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Appendices

Appendix 1 GP Questionnaire

**DIABETIC RETINOPATHY SCREENING STRUCTURED INTERVIEW QUESTIONS.**

**Diabetes Registry and Referral process for Eye Screening.**

### A. Diabetes Registry

1. Is there a register of patients with Diabetes maintained at this health centre?
   - [ ] Y
   - [ ] N
   - [ ] E
   
2. How is this kept?
   - [ ] Book
   - [ ] Electronic Database
   - [ ] Others
   
3. Is there a dedicated personnel responsible in managing the registry?
   - [ ] Y
   - [ ] N
   
4. When was the registry started?
   
5. What information are recorded in the diabetes register? (Please provide a copy of data collection sheet)

6. Is there a protocol in use in registering patients with Diabetes into the register at this health centre?
   - [ ] Y
   - [ ] N
   - [ ] E
   
7. Are all patients with diabetes reviewed at this health centre registered into the Diabetic registry?
   - [ ] Y
   - [ ] N
   - [ ] E
   
8. Are all the information recorded in the registry (in Q5) kept up to date?
   - [ ] Y
   - [ ] N
   - [ ] E

9. If yes, how often is it updated?
   - Weekly
   - Monthly
   - Annually
   - Others

10. Is the diabetic register used to invite patients to attend eye screening?
    - [ ] Y
    - [ ] N
    - [ ] E

### B. Referral for Eye Screening

11. Are all patients with diabetes reviewed at this health centre referred for eye screening?
    - [ ] Y
    - [ ] N
    - [ ] E

12. Are the patients with diabetes reviewed at this health centre exclusively referred for eye screening at this health centre? 
    - [ ] Y
    - [ ] N
    - [ ] E

13. Are you informed about whether or not your patients have attended eye screening?
    - [ ] Y
    - [ ] N

14. Is there a waiting list for any diabetic patients to undergo DR eye screening in your health centre?
    - [ ] Y
    - [ ] N

15. Is there any referral guidelines in use for diabetic patients to attend eye screening?
    - [ ] Y
    - [ ] N
    - [ ] E

16. Is there a standard referral form in use to refer diabetic patients for eye screening at this health centre? 
    - [ ] Y
    - [ ] N
    - [ ] E

17. Is there an appointment booking system in use to manage eye screening appointments?
    - [ ] Y
    - [ ] N

18. Are there standard appointment cards provided to remind patients of the date and time of eye screening? 
    - [ ] Y
    - [ ] N

19. Is there a call and recall system in use to remind patients of their eye appointment at this health centre?
    - [ ] Y
    - [ ] N

Who is responsible for this, please provide details (Name, Role, Contact details)

20. Are patients at this health centre provided with the following information:
    - i. Diabetes and Eye Complications
    - ii. Importance of DR eye screening for diabetics
    - iii. The eye examination procedures conducted in DR Screening
    - If yes, how is the information conveyed?

Please provide copies of any written information provided to patients.

---

** вопросы:**

<table>
<thead>
<tr>
<th>Q1</th>
<th>Q2</th>
<th>Q3</th>
<th>Q4</th>
<th>Q5</th>
<th>Q6</th>
<th>Q7</th>
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</tbody>
</table>
Appendix 2 Diabetic Retinopathy Screening Team Questionnaire

Health centre based DR Screening Programme: Screening pathway, DR grading and organisation of services

A. Screening and Grading Pathway

1. Are patients sent reminders to attend DR screening clinics at this health center?
   - Y
   - N (If no, mark 'E' and go to Q4)

2. How is the reminder system set up?
   - (Name, Role)

3. Are patients required to pay for undergoing DR screening?
   - Y
   - N (If no, go to Q7)

4. If yes, how much is it?
   - $ ____________________________

5. Who is responsible for receiving payments?
   - (Name, Role)

6. Is the patient’s case history taken before examination?
   - Y
   - N (If no, mark 'E')

7. If yes, what information is collected?
   - (Please provide data collection sheet)

8. Which DR grading classification is in use at this health center?
   - (Please state)

9. How are findings of the eye screening test examination recorded? (Case history, VA, Funduscopy, etc.)
   - Case note
   - Form
   - Electronic
   - Others
   - (Please state, ______________________)

10. Are all patients informed immediately of the screening outcome?
    - Y
    - N (If no, mark 'E')

11. Are GPs informed of the screening outcomes?
    - Y
    - N (If no, mark 'E')

   If yes, how is this done?
   - Case notes
   - Letter
   - Telephone
   - Email
   - Others
   - (Please specify, _____________________)

12. Are all screening attendances recorded?
    - Y
    - N (If no, mark 'E')

   If yes, how are these kept?
   - Book
   - Electronic

13. Are there measures to verify screening outcomes in use at this health centre?
    - Y
    - N (If no, mark 'E')

14. Are patients at this health centre provided with the following information:
    - i. Diabetes and Eye Complications
    - ii. Importance of DR eye screening for diabetics
    - iii. The eye examination procedures conducted in DR Screening

   If yes, how is the information conveyed?
   - Written
   - Verbal
   - Video
   - Counselling
   - (Please provide copies of any written information provided to patients)

B. Organisation of services

15. Please tick the current DR screening sessions conducted at this health center.
   - Monday
   - Tuesday
   - Wednesday
   - Thursday
   - Saturday

16. How many patients are screened per session at this health centre?

17. Is there a dedicated room for DR eye screening in this health center?
    - Y
    - N (If no, mark 'E')

18. Is the eye examination room equipped with the following:
    - Visual Acuity Charts
    - Slit-Lamp Biomicroscopy
    - 90D Lens
    - Ophthalmoscopy
    - Others
    - (Please specify, ______________________)

19. Who is involved in DR screening at this health centre?
    - Ophthalmologists
    - Ophthalmic Nurse
    - Ophthalmic Assistant
Appendix 3 NEC Questionnaire

Clinical management of referred DR cases at RIPAS Hospital

A. Evaluation of referred DR cases

1. Do the majority of the patients referred from the screening programme require:
   - Laser treatment
   - Re-evaluation
   - Referral

2. Have suspected DR cases referred to the National Eye Centre?

3. Is the patient’s case history taken before examination?

4. How is the case history recorded?

5. Is Visual Acuity test carried out on all patients referred to this hospital?

6. Are all referred patients instilled eye drops for dilatation before fundus examination?

7. What equipments are used to conduct fundus examinations for evaluating referred cases?

   - Slit Lamp Biomicroscopy
   - Fundus Photography
   - Fundus Fluorescent Angiography
   - Optical Coherence Tomography
   - Others (Please state)

8. What classification is used to grade DR severity? (Please state)

9. What classification is used to grade MD severity? (Please state)

10. What are the eye examination test results recorded?

11. Are referred cases provided with the following information:

   - Details and type of complications
   - Importance of DR screening/or diabetes
   - The eye examination procedures conducted at DR screening

   If yes, how is the information conveyed? (Please state)

12. Are the following statistics being kept at the NEC?

   - Number of referrals made to the NEC
   - Number of referred DR cases
   - Number of further evaluation of referred cases
   - Number of false positive cases referred to NEC
   - Number of non-attendances of referred suspected cases

13. Is there a reporting mechanism in use to inform the DR screening programme of the eye examination test results?

14. Are all referred patients provided with the following information when they are referred to the hospital?

   - Diabetes and eye complications
   - Importance of DR eye screening for diabetics
   - Diabetes and eye complications
   - DR Grading Classification
   - Eye examination procedures conducted in DR screening

   If yes, how is this done?

15. Are referred patients given counseling on diabetic eye care when they are referred to the hospital?

16. Are the following Statistics being kept at the NEC?

17. Are all referred patients given counseling on diabetic eye care when they are referred to the hospital?

18. Is the patient's case history taken before examination?

19. What are the average number of sessions and duration for laser treatment for:

   - Visual Acuity
   - Other helper
   - Fundus Fluorescent Angiography
   - Optical Coherence Tomography
   - Others (Please state)

20. Are all referred patients instilled eye drops for dilatation before fundus examination?

21. What tests are conducted before laser treatment is conducted?

   - Visual Acuity
   - Other helper
   - Fundus Fluorescence Angiography
   - Optical Coherence Tomography
   - Others (Please state)

22. What texts are conducted before laser treatment is conducted?

23. What are the average number of sessions and duration for laser treatment for:
# Topic Guide for Semi-Structured Interview

<table>
<thead>
<tr>
<th>Pre-amble</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Introduce study (aim and objective; explain the purpose of the interview).</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Screening pathway</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Screening pathway</strong></td>
</tr>
</tbody>
</table>
| includes all activities conducted to deliver DR screening programme from identification at risk population (all registered diabetics at 1. Describe what works well in the existing screening pathway?  
2. Describe what is beneficial for the patient/health service in the existing screening  
3. a. Describe where are the difficulties for patients/health service in the existing b. What changes have been implemented to address these challenges?  
4. Suggest ways of improving the existing screening pathway? |

<table>
<thead>
<tr>
<th>Grading pathway</th>
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<tbody>
<tr>
<td><strong>Grading pathway</strong></td>
</tr>
</tbody>
</table>
| directs the appointed screening personnel (screener) in determining which DR cases should be referred or not and also to establish  
1. Describe what works well in the existing grading pathway?  
2. Describe what is beneficial for the patient/health service in the existing grading  
3. a. Describe where are the difficulties for patients/health service in the existing b. What changes have been implemented to address these challenges?  
4. Suggest ways of improving the existing grading pathway? |

<table>
<thead>
<tr>
<th>Clinical management</th>
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<tbody>
<tr>
<td><strong>Clinical management</strong></td>
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</tbody>
</table>
| guides the Ophthalmologist on the appropriate clinical ophthalmic treatment (pan retinal/focal laser photocoagulation/Vitreo-retinal surgery) of detected cases (STDR and ME) once they have been referred from  
1. Describe what works well in the existing clinical management of DR?  
2. Describe what is beneficial for the patient/health service in the existing clinical  
3. a. Describe where are the difficulties for patients/health service in the existing b. What changes have been implemented to address these challenges?  
4. Suggest ways of improving the existing clinical management of DR? |

<table>
<thead>
<tr>
<th>Organisation of DR Screening</th>
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</thead>
<tbody>
<tr>
<td><strong>Organisation of DR Screening</strong></td>
</tr>
</tbody>
</table>
| refers to the allocation of resources for at each health institution including infrastructure, human resources and consumables,  
1. Describe what works well in the organization of existing DR screening?  
2. Describe what is beneficial for the patient/health service in the organization of  
3. a. Describe where are the difficulties for patients/health service in the organization b. What changes have been implemented to address these challenges?  
4. Suggest ways of improving the organization of existing DR screening? |

<table>
<thead>
<tr>
<th>Rounding off</th>
</tr>
</thead>
</table>
| - Any other relevant issues they may want to add  
- Can they recommend other candidates to be interviewed?  
- Present contact details for follow up |
Our Ref: MHREC/MOH/2013/18(16)

To:
Pg Hj Md Kahrol Asmee Hj Sabtu
Pegawai Mata dan Ahli Kaji Glaucoma
Bahagian Ophthalmology (Mata)
RIPAS Hospital
Kementerian Kesihatan
Negara Brunei Darussalam

Dear Pg Hj Md Kahrol Asmee;

Re: Cost Effectiveness of Diabetic Retinopathy (DR) Screening in Brunei Darussalam

14th August 2013
7 Syawal 1434

Thank you for applying for ethical review of your proposal entitled above. All documents that you have submitted on 7th August 2013 were reviewed.

The MHREC has approved your study from the ethical perspective. This approval is given for the proposed duration of your study or one calendar year from the date of this letter, whichever is shorter. If you are unable to complete your study within this period, please submit an application for extension at least 2 months before the expiry of the original MHREC approval. However, to facilitate extension of ethical approval after 1 year, you are required to submit an annual report. Please also notify the MHREC of any changes to the design of your study and inform us immediately of any adverse incidents.

I would like to wish you all the best with your study and would be grateful of if you could forward us a summary of your findings for our records.

Yours faithfully,

Dr Alice Yong
Interim Chairperson
Research & Ethics Committee

CC: 1. Acting Director General of Medical Services.
2. Director General of Health Services.
3. Timbalan Setiausaha Tetap (Professional & Technical).
4. Setiausaha Tetap.

TAT/AWML
Appendix 6 LSHTM Ethics approval

London School of Hygiene & Tropical Medicine
Keppel Street, London WC1E 7HT
United Kingdom
Switchboard: +44 (0)20 7636 8636
www.lshtm.ac.uk

Observational / Interventions Research Ethics Committee

Research Degree Student
CR / ITD
LSHTM

30 August 2013

Dear Mr. Sabtu,

Study Title: Evaluation of Diabetic Retinopathy Screening in Brunei Darussalam
LSHTM ethics ref: 6463

Thank you for your letter of 29 August 2013, responding to the Observational Committee’s request for further information on the above research and submitting revised documentation.

The further information has been considered on behalf of the Committee by the Chair.

Confirmation of ethical opinion

On behalf of the Committee, I am pleased to confirm a favourable ethical opinion for the above research on the basis described in the application form, protocol and supporting documentation as revised, subject to the conditions specified below.

Conditions of the favourable opinion

Approval is dependent on local ethical approval having been received, where relevant.

Approved documents

The final list of documents reviewed and approved by the Committee is as follows:

<table>
<thead>
<tr>
<th>Document</th>
<th>Version</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>LSHTM ethics application</td>
<td>n/a</td>
<td></td>
</tr>
<tr>
<td>Protocol</td>
<td>V3</td>
<td>13/08/2013</td>
</tr>
<tr>
<td>Information Sheet &amp; Consent form</td>
<td>V3</td>
<td>12/08/2013</td>
</tr>
<tr>
<td>Appendix 1: Diabetic Retinopathy Screening Structured Interview Questions</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Appendix 2: Costing templates</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Appendix 4: Guiding questions for interviewing respondents</td>
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</tbody>
</table>

After ethical review

Any subsequent changes to the application must be submitted to the Committee via an E2 amendment form. All studies are also required to notify the ethics committee of any serious adverse events which occur during the project via form E4. At the end of the study, please notify the committee via form E5.

Yours sincerely,

Professor John DH Porter
Chair
ethics@lshtm.ac.uk
http://intra.lshtm.ac.uk/management/committees/ethics/

Improving health worldwide

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Appendix 9 Consent form used in this study

Disability Group
London School of Hygiene & Tropical Medicine
Keppel Street, London WC1E 7HT
United Kingdom
Switchboard: +44 (0) 20 7636 8636
www.lshtm.ac.uk
www.iceh.org.uk

Evaluation of Diabetic Retinopathy (DR) Screening in Brunei Darussalam

Consent form for Interview respondents

Investigator’s name and contact details:
Pg Hj Md Khaire Asmee Bin Pg Hj Sabtu
Doctor in Public Health candidate
International Centre for Eye Health
Clinical Research Unit
Faculty of Infectious Disease
London School of Hygiene and Tropical Medicine
Keppel Street WC1E 7HT
Tel: +44 (0) 20 7958 8359 (UK)
+673 87198983 (Brunei)
Email: khoaiol.sabtu@lshtm.ac.uk

To be completed by the participant:

(Please tick as appropriate)
1. I have read the information sheet regarding this study and I fully understood what is expected of me if I decide to take part.
2. The researcher has answered and clarified any doubts that I have pertaining to this study
3. I understand that at any time I may withdraw from this study without giving any reason
4. I agree to take part in this study
5. Please tick one of the following:
   a. I give my permission for the interview to be recorded.
   b. I do not give my permission for the interview to be recorded.
6. I have read and fully understood the following statement regarding anonymity and confidentiality and agree to take part in this study acknowledging the potential risk that I may face as a result of my participation.

   "While the above procedures will maintain anonymity, it is possible I could still be identified during the presentation of results (in reports and meetings) due to the small numbers of participants in this study and due to my unique role in the Ministry of Health. In addition, my participation may still be identified through the people around me in the work place and by my presence at meetings. I acknowledge that the researcher cannot guarantee me that people accessing resultant reports, meetings and publications will not be able to identify me. I have also been made aware that due to the dependency of the analysis in this study on comparing the perspectives of various stakeholders, it will not be possible for the researcher to limit the presentation of results to the whole group.

Name of interviewee:…………………………………………………………………………
Signature:…………………………………………………………………………
Date:…………………………………………………………………………
E-Mail:…………………………………………………………………………

Improving health worldwide
Appendix 10 Information used in this study

Disability Group
London School of Hygiene & Tropical Medicine
Keppel Street, London WC1E 7HT
United Kingdom
Switchboard: +44 (0) 20 7636 8636
www.lshtm.ac.uk
www.iceh.org.uk

Participation
As key personnel to the DR screening programme, you have been invited to participate in an interview aimed at understanding the processes and organisation of the existing diabetic retinopathy screening programme in the Brunei-Muara district. The interview will take no longer than 45 minutes and will be conducted at a time and place that is convenient to you. Your participation in this study is entirely voluntary, and you may choose to withdraw in any point of this study. Should you agree to participate, we would like to record the interview and have it transcribed to aid in our analysis. However, it is your choice to make, should you prefer the interview NOT to be recorded. In which case the interview will take hand-written notes throughout the course of the interview.

Confidentiality
Throughout the study, we will ensure that your identity will be anonymised. However, we cannot guarantee complete anonymity due to the small numbers of participants in this study, your unique role in the Ministry of Health, it is possible that you could still be identified during the presentation of results (in reports and meetings), through the people around you in the work place where the study is being conducted and through your presence at meetings. Furthermore, as the analysis in this study is dependent upon the comparisons of the different perspectives of various stakeholders, it will not be possible for us the to limit the presentation of results to the whole group/department.

Ethical approval and funding
This study has been approved by the Medical and Health Ethics Committee, Ministry of Health Brunei and the London School of Hygiene and Tropical Medicine (LSHTM) and is funded by the Ministry of Health, Brunei Darussalam as part of the Brunei Government scholarship to undertake the DrPH programme at LSHTM.

Further Information
Should you have any enquiries regarding the study or require further information, please do not hesitate to get in contact.

Pg Hj Md Khairol Asmee Bin Pg Hj Sabtu
Doctor in Public Health candidate
International Centre for Eye Health
Clinical Research Unit
Faculty of Infectious Disease
London School of Hygiene and Tropical Medicine
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Doctor in Public Health candidate
International Centre for Eye Health
Clinical Research Unit
Faculty of Infectious Disease
London School of Hygiene and Tropical Medicine
Keppel Street WC1E 7HT

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+673 87198983 (Brunei)
Appendix 11 System map of DR screening in Brunei-Muara
### Appendix 12 Comparison between Organised and Opportunistic Screening

**Table 1**

<table>
<thead>
<tr>
<th>Aspect of screening</th>
<th>Organized screening</th>
<th>Opportunistic screening</th>
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<tbody>
<tr>
<td>Screening method for a particular type of cancer (e.g., FOBT vs. F5)</td>
<td>fixed: chosen by government/health department</td>
<td>Variable: chosen by individual and individual health care provider</td>
</tr>
<tr>
<td><strong>Aim</strong></td>
<td>Reduce cancer incidence/mortality/mortality at the population level</td>
<td>Reduce cancer incidence/mortality/mortality at the individual level</td>
</tr>
<tr>
<td>Sensitivity of test</td>
<td>The most sensitive test may not be chosen for a nationwide program. Sensitivity targets for practitioners and programs are established and monitored.</td>
<td>Most sensitive test usually chosen. Sensitivity at the practitioner and program level not generally monitored</td>
</tr>
<tr>
<td>Specificity of test</td>
<td>High specificity important to reduce avoidable cost from unnecessary workup of false positives and associated adverse effects</td>
<td>High specificity less important at individual level</td>
</tr>
<tr>
<td>Screening interval</td>
<td>fixed: chosen to maximize population benefit at reasonable cost</td>
<td>Variable: chosen to maximize individual’s protection against cancer morbidity/mortality: usually more frequent than in organized programs</td>
</tr>
<tr>
<td>Available financial resources</td>
<td>Limited at the population level in relation to policies of health spending taking into account all aspects of health care</td>
<td>Limited at the level of the individual, and health plan level decisions, primarily depends on finances and insurance status of the individual</td>
</tr>
<tr>
<td>Health technology assessment</td>
<td>Must have been shown to do more good than harm</td>
<td>Efficacy does not necessarily have to be demonstrated</td>
</tr>
<tr>
<td>Quality assurance</td>
<td>Set targets are to be met, and are monitored</td>
<td>Targets may be set, and may or may not be monitored</td>
</tr>
<tr>
<td>Target uptake rates</td>
<td>Specific, monitored and lower rates result in organized efforts for improvement</td>
<td>May or may not be specified (i.e., by health plans or health agencies), monitored, and few opportunities for systematic applications for population based improvement</td>
</tr>
<tr>
<td>Invited</td>
<td>fixed: all persons within a specified age range</td>
<td>Variable: persons in contact with health care professionals who recommend screening, those in particular jobs where health care coverage may include reimbursement for screening, anyone exposed to direct-to-consumer marketing</td>
</tr>
<tr>
<td>Invitation strategy</td>
<td>Active: everyone in the eligible population invited</td>
<td>Passive: no consistent strategy</td>
</tr>
<tr>
<td>Aim for equality of access</td>
<td>Equality of access built into the organization of the program</td>
<td>Equality of access is desired, but resource allocation limits the potential of outreach efforts</td>
</tr>
<tr>
<td>Relation to risk of having cancer</td>
<td>Not necessarily persons at highest risk, but the age group most likely to receive greatest benefit from screening</td>
<td>Not necessarily persons at highest risk; may lead to overscreening of low-risk and underscreening of high-risk persons</td>
</tr>
<tr>
<td>Benefits</td>
<td>Maximized for the population within available resources</td>
<td>Maximized for the individual</td>
</tr>
<tr>
<td>Harms</td>
<td>Minimized for the population within available resources</td>
<td>Not necessarily minimized</td>
</tr>
</tbody>
</table>

FOBT: Fecal occult blood test
F5: Flexible sigmoidoscopy

* Extracted from source reference (50)
### Appendix 13 Table of Quality assurance indicators used by the UK National Screening Committee

<table>
<thead>
<tr>
<th>Theme</th>
<th>Objectives</th>
<th>Minimum standard</th>
<th>Achievable Standard</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Identification of cohort</strong></td>
<td>To ensure database is accurate:</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>1. Single list of all people with diabetes and systematic call and recall from a single management system</td>
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</tr>
<tr>
<td></td>
<td>2. Comparison of DR programme database with quality management database of diabetic population</td>
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</tr>
<tr>
<td></td>
<td>3. Proportion of GP practices participating</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>4. Regular cleaning of database using national standard operating procedures (SOP)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>1. To be present</td>
<td>2. Quarterly</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2. 6 monthly</td>
<td>3. 100%</td>
<td></td>
</tr>
<tr>
<td></td>
<td>3. 6 monthly</td>
<td>4. Monthly</td>
<td></td>
</tr>
<tr>
<td><strong>Inform and Invite</strong></td>
<td>1. To invite all eligible persons with known diabetes to attend for DR screening test (Percentage of eligible population invited to screen; numerator as number of people invited during the report period plus suspensions*) Suspensions = patients already under the care of Ophthalmologists</td>
<td>1. Dependent upon analysis of existing information (Minimum standard to be set at lower quartile value and Achievable standard to be set at upper quartile value)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2. All newly diagnosed patients must be offered first screening within 3 months of the programme being notified of their diagnosis</td>
<td>2. Based on policy endorsed by programme board and recorded in minutes of meeting of programme board</td>
<td></td>
</tr>
<tr>
<td><strong>To maximise uptake</strong></td>
<td>To maximise the number of invited persons receiving the test</td>
<td>≥70%</td>
<td>≥80%</td>
</tr>
<tr>
<td></td>
<td>Proportion of those invited to screening by digital photography who have a digital screening outcome</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>To maximise performance of screening tests</strong></td>
<td>To ensure photographs are of adequate quality (Percentage of patients where gradable digital image cannot be obtained)</td>
<td>Less than 7% total un-gradable</td>
<td>Programmes should have between 2.5-6.3% total un-gradable</td>
</tr>
<tr>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td></td>
<td>To ensure grading is accurate</td>
<td>90% of grading staff are compliant</td>
<td>100% of grading staff are compliant</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>To minimise harm</strong></th>
<th>To ensure GP and patient are informed of all test results (Time between screening encounter and issuing of result letters to GP and patient)</th>
<th>0% &lt; 3 weeks</th>
<th>95% &lt; 3 weeks</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>To ensure timely referral of patients with R3 screening results (Time between screening encounter and issue of referral request)</td>
<td>95% referred within 2 calendar weeks</td>
<td>98% referred within 2 calendar weeks</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>To ensure timely consultation for all screening positive patients</strong> (Time between notification of screening positive test and consultation):</th>
<th>1. Urgent (R3M0, R3M1) 2. Routine (R2M0, R2M1, R1M1)</th>
<th>1a. 60% &lt; 2 weeks 1b. 80% &lt; 4 weeks 2a. 70% &lt; 13 weeks 2b. 95% &lt; 18 weeks</th>
<th>1. 95% &lt; 2 weeks 2. 95% &lt; 13 weeks</th>
</tr>
</thead>
</table>

| **To follow up screening positive patients (patients with referable retinopathy) (failsafe) – Timeline tracking using agreed national template** | 6 month feedback of timeline tracking results | Quarterly feedback of timeline tracking results |

| **To ensure timely biomicroscopy assessment of patients recorded as un-gradeable (maximum time between digital screening encounter and attendance for assessment by slit lamp)** | Quarterly review of timeline tracking results | Monthly review of timeline tracking results |
| Intervention/ Treatment | To ensure timely treatment of those listed by Ophthalmologists  
(Time between listing and first laser treatment following screening) |  
1. Urgent (R3M0, R3M1)  
2. Routine (R2M1, R1M1) |  
1. 90%, < 2 weeks  
2. 70%, <10 weeks |  
1. 95%, < 2 weeks  
2. 95%, < 10 weeks |
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Intervention/ Treatment</td>
<td>To minimise overall delay between screening event and first laser treatment (Time between screening encounter and first laser treatment)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
1. Urgent referrals (referred as R3M0/R3M1)  
2. Routine Referrals (referred as R2M1, R1M1) |  
1. 70%, <6 weeks  
2a. 70%, <15 weeks  
2b. 95% <18 weeks |  
1. 95%, < 6 weeks  
2. 95%, < 15 weeks |
| Outcome | To ensure regular collection of data indicating levels of new blindness due to DR | Annual report of audit results (incident cases of certifications of visual impairment and VA data using national template) | Annual report of audit results (incident cases and case reviews of certifications of visual impairment and VA data using national template) |
| Workforce and IT | To ensure that screening and grading of retinal images are provided by a trained and competent workforce |  
100% of staff (graders and image takers) qualified to national qualification standards |  
100% of all staff qualified to national qualification standards |

* R0 – No DR, R1 – Background DR, R2-Pre-proliferative DR, R3 – Proliferative DR, M0 – No Maculopathy, M1 – Maculopathy present (Grading based on National Screening Committee UK Guidelines)(34)
### Appendix 14 REPAS Grading system

<table>
<thead>
<tr>
<th>Grade</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>No diabetic retinopathy</td>
</tr>
<tr>
<td>1</td>
<td>Mild NPDR</td>
</tr>
<tr>
<td>2</td>
<td>Moderate NPDR</td>
</tr>
<tr>
<td>3</td>
<td>Severe NPDR</td>
</tr>
<tr>
<td>4</td>
<td>PDR</td>
</tr>
<tr>
<td>5</td>
<td>Cicatricial DR</td>
</tr>
<tr>
<td>9</td>
<td>No view</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Grade</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>No apparent macular oedema</td>
</tr>
<tr>
<td>1</td>
<td>Mild macular oedema</td>
</tr>
<tr>
<td>2</td>
<td>Moderate macular oedema</td>
</tr>
<tr>
<td>3</td>
<td>Severe macular oedema</td>
</tr>
<tr>
<td>9</td>
<td>No view</td>
</tr>
</tbody>
</table>

Extracted from the Brunei National Program for the Prevention of Diabetic Blindness Guideline (1)
Appendix 15 Brunei National Protocol for Management of Diabetic Eye Disease 2011

BRUNEI NATIONAL PROTOCOL FOR MANAGEMENT OF DIABETIC EYE DISEASE 2011

PURPOSE
The primary purpose of evaluating and managing diabetic retinopathy is to prevent, retard, or reverse visual loss, thereby maintaining or improving vision-related quality of life.

GOALS
1. Identify patients at risk of developing diabetic retinopathy
2. Encourage involvement of the patient and primary care physician in the management of the patient's systemic disorder, with specific attention to control of blood sugar (hemoglobin A1c), blood pressure, and serum lipids
3. Encourage and provide lifelong evaluation of retinopathy progression
4. Treat patients at risk for visual loss from diabetic retinopathy
5. Minimize the side effects of treatment that might adversely affect the patient's vision and/or vision-related quality of life
6. For patients with visual impairment from the disease, either provide visual rehabilitation services or refer the patient for such services

CARE PROCESS
The care process for diabetic retinopathy includes

1. Medical history
2. Ophthalmic examination
3. Diagnosis
4. Treatment
5. Vigilant follow-up
6. Counseling / referral

1. MEDICAL HISTORY
1. Duration of diabetes
2. Past glycemic control (hemoglobin A1c)
3. Medications
4. Medical history (e.g., obesity, renal disease, systemic hypertension, serum lipid levels, pregnancy)
5. Ocular history (e.g., trauma, ocular injections, surgery, including laser treatment and refractive surgery)

2. OPHTHALMIC EXAMINATION
The initial examination should include the following elements:
1. Visual acuity
2. Slit-lamp biomicroscopy
3. Intraocular pressure
4. Gonioscopy when indicated
5. Dilated fundoscopy including stereoscopic examination of the posterior pole
6. Examination of the peripheral retina and vitreous

Annexure 2
**Appendix 16 DER Form 1**

### DIABETIC EYE REGISTRY

**S/N:**

Note: This data sheet is to be filled for all diabetic patients attending Ophthalmology clinic for any reason. Where check boxes are provided, check (v) one or more options. Where circle buttons are provided, check (v) one option only.

1. **Name of the patient:**
2. **IC:**

3a. **Town:**
3b. **District:**

4. **Date of Birth:** (dd/mm/yy)

5. **Gender:**
   - Male
   - Female

6. **Ethnic group:**
   - Malay
   - Chinese
   - Others (specify)

7. **Type of DM:**
   - Type I
   - Type II

8. **Duration of DM:**

9. **Treatment:**
   - Oral medication
   - Insulin
   - Diet Control

10. **Systemic co-morbidity:**
    - None
    - Renal impairment
    - Hypercholesterolemia
    - Peripheral neuropathy
    - HTN
    - IHF
    - CVA
    - Other, specify

11. **Risk factors:**
    - Smoking
    - Pregnancy

12. **Ocular co-morbidity:**
    - None
    - Cataract
    - Glaucoma
    - Other, specify

13. **Previous eye examination:**
    - Yes
    - No

### SECTION 2: OCULAR FINDINGS AND MANAGEMENT

#### a) Right eye

1. **Visual acuity:**
   - Unaided
   - With glasses/ Pin hole:

2. **Intraocular pressure:**
   - mmHg

3. **Fundus examination:**

   - R
   - E
   - P
   - A
   - S

#### b) Left eye

1. **Visual acuity:**
   - Unaided
   - With glasses/ Pin hole:

2. **Intraocular pressure:**
   - mmHg

3. **Fundus examination:**

   - R
   - E
   - P
   - A
   - S

### Plan:

- Routine follow up as scheduled
- Needs further assessment (e.g. FFA)
- Needs procedures:
  - Needs laser
    - Focal
    - Grid
    - PRP
  - Needs Avastin
  - Needs Vitreo-retinal surgery
- Other, state:

* Source: Reference number (122)