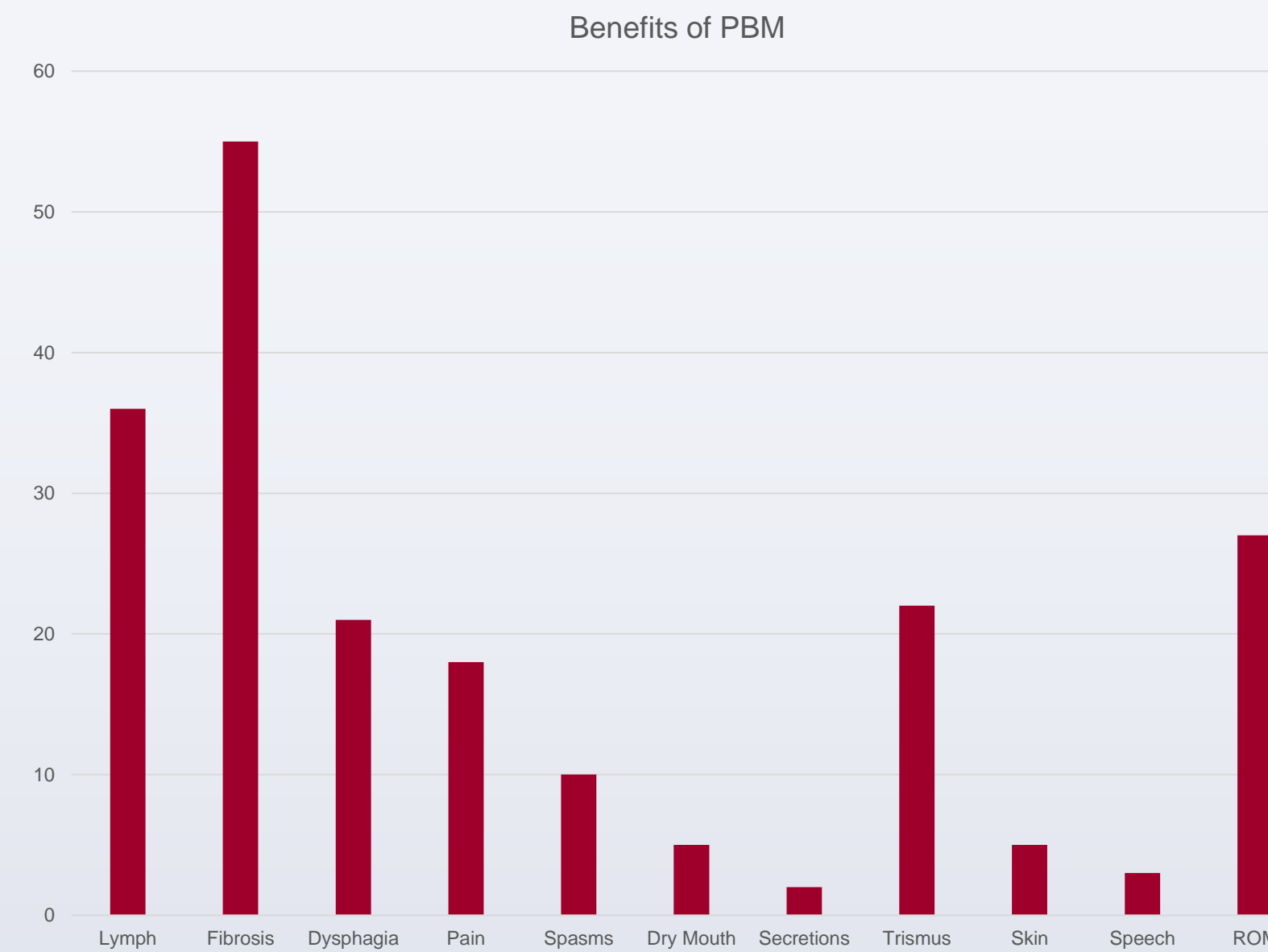


Figure 2. Benefits Observed

#### Patient Feedback

I cannot begin to explain how hard it is to live with the post treatment. I cannot eat normal food, I have no saliva, I can't turn my neck, which is constantly painful. The last six weeks have made an unbelievable change to my life. This is the first time I have had any relief, it's like a miracle.

I just thought I'd let you know that, this morning, I had my first cup of tea (albeit not very large but very careful) in almost 4 years! I can't thank you enough for your help and effort



Figure 5. Chronic Radiation Dermatitis & Fascial Lymphoedema Before & After PBM

### Discussion

A collaborative multi-disciplinary approach is essential for offering excellent patient centred personalised self-supported care in the complex symptom management of the consequences of head and neck cancer treatment. It is increasingly clear that self-care exercise management programmes are of critical importance in preventing or ameliorating long-term functional deficits. Combining this with intensive aspects of enhanced supportive care and PBM has shown great potential.

During this study PBM proved to reduce symptom burden and improve quality of life where historically there has been no effective treatment. Whilst the changes for some were small the significance of these on quality of life was high. Incorporating PBM into Enhance Supportive Care has the potential to reduce Radiation Induced Fibrosis and the reduction of their Late effects, providing hope to patients living with and beyond cancer to help manage this long term condition.

This study supports the use of PBM therapy as a significant intervention for the effective management of RIF; however further research in assessing the quantifiable reduction of RIF is needed.

### References

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2. Murphy BA, Deng J. Advances in supportive care for late effects of head and neck cancer. J Clin Oncol. 2015. 33:3314-21.
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