

Improving the reliability of the phototherapy service in a Dermatology Department in Singapore

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Introduction

Phototherapy refers to the therapeutic use of ultraviolet radiation (UVR) and is an established modality of treatment of common skin conditions such as eczema and psoriasis.

Phototherapy treatment is usually initiated by the physician, after which patients undergo nurse-administered phototherapy up to 3 times a week and UVR dose is increased gradually according to a protocol with the aim of maintaining a mild asymptomatic erythema throughout the treatment course to ensure adequacy of treatment and avoidance of burns. Nurses have to assess patients for erythema, pain and burns before each phototherapy session to decide on UVR dosimetry based on the protocol, while efficacy of treatment and need for continuation or cessation is performed by the ordering physician at 2-3 monthly intervals. See fig. 1 for flowchart.

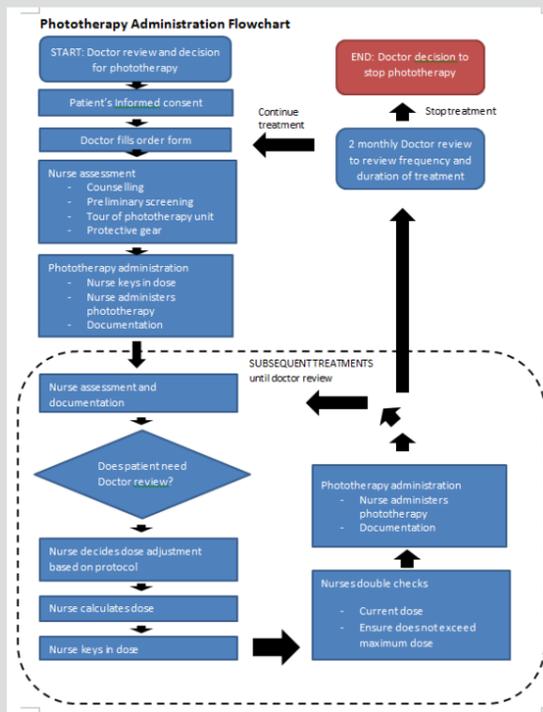


Fig.1 Phototherapy administration flowchart

What is the problem?

An audit of phototherapy records performed in September 2017 at the Dermatology outpatient clinics at Singapore General Hospital showed that only 55% of patients achieved protocol adherence of at least 80% (range 16.7-100%) resulting in suboptimal dosimetry and less effective treatment. This was contributed by inadequate documentation of objective erythema used to guide treatment and an over-reliance on patient's subjective requests on dosimetry.

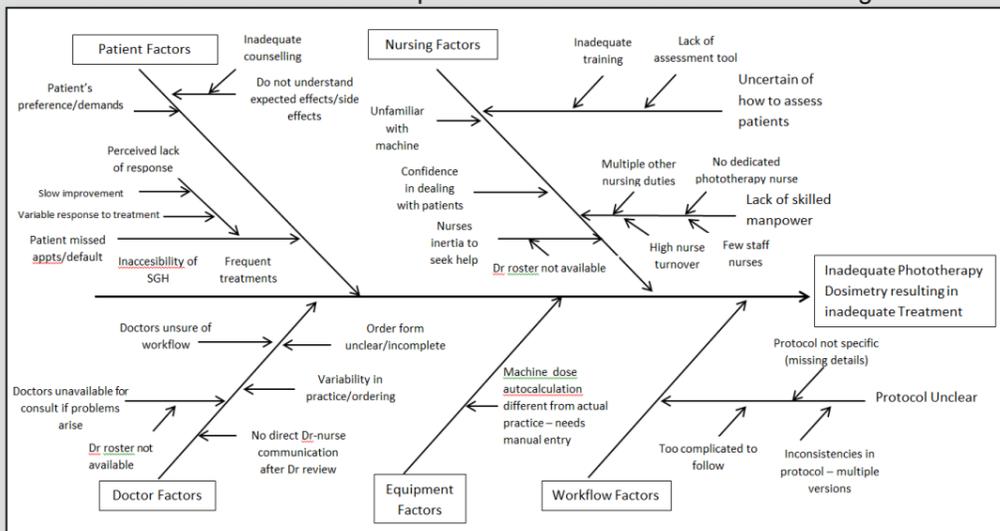
Mission statement

We thus aimed to achieve 90% of patients having ≥80% adherence to the phototherapy dosimetry protocol within 6 months.

This target was chosen instead of overall protocol adherence to ensure each patient has adequate protocol adherence to achieve a therapeutic dose. 20% leeway was given for patient's subjective requests or uncertainties in nurses assessment.

Analysis of the problem

Cause and effect diagram for root cause analysis was performed with additional feedback session for nurses to explore their concerns and difficulties. Figure 2:



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Key problems identified:

1. Inadequate training of nurses
2. Lack of objective assessment tool to decide on dosimetry
3. Inconsistencies in protocol
4. Inadequate counselling of patients (lack of understanding of need for feedback on symptoms and nurse assessment prior to each phototherapy session which affects dosimetry)
5. Doctors deemed unavailable for consult if problems encountered

Interventions/Initiatives

A single PDSA cycle including the following initiatives were rolled out from March to April 2018:

- 1) **Revision and standardization of protocol**
- 2) **Revision of phototherapy order/record form** to include the dosimetry protocol for ease of reference
- 3) **Training** was conducted for all nurses who might be rostered to cover phototherapy duties
- 4) **Standardized pictorial flipchart** for nurse counselling to patients on phototherapy
- 5) **Pictorial chart on grading the severity of erythema** provided to nurses to aid assessment of erythema pre-phototherapy
- 6) **Doctor roster made available** to nurses with instructions on which Doctors to contact if problems or doubts arise.

Decision to roll out all measures together was decided upon as they were deemed important and changes easy to implement.

Erythema History	Erythema Grading	Description Of Erythema on Attendance	Action
None	0	None	↑ by 100 mJ/cm ²
< 48 hours	+/-	No erythema (erythema only reported by patient)	↑ by 50 mJ/cm ²
48 - 72 hours	1+	Just perceptible pink erythema, asymptomatic	Hold dose
≥ 48 - 72 hours	2+	Well-defined erythema, possibly causing slight manageable discomfort	↓ by 25% of previous dose or postpone treatment. When settled, restart after 3 days at previous dose.
Pain without blistering	3+	Well-defined fiery red erythema, symptomatic, painful	No treatment. Review by doctor. Restart after 1 week when settled at 50% of previous dose.
Pain with blistering	4+	Well-defined fiery red erythema with blistering, painful	No treatment. Review by doctor. Restart after 1 week when settled at 50% of previous dose.

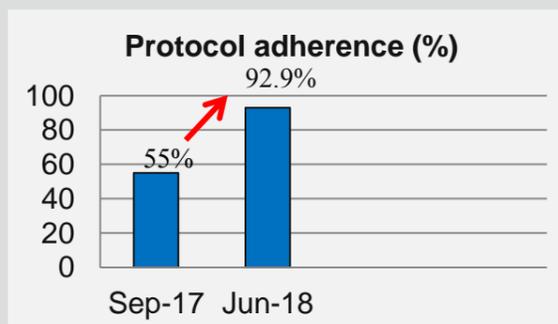
Fig 3: Dosimetry protocol



Fig 4. Nursing counselling flipchart/file

Results

Repeat audit performed on phototherapy records from March – May 2018 post PDSA cycle 1 showed that 92.9% (13 out of 14 patients) achieved ≥80% adherence to the phototherapy dosimetry protocol thus achieving the mission statement. Nurses also reported greater confidence in the counselling and administration of phototherapy.



Sustainability plans

- To conduct regular nurse training and feedback sessions – to reinforce protocol, explore potential difficulties
- 6 monthly audit of phototherapy protocol adherence

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