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A model of culturally-informed integrated diabetes education and eye screening in indigenous primary care services and specialist diabetes clinics: Study protocol

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Title: A model of culturally-informed integrated Diabetes Education and Eye Screening in Indigenous primary care services and specialist diabetes clinics:Study protocol

Running head

integrated indigenous diabetes education and eye screening

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Article type : Protocol

Abstract

Aims:

To improve diabetes management in Indigenous Australians using an integrated nurse-led model of diabetes education and eye screening in indigenous primary care and specialist diabetes clinics

Design:

A pre-post study

Methods:

This study will be implemented in indigenous primary care and specialist diabetes clinics in Victoria, Australia. Participants recruited to the study will be existing adult patient with diagnosed diabetes attending study sites. A nurse-credentialled diabetes educator and certified retinal imager will deliver three study components: (i) retinal photography as a diabetic retinopathy screening and patient engagement tool and (ii) lifestyle and behaviour surveys, administered at baseline and at the final visit, within 12 months. Findings from the surveys and participants' retinal images will be used to guide (iii) personalized diabetes education. The primary outcomes are participant adherence to diabetic eye screening recommendations and health service diabetic retinopathy screening coverage. Secondary outcomes are baseline DR prevalence and changes in clinical and lifestyle risk factor levels, diabetes knowledge and satisfaction with diabetes care.

Discussion

Compared with non-indigenous Australians, Indigenous Australians have a high prevalence of diabetic retinopathy and blindness, low adherence to eye screening recommendations and suboptimal health literacy. Nurse-credentialled diabetes educators can be trained to incorporate retinal imaging and eye screening into their clinical practice to provide image-based diabetes education to facilitate diabetic retinopathy management.

Impact:

Credentialed nurse diabetes educators who integrate eye screening and diabetes education can facilitate timelier diabetic retinopathy screening, referral pathways and treatment of sight-threatening retinopathy. We believe that this model of integrated diabetes education and eye screening will also improve adherence to eye screening recommendations, population screening coverage, health literacy, risk factor levels and diabetes self-care.

Clinical Trial Registration: ANZCTR1261800120435

Keywords:

indigenous, advanced nursing, diabetes, diabetes education, eye care, diabetic retinopathy screening, specialist diabetes clinics

Introduction

Diabetes and its chronic complications disproportionately affect populations in low to middle-income regions (Jennifer et al., 2019) racial and ethnic minority groups (Thornton et al., 2020), including Indigenous Australians (Australian Institute of Health and Welfare, 2020). A serious complication of diabetes is diabetic retinopathy (DR), which if left untreated, can lead to impaired vision or blindness (Estevez, Howard, Craig, & Brown, 2019). As DR is usually asymptomatic, particularly in the early stages and DR-related vision loss is largely avoidable, DR screening is an essential risk management strategy.

Background

The ophthalmic workforce remain at the frontline of DR screening globally and have increased their delivery of outreach services and use of supplementary telehealth and mobile technologies (Atkinson-Briggs et al., 2019). However, as the number of people with diabetes worldwide is growing, the global ophthalmic workforce is too small and concentrated in the urban regions of developed countries to remain the sole frontline provider of DR screening globally (World Health Organisation, 2019).

In Australia, DR screening is largely performed by an urban and ophthalmic workforce. Despite this, DR screening coverage for non-Indigenous Australians was 78% in 2016 (Foreman, 2017) above the 75% “acceptable coverage” benchmark used in the mature United Kingdom DR screening program (Scanlon, 2017). However, Indigenous Australians fall short of this target, with only a 53% DR screening coverage in 2016 (Foreman, 2017). This highlights an ongoing screening gap between Indigenous and non-Indigenous Australians, which needs to be addressed.

An integrated model of diabetes care has been successful in including diabetes education in frontline diabetes management through the evolution of the profession of credentialed diabetes

educators (CDEs), who educate and motivate people with diabetes to meet their diabetes management goals (Australia Diabetes Educators Association, 2020). As DR is the most common and feared complication of diabetes, an important diabetes management goal is regular screening for DR and related vision loss. CDEs who are also trained as retinal imagers are well-placed to include DR screening in their scope of practice and clinical service to help improve screening coverage among Indigenous Australians.

This paper describes a study protocol for a novel model of integrated DR screening and diabetes education that will be incorporated into routine clinical care to increase DR screening coverage among patients with diabetes, specifically Indigenous Australians and improve patient engagement with their diabetes self-management. We hypothesise that this new model of care which integrates DR screening and diabetes education into a single service, will increase DR screening coverage, patient self-management, diabetes risk factor control and ultimately improve clinical outcomes.

Methods/designs

Aim and objective

1. To develop and test a novel model of culturally informed integration of DR screening and diabetes education in Indigenous primary healthcare services and specialist diabetes clinics.
2. To determine the baseline prevalence of DR and impaired vision in this population.
3. To determine if integrating DR screening and diabetes education will improve:
 - i) patient adherence to DR screening recommendations,
 - ii) DR screening coverage rates in Indigenous primary healthcare services and specialist diabetes clinics
 - iii) patient risk factor control (blood pressure [BP], HbA1c levels, body mass index [BMI] and smoking) These risk factors are national key performance indicators for Indigenous primary healthcare services (Australian Institute of Health and Welfare, 2019)
 - iv) metabolic control (BP, Hba1c, weight, BMI, cholesterol and triglyceride),
 - v) patient health literacy and
 - vi) patient satisfaction with diabetes care.

Two key sub-studies will capture: (1) patient DR and impaired vision prevalence, patient adherence to DR screening recommendations and primary health service DR screening uptake; and (2) identify patient health literacy, clinical and biochemical risk factors, lifestyle risk factors, social and emotional wellbeing and perceived barriers and motivators to access and follow-up services; and patient satisfaction with diabetes care.

Study design, participants and interventions

This is a non-randomised, pre-post study in a single group, using both qualitative and quantitative approaches. At least five Indigenous primary health care and specialist diabetes clinics that manage diabetes and DR in Indigenous and non-Indigenous Australians in Victoria, Australia, have been approached as potential study sites. Health service board written approval has been obtained from five sites.

Recruitment

A total of 250 adults diagnosed with Type 1 or Type 2 diabetes will be recruited through these health services, with a maximum 12month follow-up period. The interventions will be delivered twice: at baseline and at the second visit at 12 months or sooner (e.g., 3 or 6 months), based on the initial retinal grading report recommendations for follow-up.

The following methods will be used to identify potential participants:

1. Medical electronic health records (EHR) to identify eligible potential participants diagnosed with Type 1 or Type 2 diabetes who are overdue for annual eye checks and an annual diabetes cycle of care.
2. Advertising, including presentations at community health promotion events, clinical staff meetings, flyers, notices and social media.
3. Direct approaches, such as talking (“yarning”) to patients as they present for diabetes education, opportunistically from clinic waiting rooms, telephoning and sending text messages (SMS) and recall letters to potential participants.
4. Referrals from general practitioners, endocrinologists, diabetes educators, nurses, allied healthcare clinicians and stakeholders.

Inclusion criteria

Participants must be adult patients of the partner primary health service and specialist diabetes clinic, have been diagnosed with Type 1 or Type 2 diabetes, able to provide written informed consent, able to effectively undergo retinal imaging and agree to complete the study surveys. They must also consent to providing relevant clinical information and be willing to return in 12 months’ time (or sooner if recommended based on their ocular health), for the final visit.

Exclusion criteria

Patients are ineligible if they do not have a diagnosis of Type 1 or Type 2 diabetes, are frail or have cognitive dysfunction prior to study commencement.

Interventions

Figure 1, 2 and 3: outline the process for DR screening and diabetes education. At baseline, the study will be explained to potential participants and written informed consent obtained, before commencing:

1. Collection of patient demographic and clinical data including age, sex, BP, HbA1c, weight, BMI, triglycerides, diabetes duration and diabetes medications. The date of the last eye examination and any significant ocular history (surgery, trauma) will also be collected.
2. Test visual acuity (starting with the right eye) using a Snellen chart, or if the patient has low reading ability or poor English, the Tumbling E chart. Presenting vision will be recorded either unaided or aided by spectacles. If presenting vision is unaided, but the participant uses spectacles, then visual acuity with spectacles will also be tested and recorded. If the visual acuity is 6/9 or worse, visual acuity will be measured using the pinhole technique.
3. Dilation of pupils: If the pupil diameter is less than 4 mm, the participant will be sat in a dark room, or in minimal light for up to ten minutes, to allow physiological dilation. The participant will be shown a picture illustrating the difference between dilated and undilated pupils (Supplementary Figure 1) and reassured that this is necessary to ensure that the images taken of their retinas are more likely to be of good quality and gradable.
4. Administer surveys: While waiting for the participant's pupils to dilate, the Diabetes Knowledge (Eigenmann, Skinner, & Colagiuri, 2011), adapted SNAPE (smoking, nutrition, alcohol, physical activity, emotional wellbeing)(Brazionis, Jenkins, Keech, Ryan, & Bursell, 2017) (Figure 4) and the Diabetes Treatment Satisfaction (Bradley, Plowright, Stewart, Valentine, & Witthaus, 2007) (Figure 5) surveys will be administered to assess the participant's diabetes health literacy, their diabetes management concerns and satisfaction with diabetes care. This will also provide the opportunity to use semi-structured open-ended "yarning"(Bessarab & Ng'Andu, 2010) with the patients to gain a better understanding of any other health-related issues, to gauge understanding and to build trust and rapport (Rheault, Coyer, Jones, & Bonner, 2019). Yarning will also empower patients to be actively engaged in discussions about their health (Durey et al., 2016) and to encourage adherence to healthcare treatment regimens (Jennings, Bond, & Hill, 2018). These surveys will be readministered, at the final visit.
5. Prepare the patient for retinal imaging: Once the pupils are 4 mm or greater in diameter, retinal imaging will be performed. The participant should be in a comfortable upright position, with their chin resting securely in a chinrest and their forehead resting against the headrest of the retinal camera system frame to minimise head movements. Once the person is comfortable, imaging will commence. The participant will be asked to look at the green

light in the camera lens and to try and limit moving or blinking when requested to do so. Before taking ocular images, participants will be warned that there may be fleeting discomfort from the brief camera flash. Pupil dilating drops will be used if images are ungradable due to small pupils, if approved by the primary healthcare service.

6. Perform DR screening: The image sequence will consist of three image fields per eye (OD [right] and OS [left]) (Supplementary Figure 2), as follows:
 - i) Macula-centred image
 - ii) Disc-centred image for vessel calibre and disc assessment
 - iii) Anterior image for documenting the ocular surface and lid pathology and for patient identification

The use of eye recognition to help identify an individual has proven effective (Azimi, Rasoulinejad, & Pacut, 2019). This technique can be useful when individuals share the same name, but no other demographic information, such as date of birth or age, is available. This is also useful in remote Indigenous and under-served communities where traditional cultural practice and custom are to not speak the name of a deceased person (McGrath & Phillips, 2008).

7. Review images with the participant. Once imaging is complete, the images will be reviewed with the participant. A model of an eye (Supplementary Figure 3) will be used to show participants the back of the eye (retina) and explain this is where diabetes damage can occur due to high blood glucose levels and other risk factors (such as smoking) and the risks of long-term uncontrolled diabetes will be explained. Using a DR grading chart (Figure 6), the participant will be shown images of each of the stages of DR: (Brien Holden Foundation, 2020):
 - (i) mild non-proliferative retinopathy,
 - (ii) moderate non-proliferative retinopathy,
 - (iii) severe non-proliferative retinopathy; and
 - (iv) proliferative retinopathy

Captured ocular images will be sent to an external ophthalmic clinician or certified grader for DR grading and follow-up recommendations based on NHMRC guidelines for DR management (National Health and Medical Research Council, 2008). The grading and recommendation report (Figure 7) will be uploaded into the participant's EHR for viewing by their treating general practitioner, for claiming the Australian government Medicare rebate (Department of Health Medicare Benefit Scheme, 2020) and any required referral to optometrists or ophthalmologists. The retinal imaging grading report will remain in the

participant's EHR and be a visual baseline history of their diabetes progression and any diabetic eye conditions. Images will also be available to visiting ophthalmic clinicians and other medical clinicians.

8. Provide diabetes education: At completion of the imaging protocol, diabetes education will lead on from the discussion of retinal images, especially if diabetic eye conditions are detected. We will also assess the participant's health literacy, diabetes knowledge and diabetes self-management, as well as their information from the SNAPE survey, to guide the education session. The diabetes education tool, "Feltman™" (Developed in partnership between Diabetes Victoria and the VACCHO, Melbourne, Victoria, Australia) [a lifestyle wall-hanging] (Diabetes Victoria, 2020) (Supplementary Figure 4) may be introduced to help explain the effects of diabetes on the body. The discussion will cover digestion, glucose production, insulin secretion, how the body uses insulin to promote glucose uptake and how diabetes may cause widespread damage in the body, including in the eyes, kidneys, large and small blood vessels, heart, nerves and feet (Diabetes Australia, n.d). Many patients lack diabetes health literacy and knowledge of the meaning of their HbA1c test levels (Gopalan, Kellom, McDonough, & Schapira, 2018) and the importance of optimising HbA1c levels in safe ranges or an appropriate individualised target to reduce the risk of long-term diabetes complications (Moghadam, Seyed, & Shahrzad, 2018) and why HbA1c monitoring is recommended every three to six months (Australian Government Department of Health, 2016). Hence, the Quality Assurance for Aboriginal and Torres Strait Islander Medical Services (QAAMS) point-of-care testing (Shephard et al., 2016) HbA1c conversion chart (Qaams Quality Assurance for Aboriginal & Torres Strait Islander Medical Services, 2020) (Supplementary Figure 5) will be discussed with them. Visit 2 will take place at 12 months (with a minimum time period between assessments of three months) after the baseline visit and will involve a repeat DR screen to check for DR and assess adherence to annual screening recommendations. The adapted SNAPE, Diabetes Knowledge and the Diabetes Treatment Satisfaction surveys will be readministered to identify any changes in lifestyle behaviours, health literacy, diabetes self-management and participant's satisfaction with their care over the intervention period. Biomedical measurements (HbA1c, blood pressure, lipid profile and weight) will be rechecked to determine if risk factor control has changed.

Data collection, management and storage

Data will be gathered by a trained CDE, who will abide by the study site protocols for data collection, access, storage and use, as well as ensuring patient confidentiality and rights, including

the right to withdraw from the study. Digital data will be stored on the site servers, which have restricted, password-protected access. To ensure anonymity, all participant data will be de-identified and access will be controlled via assigned login names and passwords. As relevant clinical information will be stored in the participants' EHR, each participant will be issued with a study number, which will be linked with their unique EHR identifier to allow data matching/re-identification should it be deemed clinically necessary. The code-breaking information will be held securely in a locked filing cabinet in a secure office accessible only by the study team at The University of Melbourne. A Microsoft Excel[®] database (2010) will be established to manage the de-identified demographic and clinical data from the participants, as well as relevant site data (patient recall system data for yearly eye checks, referrals, follow-up, reviews and patient education). Validated data from the questionnaires will also be entered, as well as relevant comments from the informal interviews.

Data analysis

Statistical data analysis will be conducted using Microsoft Excel[®] (Windows 2013) and IBM SPSS[®] statistics version 25.0 (Corp., 2017). Descriptive statistics and univariate analyses (Chi-square tests) will be used with continuous and categorical variables such as prevalence and lifestyle data, proportion treated to target DR risk factors, predictors of DR, vision outcomes and qualitative survey outcomes. Site differences will be analysed and analysis of covariance will be used to compare differences between groups. To address confounding, covariates will include age, sex and emerging and established risk factors for diabetes and DR, as appropriate. Non-parametric statistics will be used when assumptions for parametric methods are violated and all tests will be conducted with an alpha level of 0.05, with 95% confidence intervals or interquartile ranges reported, as appropriate.

Dissemination of results

Participants will be shown their retinal images and verbally advised of the preliminary results and implications of their retinal imaging immediately after the retinal photos are taken. They will also be given a copy of the final report and a letter thanking them for their participation. The study sites will also receive a final report of the overall study results with more detail on study results particularly relevant to their community. The results of the study will be published in peer-reviewed medical journals and also presented at relevant regional and national conferences.

Discussion

A large proportion of Australians with diabetes do not adhere to national screening guidelines

and Indigenous Australians are over-represented among Australians with diabetes and diabetes-related complications. Therefore, complementary diabetes care and DR management approaches are urgently needed. Our novel model of care of integrated diabetes education and DR screening can be delivered by non-ophthalmic clinicians, such as CDEs, in routine clinical care for the management of diabetes.

CDEs are recognised allied health professionals governed by the Australian Diabetes Educators Association and are recognised by the Australian national health care coverage system Medicare (Australian Diabetes Educator Association, 2020). Individuals with diabetes who attend a diabetes education consultation can claim for diabetes education (Medicare item numbers: 10951 for individual chronic disease management, 81305 for Indigenous people with diabetes and 81105 for group education sessions (Australian Diabetes Educator Association, 2020). In addition, there is an opportunity to include retinal imaging [Items 12325 or 12326] into the diabetes cycle of care consultation. This will also provide a bulk-billing incentive for general practitioners and endocrinologists (Department of Health Medicare Benefit Scheme, 2020).

The diabetes education delivered in our model will be based on health literacy and Indigenous pedagogy ways of learning and thus will use eye images and visual education tools, such as Feltman™ and the HbA1c risk grading card, as well as culturally appropriate diabetes education and health promotion resources with Indigenous artwork and pictures. Visual pictorial educational tools have proven to be effective when used in diabetes education (Browne, D'Amico, Thorpe, & Mitchell, 2014), as they stimulate the interest of the learner and help the educator to more effectively communicate the pathophysiology of diabetes and associated damage, especially to the eyes. Using visual educational tools fits with the Aboriginal pedagogy and ways of learning framework of learning through narrative, symbols and images to visualise a plan (Yunkaporta, 2009). Visual ways of learning, or visual literacy, is defined by a person's capacity to interpret and understand information presented in pictures or graphics used to communicate information (Williams, 2019).

Conclusion

In summary, our study draws on Indigenous health research to derive a novel model of integrated diabetes care using DR screening to reinforce the importance of diabetes self-management and reducing the risk of diabetes complications; improve DR screening coverage in Indigenous primary health care services and specialist diabetes clinics; and facilitate timely referral pathways to ophthalmic and diabetes specialist services. We believe that this model of care, or an adaptation thereof, may also be of relevance and interest to non-Indigenous peoples and in many other countries.

302

303 **Abbreviations**

304 **BMI:** Body mass index

305 **BP:** Blood pressure

306 **CDE(s):** Credentialed diabetes educator(s)

307 **DR:** Diabetic retinopathy

308 **EHR:** Electronic health record

309 **HbA1c:** Haemoglobin A1C

310 **SNAPE:** Smoking nutrition, alcohol, physical-activity and emotional well-being

311 **QAAMS:** Quality Assurance for Aboriginal and Torres Strait Islander Medical Services

312 **VACCHO:** Victorian Aboriginal Community Controlled Health Organisation

313

314 **Declarations**

315 **Ethics approval and consent to participate**

316 The study was approved by the University of Melbourne Human Research Ethics Committee (ID:
317 17505904) and the trial is registered with the Australian and New Zealand Clinical Trials Registry
318 (ACTRN12618001204235). Participants provided written consent before participating in the
319 study.

320 **Consent for publication**

321 “Not applicable” as no participant data have been reported in this manuscript

322 **Availability of data and materials**

323 The dataset used and/or analysed during the current study and data collected forms are available
324 from the corresponding author on reasonable request.

325 **Competing interests**

326 “The authors declare that they have no competing interests”

327 **Funding**

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329 study sponsor and funders have had no role in designing the study and will not influence its
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Practitioner Fellowship and is a Sydney Medical School Foundation Fellow. There are no conflicts of interest to declare.

Author's contributions

SAB and LB were involved in the conceptualisation of the study, writing the study protocol and preparing this manuscript. AJ, AK and LB were involved in the conceptualisation of the study and acquisition of funding for the study, reviewing manuscript drafts. All authors have read and approved the final manuscript and accept responsibility for its content.

The authors dedicate this manuscript to the memory of our colleague and researcher in diabetes and in Indigenous health Dr. Kevin Rowley (1964–2016). We acknowledge collaborators and partners in the Centre for Research Excellence in Diabetic Retinopathy Study Group.

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460 **List of figures**

461 **Figure legends**

462 Figure 1: Flowchart of study protocol

463 Figure 2: Diagram of study protocol implementation process

464 Figure 3: SPIRIT flow diagram of the iDEES study protocol

465 Figure 4: SNAPE lifestyle survey

466 Figure 5: Diabetes treatment satisfaction survey

467 Figure 6: Diabetic retinopathy grading chart

468 Figure 7: Diabetic retinopathy grading and recommendation report

469 **Supplementary figure legends**

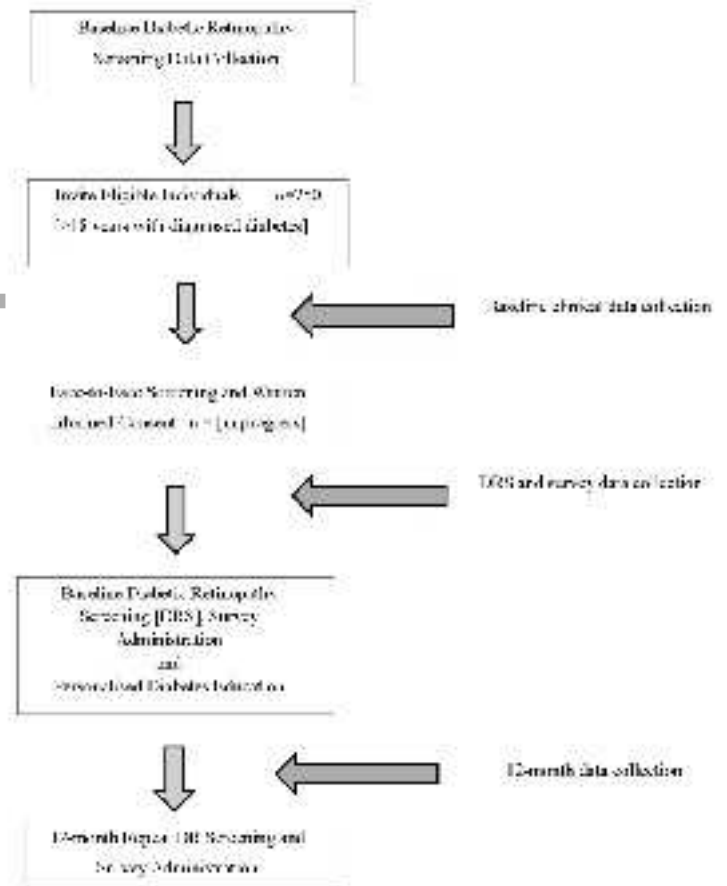
470 Supplementary Figure 1: Diagram depicting pupil dilation - diabetes education tool

471 Supplementary Figure 2: Diabetic retinopathy screening: three-field imaging protocol

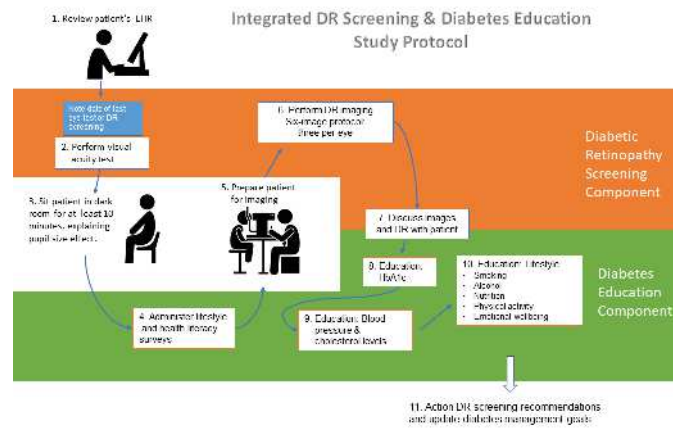
472 Supplementary Figure 3: Model of a human eye - diabetes education tool

473 Supplementary Figure 4: The Feltman - diabetes education tool

Figure 1. Flow of the Four Study Periods



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Figure 1. APFITT Phase Diagram: Status of APFITT Study Protocol

	STUDY PHASE		
	Participant	Intervention Data Collection	Outcomes Data Collection
STUDY DESIGN	Study Phase		Outcomes
ENROLLMENT			
Eligibility criteria	X		
1. Inclusion from community	X		
2. Exclusion from community	X		
INTERVENTION			
1. Intervention group (n=100)		X	X
2. Control group (n=100)		X	X
3. Intervention group (n=100)		X	X
4. Control group (n=100)		X	X
OUTCOMES			
1. Primary outcome (n=100)		X	X
2. Secondary outcome (n=100)		X	X
3. Tertiary outcome (n=100)		X	X
4. Quaternary outcome (n=100)		X	X
5. Quinary outcome (n=100)		X	X
6. Quaternary outcome (n=100)		X	X
7. Quinary outcome (n=100)		X	X
8. Quaternary outcome (n=100)		X	X
9. Quinary outcome (n=100)		X	X
10. Quaternary outcome (n=100)		X	X
11. Quinary outcome (n=100)		X	X
12. Quaternary outcome (n=100)		X	X
13. Quinary outcome (n=100)		X	X
14. Quaternary outcome (n=100)		X	X
15. Quinary outcome (n=100)		X	X
16. Quaternary outcome (n=100)		X	X
17. Quinary outcome (n=100)		X	X
18. Quaternary outcome (n=100)		X	X
19. Quinary outcome (n=100)		X	X
20. Quaternary outcome (n=100)		X	X
21. Quinary outcome (n=100)		X	X
22. Quaternary outcome (n=100)		X	X
23. Quinary outcome (n=100)		X	X
24. Quaternary outcome (n=100)		X	X
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30. Quaternary outcome (n=100)		X	X
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91. Quinary outcome (n=100)		X	X
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95. Quinary outcome (n=100)		X	X
96. Quaternary outcome (n=100)		X	X
97. Quinary outcome (n=100)		X	X
98. Quaternary outcome (n=100)		X	X
99. Quinary outcome (n=100)		X	X
100. Quaternary outcome (n=100)		X	X

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Survey		Queries									
Smoking	How soon after waking do you smoke your first cigarette?										
	Do you find it hard to stay in a place where you aren't allowed to smoke?										
	Which cigarette would be hardest to give up?										
	How many cigarettes do you smoke in a day?										
Alcohol	How often did you have a drink containing alcohol in the past year?										
	How many drinks did you have on a typical day when you were drinking in the past year?										
	How often did you have six or more drinks on one occasion in the past year?										
Depression	Have you been feeling slack, not wanted to do anything?										
	Have you been feeling unhappy, depressed, really no good, that your spirit was sad?										
	Have you found it hard to sleep at night, or had other problems with sleeping?										
	Have you felt tired or weak, that you have no energy?										
	Have you not felt like eating much even when there was food around?										
	Have you been eating too much food?										
	Have you been feeling bad about yourself, that you are useless, no good, that you have let your family down?										
	Have you felt like you can't think straight or clearly, it's hard to learn new things or concentrate?										
	Have you been talking or moving around really slow?										
	Have you felt that you can't sit still; you keep moving around too much?										
	Have you been thinking about hurting yourself or killing yourself?										
	In the last two weeks have you felt that your spirit was weak?										
	Have you been drinking more grog or smoking more ganja that you usually do?										
	Have you been feeling homesick, lonely for family or home?										
Additional culture-based questions	Have you felt your anger building up inside you ready to explode?										
	Do you think you have too much worry?										
	Have you felt that you can't stop thinking about the things that cause you worry?										
	Have you felt cranky, irritable or always in a bad mood?										
Nutrition Survey											
	Never or Rarely	< once pw	1 pw	2-3 pw	4-6 pw	1 daily	2 daily	3 daily	4-5 daily	6 or more daily	>1 daily
Vegetables											
Fruit											
Fresh Fish											
Milk-based drinks											
Juice											
Coffee or Tea											
Water											
Homemade Meals											
Take Away											
Snacks											
Diet soft drinks & cordials											
Regular soft drinks & cordials											
Physical Activity Questions											
During the last 7 days, how much time did you spend sitting on a week day? (Hours)											
During the last week, on how many days did you walk for at least 10 minutes at a time?											

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The Diabetes Treatment Satisfaction Questionnaire (change): DTSQc

For the past few months you have been taking part in a diabetes treatment study. At the start of the study you may have had a change of treatment. Today we would like to know if your experience of your current treatment (including medication and diet) has changed from your experience of treatment before the study began. Please answer each question by circling a number on each of the scales to indicate the extent to which you have experienced changes. If you have experienced no change, please circle '0'.

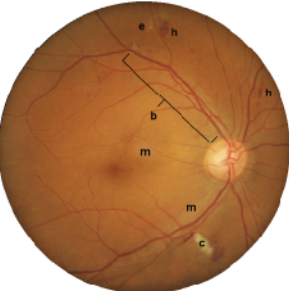
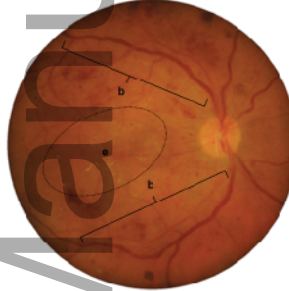
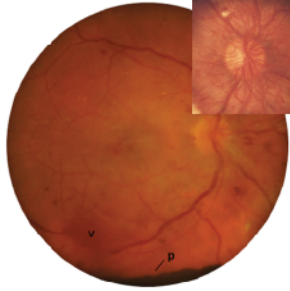
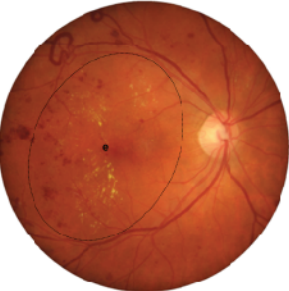
1. How satisfied are you with your current treatment?
much more satisfied now 3 2 1 0 -1 -2 -3 much less satisfied now
2. How often have you felt that your blood sugars have been unacceptably high recently?
much more of the time now 3 2 1 0 -1 -2 -3 much less of the time now
3. How often have you felt that your blood sugars have been unacceptably low recently?
much more of the time now 3 2 1 0 -1 -2 -3 much less of the time now
4. How convenient have you been finding your treatment to be recently?
much more convenient now 3 2 1 0 -1 -2 -3 much less convenient now
5. How flexible have you been finding your treatment to be recently?
much more flexible now 3 2 1 0 -1 -2 -3 much less flexible now
6. How satisfied are you with your understanding of your diabetes?
much more satisfied now 3 2 1 0 -1 -2 -3 much less satisfied now
7. How likely would you be to recommend your present treatment to someone else with your kind of diabetes?
much more likely to recommend the treatment now 3 2 1 0 -1 -2 -3 much less likely to recommend the treatment now
8. How satisfied would you be to continue with your present form of treatment?
much more satisfied now 3 2 1 0 -1 -2 -3 much less satisfied now

Please make sure that you have circled one number on each of the scales.

Bradley, C. (2013). *Handbook of Psychology and Diabetes*. Hoboken: Taylor and Francis

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Diabetic Retinopathy Guide

No diabetic retinopathy	Mild diabetic retinopathy	Moderate diabetic retinopathy
		
No diabetic retinopathy seen	Microaneurysms (m): small outpouchings of the blood vessel walls – appear as small red spots	• Microaneurysms (m) • Haemorrhages (h) • Hard exudates (e) • Cotton Wool spots (c) • Blood vessel changes (b)
Management Refer for a comprehensive examination with an <u>optometrist within 1 year</u>	Management Refer to an <u>ophthalmologist within 3 months</u>	Management Refer to an <u>optometrist or ophthalmologist within 3 months</u>
Severe diabetic retinopathy	Proliferative diabetic retinopathy	Macular oedema
		
As with moderate diabetic retinopathy, but more widespread microaneurysms, haemorrhages, blood vessel changes (b), exudate (e), and/or cotton wool spots	• Neovascularisation (inset) • Pre-retinal haemorrhage (p) • Vitreous haemorrhage (v)	• Macular oedema: swelling of the macula • Can occur at ANY stage
Management Refer to an <u>ophthalmologist within 4 weeks</u>	Management Refer to an <u>ophthalmologist within 1 week</u>	Management Refer to an <u>ophthalmologist within 4 weeks</u>
National Health and Medical Research Council Guidelines for Management of Diabetic Retinopathy (2008) https://www.nhmrc.gov.au/files/nhmrc/publications/attachments/di15.pdf Optometry Australia A guide for General Practitioners on the use of Digital Retinal Photography (2017) http://www.optometry.org.au/media/871149/gp_retinopathy_flowchart_a4_2017.pdf		

Provision of Eye health Equipment and Training – funded by the Australian Government.

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Diabetic Retinopathy Grading Report

Dear Doctor,

Based on assessment of vision and retinal photographs, the management recommendation is as follows:

Patient ID	Patient Name	DOB
Visual Acuity		
	Right Eye [OD]	Left Eye [OS]
Presenting vision ☐ Aided ☐ Unaided		
Pinhole acuity if VA < 6/9		
Diabetic retinopathy grade		
☐ Diabetic retinopathy absent – <i>Repeat screening in 12 months</i>		
☐ Mild-moderate non-proliferative diabetic retinopathy - <i>Optometry review within 3 months*</i>		
☐ Severe non-proliferative diabetic retinopathy - <i>Referral to ophthalmology within 4 weeks*</i>		
☐ Proliferative diabetic retinopathy - <i>Referral to ophthalmology within 4 weeks*</i>		
☐ Any diabetic macular oedema - <i>Referral to ophthalmology within 4 weeks*</i>		
☐ Other ocular findings		
Images gradable: Yes ☐ No ☐ <i>If no, refer to optometrist for comprehensive eye exam</i>		
<i>Please note: Retinal imaging does not replace a comprehensive eye exam provided by an ophthalmic clinician. It is recommended that Aboriginal and Torres Strait Islander [ATSI] patients have an annual eye exam and non-ATSI bi-annual, sooner if they notice a difference in their vision. The grading and recommendations are based on the NH&MRC Guidelines for the Management of Diabetic Retinopathy (2008) and are used as a general guide for grading and follow-up clinical management</i>		

Grader: ☐ Optometrist ☐ Ophthalmologist ☐ Other.....

Name..... Signature.....

Date...../...../.....