COMMONWEALTH EYE HEALTH CONSORTIUM

COECSA
COLLEGE OF OPHTHALMOLOGY OF EASTERN, CENTRAL, AND SOUTHERN AFRICA

VISION2020 LINKS

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Diabetic Retinopathy Network

DR-NET

Laser Training Manual

2018

International Centre for Eye Health

LONDON SCHOOL of HYGIENE &TROPICAL MEDICINE

THE QUEEN ELIZABETH DIAMOND JUBILEE TRUST

VISION 2020 THE RIGHT TO SIGHT

CONTENTS

Appendices:

Contributors

This document was compiled by the VISION 2020 LINKS Team at the International Centre for Eye Health, London School of Hygiene & Tropical Medicine, following a meeting at ICEH chaired by Consuela Moorman on July 2nd 2018 and endorsed by the College of Ophthalmology of Eastern Central and Southern Africa.

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1. Purpose

This manual is primarily intended as a guide for trainers to aid delivery of the laser-training course for the treatment of diabetic retinopathy in order for participants to acquire competency in safe laser treatment for their patients.

2. Audience

The course is aimed primarily at those individuals with existing responsibility for laser treatment whether they are trainees, or established practitioners who want to refresh their skills.

Pre-course preparation

Course participants will be sent pre-course learning on the management of diabetic retinopathy (DR) and the indications for PRP or focal laser. Their knowledge will be assessed at the start of the course and at the end.

Preparation will include guided reading on:

- Clinical classification and management of DR
- Current treatment options
- Principles of laser treatment

These are all covered in the **ICO guidelines for diabetic eye care** which will form the basis of the pre-course learning.

These are available at:

http://www.icoph.org/dynamic/attachments/resources/icoguidelinesfordiabeticeyecare.pdf

Programme for 2-day Course

Overview

Days 1 and 2 will be a mixture of didactic lectures and practical sessions with the emphasis on lectures on Day 1 and practical training with pre-booked and consented patients on Day 2

Pre-course assessment

Assessment images available on data stick to accompany manual

Format:

Assessment of confidence to identify, classify and treat patients with DR.

Clinical slides and photographs with questions and scorecard (circle correct answers)

The results to be submitted to trainer and the exercise repeated at the end of the course. Discussion of results with reflection

Didactic Lectures

Power point presentations to cover the following topics: (courtesy of Philip Burgess, Nicholas Beare and Anu Kumar)

1. Laser Safety Lecture (ppt)
2. How to do PRP (ppt)
3. How to do macular laser (ppt)
4. Diabetic retinopathy and cataract surgery (ppt)

We suggest that there is also a discussion about care and maintenance of equipment, what to do if the laser breaks down, the availability of technical help and the importance of having a maintenance contract.

Practical sessions:

- Laser orientation (see Appendix 1 for equipment and facilities checklist)
- Patient preparation and counselling (using competency assessment framework as a guide)
- Simulation training (Aurolab)
- Practical training with pre-booked patients (supervised one-to-one training)

Post-course assessment

Time at the end of Day 2 is set aside for assessment and monitoring/evaluation

The participant must satisfy the trainer that they have achieved an adequate level of competence (a satisfactory score using the competence assessment framework)

Award of certificates

Attendance at all sessions on both days of the course is mandatory for course completion and award of a certificate.

There are 2 types of certificate:

1. Certificate of Completion of the Laser Training Course. This certificate will be awarded to those candidates who have completed the course and satisfied the course trainers that a standard of competency has been achieved.

2. Certificate of Delivery of Laser Training Course. This certificate is for course trainers.

If a candidate does not achieve the required level of competence at the end of the course then a certificate is not issued. The local trainer would then arrange further training on the simulator and/or with a patient and re-assess the candidate at a later date. The certificate can then be issued.

Patient Consent

Consent forms should be available in the local unit. An explanation will need to be given if the patient is examined or treated by the trainer as part of the course.

It must be made clear to the patient that if they receive laser treatment on the instruction course it will involve only a limited treatment episode and they will need further treatment.

Resources

Laser Training Pack:

i. Hard copy Laser Training Manual

ii. Memory stick with DR laser training resources (see below)

iii. Simulation Device eg Aurolab (NB: be aware that the laser power settings need to be set artificially high to show the burn when using this device) Philips Studios, Zeiss calibration device

iv. Laser Lens ie pan-retinal lens and macular laser lens

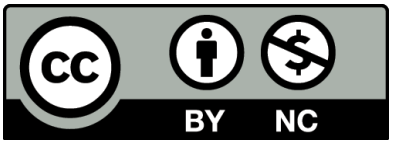
Content of memory sticks (to be given out at start of course)

Title
ICO Guidelines for Diabetic Eye Care (pre-course reading)
DR Toolkit
Diabetic retinopathy pathogenesis classification
Systemic risk factors
Laser Safety
Clinical pictures (Lucy Howe)
Laser Treatment for Maculopathy
Laser Treatment for Proliferative Diabetic Retinopathy
Diabetic retinopathy and cataract surgery
Facilities and Equipment
Preparing for Laser treatment – patient information
Certificates (for trainer and participant)
Competency Assessment Record for Laser Treatment

NB: Other resources can be found at:

https://sites.google.com/site/drnetcomm/home

VISION 2020 LINKS Diabetic Retinopathy Network (DR-NET) Laser Training Manual 2018



Appendix 1

Facilities and Equipment

Checklist

- Laser with adjustable table
- Secure, dedicated room for carrying out laser treatments with a lockable door and adequate black out facilities for any windows and overhead lighting
- Reliable electricity source with power surge protection
- Consider the heat generated by laser equipment – room should have air conditioning, fan or other temperature regulation
- Hand hygiene facility
- Lens/equipment cloths, cleanser
- Adjustable seating for doctor and patient
- Safety glasses
- Dilating drops, local anaesthetic drops, coupling fluid
- Dedicated treatment lenses (avoid 3–mirror lens) eg 'area centralis', fundus pan-retinal photocoagulation lens
- Simulation kit – as provided in the Laser Training Pack
- Laser Log Book to be kept beside the laser to record every laser treatment episode

Other considerations:

- Identify a local Laser safety officer with keys to room and laser
- Laser safety manual as per manufacturer's specifications
- Laser maintenance contracts and provider identified
- Procurement pathways for consumables

Appendix 2

Competency Assessment Record for Laser Treatment

Action	Rationale	Poor	Satis	Good	Comments
Rationale and Assessment					
Maintains a professional approach and attitude throughout the whole procedure.	Professional responsibility, gaining trust of the patient.				
Confirms that patient is aware of procedure and correct eye to be lasered. Assesses visual acuity appropriately	To promote patient choice and ensure informed consent. To ensure baseline vision level is noted				
Correct explanation of procedure given to patient.	To allay patient's fears and gain their confidence.				
Preparation and Procedure					
Correct identification of the patient and correct eye for laser treatment.	To avoid identification errors.				
Demonstrates appropriate hand washing technique and that patient has received anaesthetic drops.	To prevent infection and ensure patient comfort				
Demonstrates adherence to laser safety protocol, ensuring protection of patient and any observers	To prevent accidental laser injuries				
Demonstrates appropriate knowledge for adjusting the laser settings	To ensure optimal effect of laser without complications				

Applies laser contact lens and positions patient correctly	For patient comfort and to facilitate good view for lasering.				
Applies laser treatment competently	For optimal management				
Completion					
The practitioner responds appropriately to deal with any difficulties experienced by the patient during the procedure.	Laser treatment is uncomfortable for the patient, the patient may require encouragement and support during the procedure				
Correct lens cleansing technique at the end of the procedure	To prevent contamination and reduce risk of cross infection.				
Accurate documentation in patient's health records including any complications and/or difficulties encountered during this procedure.	To provide an accurate record of interventions undertaken.				
Name of assessor	Signature				
Name of assessed					

Appendix 3

Laser Treatment for Diabetic Maculopathy

Macular laser treatment is for Clinically Significant Macular Oedema (CSMO). This is a clinical definition and does not require a fluorescein angiogram.
CSMO is defined as:

1. Hard exudates at or within 500μm of the fovea, if associated with thickening of the adjacent retina, or
2. Retinal thickening at or within 500μm of the fovea, or
3. Retinal thickening of one optic disc area or any larger which is within one disc diameter of the centre of the macula.

Before giving the laser treatment

1. Document the corrected visual acuity.
2. Dilate the eye to be treated.
3. Obtain informed consent detailing the potential benefits and risks as:
   - Benefits: prevent further visual loss (note that the vision rarely improves)
   - Risks:
     - failure of treatment,
     - re-treatment required,
     - loss of vision due to foveal burn,
     - paracentral scotomas which usually fade but may persist
4. Explain to the patient the importance of not looking at the laser beam during treatment.

Performing the laser treatment

1. Use topical anaesthesia and a contact lens.
2. Set the spot size at 50-100 micron. A small area of thickening close to fixation can be treated with 50 micron spot size.
3. Start at a low power (e.g. 70 milliwatts) and a short duration (e.g. 0.05 seconds). Increase the duration to 0.1s before increasing the power. Remember that the burn will get more intense in less oedematous areas and also closer to the fovea.
4. Directly treat microaneurysms in areas of retinal thickening. A mild grey burn should be evident beneath the microaneurysm.
5. Place burns two burn widths apart in areas of thickening not associated with microaneurysms.
6. Only treat areas of retinal thickening between 500 and 3000 microns from the fovea at the first session (see diagram on p18). Consider treating to within 300 microns of the fovea if initial session does not resolve oedema.

Appendix 4

Laser Treatment for Proliferative Diabetic Retinopathy

Different types of laser

Most lasers in industrialised countries use green light, at approximately 510nm wavelength. This is absorbed in the outer retina and retinal pigment epithelium.

In LMICs, some clinics use a diode laser that produces infrared light at 810nm. This is absorbed in the retinal pigment epithelium and choroid. As the choroid is sensitive to pain, diode laser treatment is more uncomfortable for the patient, and a local anaesthetic block should be considered.

Before giving the laser treatment

1. Document the corrected visual acuity.
2. Dilate the eye to be treated.
3. Obtain informed consent for pan-retinal photocoagulation (PRP)
   - Benefits: prevent visual loss
   - Risks:
     - reduced visual field,
     - impaired night vision,
     - temporary visual reduction secondary to macular oedema,
     - failure of treatment.
4. Explain to the patient the importance of not looking at the laser beam during treatment.

Performing the laser treatment

1. Use topical anaesthesia and a contact lens.
   Alternatively if you are going to treat the entire retina, it may be better to give sub-Tenon's local anaesthesia and if appropriate use an indirect laser.
2. Set the spot size to 200 microns (or 500 microns with three-mirror contact lens).
3. Set exposure time to 0.1 seconds (multispot laser 0.01-0.02s). Shorter duration can be less painful for the patient.
4. Increase the power until a mild white burn is visible.
5. Treat the inferior retina first, placing the burns one burn width apart, and continue until the entire lower half is treated.
   If you are confident the patient will return, wait 2-4 weeks before treating the superior retina. If the patient is unlikely to return, treat the entire retina in one sitting.

Appendix 5 Participant Feedback

DR-NET LASER TRAINING COURSE
VISION 2020 LINKS Programme

Please complete as clearly and fully as possible; individual answers will be confidential.

Name:	**Location of course:**	**Date of course:**

1. How relevant to your day-to-day work was the laser training course? *(Tick one choice only)*

Extremely relevant	Relevant	Neither irrelevant / relevant	Irrelevant	Extremely irrelevant

2. How important to your institution / hospital was the laser training course? *(Tick one choice only)*

Extremely important	Important	Neither important / unimportant	Unimportant	Extremely unimportant

3. How much of what you have learned during the course was new for you? *(Tick one choice only)*

0-20%	21-40%	41-60%	61-80%	81-100%

4. Please rate the level of your learning and confidence in applying the following skills. *(Tick one choice for each row)*

	Confident to do on my own and to teach others	Confident to do on my own	Learned but not confident to do on my own	Need more training	Didn't learn at all	Other
Laser safety protocol						
Patient consent						
Laser settings						
Use of laser lens						
Laser treatment						
Postop advice						
Other						

5. List the details below in response to the learning objectives

I will… *(list the specific actions you will do to put your learning into practice)*	I will start... *(include date)*	and I will finish…	Evidence that this action is completed

6. How do you rate the learning through the laser training course? *(Tick one choice only)*

Extremely high	High	Neither high nor low	Low	Extremely low

7. Would you recommend participation in the laser training course to others? *(Tick one choice only)*

Extremely likely	likely	Neither likely nor unlikely	Unlikely	Extremely unlikely

8. Any other comments?

How would you improve the course?

Thank you!

Please complete and hand this to the trainer before the end of the course.

Information will be used to improve the training offered through the VISION 2020 LINKS Programme and DR-NET.

*Please note that comments may be used as **anonymous** quotes. You will not be identified – please be honest in your answers!*