

**GWENT HEALTHCARE NHS TRUST**

**Phototherapy and Photodynamic Therapy  
Service**

**Standards and Protocols**

**Department of Dermatology,  
Phototherapy Unit  
St Woolos Hospital**

**August 2009**

## Table of Contents

|                                                          |          |
|----------------------------------------------------------|----------|
| <b>Dermatology Phototherapy Service Standards .....</b>  | <b>4</b> |
| Statement of Our Service Standards: .....                | 4        |
| Standard 1: Referral.....                                | 5        |
| Rationale: .....                                         | 5        |
| Criteria:.....                                           | 5        |
| Data Source: .....                                       | 5        |
| Outcome Targets:.....                                    | 6        |
| Standard 1a: Urgent referrals.....                       | 7        |
| Rationale: .....                                         | 7        |
| Criteria:.....                                           | 7        |
| Data Source: .....                                       | 7        |
| Outcome Target: .....                                    | 7        |
| Standard 2: Patient information and consent .....        | 8        |
| Rationale: .....                                         | 8        |
| Criteria:.....                                           | 8        |
| Data source:.....                                        | 8        |
| Outcome target:.....                                     | 8        |
| Standard 3: Phototherapy Staff.....                      | 9        |
| Rationale: .....                                         | 9        |
| Criteria:.....                                           | 9        |
| Data Source: .....                                       | 9        |
| Outcome Target: .....                                    | 9        |
| Standard 4: Ultraviolet and visible light dosimetry..... | 10       |
| Rationale: .....                                         | 10       |
| Criteria:.....                                           | 10       |
| Data Sources:.....                                       | 11       |
| Outcome targets:.....                                    | 11       |
| Standard 5: Audit and clinical governance.....           | 12       |
| Rationale: .....                                         | 12       |
| Criteria:.....                                           | 12       |
| Data Source: .....                                       | 13       |
| Outcome Targets:.....                                    | 13       |
| Standard 6: Treatment methodologies.....                 | 14       |
| Rationale: .....                                         | 14       |
| Criteria:.....                                           | 14       |
| Data Source: .....                                       | 14       |
| Outcome Target: .....                                    | 14       |
| Standard 7: Discharge from a course of phototherapy..... | 15       |
| Rationale: .....                                         | 15       |
| Criteria:.....                                           | 15       |
| Data Source: .....                                       | 15       |
| Outcome Targets:.....                                    | 15       |
| Standard 8: Skin Cancer surveillance .....               | 16       |
| Rationale: .....                                         | 16       |
| Criteria:.....                                           | 16       |
| Data Source: .....                                       | 16       |
| Outcome Target: .....                                    | 16       |

|                                                                              |           |
|------------------------------------------------------------------------------|-----------|
| <b>Phototherapy protocol modifications for other skin disorders.....</b>     | <b>24</b> |
| Eczema .....                                                                 | 24        |
| <b>Missed treatment protocol.....</b>                                        | <b>29</b> |
| <b>Whole-body phototherapy discharge protocol:.....</b>                      | <b>30</b> |
| <b>PATIENT INFORMATION LEAFLET          Narrow-Band UVB Phototherapy</b>     |           |
| <b>Treatment .....</b>                                                       | <b>31</b> |
| <b>PATIENT INFORMATION LEAFLET          PUVA Phototherapy Treatment.....</b> | <b>35</b> |
| <b>UV Dosimetry Procedures .....</b>                                         | <b>39</b> |
| General .....                                                                | 39        |
| Equipment Specific Procedures .....                                          | 39        |
| Fluorescent Lamp Based Units .....                                           | 39        |
| Non-Fluorescent Lamp Based Units.....                                        | 41        |
| PDT Equipment .....                                                          | 41        |
| <b>Dermatology Photodynamic Therapy Service Standards .....</b>              | <b>42</b> |
| Statement of our Service Standards:.....                                     | 42        |
| Standard 1: Referral.....                                                    | 43        |
| Rationale: .....                                                             | 43        |
| Criteria:.....                                                               | 43        |
| Data source: .....                                                           | 43        |
| Outcome targets:.....                                                        | 43        |
| Standard 2: Patient information and consent .....                            | 44        |
| Rationale: .....                                                             | 44        |
| Criteria:.....                                                               | 44        |
| Data source: .....                                                           | 44        |
| Outcome target:.....                                                         | 44        |
| Standard 3: Phototherapy Saff .....                                          | 45        |
| Rationale: .....                                                             | 45        |
| Criteria:.....                                                               | 45        |
| Data source: .....                                                           | 45        |
| Outcome target:.....                                                         | 45        |
| Standard 4: Treatment methodology.....                                       | 46        |
| Rationale: .....                                                             | 46        |
| Criteria:.....                                                               | 46        |
| Data source: .....                                                           | 46        |
| Outcome target:.....                                                         | 46        |
| Standard 5: Treatment outcomes.....                                          | 47        |
| Rationale: .....                                                             | 47        |
| Criteria:.....                                                               | 47        |
| Data source: .....                                                           | 47        |
| Outcome target:.....                                                         | 47        |
| Standard 6: Equipment and eye safety .....                                   | 48        |
| Rationale: .....                                                             | 48        |
| Criteria:.....                                                               | 48        |
| Data source: .....                                                           | 48        |
| Outcome target:.....                                                         | 48        |
| <b>Photodynamic Therapy Protocol .....</b>                                   | <b>49</b> |
| <b>PATIENT INFORMATION LEAFLET          Photodynamic Therapy (PDT).....</b>  | <b>51</b> |

## DERMATOLOGY PHOTOTHERAPY SERVICE STANDARDS

Ultraviolet phototherapy and photochemotherapy is used to treat a variety of skin disorders, including psoriasis, eczema, mycosis fungoides, pruritis, vitiligo and many other conditions. It is also used to desensitise skin in some photosensitivity disorders such as polymorphic light eruption, solar urticaria and erythropoietic protoporphyria.

The phototherapy service aims to provide safe, appropriate and effective treatment to its patients.

### Statement of Our Service Standards:

1. Written quality standards covering patient referral, information, consent, treatment and discharge will have outcome criteria that will be routinely audited.
2. Our staff will be trained in the safe and effective use of ultraviolet irradiation equipment, and will maintain an up-to-date portfolio of continuing professional development.
3. Treatments will be safe and effective. By attendance at conferences, and review of relevant literature, we will monitor and update our treatment protocols to ensure our service conforms to best clinical practice.
4. The phototherapy sources and associated equipment will be well maintained and routinely checked for safety and compliance to the manufacturers' specifications and to Regulatory Standards.
5. The phototherapy unit will be a safe and friendly patient-centred environment.

In order to achieve these aims, each aspect of the service has standards set which will be routinely audited. Below are set out our Phototherapy Service Standards, with clear criteria and outcome targets suitable for an audit process.

## **Standard 1: Referral**

Phototherapy and PUVA will be prescribed by a Consultant Dermatologist or another practitioner working under the supervision of a Consultant Dermatologist.

An accurate diagnosis and clinical decision on appropriate treatment is essential before administering phototherapy treatment.

Patients with special needs e.g. children, learning difficulties, language barriers, will have phototherapy treatment suitably adapted to ensure safety of the patient at all times.

The Consultant Dermatologist has at all times the overall responsibility for the care of the patient.

### **Rationale:**

Phototherapy should be offered by the clinician/phototherapist to patients who have diseases for which this is, at the time of presentation, the treatment of choice. An accurate diagnosis and assessment of risk factors for complications with phototherapy, or alternatives, is required before the decision to prescribe phototherapy can be made.

In order to assess whether or not a further course of phototherapy is indicated, it is essential to have information on previous UVB and PUVA treatment.

### **Criteria:**

Outpatient referrals for phototherapy should be from the phototherapy clinic.

The patient treatment record, including information on lifetime cumulative UVB and/or PUVA exposures should be up to date at all times.

A referral form should be used to prescribe phototherapy and PUVA. Relative contra-indications and risk factors for adverse effects should be recorded on this form.

### **Data Source:**

A referral form, and letter containing the prescription for phototherapy, is in each patient's Phototherapy Unit notes.

Main hospital notes of patients who have completed one or more courses of phototherapy contain sheet summarising previous UVB and PUVA courses (at a minimum, cumulative UVB and PUVA exposures should be recorded in the medical notes). For patients with notes at other Trust hospitals, summary phototherapy sheets should be sent for inclusion in those notes.

**Outcome Targets:**

A referral form is present in 100% of Phototherapy Unit notes.

A referral letter is present in >90% of Phototherapy Unit notes.

Up-to-date summary of cumulative doses is present in >80% of notes by 4 weeks after completion of the course of treatment.

**Standard 1a: Urgent referrals**

Patients referred urgently for phototherapy will start treatment soon after referral.

**Rationale:**

If the patient is considered to require treatment urgently, then treatment should be started quickly to reduce patient discomfort, and avoid the need for hospital admission.

**Criteria:**

Proportion of patients referred urgently for phototherapy or PUVA who start treatment within the recommended maximum time interval.

**Data Source:**

Patients phototherapy notes -will be able to collect information on time between referral and start of treatment for those whose referral form was marked urgent.

**Outcome Target:**

>90% urgent referrals to start treatment within three weeks of referral from Dermatology Outpatients.

## **Standard 2: Patient information and consent**

All patients will be given information in a suitable format about the treatment including possible adverse effects. This should be up-to-date, comprehensive and easily understood by a layman. The phototherapy service liase with the Patient Information Unit (PIU) who will be responsible for the production of suitable patient information leaflets. The phototherapy service will review these at least every 2 years to ensure that these are kept up-to-date.

All patients about to undergo phototherapy treatment will give written informed consent relating to each treatment course after receiving appropriate information. For those patients unable to give consent, consent will be sought from a suitable person (spouse/parent/carer/guardian) in accordance with Trust Policy for consent.

### **Rationale:**

Patient knowledge of minor adverse events makes these easier to manage during treatment, and will minimise non-attendance or non-completion of treatment. Some side effects can be avoided if patients are warned. All phototherapy patients should be aware of long-term risks of ultraviolet phototherapy.

Patients need information in order to consent to treatment.

### **Criteria:**

All patient information leaflets are up-to-date (reviewed at least every 2 years) and are given to every patient.

All patients must give written consent

### **Data source:**

Patient assessment form tick-box for recording that information leaflet has been given.  
Consent form has confirmation that patient has received appropriate information leaflet.  
Signed and dated consent form.

### **Outcome target:**

Patient information checkbox is ticked in 100% of patient initial assessment forms.

Signed and dated consent form is present in 100% of patient notes.

100% of patient information leaflets have version number and review date, and are up-to-date.

### **Standard 3: Phototherapy Staff**

Patients are treated by qualified Phototherapists. Phototherapists are members of the phototherapy team, and part of a multidisciplinary dermatology team, which includes clinicians, medical physicists, phototherapists and other nursing staff.

#### **Rationale:**

To ensure optimal effectiveness and safety phototherapy must be administered by phototherapists with an adequate knowledge of the treatments, equipment and of the conditions being treated.

#### **Criteria:**

All phototherapists will be expected to have undertaken and passed the Newport Residential Training Course for Phototherapists.

Attendance, at least once every 2 years, at suitable phototherapy update courses.

Maintenance of a portfolio with evidence of reflective practice in phototherapy.

Satisfactory annual Agenda for Change Knowledge and Skills Framework review.

#### **Data Source:**

Training course certificates.

#### **Outcome Target:**

100% of all phototherapy treatments are administered by a trained phototherapist.

100% of our phototherapists have Newport Residential Training Course for Phototherapists certification.

100% of our phototherapists have had update training within the last two years.

## **Standard 4: Ultraviolet and visible light dosimetry**

The phototherapy service will have robust and accurate systems in place for ultraviolet and visible light dosimetry.

All equipment will be regularly calibrated and checked for electrical safety.

All calibrations will be traceable to national standards.

Staff exposure to ultraviolet radiation will be regularly checked to ensure it is within recommended limits.

### **Rationale:**

Robust and accurate systems of ultraviolet and visible light exposure measurement and delivery are necessary to ensure the rapid clearance of disease with minimum risk of acute side effects.

Accurate exposure measurements also facilitate the introduction of new treatment regimes, allow the inter-comparison of results between centres, and enable the recording of patient cumulative doses.

Routine calibration and service checks ensures early detection of equipment problems, minimising risks to patients, and maintains traceable records of safety and quality assurance systems.

Regular ultraviolet risk assessments of the phototherapy unit will ensure the safety of patients, staff and visitors.

Expertise and equipment to undertake such dosimetry is only available from Medical Physics.

Staff occupational exposure to ultraviolet radiation must be assessed and kept below recommended limits.

### **Criteria:**

Overall responsibility for UV dosimetry should be ascribed to a Medical Physicist experienced in phototherapy.

Written dosimetry protocols should be in place, which take account of local factors and currently available guidelines (e.g. BPG Guidelines, 2002; Scottish UV Dosimetry Guidelines, 2001; IPEM Report 76, 1997).

UV output of each phototherapy equipment should be calibrated on a regular basis, preferably once per month but at least once per two months.

Dosimeters should be calibrated regularly against standards traceable to the National Physical Laboratory.

An annual UV risk assessment of the phototherapy unit will be undertaken.

Annual inter-centre comparison measurements should be carried out.

All staff involved in the measurement and delivery of UV radiation should receive appropriate training.

Equipment should be checked for electrical safety at least annually.

**Data Sources:**

Written Dosimetry protocol documents.

Calibration record sheets.

Electrical safety stickers and record sheets.

Intercomparison exercise report.

UV risk assessment document.

**Outcome targets:**

100% of dosimetry protocols have version number and revision date and are up-to-date.

100% of ultraviolet therapeutic sources equipment have a record of calibration within the recommended intervals (no longer than two months).

100% of ultraviolet therapeutic sources equipment have a record of electrical safety check within the recommended interval (maximum interval 12 months).

100% of dosimeters are calibrated within the recommended interval.

UV risk assessment undertaken annually.

## **Standard 5: Audit and clinical governance**

The phototherapy service will encourage regular meetings between all members of the multidisciplinary phototherapy team to discuss matters appertaining to clinical governance and audit.

Aspects of the service will be audited annually and presented to the Dermatology Directorate audit meeting.

The phototherapy team will attend local and multi-centre clinical governance and audit meetings with other centres in the region.

The service will adopt a 'no-blame' culture to encourage the full and detailed reporting of adverse events in phototherapy.

### **Rationale:**

Good communication is required among the different staff groups involved in delivering phototherapy.

Sharing experiences and expertise between centres will help to establish and maintain best clinical practices in phototherapies.

Reports of adverse incidents should be made available, so that we and other centres can benefit from the lessons learned, and any problems with equipment, staff or procedures can be caught before they cause adverse events or interruption to the service.

Review of protocols and procedures allows these to be checked against current best practice or national guidelines and updated if necessary.

### **Criteria:**

All members of the phototherapy team should be encouraged to attend the local audit and clinical governance meetings.

At least one member of the phototherapy team should attend every multi-centre audit and clinical governance meeting.

All members of the phototherapy team should attend at least one of the multi-centre audit and clinical governance meetings every year.

All adverse events noted at the clinical governance and audit meetings. Any adverse event more serious than an E1 erythema shall be discussed at the meeting, and the outcome recorded on the adverse event form and if appropriate on a Trust Incident Form.

The phototherapy service should present a review of adverse events annually to the Dermatology Audit meeting.

At least one other audit should be undertaken and presented to the Audit meeting.

**Data Source:**

Minutes of local audit and clinical governance meetings.

Minutes of multi-centre audit and clinical governance meetings.

Minutes of the Dermatology Directorate Audit meeting(s).

Adverse event record book and/or Trust Incident Forms.

**Outcome Targets:**

Adverse events plus at least one other aspect of the phototherapy service to be audited and presented to the Directorate Audit meeting annually.

80% of all adverse events above E1 erythema to have outcome decision recorded on adverse event form.

Representative of phototherapy team present at 90% of multi-centre clinical governance and audit meetings.

At least 6 local clinical governance and audit meetings to be held in any one year.

## **Standard 6: Treatment methodologies**

All patients treated with UVB or PUVA are treated according to optimally effective, and safe, regimens based on the best available study evidence, adapted as necessary to be appropriate for each individual patient, and to local Phototherapy Unit circumstances.

### **Rationale:**

Treatment regimen variables (including starting dose, incremental dosage regimen, treatment frequency, concomitant therapies, and how decision to stop a course of treatment is made) influence the efficacy of treatment, acute side effects, and the cumulative exposures and ultraviolet doses required (thereby probably affecting risk of skin cancer as a long-term side effect).

### **Criteria:**

Written protocols for all relevant forms of phototherapy are available, and used.

The proportion of patients achieving clearance (when skin has returned to normal appearance or complete absence of original disease), or near-clearance (MRA -minimal residual activity) of psoriasis should be high (taking into account the published or expected success rate for any specific disorder).

Clearance or near-clearance of psoriasis should be achieved with an appropriate number of treatments.

### **Data Source:**

Presence or absence of up-to-date written protocols.

The percentages of patients treated with whole-body UVB and whole-body PUVA who were documented to be clear or near-clear/at minimal residual activity at end of course.

Numbers of treatments per successful (defined as achieving clearance/near clearance/minimal residual activity) whole body UVB course for psoriasis.

### **Outcome Target:**

100% of treatment protocols are up-to-date and used, in the phototherapy unit.

Clearance/near-clearance (minimal residual activity) of whole body psoriasis/other diseases has an outcome of >70% of completed courses, and >60% of all courses (including incomplete courses due to patients failing to attend, or other reasons).

Median UVB treatments per successful whole-body treatment course for psoriasis <30.

## **Standard 7: Discharge from a course of phototherapy**

We should have a clear protocol to guide those administering or reviewing treatment on when a course should be stopped.

Patients should be able to access treatment if needed for any relapse in their presenting condition following phototherapy.

### **Rationale:**

Discharge should be after an appropriate number of treatments for each individual's condition. Early discharge leads to inadequate improvement in the condition treated (and may lead to early relapse). Delayed discharge exposes patients to unnecessary risks of adverse effects, and wastes resources.

The majority of indications for UVB and PUVA are chronic diseases that can be controlled, but not cured. Most patients will experience recurrence of their condition some time following phototherapy, although this will sometimes be mild and amenable to home management. Patients need to know how to obtain advice if their condition recurs.

### **Criteria:**

There is a protocol with guidance on when to stop treatment, and when to seek dermatologist's advice on when to stop a course of treatment.

On discharge patients have information, tailored to individual needs on access to assistance and follow-up services.

The patient's GP is notified following a course of phototherapy, and informed of any follow-up arrangement.

### **Data Source:**

Protocol with guidelines for stopping treatment.

GP letter in patient notes.

### **Outcome Targets:**

Discharge protocol up-to-date and available in phototherapy unit.

GP letter stating reasons for discharge present in 90% of patient notes.

## **Standard 8: Skin Cancer surveillance**

All patients at significantly increased risk of skin cancer as a result of UVB and/or PUVA treatment are made aware of their increased risk, their GP is informed and they are offered tumour surveillance skin examinations either by a Dermatologist or a skin cancer Specialist Nurse.

### **Rationale:**

PUVA and UVB treatment cause an increased risk of skin cancer. The increased risk is related to overall numbers of treatments and ultraviolet doses administered. It is the responsibility of those prescribing these treatments to alert patients to the risks, and to minimise these by follow-up to identify any skin cancers or pre-cancers at early, readily treatable, stages.

### **Criteria:**

Complete data on all treatment courses is entered into the patient notes.

All patients who have received >150 whole-body PUVA treatments and/or >250 whole-body UVB treatments should be invited for annual skin cancer screening review.

Documentation of at risk status in main hospital case notes and letters to GPs.

### **Data Source:**

Survey of skin cancers detected each year at annual reviews.

### **Outcome Target:**

100% of patients who have received more than the maximum recommended number of treatments are reviewed for skin cancer annually.

## Narrow-band UVB (TL-01) Phototherapy Protocol.

- All patients will be assessed for risk factors and contra-indications to narrow-band UVB phototherapy before undergoing a course of treatment.
- Determine minimal erythema dose (MED) on lower back / buttock with readings at 24 hours (See MED protocol).
- Initial irradiation dose: 70% of MED. Use 50% if caution is required or recommended on the referral form.
- If no MED reactions are present, use 70% of maximum MED test dose or retest using a higher dose range.
- If patient's back / buttock is too extensively involved (active/flared) choose starting dose according to phototype or referral instructions:

| Skin phototype | Start dose J/cm <sup>2</sup> |
|----------------|------------------------------|
| I              | 0.15                         |
| II             | 0.2                          |
| III            | 0.3                          |
| IV             | 0.3                          |

- UVB treatments to be given three times weekly, with 2 days between treatments.
- Phototherapist must document administered dose of UVB. Reason for non-administration of treatment should also be documented in treatment notes
- All patients to wear UV opaque goggles in the cabin. Face shield should also be worn unless significant lesions present on face.
- Increment Regimen: Increments will be given at each visit, based on a percentage of the previous dose and erythema response as follows:

| Grade            | Definition                                                           | Action                                                                                                                    |
|------------------|----------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------|
| E0               | No erythema and no report of erythema after last treatment           | 20% increment                                                                                                             |
| E0+              | Patient reports erythema after last treatment but now resolved       | 20% increment but if previous E0+ then hold dose or 10% increment                                                         |
| E1 (mild)        | barely perceptible asymptomatic erythema                             | repeat previous dose then consider 10% increments                                                                         |
| E2 (moderate)    | well-defined erythema, possibly causing slight manageable discomfort | Postpone one treatment if not completely settled; if settled, repeat previous dose and thereafter consider 10% increments |
| E3 (severe)      | well-defined symptomatic/painful erythema                            | No treatment and reviewed by Doctor when possible. When completely settled, 50% of previous dose then 10% increments      |
| E4 (very severe) | painful erythema usually with blistering                             | No treatment and review by Doctor.                                                                                        |

- Usual course consists of 18-24 treatments. Maximum number of treatments per course is 30. Maximum dose per treatment is 3J/cm<sup>2</sup>. Lifetime limit of 350 treatments.
- Adverse events to be recorded in Adverse Event Book, and if necessary on a Trust Incident Form. E1 events only to be recorded on E1 record sheet (not separately).
- If a patient develops small areas of erythema, repeat the previous dose and apply a high Sun Protection Factor (SPF) total block (UVA and UVB blocking) sunscreen for one treatment.
- If patient develops itch, encourage use of emollients. If persistent, review by Doctor
- If patient develops Polymorphic Light Eruption (PLE), encourage use of emollients and prescribed topical steroids or seek medical advice. Postpone treatment if troublesome and reduce to 10% increments.

15. If patient cancels/misses treatment -See missed treatment protocol
16. Discharge -See discharge protocol.
17. Treatment details, cumulative dose, adverse events and treatment outcome to be documented in the phototherapy notes, with a summary in the main hospital notes (if patient has notes in other Trust hospital, send copy to be put in those notes).

## Systemic PUVA Phototherapy Protocol

- All patients will be assessed for risk factors and contra-indications to systemic PUVA before undergoing a course of treatment.
- 8-Methoxy-psoralen (8-MOP) will be used at a dose rate of 25mg/m<sup>2</sup> body surface area (preferred method) or 0.6mg/kg body weight. If side effects of taking 8-MOP are intolerable, then 5-methoxypsoralen (5-MOP) can be used at 50mg/m<sup>2</sup> BSA or 1.2mg/kg body weight.
- Prior to MPD or treatment, the patient must ingest psoralen tablets. Patients taking 8-MOP should take the tablets 2 hours before treatment with a light snack. Patients taking 5-MOP tablets should take them 2.5 hours before treatment with a light snack.
- All patients must wear adequate eye protection if exposed to any form of UVA from the time of ingestion of psoralen tablets for at least 12 hours.
- Determine MPD (minimum phototoxic dose) with readings at 72 hours. Use lower back/buttock site if clear of lesions.
- Initial irradiation dose: 70% of MPD. Use 50% if caution is required or recommended on referral form.
- If no MPD reactions are present, use 70% of maximum MPD test dose or retest using a higher dose range.
- If patient's back is too extensively involved (active/flared) choose starting dose according to phototype or referral instructions:

| Skin phototype | Start dose J/cm <sup>2</sup> |
|----------------|------------------------------|
| I              | 0.5                          |
| II             | 1.0                          |
| III            | 1.5                          |
| IV             | 2.0                          |

- PUVA treatment will usually be given twice a week (Monday – Thursday or Tuesday - Friday), with a minimum of 72 hours interval between treatments.
- Usual course of PUVA consists of 18-24 treatments. Maximum number of treatments per course is 30. Maximum dose per treatment is 15J/cm<sup>2</sup>. Lifetime limit of 150 treatments.
- All patients to wear UV opaque goggles in the cabin. Face shield should also be worn unless significant lesions present on face.
- Phototherapist must document administered dose of UVA. Reason for non-administration of treatment should be documented in treatment notes.
- Increment Regimen -increments will be given at each visit based on a percentage of the previous dose and erythema response. 40% increments to be applied
- Modifications in case of erythema:

| Grade            | Definition                                                           | Action                                                                                                               |
|------------------|----------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------|
| E0               | No erythema and no report of erythema after last treatment           | 40% increment. For 1/week treatment use 20%                                                                          |
| E0+              | Patient reports erythema after last treatment but now resolved       | 40% increment but if previous E0+ then hold dose or 20% increment                                                    |
| E1 (mild)        | barely perceptible asymptomatic erythema                             | repeat previous dose then consider 20% increments                                                                    |
| E2 (moderate)    | well-defined erythema, possibly causing slight manageable discomfort | Postpone one treatment. Next treatment, repeat previous dose and thereafter consider 20% increments                  |
| E3 (severe)      | well-defined symptomatic/painful erythema                            | No treatment and reviewed by Doctor when possible. When completely settled, 50% of previous dose then 20% increments |
| E4 (very severe) | painful erythema usually with blistering                             | No treatment and review by Doctor.                                                                                   |

15. Adverse events to be recorded in Adverse Event Book, and if necessary on a Trust Incident Form. E1 events only to be recorded on E1 record sheet (not separately).
16. If a patient develops small areas of erythema, repeat the previous dose and apply high Sun Protection Factor (SPF) total block (UVA and UVB protection) sunscreen for one treatment.
17. If patient develops itch, encourage use of prescribed topical steroids and emollients. Seek medical advice.
18. If patient develops Polymorphic Light Eruption (PLE), encourage use of emollients and prescribed topical steroids or seek medical advice. Postpone treatment if troublesome and reduce to 20% increments.
19. If patient cancels/misses treatments -See missed treatment protocol
20. Discharge -See discharge protocol.
21. Treatment details, cumulative dose, adverse events and treatment outcome to be documented in the patient phototherapy notes, with a summary in the main hospital notes (if patient has notes in other Trust hospital, send copy to be put in those notes).

## Bath PUVA Phototherapy Protocol

- All patients will be assessed for risk factors and contra-indications to bath PUVA before undergoing a course of treatment.
- Before MPD or treatment, the patient must soak in a warm bath of 8-MOP solution for 10 minutes. Concentration - 30 ml of 1.2% 8-MOP solution to 140 litres of water. For sensitive patients half of this can be used (15ml 8-MOP solution in 140l water).
- Determine MPD (minimum phototoxic dose) on lower back/buttock with readings at 96 hours
- Initial irradiation dose: 70% of MPD Use 40% if caution is required or recommended on the referral form.
- If no MPD reactions are present, use 70% of maximum MPD test dose or retest using a higher dose range.
- If patient's back/buttock is too extensively involved (active/flared) choose starting dose according to phototype or referral form.

| Skin phototype | Start dose J/cm <sup>2</sup> |
|----------------|------------------------------|
| I              | 0.2                          |
| II             | 0.3                          |
| III            | 0.4                          |
| IV             | 0.5                          |

- UVA treatment will usually be given three times a fortnight (e.g. Monday – Friday – Wednesday, or Tuesday – Thursday - Saturday), with a minimum of 72 hours interval between treatments, unless patients attending once weekly.
- All patients to wear UV opaque goggles in the cabin. Face shield should also be worn unless significant lesions present on face.
- Phototherapist must document administered dose of UVA. Reason for non-administration of treatment should be documented in treatment notes.
- Increment Regimen -increments will be given at each visit based on a percentage of the previous dose and erythema response.

| Grade            | Definition                                                           | Action                                                                                                               |
|------------------|----------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------|
| E0               | No erythema and no report of erythema after last treatment           | 40% increment. For 1/week treatment use 20%                                                                          |
| E0+              | Patient reports erythema after last treatment but now resolved       | 40% increment but if previous E0+ then hold dose or 20% increment                                                    |
| E1 (mild)        | barely perceptible asymptomatic erythema                             | repeat previous dose then consider 20% increments                                                                    |
| E2 (moderate)    | well-defined erythema, possibly causing slight manageable discomfort | Postpone one treatment. Next treatment, repeat previous dose and thereafter consider 20% increments                  |
| E3 (severe)      | well-defined symptomatic/painful erythema                            | No treatment and reviewed by Doctor when possible. When completely settled, 50% of previous dose then 20% increments |
| E4 (very severe) | painful erythema usually with blistering                             | No treatment and review by Doctor.                                                                                   |

- Usual course of PUVA consists of 18-24 treatments. Maximum number of treatments per course is 30. Maximum dose per treatment is 7J/cm<sup>2</sup>. Lifetime limit of 150 treatments.
- Adverse events to be recorded in Adverse Event Book, and if necessary on a Trust Incident Form. E1 events only to be recorded on E1 record sheet (not separately).

13. If a patient develops small areas of erythema, repeat the previous dose and apply a high Sun Protection Factor (SPF) total block (UVA and UVB protection) sunscreen for one treatment.
14. If patient develops itch, encourage use of prescribed topical steroids and emollients. Seek medical advice.
15. If patient develops Polymorphic Light Eruption (PLE), encourage use of emollients and prescribed topical steroids or seek medical advice. Postpone treatment if troublesome and reduce to 20% increments.
16. If patient cancels/misses treatments -See missed treatment protocol.
17. Discharge -See discharge protocol.
18. Treatment details, cumulative dose, adverse events and treatment outcome to be documented in the patient phototherapy notes, with a summary in the main hospital notes (if patient has notes in other Trust hospital, send copy to be put in those notes).

## Hand/foot soak PUVA Phototherapy Protocol

- All patients will be assessed for risk factors and contra-indications to soak PUVA before undergoing a course of treatment.
- For Topical Soaks the patient is required to soak hands and/or feet using 8-MOP solution for 15 minutes.
- Concentration of 3mg/l: 0.25 ml 8-MOP 1.2% solution per litre (0.75ml in 3litres: 1.0ml in 4litres).
- UVA exposure is ideally given 30 minutes afterwards but can be given immediately.
- For Gel (0.005% 8-Methoxypsoralen solution in aqueous gel), apply a thin layer over the affected areas, taking care to avoid applying to surrounding unaffected skin. Then wait for a further 15 minutes prior to treatment. Carefully remove gel before UV irradiation.
- PUVA treatment will usually be given three times a fortnight, with a minimum of 72-hour intervals between treatment, unless patient is attending once weekly.
- Phototherapist must document administered dose of UVA in  $J/cm^2$  and exposure time. Reason for non-administration of treatment should also be documented in treatment notes.
- Start doses (unless otherwise directed on referral form).

### Topical Soaks

*Skin Phototypes I / II, cautious regimen*

*Palms and Soles*

*Dorsa*

*0.3  $J/cm^2$*

*0.15  $J/cm^2$*

*All other skin types, normal regimen*

*0.5  $J/cm^2$*

*0.25  $J/cm^2$*

Use cautious regimen for patients with eczema, or suspected drug photosensitivity.

**Gel** (applied to lesional skin only)

*Skin Phototypes I / II, cautious regimen*

*0.5  $J/cm^2$*

*All other skin types, normal regimen*

*1.0  $J/cm^2$*

- Increment Regimen -increments will be given at each visit based on a percentage of the previous dose and erythema response.

| Grade            | Definition                                                           | Action                                                                                                               |
|------------------|----------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------|
| E0               | No erythema and no report of erythema after last treatment           | 40% increment. For 1/week treatment use 20%                                                                          |
| E0+              | Patient reports erythema after last treatment but now resolved       | 40% increment but if previous E0+ then hold dose or 20% increment                                                    |
| E1 (mild)        | barely perceptible asymptomatic erythema                             | repeat previous dose then consider 20% increments                                                                    |
| E2 (moderate)    | well-defined erythema, possibly causing slight manageable discomfort | Postpone one treatment. Next treatment, repeat previous dose and thereafter consider 20% increments                  |
| E3 (severe)      | well-defined symptomatic/painful erythema                            | No treatment and reviewed by Doctor when possible. When completely settled, 50% of previous dose then 20% increments |
| E4 (very severe) | painful erythema usually with blistering                             | No treatment and review by Doctor.                                                                                   |

- Patients to wear UV opaque visor when having UV irradiation to their hands or feet.
- Maximum number of treatments per course is 40. Maximum dose per treatment is  $7J/cm^2$ . Lifetime limit of 150 treatments.
- Adverse events to be recorded in Adverse Event Book, and if necessary on an Incident Form. E1 events only to be recorded on E1 record sheet (not separately).
- If patient develops itch, encourage use of prescribed topical steroids and emollients. Seek medical advice.
- If patient cancels/misses treatments -See missed treatment protocol.
- Discharge -See discharge protocol.
- Treatment details, cumulative dose, adverse events and treatment outcome to be documented in the phototherapy notes, with a summary in the main hospital notes (if patient has notes in an other hospital, send copy to be put in those notes).

## PHOTOTHERAPY PROTOCOL MODIFICATIONS FOR OTHER SKIN DISORDERS.

### Eczema

1. Generally cautious approach
2. MED/MPD: start at 70% MED/MPD, increment 20% for TL-01, 40% for bath or systemic PUVA. If E1 erythema develops, change to 10% increment for nbUVB, or 20% for bath or systemic PUVA.
3. End of phototherapy course taper treatment: UVB use last dose level, 6 weeks at 2/week, followed by 6 weeks at 1/week with 20% reduction in dose for each treatment then discharge;  
Systemic PUVA 6 weeks at 1/week; bath PUVA: 6 weeks at 1/week each with 20% reduction in dose for each treatment then discharge.

### Vitiligo:

1. Treat as skin type I
2. 3 month or 40 treatment trial. If no response, discontinue.
3. Use TL-01 unless otherwise indicated. Start dose  $0.1\text{J}/\text{cm}^2$ , increments 20%.
4. Continue incrementing dose until erythema, then hold dose until erythema fades. Thereafter increment by 10%.
5. If systemic PUVA then use 5-MOP. Start dose  $0.5\text{J}/\text{cm}^2$ , dose increment 40% until vitiligo is just pink, then maintain until erythema fades. Thereafter increase by 20%. If persistent erythema, increment by 10%.
6. If using UVB, patients with significant involvement of the skin of the eyelids can remove their goggles for some or all of the treatment time. Ensure that they keep their eyes closed during irradiation.
7. Patients to have review and clinical photographs taken before treatment and at three month intervals during their course.
8. Maximum 12 months treatment.

### Mycosis Fungoides:

1. Use TL-01 for patch stage MF and for maintenance phototherapy if possible.
2. Systemic PUVA if thicker plaque stage: bath PUVA can be used if all lesions can be photosensitised.
3. Start dose and increments as for psoriasis.
4. Continue until skin has cleared.
5. Sanctuary sites may require supplemental irradiation using local source (e.g. canopy or psoracomb device).
6. No lifetime limit.
7. If eyelid involvement, then remove goggles until lesion has cleared. Tell patient to keep eyes closed when in the cabinet.
8. If maintenance phototherapy is required (once the skin is clear), try to use a longer interval between treatments than for normal therapy. To start, use once per week for all modalities, increasing or decreasing the interval as determined by the individual patient response. Review every 20 maintenance treatments.

**Palmoplantar pustulosis:**

1. Only use systemic PUVA (with or without retinoids) for PPP.
2. Use body surface area (preferably) or weight to determine the dose of systemic psoralen. Use 8-MOP psoralen unless side effects not tolerated - then use 5-MOP psoralen.
3. Start doses as follows:

| Skin phototype | Start dose J/cm <sup>2</sup> |
|----------------|------------------------------|
| I              | 0.5                          |
| II             | 1.0                          |
| III            | 1.5                          |
| IV             | 2.0                          |

4. Protective eyewear to be worn from the time of tablet ingestion for twelve hours.
5. Maximum 30 treatments for hands, 40 treatments for feet.

**Polymorphic Light Eruption (PLE):**

Both PUVA and narrowband UVB are effective in the prophylaxis of this condition. Treatment is given in the early spring.

**Narrowband UVB regimen:**

1. Start treatment at 70% of MED.
2. Increments at each treatment (if there is no erythema) of 20%.
3. Treatment is three times per week for either three or four weeks (9 or 12 treatments in total).
4. If the patient develops mild PLE during treatment continue with treatment in combination with emollients and topical steroids.
5. For more severe flare-ups of PLE stop treatment until the rash clears and then recommence at a lower dose (oral steroids are sometimes needed for bad flare-ups).
6. Encourage patients to keep their improved sun-tolerance "topped up" by regular sun-exposure throughout the summer.

**PUVA regimen:**

1. Either bath PUVA or systemic PUVA can be used (a variety of treatment regimens are in use).
2. Treatment is given twice weekly to the following schedule:
 

|               |                                                                                       |
|---------------|---------------------------------------------------------------------------------------|
| Systemic PUVA | Start at 0.5 J/cm <sup>2</sup> increase by 40% of previous dose over <u>4 weeks</u> . |
| Bath PUVA     | Start at 0.1 J/cm <sup>2</sup> increase by 20% of previous dose over <u>4 weeks</u> . |

| WEEK | SYSTEMIC PUVA             |                           | BATH PUVA                 |                           |
|------|---------------------------|---------------------------|---------------------------|---------------------------|
|      | 1 <sup>st</sup> Treatment | 2 <sup>nd</sup> Treatment | 1 <sup>st</sup> Treatment | 2 <sup>nd</sup> Treatment |
| 1    | 0.5 J/cm <sup>2</sup>     | 0.7 J/cm <sup>2</sup>     | 0.1 J/cm <sup>2</sup>     | 0.14 J/cm <sup>2</sup>    |
| 2    | 1.0 J/cm <sup>2</sup>     | 1.4 J/cm <sup>2</sup>     | 0.2 J/cm <sup>2</sup>     | 0.28 J/cm <sup>2</sup>    |
| 3    | 2.0 J/cm <sup>2</sup>     | 2.8 J/cm <sup>2</sup>     | 0.39 J/cm <sup>2</sup>    | 0.55 J/cm <sup>2</sup>    |
| 4    | 3.9 J/cm <sup>2</sup>     | 5.5 J/cm <sup>2</sup>     | 0.77 J/cm <sup>2</sup>    | 1.08 J/cm <sup>2</sup>    |

3. Treatment is stopped after 4 weeks (8 treatments in total).
4. If the patient develops mild PLE during treatment continue with treatment in combination with emollients and topical steroids.
5. For more severe flare-ups of PLE stop treatment until the rash clears and then recommence at a lower dose (oral steroids are sometimes needed for bad flare-ups).
6. Encourage patients to keep their improved sun-tolerance "topped up" by regular sun-exposure throughout the summer.

## Narrow-band UVB (TL-01) Minimal Erythema Dose (MED) Test Protocol using the Durham / Hybec MED tester.

1. All patients will be assessed for risk factors and contra-indications to narrow-band UVB phototherapy before undergoing a course of treatment.
2. Patient to have a counselling and consent session, and sign the appropriate treatment consent form before performing the MED test.
3. Use unexposed skin on or near the buttock or lower back. If these areas are not suitable, choose another unexposed area, for example inner upper arm or inner thigh.
4. Check that the MED test record sheet is up to date and that irradiation times have been calculated for the MED tester to be used. Ensure that the serial number on the record sheet is the same as the unit you are using.
5. Assess the patient Boston skin phototype, and choose a suitable maximum dose from the MED record sheet.

| <b>Skin phototype</b> | <b>Maximum MED Dose J/cm<sup>2</sup></b> |
|-----------------------|------------------------------------------|
| I or II               | 0.55                                     |
| III                   | 0.77                                     |
| IV or V               | 1.08                                     |

6. Ensure the Durham MED tester, a skin marker pen and a suitable count-down timer are available in a suitable area which ensures patient privacy.
7. Following the instructions on the MED test record sheet, place the Durham MED tester face down on a hard surface and switch on to warm up for 10 minutes (or as recommended on the MED test record sheet).
8. Position the patient comfortably with the test area exposed.
9. Set the timer for the appropriate maximum dose.
10. After the appropriate warm-up period switch off the MED tester. Check that no parts of the MED tester are too hot.
11. Check the position of the open, or maximum dose, aperture.
12. Apply the MED tester to the test area with slight pressure to the skin. Ensure that all apertures are in direct contact with the skin.
13. Switch on the MED tester and the count-down timer simultaneously.
14. At the end of the time, switch off the MED tester and remove from the skin.
15. Using the skin marker pen, mark: the boundaries of the test area; the position of the maximum aperture; if required the individual aperture edges can be marked. Tell the patient not to rub or clean this area until the test results have been assessed the next day.
16. MED test is read at 24 hours.
17. Using a daylight lamp, suitably illuminate the area to be read.  
**The MED is the dose to give a just perceptible erythema.**
18. Mark the MED on the test record sheet, and write the MED in the result box. Sign and date the record sheet and place it in the patient's phototherapy notes.
19. If any test areas are very red, indurated or blistered, use sunblock before the first treatment.
20. If no areas are red, then either: repeat the test using a higher maximum dose, or: Use the maximum applied dose as the MED.
21. If all areas are red, **do not** proceed to treatment. Either: request further review by referring clinician, or: repeat MED test using lower maximum dose.
22. Clean the MED tester after each use with detergent wipes.

## Narrow-band UVB (TL-01) Minimal Erythema Dose (MED) Test Protocol using a fully enclosed MED tester.

1. All patients will be assessed for risk factors and contra-indications to narrow-band UVB phototherapy before undergoing a course of treatment.
2. Patient to have a counselling and consent session, and sign the appropriate treatment consent form before performing the MED test.
3. Use unexposed skin on or near the buttock or lower back. If these areas are not suitable, choose another unexposed area, for example inner upper arm or inner thigh.
4. Check that the MED test record sheet is up to date and that irradiation times have been calculated for the MED tester to be used. Ensure that the serial number on the record sheet is the same as the unit you are using.
5. Assess the patient Boston skin phototype, and choose a suitable maximum dose.

| <b>Skin phototype</b> | <b>Maximum MED Dose J/cm<sup>2</sup></b> |
|-----------------------|------------------------------------------|
| I or II               | 0.55                                     |
| III                   | 0.77                                     |
| IV or V               | 1.08                                     |

6. Ensure the MED tester, a skin marker pen and a suitable count-down timer are available in a suitable area which ensures patient privacy.
7. Position the patient comfortably with the test area exposed.
8. Set the timer for the appropriate maximum dose.
9. Check the position of the open, or maximum dose, aperture and chose the specific area of skin to be irradiated. Check how the tester will be positioned over this area.
10. Following the instructions on the MED test record sheet, place the MED tester face down on a hard surface and switch on to **warm up for 1 minute** (or as recommended on the MED test record sheet).
11. After the appropriate warm-up period switch off the MED tester. Check that no parts of the MED tester are too hot.
12. As soon as possible apply the MED tester to the test area with slight pressure to the skin. Ensure that all apertures are in direct contact with the skin.
13. Switch on the MED tester and the count-down timer simultaneously.
14. At the end of the time, switch off the MED tester and remove from the skin.
15. Using the skin marker pen, mark: the boundaries of the test area and the position of the maximum aperture. Tell the patient not to rub or clean this area until the test results have been assessed the next day.
16. MED test is read at 24 hours.
17. Using a daylight lamp, suitably illuminate the area to be read.  
**The MED is the dose to give a just perceptible erythema.**
18. Mark the MED on the test record sheet, and write the MED in the result box. Sign and date the record sheet and place it in the patient's phototherapy notes.
19. If any test areas are very red, indurated or blistered, use sunblock before the first treatment.
20. If no areas are red, then either: repeat the test using a higher maximum dose, or: Use the maximum applied dose as the MED.
21. If all areas are red, **do not** proceed to treatment. Either: request further review by referring clinician, or: repeat MED test using lower maximum dose.
22. Clean the MED tester after each use with detergent wipes.
23. Leave MED tester to cool for a minimum of 15 minutes between patients.

## PUVA Minimal Phototoxic Dose (MPD) Test Protocol.

1. All patients will be assessed for risk factors and contra-indications to PUVA phototherapy before undergoing a course of treatment.
2. Patient to have a counselling and consent session, and sign the appropriate treatment consent form before the MPD test is administered.
3. Use unexposed skin on or near the buttock or lower back. If these areas are not suitable, choose another unexposed area, for example inner upper arm or inner thigh.
4. Check that the MPD test record sheet is up to date and that irradiation times have been calculated for the UVA panel to be used.
5. Prepare a plastic template with 8 apertures of 1 x 1cm, and 7 UV opaque adhesive tape tags.
6. Use H600 UVA unit (white Hospital Lamp Supplies PUVA unit) or other suitable source of PUVA UVA, e.g. Waldmann 800K canopy.
7. Ensure the UVA panel, a skin marker pen and a suitable count-down timer are available in a suitable area which ensures patient privacy. Ensure this area is curtained before the UVA panel is used.
8. Photosensitise the patient with the appropriate method – bath or systemic psoralen, using the relevant treatment protocol.
9. Warm up panel for 10 minutes.
10. Place the template on the test area, cover up the rest of the patient using drapes, gowns, etc. Ensure goggles and/or visors are used.
11. Mark positions of each aperture in your standard sequence on the patients skin. Place covering tags on the 7 lower dose apertures. Mark position of template on the MPD test sheet.
12. Position the patient comfortably with the test area exposed at 20cms from the middle of the face of the PUVA panel.
13. Set the UVA panel timer and the count-down timer for the maximum time indicated on the MPD test sheet.
14. Start UVA panel and count-down timer simultaneously.
15. Peel off tags from lower dose apertures at the times indicated on the MPD test sheet.
16. Tell the patient not to rub or vigorously clean the test area until the test results have been assessed.

### Reading the results:

17. Systemic PUVA MPD test is read at 3 days. Bath PUVA MPD test is read at 5 days.
18. Using a daylight lamp, suitably illuminate the area to be read.  
**The MPD is the dose to give a just perceptible erythema.**
19. Mark the MPD on the test record sheet, and write the MPD in the result box. Sign and date the record sheet and place it in the patient's phototherapy notes.
20. If any test areas are very red, indurated or blistered, use sunblock before the first treatment.
21. If no areas are red, then either: repeat the test using a higher maximum dose, or: Use the maximum applied dose as the MPD.
22. If all areas are red, **do not** proceed to treatment. Either: request further review by referring clinician, or: repeat MPD test using lower maximum dose.

## MISSED TREATMENT PROTOCOL

Ensure treatments have not been cancelled or missed due to erythema, if so follow appropriate protocol increment regime.

This protocol applies to all modalities of photo(chemo)therapies, i.e. UVB, systemic and bath PUVA and hand/foot soak PUVA.

Dose increments to be administered after missed treatments:

|                                          |                                                                       |
|------------------------------------------|-----------------------------------------------------------------------|
| Patient misses or cancels 1 treatment    | UVB: Continue with previous increments.<br>PUVA: Repeat previous dose |
| Patient misses or cancels 2 treatments   | Repeat previous dose                                                  |
| Patient misses or cancels 3 treatments   | Give dose before previous dose                                        |
| Patient misses or cancels 4-6 treatments | Give 50% of previous dose                                             |
| Patient misses more than 6 treatments    | Discharge to GP or refer back to consultant                           |

## WHOLE-BODY PHOTOTHERAPY DISCHARGE PROTOCOL:

See separate treatment protocols for mycosis fungoides, desensitisation (polymorphic light eruption, erythropoietic protoporphyria) vitiligo and alopecia.

1. A course of whole-body phototherapy usually consists of 18-24 treatments.
2. Exceptionally, up to 30 treatments can be offered in any one course.
3. Courses are normally restricted to one per year.
4. Tapering of treatments (after successful treatment of atopic eczema):
  - 4.1. for three times per week UVB, offer 3 weeks at twice a week followed by 3 weeks at once a week (thus these courses could require  $24 + 9 = 33$  treatments).
  - 4.2. for twice weekly systemic PUVA offer 3 weeks at once per week.
  - 4.3. for three times per fortnight Bath PUVA offer 3 weeks at once per week.
5. Discharge criteria:
  - 5.1. The patients skin is clear
  - 5.2. The patient declines further treatment
  - 5.3. The patient has 4 treatments at minimal residual activity (i.e. no further improvement)
  - 5.4. The patient has had 24 (30 in exceptional circumstances) treatments (but see point 4 above)
  - 5.5. The treatment is stopped on medical advice
  - 5.6. The patient fails to attend a treatment without due notice
6. A letter setting out a summary of treatment and reasons for discharge is sent to the patient's GP on completion of treatment.
7. Follow-up
  - 7.1. Patients completing treatment having incurred no problems - discharge to GP.
  - 7.2. Patients who have failed to attend - discharge to GP.
  - 7.3. If patient has had problems with the UV phototherapy , discuss with referring Doctor.
  - 7.4. Patients who have flared quickly after treatment is completed should be offered an appointment with the referring consultant.
  - 7.5. Patients attending for desensitisation should be given an appointment for early the following year.

## **PATIENT INFORMATION LEAFLET**

### **Narrow-Band UVB Phototherapy Treatment**

## **What is UVB treatment?**

UVB is a form of ultraviolet light, produced from UV fluorescent tubes, that is beneficial in the treatment of a wide variety of skin disorders. We use narrow-band UVB, which is a relatively recent development and has been shown to be more effective, and is probably as safe, as the older broad band UVB treatment. It is now the most widely used phototherapy in the UK.

## **How is UVB treatment given?**

A qualified phototherapist will always supervise your treatment.

UVB treatment is administered three times a week (for example on a Monday, Wednesday and a Friday). Usually approximately 18-24 treatments are required for clearance of your skin condition although some disorders may take longer to clear than others.

Before treatment is commenced the phototherapy nurse may like to establish a safe starting dose for you. This is called an MED test and it will measure your tolerance to UVB light (in some circumstances an MED test is not necessary). The MED test is applied to the lower back on the first day, and is read 24 hours later. The result is used to calculate your start dose. At each subsequent treatment, the dose will be increased, depending on how your skin has responded to the previous treatment.

When you arrive for treatment you will need to undress and put on UV protective goggles and a face visor. Men will need to wear protection on their genitals. The phototherapist will check and ask you about your skin, and will then calculate your dose for that treatment. You will then enter the phototherapy cabinet and the nurse will tell you how long the treatment will take.

Ideally, there should be no redness of the skin after treatment and no discomfort. If at any time you feel that the UV dose you have been given has caused discomfort or has caused a marked, persisting skin redness (like mild sunburn), you must let the phototherapist know so that further increments can be adjusted appropriately.

## **Possible side effects of UVB**

Most people who have UVB treatment suffer no side effects, but if side effects do occur they are usually mild and virtually never permanent. Most side effects can be treated with creams or will disappear of their own accord within a few days. Some of the side effects that can occur are:-

- Some patients experience a prickling sensation of the skin following UVB. This can occur even on non-treatment days and may even be severe enough to discontinue treatment.
- There will be an increased tendency for your skin to be dry following UVB. It is recommended that you use a moisturiser frequently during your UVB course.
- Your skin may become red, similar to the redness caused by sunburn. Occasionally the dose of light that you receive will exceed your skin's tolerance and you may develop a more prolonged redness, i.e. a burn. Rarely blistering of the skin may occur. If this happens, treatment will be suspended until the skin settles down again. We may prescribe an alternative treatment to alleviate the symptoms of a burn.
- Cold sores can develop on the lips during treatment. If you are prone to developing cold sores inform the phototherapist who will advise the use of a face visor and a lip block will be applied to your lips before you go in the cabinet.
- Long- term use of UVB may accelerate the ageing process of the skin, and also increase the chance of skin cancer in later life. Due to the potentially harmful long-term effects on the skin you will be limited to a total of 250-300 treatments in your lifetime.

## **Do's and don'ts whilst having UVB**

- You must avoid sun beds and sunbathing during the course of your treatment.
- Protective goggles should always be worn in the cabinet to protect your eyes from UVB light. A face visor is also

recommended unless there is significant involvement of the face.

- Avoid wearing any perfume, deodorant or make-up when you attend for treatment, as your skin may become sensitive to the UV light.
- Men must shield their genital area with a sock, jock strap or underpants whilst in the cabinet.
- Inform the phototherapy nurse if you start any new medication, creams or ointments once you have started your course of UVB. Be aware that some medications that you may have in your bathroom cabinet (such as simple headache tablets) may cause sensitivity to UV light.
- Avoid having your hair cut or waxed if possible during your course of treatment. If you do have hair cut, inform the phototherapist so that sun block can be applied to previously unexposed skin.
- Ensure that you stand in the centre of the cabinet as you have been shown.
- If any item of clothing is worn in the cabinet, it should be used for each of your treatments, ensuring that the same item of clothing is always worn. It is important that you develop a routine in the cabinet, and always repeat it when you come in for treatment. Changing your pattern of behaviour in the cabinet may lead to a burn if previously unexposed skin is subsequently exposed.

### **How to contact us:**

- The telephone number of the Phototherapy Unit is **01633 234963** during working hours.
- Any urgent enquiries can be dealt with by telephoning the Dermatology Ward on **01633 234646**.

## **PATIENT INFORMATION LEAFLET**

### **PUVA Phototherapy Treatment**

**What is PUVA treatment?**

PUVA is a combination treatment consisting of taking a photosensitising drug called Psoralen (P) and exposing the (temporarily sensitised skin) to long wavelength artificially produced Ultraviolet A (UVA) light-hence the term PUVA. The drug reacts with UV light in the skin and results in improvement of a number of skin conditions.

**How is PUVA treatment given?**

A qualified phototherapist will always supervise your treatment.

**Systemic PUVA (Oral PUVA, “tablet PUVA”)**

8-Methoxypsoralen tablets (also known as 8-MOP or psoralen) are taken by mouth two hours before exposure to UVA. The tablets are best taken with a light snack such as toast or a banana as some patients can feel slightly nauseous if the drug is taken on an empty stomach. If this feeling of sickness is severe, it may be appropriate to switch to different psoralen tablets (5-MOP) which are less likely to induce this side effect. Once the tablets are taken the patient immediately puts on a pair of sunglasses, which have been previously tested to ensure their effectiveness in blocking out UV light. The tablets photosensitise the skin and the eyes to UV light, thus making it necessary to protect the eyes. If suitable eye protection is not worn there is a risk that cataracts may develop. The sunglasses must be worn for 12 hours after taking the tablets, as it takes this long for the effects of the psoralen to wear off.

Systemic PUVA is administered twice a week. Usually 20 treatments are required for clearance of your skin condition although some skin conditions may take longer to clear than others.

**Bath PUVA**

The skin can also be sensitised using a psoralen bath. The patient lies in a bath of dilute psoralen solution for 10-15 minutes, then UVA light is administered in the usual way in a phototherapy cabinet. The skin is more sensitised than with oral PUVA, so the times needed for a sufficient UVA dose are shorter. Also, the eyes are not sensitised, so eye protection is not necessary.

Whole-body PUVA treatment takes place in a special phototherapy cabinet, which contains UVA light tubes. Before treatment is commenced the phototherapy nurse may like to establish a safe starting dose for you. This is called an MPD test and it will measure your tolerance to UVA light (in some circumstances an MPD test is not necessary). The MPD result is used to calculate the initial UVA starting dose. At subsequent visits, the dose will be increased according to the skin response to the previous treatment.

After each treatment you may develop a mild skin redness, which should cause no discomfort. If at any time you feel that the dose you have been given has caused discomfort or has caused a marked, persisting skin redness (like mild sunburn), you must let the phototherapist know so that further increments can be adjusted.

Bath PUVA is administered three times a fortnight (Mon-Fri-Wed). Usually 20 treatments are required for clearance of your skin condition although some skin conditions may take longer to clear than others.

**Topical PUVA**

This is used to treat a small area of your body such as the hands and feet. Topical psoralen is available in a paint, gel or emulsion and is applied to the affected area 15 minutes before UVA treatment is given. Generally a small canopy is used to administer PUVA to affected

areas. There is no need to wear sunglasses with topical PUVA as the Psoralen is not absorbed into the general circulation.

Topical PUVA treatment is administered twice a week. You may need to attend for approximately 15 weeks.

### **Safety precautions to take whilst having any form of PUVA**

You must avoid sun beds and sunbathing during the course of your treatment.

Protective goggles should always be worn in the cabinet to protect your eyes from UVA light. In extreme circumstances, the phototherapist may recommend that goggles be removed for a short time, in which case it is imperative that your eyes are shut whilst in the cabinet.

Avoid wearing any perfume, deodorant or make-up when you attend for treatment, as your skin may become sensitive to the UV light.

Men must shield their genital area with a sock, jock strap or underpants whilst in the cabinet.

Inform the phototherapy nurse if you start any new medication, creams or ointments once you have started your course of PUVA. Be aware that some medications that you may have in your bathroom cabinet (such as simple headache tablets) may cause sensitivity to UV light.

Avoid having your hair cut if possible during your course of treatment. If you do have hair cut, inform the phototherapist so that sun block can be applied to previously unexposed skin.

Females MUST NOT become pregnant whilst having PUVA.

Ensure that you stand in the centre of the cabinet as you have been shown. If any item of clothing is worn in the cabinet, it should be used for the duration of your treatment, therefore ensuring that the same item of clothing is always worn. It is important that you develop a routine in the cabinet, and always repeat it when you come in for treatment. Changing your pattern of behaviour in the cabinet may lead to a burn if previously unexposed skin is subsequently exposed.

### **Extra Precautions to be taken whilst having oral PUVA**

You should wear protective sunglasses as soon as you take the psoralen tablets, and for at least 12 hours afterwards

After you have taken the tablets you should avoid exposure of your skin to sunlight (including light through glass) as your skin is photosensitised for at least 12 hours and may burn if exposed. On bright days cover all exposed areas of your skin by wearing long sleeves, sunhats, sun block, gloves etc.

### **Extra precautions to take whilst having topical PUVA**

Care must be taken with topical PUVA solution. Avoid contact with the eyes. Wear the protective goggles provided. The photosensitiser is applied to the skin 15 minutes before irradiation with UVA.

After application of the sensitiser, your skin is photosensitive for at least 6 hours. It is therefore important that you avoid both natural and artificial UV light for at least 6 hours until the photosensitising effects of the psoralen has worn off. Ensure that all areas of your body, which might be exposed to UV light, are covered up with suitable clothing.

### **Possible side effects of PUVA**

Most people who have PUVA treatment suffer no side effects, but if side effects do occur they are usually mild and virtually never permanent. Most side effects can be treated with creams or will disappear of their own accord in a few days.

Some of the side effects that can occur are: -

Your skin may become red, similar to the redness caused by sunburn. We aim to produce a mild redness of the skin after every treatment without any discomfort. Occasionally the dose of light that you receive will exceed your skin's tolerance and you may develop a more prolonged redness, i.e. a burn. Rarely blistering of the skin may occur. If this happens, treatment will be suspended until the skin settles down again. We may prescribe an alternative treatment to alleviate the symptoms of a burn.

Long-term use of PUVA may accelerate the ageing process of the skin, and also increase the chance of skin cancer in later life. Due to the potentially harmful long-term effects on the skin you are limited to a total of 150-200 treatments in your lifetime.

Cold sores can develop on the lips during treatment. If you are prone to developing cold sores in the summertime, inform the phototherapist and a lip block will be applied to your lips before you go in the cabinet.

There will be an increased tendency for your skin to be dry following PUVA. It is recommended that you use a moisturiser frequently during your PUVA course.

Nausea can occasionally be a problem for patients who take psoralen tablets. If so, let the phototherapist know so that your medication can be altered.

Some patients experience a prickling sensation of the skin following PUVA. This can occur even on non-treatment days and may even be severe enough to discontinue treatment.

**How to contact us:**

- The telephone number of the Phototherapy Unit is 01633 234963 during working hours.
- Any urgent enquiries can be dealt with by telephoning the Dermatology Ward on 01633 234646.

# UV DOSIMETRY PROCEDURES

## General

This document outlines the procedures for performing the monthly Quality Assurance (QA) readings on the variety of Photo-Dermatology equipment serviced by medical physics, UHW.

1. Dosimetry checks should be done if possible at monthly intervals, or a minimum of 6 times per year. Annual electrical safety checks must be done and recorded in the equipment safety log, provided by UHW medical physics annually.
2. In general, medical physics technicians and observers should be aware of the need to wear appropriate personal protective items. These would typically include face/eye protection such as visor or goggles and hand protection such as cotton gloves. Long sleeves should also be worn for the duration of these checks.
3. Checks normally involve the equipment having a fixed warm-up period before taking the readings. Ideally the checks should be performed in the morning before any normal use has taken place so that a baseline condition can be used. This situation is not always achievable in practice however. Fluorescent lamps normally require a 5 minute warm-up period but the procedure for individual equipment should be checked accordingly.
4. Most checks are performed using a source-detector distance which reflects the respective treatment distance for that equipment. In general whole body cabinets have the average dose noted whilst the smaller units have the maximum value noted. Certain hand & foot units have two values noted, one at the treatment glass surface and another at a fixed distance from the glass. On equipment with lapsed time monitoring the tube time should also be noted.

## Equipment Specific Procedures

### Fluorescent Lamp Based Units

#### 1. UV Cabinets with Integral Dosimetry

- 1.1. For UV cabinets fitted with integral dosimetry (e.g. Waldmann 7001), average cabinet readings are compared with average jig readings and a ratio of the two averages is determined.
- 1.2. The jig is placed centrally in the cabinet. After a 5 minute warm-up period the detector is rotated to the centre of each panel with a reading taken at that point. Simultaneously a reading of the internal meter is also noted. Normally the door panel (or right hand door facing if there are two doors) is called panel 1 and a clockwise rotation is used. For the St. Woolos jig the detector sleeve position used is TP, the height setting is FP and the detector holder position is BOTTOM. The IL1400A detector is placed in the sleeve with the detector face flush with the sleeve.
- 1.3. Once all panels have been read an average value is calculated for both the jig and internal readings. The ratio of the averages is then noted. Average jig value will be used to determine overall tube performance and to help determine when a tube change is required.

## 2. Hand and Foot Units – Flat

- 2.1. This category of units will typically include models such as the Waldmann 180/181 or the Canterbury HN60. These units will normally have a warm-up period of 5 minutes before measurements are made. The detector is then placed on the treatment glass surface and a series of readings taken along different parts of the central portion of the treatment surface to determine the maximum value obtained. This maximum reading is then noted.
- 2.2. Where a distance reading is required (typically source to detector 20cms) the unit is reoriented and the detector placed in a holder such as the cabinet jig at the required distance. The detector is then positioned at the distance required pointing directly at the centre of the treatment surface. The value obtained is noted.

## 3. Hand and Foot Units – Curved

- 3.1. This category of equipment will include the half-canopy models such as the Waldmann PUVA 200. As with the Hand & Foot Flat models, these readings will normally be obtained after a 5 minute warm-up period. Typically these units are normally mounted on top of a flat unit and where this is the case the measurements are normally made with the unit in this position. The detector is placed on the glass of the flat unit facing the curved unit. Readings are then taken along the central axis to find the maximum output obtainable.

**Note:-** Where flat and curved units are used together in combination mode a separate “combi” reading with both units switched on is required for each of the flat and curved units in addition to the separate readings obtained above.

## 4. Canopy Units

- 4.1. This category of equipment will include the half-canopy models such as the Waldmann PUVA 800. Readings from these models will normally be obtained after a 5 minute warm-up period. The detector is placed in a holder such as the cabinet jig at the required source to detector distance pointing directly at the centre of the tube area. The value obtained is noted.

## 5. Dermalight 180

- 5.1. As with similar fluorescent lamp based units this model is normally checked after a 5 minute warm-up period. The detector is placed facing the tube centre at a distance level with the bottom edges of the handles. The reading obtained after 5 minutes warm-up is noted.

## **Non-Fluorescent Lamp Based Units**

### **6. UVA-1 Spotlamp**

6.1. The detector is placed centrally facing the lamp at a source-detector distance of 20 cms. The reading is then taken after a 10 minute warm-up period.

## **PDT Equipment**

### **7. Actilite Red LED**

7.1. Although this equipment does not require a warm-up period as such the output is measured at the start and after a set period. The detector is placed centrally facing the LEDs at a source-detector distance of 8 cms. The output is then recorded at switch on and after a 5 minute period of use.

### **8. Waldmann PDT 1200**

8.1. This equipment has a warm-up period programmed into its normal operation cycle. On equipment switch-on the warm-up cycle of approximately 3 minutes is enacted automatically and cannot be overridden. During this period a red crosshair target is illuminated and this is useful for setting the centre position for the detector. A source-detector distance of 30 cms is used for this test. After the warm-up cycle has completed a treatment cycle is programmed and measurements noted at switch-on and after a 5 minute treatment time.

### **9. Photocure PDT Lamp**

9.1. This lamp requires an automatic calibration as part of its switch-on cycle. A source-detector distance of 35 cms is set with the instrument calliper used for setting the distance. The instrument is calibrated using the internal sensor and the output value noted. After calibration the IL1400A detector is placed level with the clamp and its orientation adjusted for maximum reading. That maximum value is noted.

***This protocol was adapted from a document written by Mark Thomas, Principal Technician, Department of Medical Physics and Bioengineering, UHW, Cardiff.***

## DERMATOLOGY PHOTODYNAMIC THERAPY SERVICE STANDARDS

Photodynamic Therapy (PDT) is used to treat a variety of superficial cancerous and pre-cancerous lesions including actinic keratoses (AK's), superficial basal cell carcinomas (BCC's) and Bowen's disease. It is indicated for non-pigmented, non-hyperkeratotic thin superficial lesions which are unsuitable for other conventional treatments. The National Institute for health and Clinical Excellence (NICE) has approved the use of PDT specifically for these indications.

The phototherapy service aims to provide safe, appropriate and effective PDT treatment to its patients.

### **Statement of our Service Standards:**

1. Written quality standards covering patient referral, information, consent, treatment and discharge will have outcome criteria that will be routinely audited.
2. Our staff will be trained in the safe and effective use of the PDT lamps and other associated equipment, and will maintain an up-to-date portfolio of continuing professional development.
3. Treatments will be appropriate, safe and effective. By attendance at conferences and training courses, and review of relevant literature, we will monitor and update our treatment protocols to ensure our service conforms to best clinical practice and national (NICE) guidelines.
4. The PDT lamps and associated equipment will be well maintained and routinely checked for safety and compliance to the manufacturers' specifications and to Regulatory Standards.
5. The phototherapy environment, where the PDT treatment is undertaken, will be safe and friendly.

In order to achieve these aims, each aspect of the service has standards set which will be routinely audited. Below are set out our PDT Service Standards, with clear criteria and outcome targets suitable for an audit process.

## **Standard 1: Referral**

All patients will be referred by a Consultant Dermatologist or other clinical practitioner working under the supervision or approval of a Consultant Dermatologist, and each lesion or area to be treated will be identified. Where possible lesion diagnosis will be confirmed by histology.

### **Rationale:**

An accurate diagnosis and clinical decision on appropriate treatment is essential before administering PDT treatment. The Consultant Dermatologist has at all times the overall responsibility for the care of the patient.

### **Criteria:**

All referrals should come from a dermatology clinic.

All lesions to be treated shall be identified in the referral.

Lesion diagnosis will be confirmed by histology where appropriate.

### **Data source:**

A referral letter for appropriate PDT treatment, dictated by the prescribing doctor, is in each patient's main and PDT notes.

A copy of, or reference to, histological confirmation, is in each patient's main and PDT notes.

### **Outcome targets:**

Referral letter is present in 100% of patient notes.

Clear identification of lesion(s) or area(s) to be treated is in 100% of referral letters.

Histological confirmation of lesions is present in 80% of referrals.

## **Standard 2: Patient information and consent**

All patients will be given information in a suitable format about the treatment including possible adverse effects. This should be up-to-date, comprehensive and easily understood by a layman.

All patients about to undergo PDT treatment give written informed consent relating to each treatment course after receiving appropriate information. For those patients unable to give consent, consent will be sought from a suitable person (spouse/parent/carer/guardian) in accordance with Trust Policy for consent. The Guidance Notes on the reverse of Consent Form 3 will be followed.

### **Rationale:**

Patient knowledge of minor adverse events makes these easier to manage during treatment, and will minimise non-attendance or non-completion of treatment. Some side effects can be avoided if patients are warned. Patients need information in order to consent to treatment.

### **Criteria:**

All patient information leaflets produced in collaboration with the Patient Information Unit are up-to-date (reviewed at least every 2 years) and are given to every patient. All patients must give written consent, which will be taken by the phototherapy nurse or other professional with adequate knowledge of the risks, benefits and procedures of photodynamic therapy.

### **Data source:**

Patient assessment form tick-box for recording that information leaflet has been given.

Consent form has confirmation that patient has received appropriate information leaflet.

### **Outcome target:**

Patient information checkbox is ticked in 100% of patient initial assessment forms.

Signed and dated consent form is present in 100% of patient notes.

### **Standard 3: Phototherapy Staff**

All patients will be treated by qualified phototherapy practitioners. Phototherapy nurses are part of a multidisciplinary team, which includes clinicians, medical physicists and other nursing staff.

Currently there is no nationally approved training course or standard of training for phototherapy or photodynamic therapy. We therefore define two separate training requirements for administration of photodynamic therapy: firstly all staff will receive training on the specific sources used in the unit, from either the supplier representative or from the consultant medical physicist; secondly, all staff will have attended the phototherapy training module relating to photodynamic therapy on the Gwent residential phototherapy course or an equivalent course approved by the consultant medical physicist.

#### **Rationale:**

To ensure optimal effectiveness and safety PDT treatments must be administered by nurses with adequate knowledge of the skin conditions being treated, and the treatment protocols and side effects.

#### **Criteria:**

All phototherapists administering PDT treatment must be trained and experienced in the use, safety and side effects of PDT treatment of skin.

They must attend update training which includes photodynamic therapy annually. A suitable course is provided by the Department Nursing Education team.

#### **Data source:**

Phototherapy or PDT Training qualification certificates.

Certificates of attendance for update courses.

Evidence of reflective practice of photodynamic therapy in a portfolio, and/or Agenda for Change Knowledge and Skills Framework review

#### **Outcome target:**

Trained phototherapist administers 100% of patient treatments.

Annual update training certificates held by all phototherapists.

## **Standard 4: Treatment methodology**

All patients treated with appropriate, optimally effective and safe regimens based on the best study evidence, adapted as necessary for each individual patient and local practice and circumstances. Treatment protocols are kept up-to-date by annual review against current evidence, national guidelines and best practice.

### **Rationale:**

Treatment regimens ensure the consistency and efficacy of treatments, and minimise the rate of acute adverse events.

Percentage of successful treatment courses should be maximised and number of treatments needed should be minimised for each skin lesion treated.

### **Criteria:**

Written protocols for all relevant skin conditions treated are available and used in the PDT service.

### **Data source:**

Each treatment protocol has a last reviewed and a review-by date.

### **Outcome target:**

100% of PDT treatment protocols are up-to-date, and are reviewed annually and updated as necessary.

## **Standard 5: Treatment outcomes**

There are multiple factors affecting the outcome of PDT treatment of skin lesions, and multiple treatments are sometimes required to achieve satisfactory results. Too few treatments will result in sub optimal results or treatment failure, but continuing after maximum improvement has been achieved may result in an increased risk of adverse events, and is expensive in terms of both patient time and clinic resources.

### **Rationale:**

It is important that both patient and PDT practitioner have an agreed set of criteria to define the best time to stop treatment. This may be either because of complete resolution of the lesion(s) treated, or a partial response which nevertheless is useful in allowing the easier administration of alternative treatments, or treatment failure.

### **Criteria:**

Assessment of size and clinical features of lesions. Patient and clinician assessment of global improvement from standardised photographs. Clinician and patient assessment of adverse events.

### **Data source:**

PDT assessment forms.

### **Outcome target:**

70% of all PDT treatments are successful. Discharge letter contains assessment information to justify reason for discharge in 100% of cases.

## **Standard 6: Equipment and eye safety**

Patients, relatives and staff must be adequately protected from PDT lamp output and associated hazards. PDT safety management includes both engineering and administrative strategies. Equipment maintenance, use of personal protective equipment, and adherence to local rules are integral to the safe use of intense light sources. Access to proper advice and training are also essential.

### **Rationale:**

Proper maintenance is essential for ensuring safety and efficacy of treatments, for minimising breakdowns (which lead to cancelled clinics or patient appointments) and prolonging the life of equipment. Eye safety is important for patients and phototherapy staff.

### **Criteria:**

Up-to-date risk assessments and local rules are required for the administration of PDT in the phototherapy unit.

### **Data source:**

Local rules document, maintenance record.

### **Outcome target:**

PDT lamps serviced once per year and never more than 4 weeks overdue. Local rules up-to-date and reviewed annually, and signed by 100% of users.

# PHOTODYNAMIC THERAPY PROTOCOL

## Galderma Metvix<sup>®</sup> 160M/GM cream

### Lesions covered by this protocol:

Actinic keratoses, superficial or nodular Basal Cell Carcinomas (BCC's), Bowen's Disease.

### 1. Lesion documentation:

- 1.1. Consultant referral letter and patient notes to be present.
- 1.2. Diagnosis of lesion(s) to be treated to be clearly stated in referral letter.
- 1.3. Histological confirmation where appropriate.
- 1.4. Site and number of lesions to be treated clearly stated.
- 1.5. Measure two longest perpendicular dimensions and record on PDT treatment form.
- 1.6. Complete patient details on PDT treatment form.
- 1.7. Record location and shape of lesion on body map. Take or have taken a good photograph of the lesion.
- 1.8. Give PDT patient information leaflet.
- 1.9. Obtain written consent to PDT.

### 2. Lesion preparation:

- 2.1. All crust or scales to be removed, lesion to be debrided and abraded. For particularly crusty lesions, patient to apply suitable emollient or keratolytic agent as advised.
- 2.2. Clean area with sterile saline.
- 2.3. Apply Metvix cream to cover entire surface of the lesion plus a minimum surrounding margin of 5-10mm. A thin layer of cream (about 1mm thick) is needed.
- 2.4. Place occlusive dressing over the area (e.g. Tegaderm), then a light-proof dressing.
- 2.5. Patient told to return in 3 hours.

### 3. Lesion Treatment:

- 3.1. Remove all dressings and clean off excess cream using sterile saline.
- 3.2. Check surface fluorescence using Wood's lamp (UV or blue light) in darkened room (room with no windows if available). Record presence / absence / intensity of characteristic red fluorescence on PDT treatment form.
- 3.3. Patient comfortably positioned to expose the treatment area to the lamp.

- 3.4. Lamp to be used according to the instructions specific to the model.  
For the Waldmann PDT1200 position the lamp at a distance from the skin so that the measured output is not higher than  $100\text{mW}/\text{cm}^2$ . If using the Waldmann PDT1200, calculate time needed to deliver  $75\text{J}/\text{cm}^2$  (usually 9-14 minutes). If using a LED source, such as Aktelite,  $37\text{J}/\text{cm}^2$  is recommended.
- 3.5. Ensure patient, operator and any others present are wearing appropriate protective eyewear. Ensure access to treatment area is restricted.
- 3.6. Prepare fan, cool water spray and towels for lesion site cooling.
- 3.7. Using the guide light ensure that the whole lesion plus a margin of at least 10mm is illuminated.
- 3.8. Switch on full illumination. Use spray and cooling fan as required. If patient cannot tolerate continuous illumination, the treatment time can be fractionated into shorter intervals. Entonox may be self-administered by the patient if necessary.
- 3.9. The nurse must ensure that the treatment area remains centred within the illumination beam throughout the treatment time. The nurse must move the lamp away and switch off at the end of the illumination time.
- 3.10. After illumination, repeat the fluorescence check. If residual fluorescence is detected, further illumination may be given.

#### **4. End of treatment:**

- 4.1. Apply non-adherent dressings if necessary. Give patient dressings for use at home.
- 4.2. Tell patient to protect treated area from sun exposure for 48 hours. Give wound healing advice as necessary.
- 4.3. Ensure patient has information leaflet before they leave the unit.
- 4.4. Ensure next appointment is arranged (approximately 7 days second of two treatments, about 3 months for lesion response review).

#### **5. Second treatment**

- 5.1. The Metvix license indicates a repeat treatment at one week for BCC's and Bowen's lesions. The complete treatment protocol should be repeated. A few days slippage is unlikely to be significant.

#### **6. Follow-up**

- 6.1. Clinic review at 3 months.
- 6.2. Further reviews as indicated by referring consultant.

## **PATIENT INFORMATION LEAFLET**

### **PHOTODYNAMIC THERAPY (PDT)**

Please read this leaflet carefully and keep in a safe place in order that you can refer to it following your treatment.

## **Patient information sheet- Photodynamic therapy**

Your Consultant Dermatologist has decided that photodynamic therapy (PDT) is the most appropriate way to treat your skin lesion(s).

### **What is PDT?**

PDT is a relatively new form of treatment which uses visible red light with a photosensitising cream (M-ALA) to selectively target and destroy the abnormal cells in your skin lesion(s).

### **Procedure**

1. You will be asked some questions relating to your lesion(s) and your general state of health. Forms will be completed on your behalf and your lesion(s) will be photographed for your clinical records.
2. You will be asked to sign a treatment consent form.
3. A photosensitising cream will be applied to your skin and covered with a lightproof dressing for 3-4 hours. You will be able to leave the clinic and return 3-4 hours later. You may wish to bring a hat or cap to wear.
4. When you return to the unit the area(s) to be treated will first be examined under ultraviolet light to ensure that the cream has been absorbed by the abnormal cells in your lesion(s).
5. Then, the PDT lamp will be positioned over the lesion and red light will be shone onto the area for approximately 10 minutes.
6. A dressing may be applied to the lesion before you leave the clinic with further instructions for the week ahead.
7. You may be asked to return a week later for the procedure to be repeated.

8. Following completion of treatment you may be recommended to return to see your Consultant Dermatologist for a progress review.

### **What to expect**

If your skin is crusted or scaly, the nurse will carefully remove this before the cream is applied. The cream contains the active photosensitiser (M-ALA). You may feel some mild burning or stinging when the cream is applied.

The area will be covered with an light-proof dressing for 3 or 4 hours. You may leave the clinic for this time. When you return to the clinic the dressing will be removed, the cream wiped off with saline and the lesion will be irradiated for 10 minutes. It is quite normal to feel some discomfort during this time such as burning, stinging or a “pins and needles” type of discomfort. If you feel heat or pain the lesion can be cooled down with a fan and a gentle fine spray of water. The treatment can be paused and recommenced at any stage of the procedure.

### **Afterwards**

It is normal for the lesion to feel uncomfortable for the remainder of the day-even for up to a few days afterwards. If necessary a painkilling tablet such as paracetamol can be used. You may want to have someone to drive you home afterwards.

The lesion may become blistered and weepy. This is perfectly normal, dressings will be supplied for you to use at home.

When the lesion becomes crusted a smear of Vaseline can be applied to the area.

You will be reviewed approximately 7 days after treatment, and for some lesions the process will be repeated again.

Occasionally there is an increase in skin pigmentation following treatment, but this should fade and disappear with time.

Rarely, PDT treatment can cause a deeper blister i.e. an ulcerated area, which can take a longer time to heal.

You may be reviewed three months after treatment by your Consultant Dermatologist.

## **Results of the treatment**

Normally, one treatment cycle (which may consist of either one or two treatments, depending what type of lesion is being treated) is sufficient to clear the lesion. On multiple lesions, or wide areas of sun damage, more than one treatment cycle may be required to cover the affected area, and these treatments may be given on separate occasions.

It is not unusual for a second, or even a third, treatment cycle to be necessary to achieve the maximum clearance of the lesions.

Sometimes, a persistent area may remain (possibly because the lesion there is thicker than elsewhere), and this area may be amenable to treatment by conventional means.

Areas successfully treated with PDT are often pink and smooth, giving a slight contrast with surrounding areas of skin.

## **How to contact us:**

- The telephone number of the Phototherapy Unit is 01633 234963 during working hours.
- If no-one is available to take your call, a message can be left on the answer machine and someone will contact you as soon as possible.
- Any urgent enquiries can be dealt with by telephoning the Dermatology Ward on 01633 234646.

# UV Safety

## Local Rules governing the use of Ultra-Violet Radiation

There is at present no Code of Practice governing the use of ultra-violet (U.V.) radiation within Gwent Healthcare NHS Trust. It is therefore recommended that all U.V. sources should be used in accordance with the recommendations of the National Radiological Protection Board (Ref.1). A copy of this booklet should be provided to all Directorates working with ultra-violet radiation. These local rules apply to staff, not patients or visitors. The Local UV Radiation Protection Officer is Dr. C. Edwards, Dermatology, Royal Gwent Hospital, ext. 8560.

### Limits

For all UV sources the effective radiant exposure on unprotected skin should not exceed  $30\text{Jm}^{-2}$  within an 8 hour period. For UVB and UVC wavelengths (<315nm), the effective radiant exposure on unprotected eyes should not exceed  $30\text{Jm}^{-2}$  within an 8 hour period. For UVA wavelengths (400-315nm), the total radiant exposure incident on unprotected eyes should not exceed  $10^4\text{Jm}^{-2}$  within an 8 hour period. 2

### Administration

- 1 The responsibility for U.V. safety rests with the Clinical Director of Dermatology who should appoint a U.V. Safety Officer to assist in ensuring the day to day compliance with these Local Rules. The Clinical Director may appoint the Directorate Safety Officer, the Directorate Radiation Supervisor or another individual as he/she considers appropriate. This responsibility extends to ensuring that all members of his/her staff are aware of the hazards of U.V. radiation, and also of their responsibilities to both themselves and others within the dermatology department.
- 2 All U.V. workers within the Department of Dermatology are subject to these Local Rules regarding U.V. sources.
- 3 Any worker undertaking U.V. work in any establishment other than the Hospital must also conform to the Local Rules in force at that establishment.
- 4 Any person, not being a member of staff or a student of the Trust, who wishes to undertake work with U.V. sources on Trust premises must at all times conform to these Local Rules.
- 5 The RPO must be notified of all new U.V. sources within the department of Dermatology so that a risk assessment may be made, and advice given on maximum permissible exposure in an eight hour period. (see footnote)\*. Any recommended signs, systems of work, protective screens, interlocks etc. must be obtained and in position prior to the equipment being put into use.
- 6 Equipment emitting U.V. radiation must not be used by personnel who are untrained.
- 7 Where practicable, access to an area where equipment emits U.V. radiation should be limited to those persons directly concerned with its use.
- 8 Any adverse incidents will be reported to the clinical director, and a critical incident

form filled out and sent to the appropriate manager if necessary.

### **General Protective Measures**

- 9 Hazard warning signs should be used to indicate the presence of ultra-violet radiation which may pose a risk to health. Where necessary warning lights may be used to show when equipment is energised. The RPO will advise Directorates on this matter.
- 10 All U.V. sources should be operated in sealed housings or behind screens. Sealed housings may contain windows of suitably absorbent material e.g. acrylics, PVC., window glass.
- 11 The intensity of reflected radiation should be kept to a minimum, e.g. by avoiding light glossy surfaces and shiny metal objects in the vicinity of U.V. sources.

### **Personal Protection**

- 12 All exposure times should be kept to a minimum. Distance is also a safety factor.
- 14 U.V. radiation is always accompanied by visible light, so avoiding such light avoids UV exposure. However, the intensity (or brightness) of the visible component is no guide to the U.V. hazard.
- 15 Portable U.V. sources, which are not mounted on a stand during use, should always be used in such a way that the radiation is directed away from the eyes.
- 16 Protective goggles, spectacles or face masks must always be worn if there is a potential eye hazard. Skin on the hands and arms which may be exposed must be protected by wearing gloves and long sleeved clothing.
- 17 High pressure lamps are a potential explosive hazard. Eyes should be protected against flying glass when removing or replacing lamps.

### **References**

- 1 National Radiological Protection Board. "Protection against ultraviolet radiation in the workplace." (Out of print - awaiting revision)
- 2 International Non-Ionizing Radiation Committee/International Radiation Protection Association. Proposed changes to the IRPA 1985 guidelines on limits to exposure to ultra violet radiation. Health Physics 1989;56:971-972.