PROTOCOL NAME:

Details of sponsor

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## Purpose:

To validate a newly developed battery of performance-based tests of visual function to be presented using virtual reality. The tests are intended as potential outcome measures for clinical trials of treatments of eye disease: they measure visual performance in patients with low vision on visual tasks that a relevant for daily life.

## Introduction:

The ability of patients to perform vision-related daily living tasks is often a desirable metric for assessing the success of a new therapeutic intervention, particularly for making cost-effectiveness decisions. Next generation virtual reality (VR) technology offers the potential to provide customized and standardized naturalistic environments to test patients safely on performance-based measures of visual function for use in assessing the outcomes of clinical trials. We will develop such performance-based measures of visual function in VR and trial them on patients with low vision who have sight impairment.

There is a clear need for improved protocols for assessing the outcomes of clinical trials. Visual performance measures are the most relevant outcome measures for treatment of visual disease, because they capture the visual skills that are most relevant for patients' daily lives. However, because such measures are expensive, and difficult and time consuming to implement and analyse, clinical trials typically rely on standard optometric measures like visual acuity, and on patient answers to quality of life questionnaires. Both of these have significant drawbacks: Standard optometric measures may not correlate well with functional visual ability in various eye pathologies. Questionnaire-based quality of life measures are subjective, may not well isolate visual function, and may correlate poorly with objective measures of visual performance. In a minority of trials where performance measures are used the complexity and expense of generating custom physical environments in which to measure visual performance may preclude multi-centre designs. For the patients, measures of visual performance in physical environments may be carry increased risk of falls or accidents or provoke anxiety. For researchers, the increased risks can make it difficult to get approval for real-world studies.

VR offers the potential to provide a step-change in the way clinical outcomes are assessed, by providing custom interactive assessments of visual performance, offering the advantages of complex and naturalistic visual environments without the expense and potential risks to patients. Visual performance data generated in a VR environment could be gathered and analysed automatically, e.g. using hand movements, eye movements or verbal responses, or using motion vectors on a

treadmill for visually guided navigation. The potential to provide custom standardized VR environments in which to measure visual performance has clear potential for use as outcome assessments in multi-centre trials.

The project team have developed custom performance-based tests of visual function in a VR environment, testing skills including object search, clock face and symbol recognition, recognition of gestures and visually guided action. In the current study we propose to pilot the test battery on healthy able-bodied low-vision patients with bilateral ocular disease. Disease selection will reflect the differing types of visual function loss demonstrated by low vision patients; Central loss (e.g. Stargardt's disease); Peripheral loss (e.g. advanced retinitis pigmentosa), and diffuse loss (e.g. Albinism).

## Aims of the Research Project:

1. To validate a new virtual reality (VR)-based battery of performance-based tests of visual function that are relevant for patients' daily lives.
2. To quantify the reproducibility of the performance-based tests.
3. To gather acceptability and ease-of-use data from patients.

## Experimental Plan

### The test battery.

The test battery, developed by Dr. Bosten at the University of Sussex, incorporates the following tasks

**Object search.** Participants identify 30 common household objects (e.g. cups, plates, cutlery) placed in a cluttered simulated living room. An infra-red and optical sensing device (Leap Motion, San Francisco, CA) to detect users' hands and project an image of the hands in real time into the virtual environment. Participants indicate the positions of objects they are instructed to identify by pointing to them in the virtual environment.

**Box search.** In a variation on the object search task, participants are required to indicate the locations of a series of boxes, one presented on each trial. The boxes have a variety of sizes and colours.

**Clock face recognition.** Patients view analogue clock hands with circular clock faces. Participants are required to tell the time by a verbal response, which is recorded by the tester. According to the responses, the size of the clock face alters on subsequent trials along a logarithmic scale in an adaptive staircase procedure. The performance measure is the size of clock face at which the participant is able to correctly tell the time.

**Gesture recognition.** Stimuli are short animations of an avatar performing common gestures including pointing, waving, beckoning, shush and stop[7]. Patients are required to describe the gesture, and performance is recorded by the tester.

**Visually guided action.** In this test an avatar rolls a ball towards the patient across a table in the virtual environment. The ball is rolled at random angles and at 5 different speeds. Participants are required to intercept the balls using images of their hands projected into the virtual environment (using the Leap motion developer kit). Performance is measured as the number of accurate interceptions as a function of ball speed.

### Pilot Testing with low-vision patients.

Dr. Hogg and Dr. Jackson will arrange to pilot our performance-based tests of visual function on 20 patients with low vision aged 20-50, including patients with Stargardt's disease, advanced retinitis pigmentosa and Albinism. All patients will have colour fundus images and OCT scans taken to enable accurate phenotyping. They will each attend the Northern Ireland Clinical Research Facility (NICRF) for 2 x 2-hour sessions. They will be assessed in both sessions on all five performance-based measures, allowing us to monitor the consistency of our measurements across two time-points. We will also gather qualitative data on ease of use and patient comfort. We have chosen to use young patients in this study because they may be more comfortable with using virtual technologies. We hope to explore applications with older patients in future studies.

## Study Procedures

### Inclusion Criteria:

1. Male and female participants
2. Age 20-50
3. Bilateral sight impairment due to Stargardt's disease, retinitis pigmentosa or albinism.
4. Sight impairment criteria are as follows:
   -Visual acuity of 3 / 60 to 6 / 60 with a full field of vision.
   -Visual acuity of up to 6 / 24 with a moderate reduction of field of vision

### Exclusion Criteria:

1. Any physical impairment that would make use of the virtual reality headset difficult or unsafe.
2. A history of vertigo or dizziness.

### Clinic Visit 1 and 2:

1. Seeking Consent: The Research Optometrist will take consent. The information leaflet on the study will be given to potential participants at their low vision appointment. After participants have had sufficient time to gauge their involvement we will acquire written informed consent.
2. Demographic Questionnaire (Appendix 1)
3. Habitual Visual Acuity: LogMAR visual acuity will be recorded for each eye with their normal refractive corrections (glasses or contact lenses in place).
4. NEI VFQ 25- interviewer administered version.
5. Virtual Reality Tests – sufficient time will be given to enable the participant to adjust to the headset and the new tasks.
6. Questionnaire on ease of use and acceptability (Appendix 2)
7. Colour Fundus photographs and Optical Coherence Tomography Retinal Scans.

The total study visit should take approximately 2 hours. Given that the protocol only includes non-invasive visual function tests, the participant should experience minimal pain, discomfort or distress. The tests do require concentration and some participants may find them boring. Some users of VR headsets have reported nausea or dizziness during use so the participant will be warned about this and asked to report if either of these symptoms occur. The test would then be aborted.

## Sample Size

This is a small pilot study and therefore we haven't attempted to undertake a formal sample size calculation. However we feel the sample size chosen is sufficient to identify any key issues with using this technology with participants with low vision and also to give some indication of the repeatability of the tests.

## Statistical Analysis

Given the pilot nature of this study limited statistical analysis will be undertaken. Greater weight will be given to the responses to the ease of use and acceptability questionnaire. Bland and Altman analysis will be used to investigate the repeatability of the tests.

Visual performance tests in virtual reality using the Oculus rift.

Participants will complete a variety of tasks to assess their visual performance in situations equivalent to those they encounter in daily life. Tests are run via the software Unity and participants are guided through each task by the optometrist.

## Study Plan

| **Activity** | Visit 1 | Visit 2 |
|---|---|---|
| Informed consent [1] | X | |
| Demographics/Medical history | X | |
| NEI VFQ | X | X |
| Visual Acuity | X | X |
| VR test | X | X |
| Retinal Imaging | X | X |
| Ease of use questionnaire | X | X |

1 Must be dated/signed prior to performing study procedures

# Appendix 1: Measuring Visual Acuity

## 1.1 ETDRS LogMAR Visual Acuity Charts

- There are a number of ETDRS charts. For the purposes of the cohort study only Charts 1 and 2 and Chart R are needed.
- Chart R is used for refraction.
- After refraction is complete Charts 1 and 2 are used for testing the right and left eye respectively.
- Each line has 5 uniformly sized and spaced letters which decrease progressively in size from the top most line.

LogMAR charts were developed and popularised by Bailey and Lovie and hence they are sometimes referred to as Bailey Lovie Charts. The visual angle is largest with the largest letters. The advantage of these charts is that there is a geometric progression of the visual angle with a doubling or a halving with every 3 line change. Therefore calculation of the visual angle is very simple and allowances are made for the testing distance.

- The charts may be standardised for testing at 4 M or testing at 3M.
- Regardless, they may be used at any testing distance as long as the appropriate conversions are clearly understood.
- Changing the testing distance simply extends the range of acuity the chart can test.
- Thus for example when used at a distance of 4M the acuity range is -0.3 logMAR to 1.0.
- By moving the chart to 2M, the range becomes 0.0 logMAR to 1.3.
- When testing is undertaken at 1M, acuities as worse as 1.6 can be assessed.
- Although standardised for the 4 M distance, the chart can be easily used at 2M or 1M .
- In order to obtain an acuity, when the chart has been used at 2M or 1M the examiner simply adds 15 letters or 0 letters (for 2M and 1M respectively) to the number of letters read at the testing distance.

- Full details on how the results of the tests should be scored and recorded will be provided along with the forms used to record acuity.

## 1.2 Retroilluminated Visual Acuity Box

- The illuminated box can be mounted on a wall or be used free standing.
- The box should be placed so that the top of the third row of letters (0.8 logMAR at 4 Metres testing distance ) is 49 $\pm$ 2 (124.5 $\pm$ 5.1cm) inches from the floor.

## 1.3 Ambient lighting

- Most of the room lights should be turned off during the visual acuity test.
- Retro-illumination within the box itself provides the appropriate level of illumination to undertake the test and should also allow the examiner to record the test results without any additional lighting..

## 1.4 Visual Acuity Lanes

- A distance of 2 meters (78.7 inches) is required between the patient's eyes and the visual acuity chart for the 2 meter test, and a distance of exactly 1 meter (39.37 inches) is required for the 1 meter test.
- Wall-mounted box: In addition to the 4 meter lane, 17.78 cm (7 inches) must be allowed for the depth of the box plus space for the patient. If space is insufficient, the test may be undertaken at any specified distance as long as this is taken into account during the recording of information.
- Stand-mounted box: In addition to the 4 meter lane, 33.02cm (13 inches) must be allowed for the stand's casters plus space for the patient.

## 1.5 Marking the distance

- The distances are measured form the eye of the patient, seated comfortably in a chair with his or her back firmly placed against the

chairs back, to the centre of the second (left eye) or fourth letter (right eye) of the third line of the chart. The horizontal distance must be measured individually for each examination. 1 or 2 meter sticks can be used.

### 1.6 Recording of VA

- Each eye should be tested separately at a specified distance
- The testing distance should be clearly marked on the record of acuity form
- Use chart 1 to test the RE and chart 2 to test the LE
- Place the appropriate correction in the trial frame on the eye to be tested and ensure that the fellow eye is occluded properly.
- Ask the patient to read steadily line by line.
- The examiner can make reassuring comments but should not tell the patient whether a letter is correctly or incorrectly identified.
- The patient may be encouraged to guess letters and if letters are missed the examiner may point to the row of letters as patients often use eccentric fixation.
- When visual acuity is worse than logMAR 0.8 (that is fewer than 15 letters read at 4M testing distance) testing should be repeated at 1 meter.
- If a patient is unable to read any letters on the largest line at 1 meter vision should be checked with a pinhole to assess whether reduced vision is due, at least in part, to a very large refractive error.
- For the purposes of recording VA, each letter read correctly should be circled.
- Cross out letters incorrectly identified.
- If a patient skips a letter leave this unmarked, though the patient may be encouraged to reattempt the line on which the letters were missed.
- Patients are also encouraged to guess and the examiner should not stop until a minimum of 3 letters on one row are incorrectly identified.

### 1.7 Scoring.

- VA may recorded as a linear variable ie. simply enter the number of letters read and the testing distance.
- If no letters are read at 4M, only the score at the 1M testing distance is entered.
- If fewer than 20 letters are read at the 4 M testing distance, the number of letters correctly identified at this distance is added to the score obtained on the 1M testing distance.
- If more than 20 letters are read at 4M, the total read at 4 M is increased by a further 30.
- If the 2 M testing distance is used simply add 15 letters instead of 30 to the score
- If a visual angle is required, the line on which a minimum of 3 letters are correctly identified is entered as the visual acuity.
- At each follow-up visit, the refraction recorded at the previous visit may be used as the beginning approximate refraction for each eye

## Appendix 2- Running the performance-based tests for Oculus Rift

Ensure the Oculus Rift is connected to the PC and switch the equipment on.

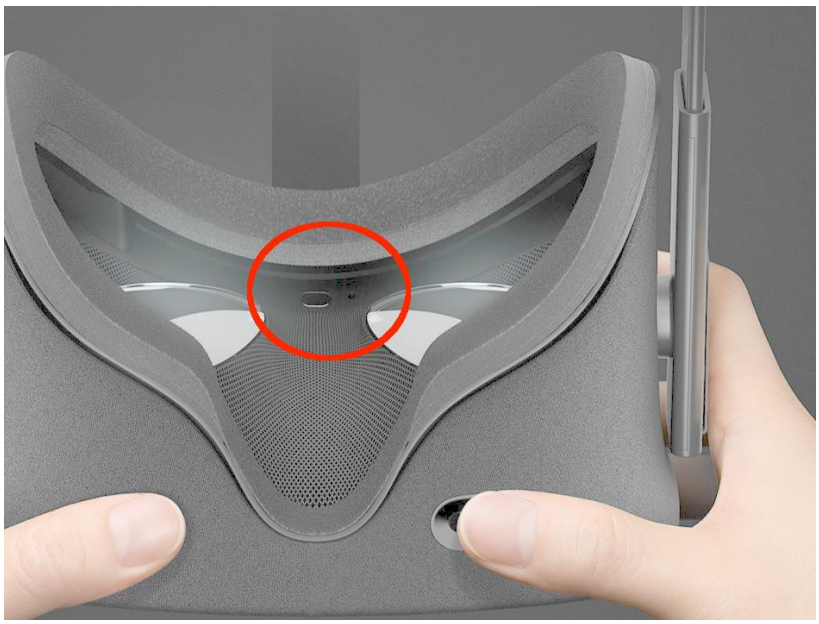
Participants should use the Oculus rift wearing their usual correction, either glasses or contact lenses. The maximum size of glasses that can be accommodated is 50mm x 142mm.

Help the Participant put the Oculus Rift VR lenses on. This should be done back to front if the participant is not wearing glasses, or front to back if they are wearing glasses.  Adjust the head straps until the Oculus rift is comfortably placed and secure.

Present a demo scene so the participant can see a scene within the Oculus rift.

Allow the participant to adjust the distance the lenses are apart (red circle below) using the slider at the base of the Oculus Rift (as in the diagram below) until the participant reports that the image they see inside is maximally sharp. This adjustment is designed for different IPDs. The range on the slider is 58-71mm.

Once the IPD is set correctly set, close the demo scene.



Launch Unity

Select the project “vision tests”

Navigate to the first scene “clock task”. Open the scene by double clicking. Locate the task script is on the ExperimentControl object. Set a participant tag on the script for storing the participant’s data. Start the scene. On each trial, if participant tells the time correctly, press y. If not press n. To save the results, press s. The staircases terminate after 80 trials and data will be saved automatically at that point. Pressing stop also saves the results.

Navigate to the second scene “catch task”. Start the scene. The GUI for entering the data is in Display 1 (see top left corner of Game tab to switch display if it's not already there). Enter the participant tag. Ask participant if they feel if they are at a natural height (above table, not floating below or too high above ground). According to the participant’s response, adjust the Y axis on LM Head Mounted Rig (Position). Click Start. (Trials per speed should 5). Click Next Trial to start each trial – the task will end and save results automatically. Click Save Results to save the results and quit early if needed. Sometimes the hands will disappear from the virtual environment if a participant makes a movement out of the range of the Leap’s ability to detect. If this happens, instruct the participant to hold their hands steadily in front of the head set where the Leap is mounted until the hands are recognized again. The hands must be present throughout a trial for the data for that trial to be recorded.

Navigate to the first scene “gestures”. Start the scene. The GUI is in Display 2 (see top left corner of Game tab to switch display if it's not already there). Enter the participant tag. Click next trial to play the next trial. Click replay to play the current trial. Enter a note to record the participant’s verbal response on each trial, and click 'correct' or 'incorrect' to log the participants response. Click Save Results to save.

Navigate to the second scene “object tasks”. Run the “object task” first. The script is in the Scripts object (Object Search Task), Make sure GUI is Display 1. Start the scene. Enter the participant tag. Click Start (on right hand panel). Click Next Trial to begin next trial. On each trial an object appears in front of the participant and they are required to find a matching object elsewhere in the scene and then indicate its location by pointing to it using their virtual hands. The trial ends either when the object is correctly located (and pointed to), or after 30seconds. The object disappears at the end of each trial. A new object appears when “next trial” is clicked. The data is saved automatically once the 30 trials are complete.

Next run the box search task. The script is in the Scripts object (Varying Object Task). Start the scene. Enter the participant tag. Click Start. The trials work the same way as for the object search task, except that this time there is a black out between trials – in order to mask the visual transient caused by the box appearing on each trial. The data is saved automatically once the 30 trials are complete.

Gently remove the VR headset from the participant's head.

Clean the lenses with the lens cloths provided.

If, for any reason, the participant is unable to complete the tests, record the reason on the acceptability and ease of use questionnaire.

# Appendix 3: Retinal imaging

## Spectralis HRA+OCT

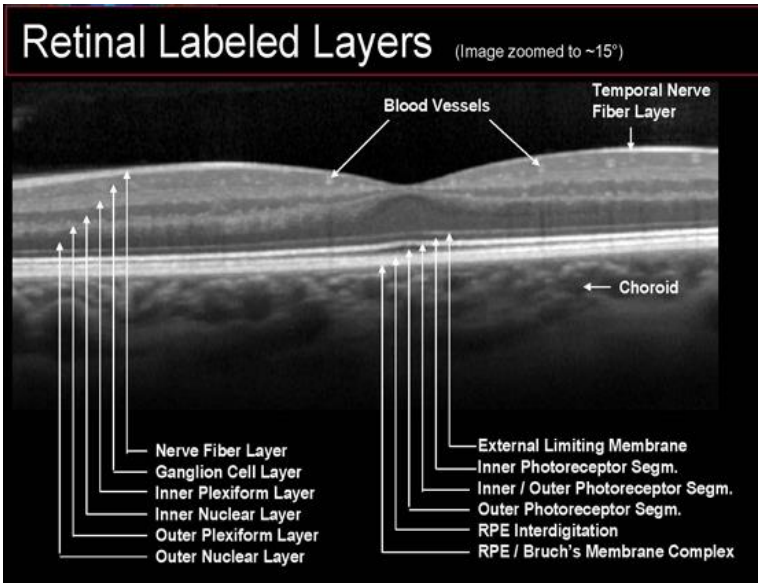
**Following informed consent each participant will have the following**

**Horizontal single line scans** through the Fovea with an ART setting of 100

**Vertical single line scan** through the Fovea with an ART setting of 100

**Posterior Pole (**centred on the Fovea with an ART setting of 9, 61 sections)

OCT will be performed using the following parameters.




### Equipment

Spectralis HRA+OCT

Chair

Alcohol cleaning wipes

**SYSTEM START UP**

1 Remove dust cover

2 Remove lens cover

3Switch on the power at the wall socket

4 Switch on the isolating transformer – lower white box

5 Switch on the laser box power supply – upper white box

6 Switch on the PC

7 The PC will start its boot sequence, when the Microsoft desktop is displayed start HEYEX

**Procedure**

Clean participant contact areas with the alcohol wipes prior to any measurement*s*

**OCT OPERATION – New Patient Examination**

1 Unlock camera head and check the camera head position is square and level

2 Set the filter wheel to the **R** position

3 Press the **database** button to bring up patient list (yellow button – top of left screen)

4 Select a **new patient** and input the patient data;

-LAST NAME **Enter the ID number**

-FIRST NAME

-DOB - 2 days

SEX **Select Male/ Female from drop down menu**

**Examination Data**

**Operator: State Initials**

5 Turn on the **camera power** (yellow button – lower right of touch screen)

6 Check **fixation** position is correct (centre) and the **Focus** is set to 0.00, then select **IR + OCT**

Adjust the chin rest so eyes are level with the red marks.

Adjust table height for the patient.

Make sure the patient's forehead is firmly against the head rest.

7 Using the **reference image** (left side of the screen) move the camera forward and centre the bright reflectance image vertically and horizontally

To move the bright reflectance vertically Rotate the joystick

8 **Focus** the reference image – rotate focus knob on camera head

9 **Position OCT** scan – check the OCT image is level and between blue markers

To move OCT vertically up & down Joystick forward & back

To move OCT horizontally left & right Joystick left & right

10 Turn on **tracking and ART** (black button on touch screen) – remember to watch the live OCT image at the bottom of the screen

11 Let the number of **ART** images build to 100 and press **Acquire** (blue button on touch screen)

12 Repeat for **vertical line scan** (click on the up arrow next to the ART display)

**To level the tilt of the vertical OCT image Rotate Joystick**

13 Repeat for **volume scan (P Pole) –** watch live OCT window at the bottom of the screen (ART 9).

**IF DILATED**

17 Change filter wheel to A turn on BAF let bleach for 30 secs turn to IR and realign switch on again to BAF let it build (Art 100) and take image.

***18 Set filter wheel to S Realign***

**Keep the live OCT image level and in the centre of screen**

19 Lock camera head

20 Check your images to make sure you are happy with the examination. Then to **Set**

**Reference** images, select the images required, right click on your selection, then press

**Progression** and **Set Reference**

**Myopes** if the OCT image is curved excessively or you cannot bring the OCT up to the ideal

Position use the **Long Eye** button and select either **X** or **XL**

Before starting check the following;

· Unlock camera head

Set the filter wheel to the **R** position

· Ensure **fixation** is at **centre** position

· Adjust the **focus** and set it to **0.00** then select **IR OCT**

· Adjust the chin rest so eyes are level with the red marks on the sides of the headrest

· Adjust table height to suit the patient ensuring their forehead is firmly against the head rest

1. **Horizontal and vertical single line scans** through the Fovea with an ART setting of 100

2. **Posterior Pole (P.Pole)** centred on the Fovea with an ART setting of 9

**Notes:**

· IMPORTANT check and review the patient's images before allowing them to move on.

· IMPORTANT set reference images, select the images you want to use, right click on your selection and press Progression/Set Reference

· Allow the patients to rest between scans if they are uncomfortable or struggle to fixate.

· Actively encourage patients to blink to keep a good tear film; this is particularly important

for contact lens wearers. Dry eyes will deteriorate image quality.

**SYSTEM SHUTDOWN**

1 Close all HEYEX dialog boxes and windows and close HEYEX.

2 Select "Start \ Turn off Computer".

3 When the PC shuts down completely, then turn off the laser box power supply – upper white box

4 Turn off the isolating transformer - lower white box

5 Turn off the power at the wall socket

Unlock camera head and check

## Digital colour fundus Photography

Following informed consent, each subject will have the following images captured in each eye:

Anterior segment image right and left eye

Macula centered stereo pair right and left eye

Disc centered stereo pair right and left eye

Equipment

Digital Retina Camera CX-1

Chair

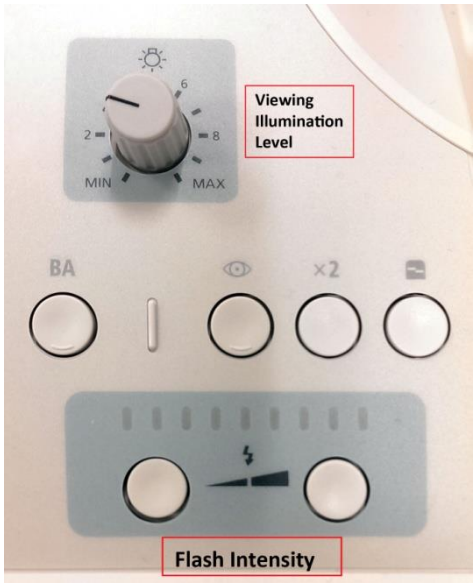
Alcohol Wipes

### Camera Controls


#### Viewing Illumination

The "Viewing Illumination Knob" (top left on the base) controls the brightness of the light shining on the patient's eye. This has no direct

correlation to the exposure of the captured image. It varies from min to max (0-10) and is best kept to the minimum necessary to get a clear view of the retina. Around 3 is adequate for most patients.




It is worth remembering that this is only of concern when shooting in the Mydriatic mode as in the Non-Mydriatic mode the camera uses infrared light and this does not bother the patient.

**Flash Intensity**

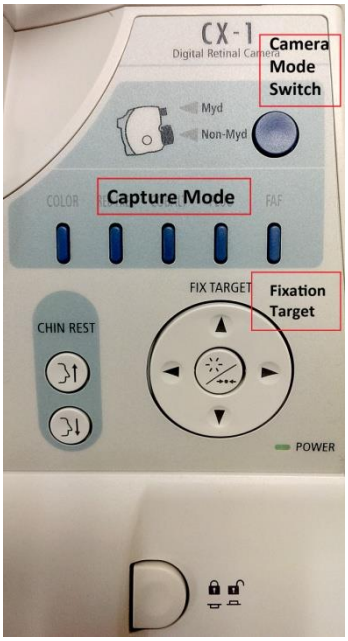
Below the “Viewing Illumination Knob” are two buttons that adjust the intensity of the flash. This is what determines the brightness of the captured image.

This is normally set quite low, usually around 1 or 2, indicated by the little lights above the buttons.

You may have to adjust this depending on the patient. Iris colour and the patient’s ethnicity will have and affect on this. Also the photos centred on the Optic Disc will require a lower flash level those centred on the macula.

**Mode Buttons**

On the right side of the camera base you will find selection buttons which enable the mode of the camera.




Pressing the round blue button alternates between the Mydriatic and Non-Mydriatic mode of the camera.

Below this button are a series of long blue buttons which select the capture mode of the camera. Options are:

1. Colour
2. Red-Free
3. Cobalt
4. Fluorescein
5. FAF

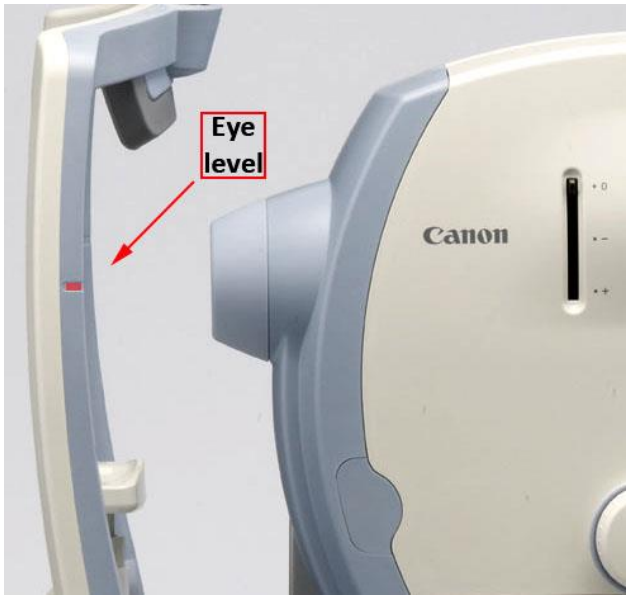
**Fixation**

The Fixation Target adjuster is located below the Capture Mode buttons. This large round button operates like a joystick allowing you to move the internal fixation light around in the direction of the arrows. This is used to steer the patients view toward the position you need to get the correct field definition (Field 1, Field 2 etc) see the appropriate study protocol for required fields.

**Chinrest Height adjuster**

To the left of the fixation adjuster, there are two buttons which adjust the height of the chin rest. Adjust the chinrest height using these buttons until

the patients eyes are level with the eye level indicator located on the side of the forehead rest support. Ask the patient to sit back if a large adjustment is necessary.



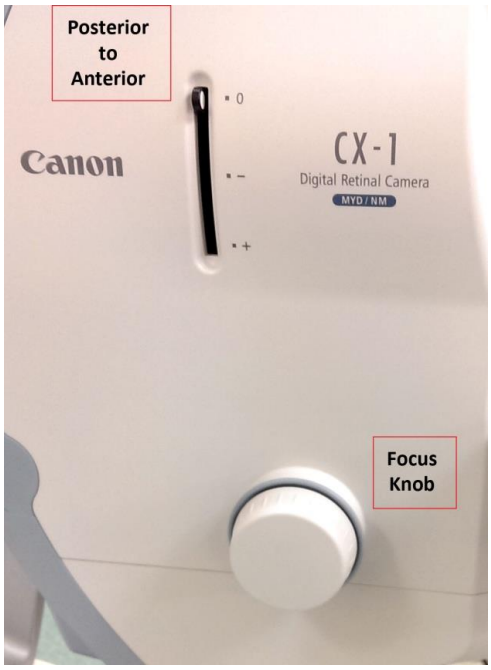

Also make sure the height of the table is comfortable for the patient, adjust as necessary

**Focus Knob**

On both sides of the camera body you'll find the focus knob. Use this knob to focus the image before capture. While in the Myd mode you will do this while looking down the ocular.

Also on the side of the camera you will see a lever with positions 0, - & +. This is the diopter compensation lens selector. You will need to use this to get the focus right, if the patients is Myopic (use -) or Hyperopic (use +). 0 is normal.

You will also need to select the + setting to get an acceptable anterior FR image.




**Keep camera back away from patient until ready to photograph**

It is good practice to keep the camera back from the chinrest when not using it. This avoids accidents as patients come forward and touch the lens with their noses causing a smudge which needs to be cleaned.

.

**System Start Up**

Remove Dust Cover

Remove lens cap

Switching Camera and PC on

The camera should be switched on at the wall and then using the switch on the side of the base before the PC is booted up.

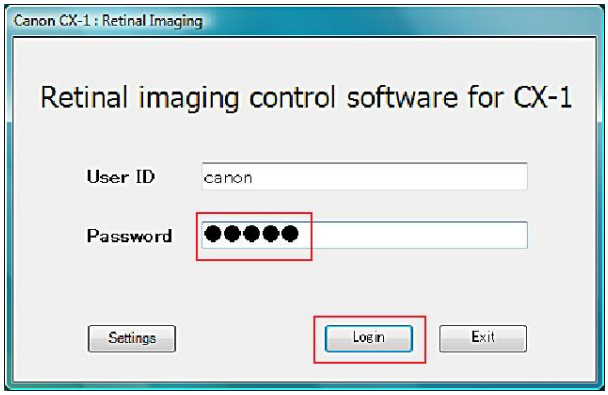

This helps ensure that the software sees the camera. Switch the PC on as normal.

**Logging In and Starting Capture Software**

Log into the PC using the CRF user name and password “Cl1n1cal”

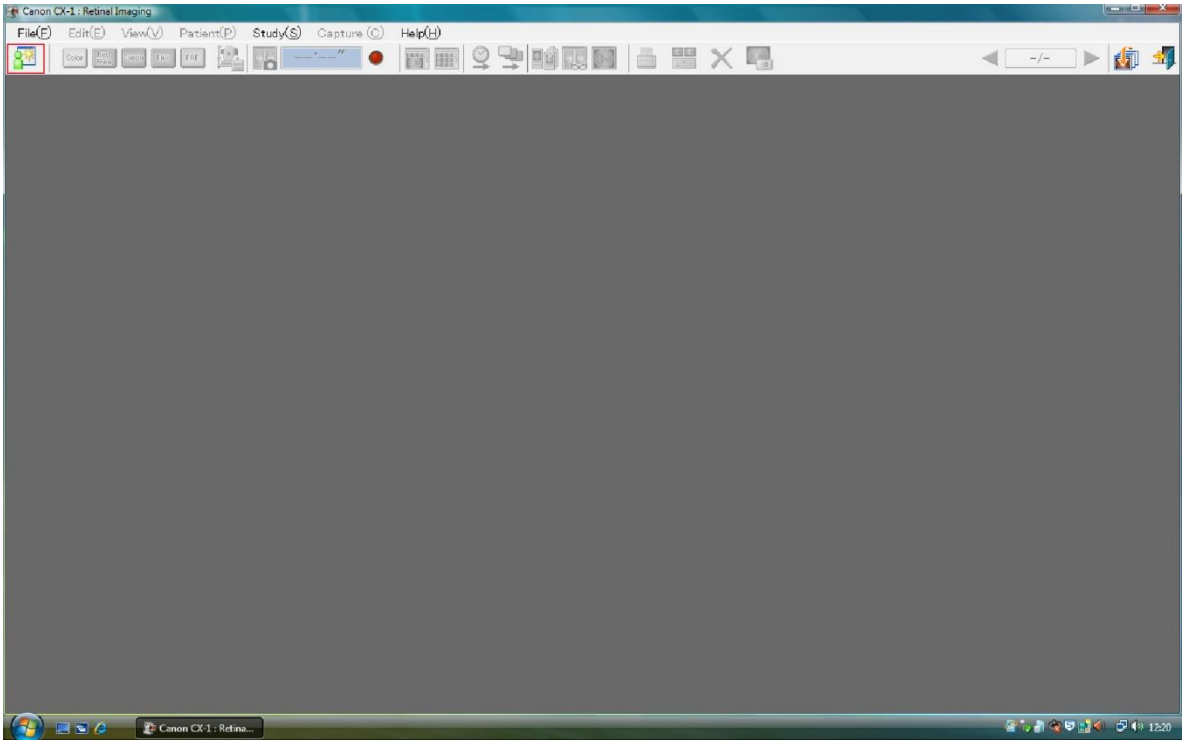
Double click the CX-1 icon 

on the desktop to launch the software.




Password is “canon”, click “Log in”

Once you are logged in you will see this window

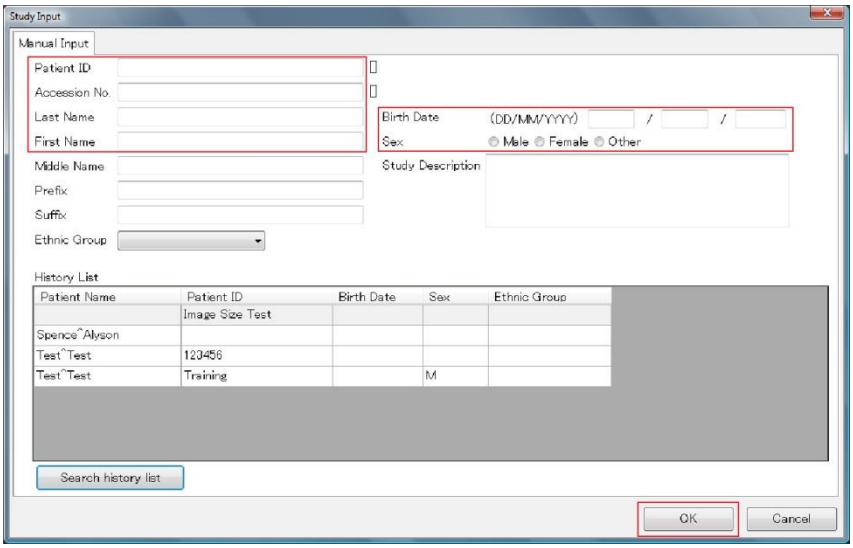



**Entering patient details**

To enter a new patients details or to select an existing patient click on this icon

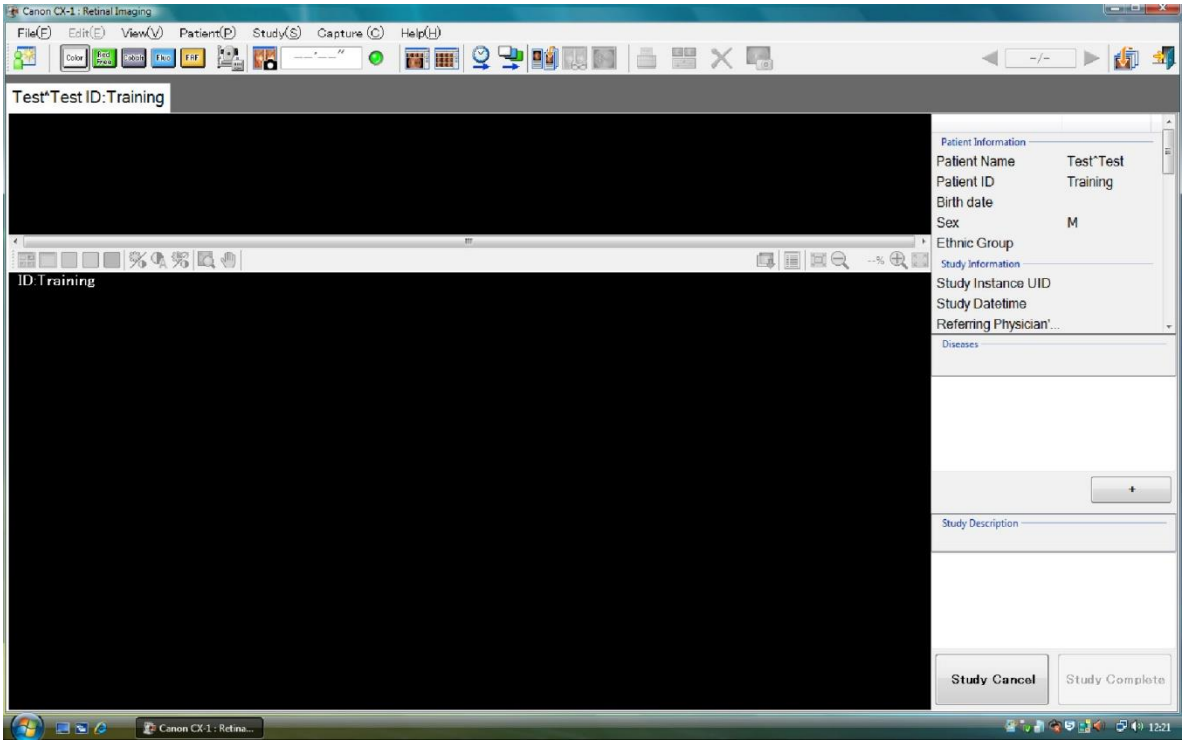
Ensure correct patient details are entered

Participant ID,




Click “OK” to proceed.

You will then be presented with the capture window as below




**Procedure**

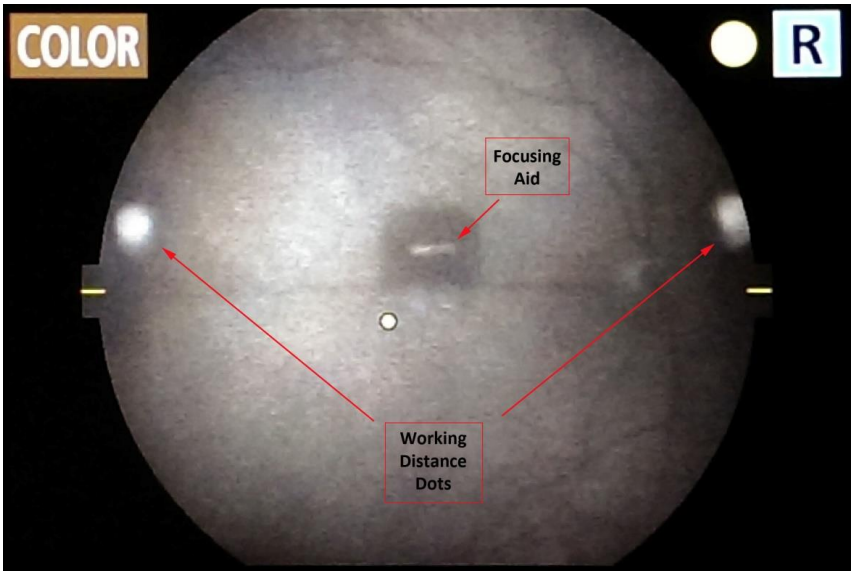
Clean participant contact areas with the alcohol wipes prior to any measurements

When you have made your patient comfortable, by adjusting the table and chinrest height, you are ready to capture the shot.

Ensure camera is in Non-Myd mode select which capture mode you want to use, e.g. colour.

1. Move the camera forward towards the patient while centring on the pupil.
2. As you get closer you will begin to see the retina
3. At this point it is important to make small adjustments in all directions using the joystick. This includes rotating the joystick to raise and lower the camera
4. As your get closer still you will see an image on the back of the camera similar to that in the figure below

5. If you have correctly lined up on the pupil and are at the correct working distance, you should now see two white dots along a mid-horizontal line, one on the left and one on the right. These are the working distance dots. If these are visible then the camera-patient distance is correct and the alignment is also correct
6. The next thing you need to check is the focus. This is adjusted using the focus knob on the side of the camera
7. While in the Non-Myd mode you have the assistance of the focus bar which is visible on the back of the camera and in the figure below. Rotate it until the bar lines up
8. When you have all these things adjusted, working distance/alignment dots and focus, simply press the trigger on top of the joystick




Required Pictures

**Field 1M** - Optic Disc centered stereo pair right and left eye.

Centre optic disc on screen

Move joystick as far to the left as possible while maintaining good even lamination.

Take shot move to right and repeat procedure

Stereo images are captured with a lateral movement of the camera between the two shots

**Field 2-** Macula centered stereo pair right and left eye

Centre macula on screen

Move joystick as far to the left as possible while maintaining good even lumination..

Take shot move to right and repeat procedure.

Stereo images are captured with a lateral movement of the camera between the two shots

**Fundus Reflex Photo** - Anterior segment image right and left eye-

Move camera back from participant

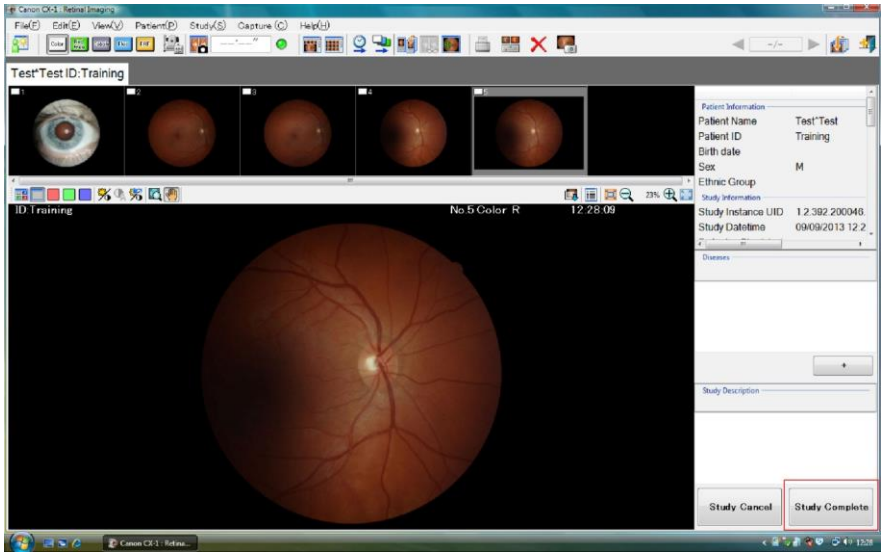
Move diopter compensation lens selector to + position

Move camera forward, centre and focus the mage on the pupil while the participant is looking straight ahead.

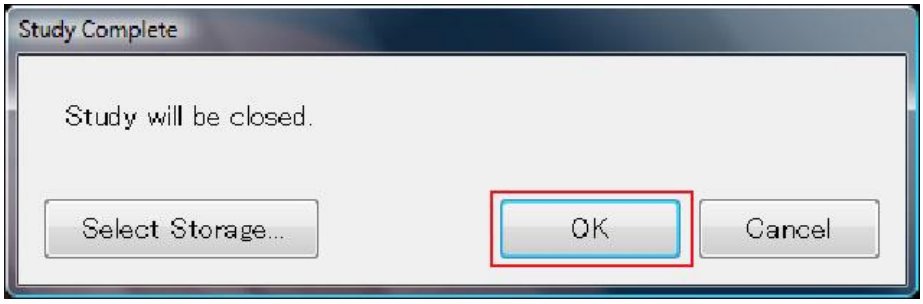
Take shot

You need to save what you have captured

Click on the “Study Complete” button




Then click “OK”




System shutdown

Turn off camera
Turn off PC