

## Evaluation of the Mount Druitt Community Diabetes Clinic (MDCDC) including the virtual care model

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RS238

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## Executive summary

### Background

This is an evaluation of the Mt Druitt Community Diabetes Clinic (MDCDC). This clinic was launched in May 2020 and has operated using a combination of virtual and in-person care modalities, with the aim of:

- improving outcomes for people with diabetes in the local community
- enhancing the capability and capacity of general practice in diabetes management
- providing better value care for people with diabetes, especially those requiring specialist team input to better manage their condition.

The primary reason for undertaking this evaluation was to inform local service delivery improvements in Western Sydney Diabetes. Health service planners can also draw on the findings as they consider the potential roll-out of future virtual models of care in other settings and clinical contexts.

### Key service use statistics for the 2020-21 financial year

- 209 clients
- 2,130 occasions of service (a mix of in-person, video conference and telephone)
- 10 days average waiting time for new appointments
- 76% attendance rate at appointments
- 59% of patients used a Flash continuous glucose monitoring (CGM) device.

### Key findings

The clinic has enjoyed a positive launch and demonstrated its value on a number of fronts:

- Strong acceptance of the model has been expressed by clinic staff, referring GPs and patients alike. This includes positive feedback about the multidisciplinary team model, use of continuous glucose monitoring (CGM) and the virtual care environment.
- Significant capacity-building outcomes have been reported by clinic staff and referring GPs.
- The model has provided a timely and relatively seamless service experience for patients. This stands in contrast to the long waiting lists and extended referral pathways of the conventional diabetes clinic model.
- Clinical outcomes for patients have been positive, including improved HbA1c levels, stable eGFR values, increased use of newer medications, improved insulin use and weight loss.
- The model has proven itself to be efficient, operating with a slightly lower cost per occasion of service than comparable clinic models while delivering a range of additional benefits.

### Next steps for the clinic in Mount Druitt

The MDCDC offers a promising model of practice that is worthy of continued development. As the service model matures, considerations include:

- monitoring the blend between virtual care and in-person care, optimising the balance to provide appropriate care that suits patients and maximises efficiency within whatever lockdown conditions may be imposed over time
- expanding the use of video-based patient education resources, to assist with communication
- an expanded insulin stabilisation service, with capacity to offer CGM for a broader range of patients
- expansion of the Diabetes Nurse Practitioner role to review patients with diabetes attending the local wound clinic

- greater access to support from dieticians in the multidisciplinary team, as well as additional multidisciplinary services including social work, psychology, alcohol and other drug counselling, exercise physiology, occupational therapy, physiotherapy and wound care
- consideration of additional transport options for those without a driver's licence or vehicle, to address barriers to accessing in-person appointments
- additional capacity building of nursing or allied health staff with rotation options in the team
- expanded communication and promotion of the service to GPs in the local community.

## Broader implications for practice in other settings

Lessons from this evaluation will be applicable to a variety of service and clinical contexts beyond the diabetes community. The audience for this evaluation should extend to those with an interest in:

- team based care
- physical access to care
- GP capability building
- virtual care
- working with complex and vulnerable populations.

The MDCDC model offers particular insights for those in other geographic areas and clinical contexts who are interested in pursuing a similar model. Clinicians involved in the MDCDC advise that their model would be best suited to contexts with:

- specific health conditions – one that presents a high burden of disease and whose treatment benefits from multidisciplinary care
- a clear need for capacity building in the primary health workforce (e.g. due to the pace of change and innovation in the treatment of this health condition)
- other limitations in the existing care system that can be addressed by the model (e.g. delays in receiving specialist care, coordination challenges between different health practitioners)
- strong clinical leadership from respected local specialists and other clinical champions, including a passion for capacity-building and innovation
- an entrepreneurial spirit and 'can-do attitude' among these clinicians, as well as among executives in their auspicing agency
- a suitable venue that is welcoming, convenient and community-oriented.

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- Appendix B: Interview guides for clinic patients (B1) and providers (B2)
- Appendix C: Study protocol: Effectiveness of Virtual Care for Diabetes – patients and providers insights
- Appendix D: Workshop discussion guide for clinic staff and collocated allied health professionals
- Appendix E: Original MDCDC Operational Model (November 2018)

## Acknowledgements

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## Glossary

ACI	NSW Agency for Clinical Innovation
eGFR	Estimated glomerular filtration rate, indicates the level of creatinine in a blood sample
GP	General practitioner / general practice
HbA1c	Haemoglobin A1c – the glycated haemoglobin test used to diagnose and monitor diabetes
LHD	Local Health District
MDCDC	Mount Druitt Community Diabetes Clinic
NSW	New South Wales
VMO	Visiting Medical Officer
WSD	Western Sydney Diabetes
WSDLHD	Western Sydney Local Health District



## 1 Introduction

### 1.1 Background

Western Sydney is a diabetes hotspot. Within this area, Mount Druitt is the 'hottest' hotspot, with recent diabetes detection in adults attending General Practices showing diabetes rates as high as 35% of people tested.

The Mount Druitt Communitary Diabetes Clinic (MDCDC) was launched in May 2020. It has operated using a combination of virtual and in-person care modalities, with the aim of:

- improving outcomes for people with diabetes in the local community
- enhancing the capability and capacity of general practice in diabetes management
- providing better value care for people with diabetes, especially those requiring specialist team input to better manage their condition.

### 1.2 This evaluation

This evaluation was jointly commissioned and resourced by the NSW Agency for Clinical Innovation (ACI) and Western Sydney Diabetes. Rooftop Social worked in partnership with the team at WSD to design and undertake the evaluation.

#### Evaluation objectives

The objectives of the evaluation were to:

- explore the experiences of patients and health providers involved with the MDCDC model, including but not limited to its virtual care components
- confirm that clinical outcomes for patients accessing the MDCDC model are equivalent to usual care or better
- describe the MDCDC model's impact on general practice capacity and confidence for patients with diabetes
- quantify the costs associated with rollout of the MDCDC, assess value for money and identify any potential efficiencies
- identify potential improvements to the design and implementation of the WSD model
- identify any lessons for comparable existing services, or future scaled-up services, across NSW, including services for people with diabetes and other health services delivered virtually.

#### Evaluation questions and data sources

The evaluation questions are summarised in Table 1 below, mapped against the data sources that inform them. Detailed evaluation sub-questions are set out in Appendix A.

There were three main data sources for the evaluation:

1. **Qualitative feedback** from clinic patients and staff, as well as referring GPs and allied health personnel who work in the community health service. This included:
  - Individual interviews with patients (n=10) and referring GPs (n=5), two of whom had also worked in the clinic as GP VMOs. These interviews were conducted by members of the WSD team using the interview guides at Appendix B and following the approved study protocol at Appendix C.
  - Two focus groups, one with clinic staff (n=10) and a second with collocated allied health personnel (n=3) in the community health service. Both discussions were held online due to restrictions flowing from the COVID-19 response. They were facilitated by Rooftop Social on 1 July 2021 using the discussion guide at Appendix D.



2. **Analysis of clinical data** for a sample of patients admitted between July 2020 and June 2021 (n=73). These data show clinical markers of diabetes before and after accessing the service, to identify and describe changes in diabetes indicators such as HbA1c and eGFR. Undertaken by WSD, this analysis did not compare client outcomes with those of a control group. This is partly due to difficulties in identifying an appropriate comparator group for patients accessing 'usual care', but also because an Australian clinical trial has already shown that patients receiving integrated clinical care for diabetes experience similar or better outcomes than patients receiving usual care.<sup>1</sup>
3. **Analysis of administrative records** from the clinic, both to describe scale and to calculate the cost of clinical services provided in the MDCDC. These costs were then compared with the 'usual care' cost of arranging individual specialist appointments (e.g. with a diabetes nurse educator, then with a dietician and so on). This analysis was undertaken by WSD using a simple regression model, with month of the year as a fixed effect. The national weighted activity unit (NWAU) generated by the MDCDC during the 2020-21 financial year was compared with the target NWAU of 56 to see if this target is being met.

**Table 1: Evaluation domains and data sources**

	Qualitative feedback			Clinical data	Administrative records
	Interviews with 15 clinic patients	Interviews with 5 referring GPs	Focus groups with 10 clinic staff and 3 collocated allied health personnel		
1. Implementation	✓	✓	✓		✓
2. Patient experience	✓ self reported	✓ observed			
3. Clinician experience		✓	✓		
4. Clinical outcomes	✓ self-reported	✓ observed		✓	
5. System integration and capacity		✓	✓		
6. Value for money		✓ perceived			✓
7. Implications for practice and scaling*		✓	✓		

\* Also draw on findings from domains 1-6.

## Analysis and reporting

Following collection and initial analysis of the data, Rooftop Social facilitated a workshop with key members of the evaluation team to share and synthesise the results from different sources, reach consensus on high-level evaluation findings and identify areas for further analysis.

We then held a second workshop with selected clinicians involved with the MDCDC to review the draft findings and discuss recommendations for strengthening the design and implementation of the virtual and hybrid care models as the work of the MDCDC continues.

<sup>1</sup> Russell AW, Donald M, Borg SJ, Zhang J, BurrIDGE LH, Ware RS, Begum N, McIntyre HD, Jackson CL (2019) Clinical outcomes of an integrated primary-secondary model of care for individuals with complex type 2 diabetes: a non-inferiority randomised controlled trial. *Diabetologia*. 2019 Jan;62(1):41-52. doi: 10.1007/s00125-018-4740-x. Epub 2018 Oct 3. PMID: 30284015.

## 2 About the Mount Druitt Community Diabetes Clinic

### 2.1 Context

Diabetes is a chronic condition that affects the way the body regulates blood sugar. It can affect most organs in the body and is associated with a range of complications including heart, kidney, eye and foot disease.

Most diabetes care is provided in a primary care setting. Management of type 2 diabetes is complex and ever-changing, and there are concerns about the level of experience and confidence in the primary care system to manage the condition well. Without action to address this challenge, diabetes is poised to place an increasing social and economic burdens on the state's healthcare system.

Western Sydney is a diabetes hotspot, with disease rates higher than the NSW average and unfavourable social determinants of health.

### 2.2 Model of care

The MDCDC provides community-based care for patients with type 2 diabetes who require the input of a specialist team. The clinic provides an integrated specialist service in partnership with primary care, bringing together acute and community-based specialist services at the one location.

The table below provides a brief comparison between the MDCDC model and the care and treatment patients could otherwise expect to receive under the traditional model of specialist referral. Key aspects of the service model are expanded on the following pages.

**Table 2: Key features of the MDCDC model compared with the traditional specialist referral model**

The MDCDC model	The traditional specialist referral model	
	Model of care	Patient experience
<ul style="list-style-type: none"> <li>• Value-based</li> <li>• Combination of in-person and virtual options</li> <li>• Case conferencing appointments that include the patient's GP as well as the patient</li> <li>• Transfer of knowledge to GPs to help them better manage other (non-clinic) patients with type 2 diabetes</li> <li>• Bridging primary and tertiary care in an integrated community experience:                             <ul style="list-style-type: none"> <li>– care delivered in a community setting or virtually</li> <li>– multi-disciplinary team care including GP VMO, endocrinologist, diabetes educators and dietitian</li> </ul> </li> <li>• Virtual care diabetes bundle:                             <ul style="list-style-type: none"> <li>– access to educational resources</li> <li>– joint specialist/GP case conferencing</li> <li>– continuous glucose monitoring</li> <li>– healthy living advice</li> <li>– tech-assisted insulin stabilisation between appointments to identify optimal insulin doses and achieve glycaemic targets faster</li> </ul> </li> <li>• Support for workflow changes</li> </ul>	<ul style="list-style-type: none"> <li>• Volume based</li> <li>• In-person appointments</li> <li>• Not team-based</li> <li>• No opportunities for GP capacity building</li> <li>• Limited or uncoordinated allied health input</li> <li>• Continuous glucose monitoring not utilised</li> <li>• Disrupted continuity of care due to suboptimal communication (e.g. the only interaction between primary and tertiary care is via written communication, which may be delayed)</li> </ul>	<ul style="list-style-type: none"> <li>• Long wait times for specialist appointments</li> <li>• One delivery mode only (in-person)</li> <li>• Limited access to education resources</li> <li>• Patients not discharged back to GP</li> <li>• Delays between patient interactions with GP, specialist and allied health professionals</li> </ul>



## Staffing, venue and operations

The clinic operates weekly on Thursday mornings. It is coordinated by a Transition Nurse Practitioner and led by endocrinologists who support four GP Visiting Medical Officers (VMOs), as well as diabetes educators, a dietician and the nurse practitioner. The GP VMOs rotate out of these positions every six months.

Mt Druitt Community Health Centre was selected as a suitable location for the clinic not only due to the high prevalence of diabetes in the community, but also because the venue could supply co-located clinical spaces and could accommodate increased clinical consultation.

Prior to launching the clinic, WSD developed an operational model that set out how patients would be assessed and receive care (attached at Appendix E). This operational model and the location were determined through a working group process, informed by local stakeholder consultations. The model was then adapted over time, particularly in response to the COVID-19 pandemic.

The model of care was jointly developed by Western Sydney Local Health District and Metro South Health in Brisbane, who have a history of collaborating to develop models of care and approaches to prevent diabetes in their regions.

## Key features of the patient journey

Patients are referred to the clinic by their GP. If a community nurse or allied health professional is working with a person who they believe may benefit from the clinic, they raise this with the nurse practitioner and a GP referral is requested by the referring clinician.

Prior to their appointment at the clinic, patients are reviewed by the nurse practitioner to obtain diabetes history, assess diabetes self-management skills, injection technique and foot check. This may involve a consultation by phone or in person, as well as Flash continuous glucose monitoring where appropriate.

On the morning of the clinic, each case is reviewed by the multidisciplinary team – including the four GP VMOs and the supervising endocrinologist from WSD, as well as the nurse practitioner, diabetes educator and dietician.

Patients are then seen by the GP VMO and other members of the multidisciplinary team as appropriate. Their referring GP joins this case conference via telehealth to discuss their patient's management plan.

After this consultation in the morning, the nurse practitioner may also be involved in stabilisation. The dietician runs consultations with patients in the afternoon via individual and group sessions. Any patient who needs to start insulin or injectables is seen by the nurse practitioner or diabetes educator immediately after the medical review.

Flash continuous glucose monitoring technology is available to allow patients to test their glucose levels without pricking their finger. The system involves a small subdermal sensor in the patient's upper arm which sends a glucose reading to a reader (or mobile phone).

Consultation with a dietician after continuous glucose monitoring is a special feature that allows for patient-centred education, personalised intervention and discussion.

## Responding to COVID-19 and the virtual care component

A virtual care component was added to the model of care as part of the public health response to the COVID-19 pandemic in 2020. Resources to support workflow changes were developed, a virtual care platform was adopted and WSD led the development of a virtual care diabetes bundle. This bundle included: access to educational resources; a joint specialist/GP case conference service; continuous glucose monitoring applications; and healthy living advice.

A new 'concierge' service was also established to supporting patients and GPs to be technically ready in joining the virtual waiting room. NSW Health supports virtual care through Activity Based Funding and the Commonwealth Government with Medicare Benefit Scheme (MBS) billing for 'Case Conferences'. New COVID-19 telehealth MBS item numbers have made this economically feasible. The additional funds made available during COVID-19 have allowed for the set-up of virtual care infrastructure. WSD has used the myVirtualCare videoconferencing platform developed by eHealth NSW and ACI.

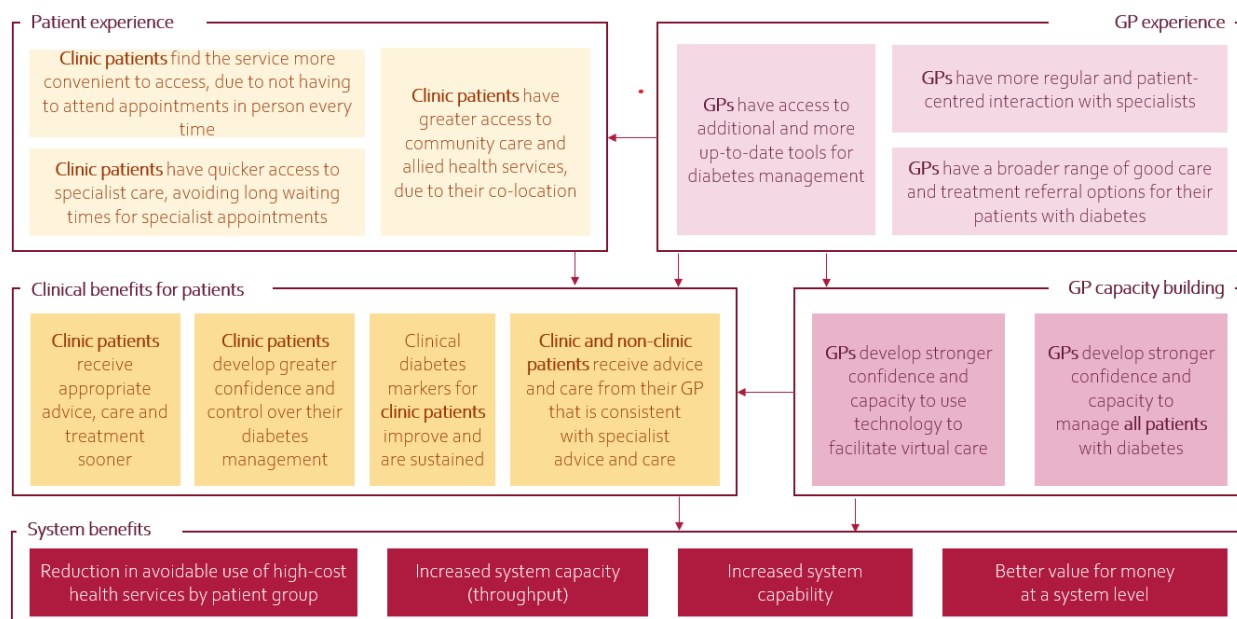
During the peak of the pandemic in 2020, services were provided entirely at a distance. Later in 2020 the clinic adopted a hybrid approach of in-person and virtual care consultations. When the pandemic escalated again in the winter of 2021, services reverted to virtual only.

## 2.3 Anticipated outcomes and benefits

The MDCDC serves a patient population with relatively low socio-economic status in a location close to the centre of need in Sydney. Figure 2 below provides an overview of the anticipated outcomes and benefits, with reference to the patient experience, GP experience, clinical benefits for patients, GP capacity and system-level benefits.

In reading this outcome framework, note that the uplift in patients' confidence to self-manage their diabetes is expected to be a *cumulative* result of several features of the clinic, particularly the consistency between primary and specialist care they receive as a result of joint case conferencing, their access to educational resources and the continuous glucose monitoring at home.

Figure 2: Anticipated outcomes, compared with usual care



### 3 Implementation

This section of the report describes service utilisation and identifies the major facilitators of and barriers to implementation of the MDCDC, drawing on a combination of qualitative feedback and clinic records.

#### 3.1 Service use

The clinic provided a total of **2,130 occasions of service** during the 2020-21 financial year. This includes a mix of in-person and virtual (videoconferencing and telephone) appointments.

The clinic was attended by a total of **209 individual clients**. Each of these clients had an initial consultation with the GP VMO, joined by other members of the multidisciplinary team as required. The subsequent pathway of follow-up appointments and care varied from client to client, responding to need.

In total, the clinic provided a total of **3,412 appointments** during the 2020-21 financial year: 1,164 new appointments and 2,248 follow-up appointments.<sup>2</sup> Appointments during the 2020-21 financial year most commonly with the diabetes educator (1,435) and the GP VMOs (1,601). The clinic also provided a large volume of dietician consultations (200) and nursing assistance (176) (Table 3).

**Table 3: Use of multidisciplinary components – all appointments, new and follow-up**

Provider type	No. appointments	No. individual clients accessing these appointments	% of total clients accessing these appointments (base n=209)
Diabetes educator	1,435	209	100%
GP VMO / endocrinologist	1,601	178	85%
Dietician	200	64	31%
Registered Nurse	176	25	12%
<b>Total</b>	<b>3,412</b>	<b>209</b>	<b>100%</b>

For new appointments, the clinic provided an **average waiting time of 10 days** during the 2020-21 financial year. This is a few days longer than the 8-day average at the WSD complex diabetes clinics run in Blacktown hospital, but still well within the target time of 14 days for all WSD clinics.

The clinic had a **76% attendance rate**, slightly above the 72% attendance rate at the WSD complex diabetes clinics in Blacktown hospital. This difference was primarily due to fewer *cancellations* at the Mount Druitt clinic than at the WSD hospital clinics, rather than lower incidence of people not attending appointments they had made. The 'did not attend' (DNA) rate at Mount Druitt was an acceptable 4% of all consultations.

When asked to consider **service gaps**, clinic staff said they were unaware of any specific patient groups that have been unable to access the community clinic. As noted in Section 5.2, the model involves a number of strategies to address the underlying challenges in providing care for vulnerable clients in a low socioeconomic area.

<sup>2</sup> The number of appointments is larger than the number of occasions of service, as multidisciplinary occasions of service (such as the initial consultation with the GP VMO on a Thursday morning) count as one appointment for *each* of the attending health professionals.

### 3.2 Referral, CGM and second appointments

#### GP engagement with the program and utilisation of the clinic

A total of **210 general practitioners** referred patients to the clinic over the 2020-21 financial year. These GPs were based not only in Mount Druitt itself but also from the surrounding area, including suburbs such as Blacktown, Riverstone, Quakers Hill and Rouse Hill.

Further discussion of GP engagement in the clinic is reported in Section 5: Clinician experience.

#### Use of continuous glucose monitoring

Three in five patients (59%) were provided with a Flash continuous glucose monitoring (CGM) device and used it (to at least some extent) to monitor their glucose levels.<sup>3</sup>

#### Second appointments

As noted earlier, 2,248 'second appointments' were provided during the 2020-21 financial year. In total, 178 clients (85% of the total) accessed one or more follow-up appointments across the multidisciplinary team (Table 4). These figures do not include other appointments that patients may have made with other allied health professionals (e.g. a podiatrist) at the community health centre.

**Table 4: Use of follow-up multidisciplinary components**

Provider type	No. follow-up appointments	No. individual clients accessing these appointments	% of total clients accessing these appointments (base n=209)
Diabetes educator	716	166	79%
GP VMO / endocrinologist	608	146	70%
Dietician	54	45	22%
Registered Nurse	87	32	15%
<b>Total</b>	<b>2,248</b>	<b>178</b>	<b>85%</b>

<sup>3</sup> The remaining patients either did not receive a CGM device did not record any data from the CGM they were provided with.

## 4 Patient experience

This section of the report focuses on the self-reported patient experience of receiving care via the MDCDC. It draws on interviews with 15 patients who attended the clinic by virtual appointment for their initial consultation or a follow up consultation.

Overall, patients attending the clinic provided **consistently positive feedback** about their experience with the model, stating that they felt confident in the quality of the ongoing care and treatment they had received. Our consultation with patients identified no significant resistance or misgivings about the model.

This evaluation has no access to feedback from non-attending patients about their reasons for not following through on the referral or for cancelling their appointment. However, we note that the cancellation rate for the MDCDC is lower than the cancellation rate for the complex diabetes clinics in Blacktown hospital (see Section 3.1).

### 4.1 Perceived benefits and strengths of the clinic

#### Access to integrated care

Patients were consistently positive about having a team of health professionals – such as educators and dietitians – providing integrated care. One patient described the experience as:

*Just directing me to the right people...  
Best for teamwork: team for the doctors, team for me.*

#### A convenient location to visit

The physical setting of the clinic is seen as a strength, with the community centre providing easy access for those living in the local area. One patient observed that she has much better access to diabetes care than her parents did in previous years:

*I've lived in Mount Druitt for 55 years and it's the best thing that's ever happened... [The clinic] is handy – very, very handy. I know by my Mum's experience, and my Dad's.*

Patients based out of the local area appreciated the community centre's proximity to public transport. Some also noted the benefits of incidental exercise while travelling to and from appointments:

*I'm doing a little bit of exercising while I'm going in too.*

#### Perceived advantages of a virtual care environment

In the main, patients reported that videoconference appointments 'felt just as good' as being in the same physical room with doctors. A number commented that **virtual case conferences felt highly productive**, with everyone well prepared and instant access to medications list and records during the consultation:

*A lot of times I don't have the information... like what medications I'm on...  
There's a lot. I can't remember. But my GP, she can bring it up on the screen.*

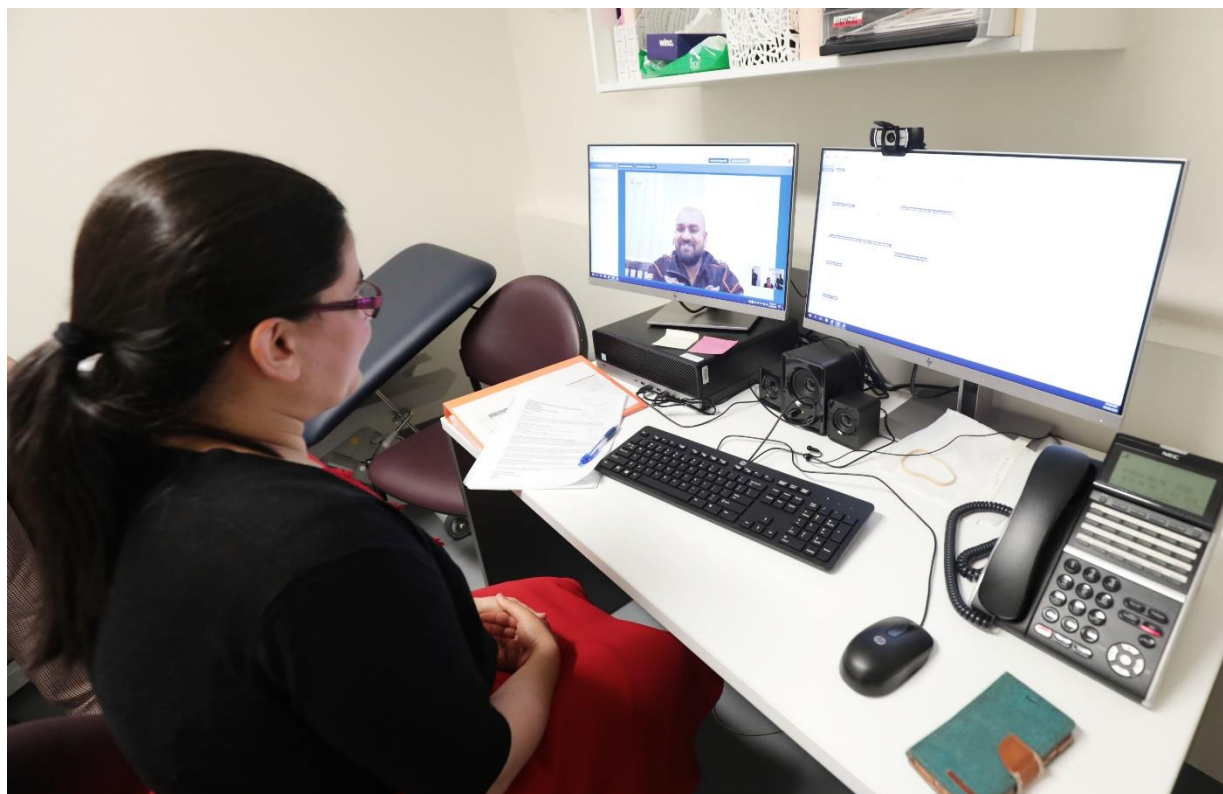
The **convenience of online and telephone consultations** was also widely appreciated, particularly among those with mobility issues (including elderly patients) and those who would otherwise be dependent on a family member to help them get to and from the clinic. Some participants were also complimentary about the punctual start time for their virtual appointments, with minimal waiting around compared with their experience of in-person appointments.

Finally, some patients valued the social distancing that virtual appointments allow, not only during the COVID-19 pandemic but more broadly for those who are immunocompromised:

*Anything to keep out of the COVID... I'm one of those ones that – my immune system, I get attracted to something that I shouldn't have.*

## Well-supported use of technology

Patients reported feeling well supported by the technical support team in making sure they were well set up for video conference appointments, e.g. that they had the correct link for joining the appointment and that their audio and video were connected properly. This was particularly appreciated by patients who described themselves as being 'less tech savvy'.



*Doctor-patient videoconferencing*

## 4.2 Perceived challenges and limitations of the clinic

### Challenges and limitations with in-person appointments

Some patients who have attended clinic appointments in person spoke of experiencing anxiety going into the clinic for an appointment. Others spoke of the difficulty they had experienced in remembering their medication information and bringing all the necessary records with them. In both situations, virtual care appointments offer a particular advantage over the traditional in-person appointment (see above).

### Challenges and limitations with virtual care appointments

Some patients said it would have been good for their GP to have some technical support or pre-training prior to the case conference, to sort out technical issues for beforehand rather than losing consult time during the appointment.



Among patients who experienced both modalities (in-person and virtual), some felt that virtual appointments tended to be more 'in doctor's language', and said it was harder to ask questions when online.

*Face-to-face is better.... they can tell me what is wrong with me... they can tell me what they're talking about in plain English. Not doctor-doctor English.*

In some instances, patients in virtual consultations are put on hold to allow for internal discussions, e.g. for the GP VMO to consult briefly with the specialist endocrinologist. Although patients accepted this as a reasonable process, a few noted that the experience of getting this on-the-spot 'second opinion' would have been different if they were in the appointment in person.

*I didn't speak to the doctor face-to-face, because they take it to another level, who takes everything in, all the reports in. And then she comes back and says, 'this is what the doctor said, and this is how you've got to do it'.*

#### **4.3 Patient confidence with diabetes management after accessing the clinic**

With very few exceptions, the patients we spoke to said that the clinic had provided them with the treatment, care and support they needed to manage their diabetes better. In part this was a function of the shared decision making in the case conferences, with the opportunity and time for patients to talk things through with the consultants:

*They would tell me something and then they would ask, you know, what I thought and, um, did I understand.*

In addition, patients also appreciated the follow-up support, and spoke of being contacted on multiple occasions by someone from the clinic who was checking in on them to assist. This is consistent with the intent of the service model, which involves patient follow up for ongoing diabetes management by the same nurse practitioner who conducted the pre-clinic checks.

## 5 Clinician experience

This section of the report describes the experience of providing care in the MDCDC model, as reported by those working in the clinic, as well the experience of GPs referring patients to the clinic.

Overall, the MDCDC model has enjoyed **strong support** from the clinicians involved in delivering it, as well as a healthy referral rate and **consistently positive feedback** from referring GPs. The consultations for this evaluation revealed some helpful suggestions about ways the clinic could be strengthened, but no fundamental concerns about the model or its operation.

### 5.1 Clinician experiences of working in clinic

Health professionals working in the clinic consistently agreed that the practice model has been a positive one.

*It's a great model for chronic and complex nursing. The collaboration between multiple disciplines is exactly what we should be doing.*

Clinic staff report healthy culture, positive teamwork and strong professional rapport built up over time.

#### Perceived strengths of the model

As reported by clinicians, the perceived strengths of the model include:

- the efficiency of working arrangements in the multidisciplinary team, including things like the timing and spread of patient appointments and a cohesive internal team communication between clerical and clinical staff

*We get the case notes the day before, we are so well prepped.*

- the clinical advantages of operating as multidisciplinary team, allowing effective patient care that is timely and well-coordinated (see 5.3 below)

*A small multidisciplinary team is an effective way to deal with complex cases. We are all around the table and deliver the care instantly. Not reliant on email or mail – no bureaucratic hold ups. The group is small, and can deliver all the care in one day.*

- effective use of digital platforms like myVirtualCare, in situations when it is impractical for patients to attend in person
- the location of the clinic at the community health centre

*People don't like going to hospitals – we're a friendlier place to visit*

- strong professional growth in diabetes management among the cohort of GP VMOs and other staff in the community health centre, flowing from their collaboration with the multi-disciplinary team as well as with each other:

*I learn heaps on the diabetes day – and use this knowledge in my other work. Outside of the clinic, it's almost impossible to get hold of an endocrinologist for advice or input to a patient. As one example, I was seeing one client in the chronic and complex nursing practice for unintentional weight loss (of over 40kg). She had severe gastro symptoms. Based on what I'd learned through the MDCDC, I suspected a medication side-effect. I got support from the WSD team to check, and I was right. If I wasn't part of the diabetes team I would never have thought to look at the medications.*



*Flash eye testing*

One GP VMO reported that, when they first started at the clinic, they had initially been uncertain about **doing the clinic consults with patient's referring GP** in the room, concerned that the referring GP might be resistant to taking advice from another GP rather than from a specialist endocrinologist. Happy, they reported that this concern was unfounded, and that they have never had a problem with power dynamics between themselves and any of the referring GPs.

### Responding to the challenges faced by the client base

Clinicians identified a number of **inherent challenges of working with vulnerable clients in a low socio-economic area**, and discussed the various challenges of supporting patients who have:

- Limited access to transport, which affects their capacity to attend appointments. Although there is free and easy parking at the venue, not all patients have access to a car. There are some options for financial support with transport, but only for certain clients and eligibility and access is not simple.<sup>4</sup>
- Complex home environments, including unstable housing unsafe home environment and so on. This can have a direct impact on attendance at appointments, as well as adherence to agreed diabetes management plans.
- Low or no phone credit, limited or no home internet, and limited familiarity with technology. Independently or together, these factors can limit a patients' capacity to attend virtual appointments and resources and use the Flash CGM technology.

*Our client base is not really tech savvy. You have to call them, and they won't answer private or blocked numbers. Texting first can really help. Rapport building is key.*

<sup>4</sup> Staff at the community health centre reported that clients who are registered with the Closing the Gap outreach program are able to get a taxi paid for, but that this has to go through their phone and can be administratively cumbersome. Patients aged over 65 (or over 50 if they are Aboriginal) are able to use 'Go Connect', which costs \$15 for a round trip. However even that subsidised cost can reportedly be a barrier.

*I don't think I've used the [online] resources – I talk to people personally, tend to print out good resources for them.*

- Low levels of literacy and health literacy, requiring messages to be communicated simply and visually, and reinforced consistently.
- Comorbidity and high complexity of clinical presentation, which can make diabetes management a challenge, e.g. if patient is unable to take pills due to frailty, or there is no-one to help the patient prepare food.

Clinic staff spoke of trying to cater for these situations as much as possible, assisting with practical barriers to access where they can even though some of these situations fall outside of their role. Clinic staff meet with patients prior to the clinic visit, sometimes on multiple occasions, and at times working alongside the referring person from community health or an Aboriginal health worker. There is also an Aboriginal nurse facilitator who works at the clinic active with Aboriginal patients and does considerable 'background work' prior to the appointment to maximise patient's attendance rates.

*There are lots of creative workarounds to try to make sure that the appointments happen. This is the kind of thing that doesn't happen in other clinics. Elsewhere if a patient doesn't show up more than once they get delisted and can't get an appointment.*

## Referral from GPs

**Referral pathways** for the clinic require a referral from the patient's GP. There are various reasons for this, both related to the structure of Medicare billing arrangements and due to the importance of having the patient's regular GP as part of the multidisciplinary consultation. However, staff at the community health centre did note that this requirement can pose a barrier to access:

*Referral process can be a bit convoluted. It's annoying that you can't self-refer – you have to get your GP to refer. I've told 10+ people to ask their GP to refer but none of them have. Some people don't have a GP or their GP isn't keen. If we can remove a step that's a win, to reduce barriers. Could there be internal referrals?*

One possible response here that is being considered by the clinic is to open up a day for internal referrals, in which patients are seen by the Diabetes Educator, making it streamlined for the patient's GP to refer.

Clinic staff also noted that **referring GPs need to be actively involved** in the multidisciplinary case conference if the MDCCDC model is to deliver its full benefit. This is not always the case, however:

*With this model we are highly reliant on the referring GP. They usually are not expecting that they need to be present at the time. It's probably 50-50 between GPs who contribute and those that don't.*

Referring a patient to the MDCCDC is unlike a typical referral experience. Clinic staff reported that referring GPs need orientation in order to know what to expect, both for their patients and for themselves, and that over time they have increasingly invested in 'front end' communication with GPs to maximise the value of the referral for all involved:

*GPs need to learn how to refer to the service – it's not like a normal referral. We on-board new referring GPs about what's involved in making the referral. This is time consuming, but essential.*

*The key message is that the referring GP is part of the team at the clinic. They are **joining** the clinic, not referring to the clinic.*

Referral by **GPs working at large corporate practices** presents a particular set of challenges for the clinic. In these settings, an individual GP's desire to engage with the clinic is not enough; the practice owners or managers also need to be in favour of the referral. In cases where the practice is financially-driven, based on bulk billing only, volume of appointments is a key driver of profit. Accordingly, long appointments – like the MDCDC collaborative case conference – are not always seen in as positive a light as they might otherwise be. There is also a reported need to assist administrative staff at corporate GP clinics to understand the clinic model and support the logistics of both the referral and the telehealth consultation.

*The GP might be on board, but their admin staff need to 'get it' as well.*

### Promotional resources

As noted above, there is a need for **written resources** to be very simple and geared towards readers with limited literacy. This has implications both for the clinic's promotional resources as well as educational resources designed for use with patients.

*The brochure is pretty long – it's a bit of a booklet. Can there be something simpler? A one pager?*

*The NDSS resources are very wordy. I use other ones – Bakers Institute, or ones from QLD, or I've developed my own. Diabetes Australia have good resources. You need things that are visual rather than simple. There are some good exercise resources too.*

As the clinic is still reasonably new, there is still a need to reinforce the purpose and scope of the clinic in the local health sector, particularly to GPs. This point is discussed further in section 5.5: Future directions.

*We sometimes get referrals that assume we're a general endocrine clinic (e.g. referral for a Thyroid prob), even though we're narrower than that – just diabetes.*

### Supply of CGM readers

Scanning of CGM sensor technology requires patients to either use their mobile phone (requiring WiFi) or via a reader. The clinic has a limited supply of readers that it can lend to patients for diagnostic purposes, when changing medications, before discharging and so on.<sup>5</sup> Clinic staff noted that a larger supply of readers could assist in maximising the benefits of the technology for the patient group:

*If we could have more of those [continuous] glucose monitors that would be great. They're a really effective educational tool, raising awareness to trigger self-management and conversations about self-management. Otherwise this cohort is pretty bad at doing the finger prick thing.*

### Other challenges

A number of clinicians reported frustration with the speed and capacity of the available internet connection for the virtual consultations. In-house WiFi is not available and Mt Druitt suffers from poor mobile service.

## 5.2 Perceived benefits of the clinic for patients

As noted above, clinic staff are impressed by the way in which the MDCDC model allows patients to receive holistic and coordinated care in one visit:

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<sup>5</sup> Readers cost \$120-\$150: a price few patients could afford.



*Patients have so much else going on in their lives. If they can see everyone in one place on one day – it's very patient centred.*

This is contrasted with the usual model that requires patients to 'run around' to a series of appointments, which creates a risk of discontinuity of care.

*This means that things happen quicker for the patient. People don't fall through the cracks here, but they often do in other settings – lots of chasing up from one appointment to the next, then chasing people for follow up appointments, and chasing whoever did the last appointment. And if patient does not come to see us as a GP in between their clinic visits, we have a lot of assuming to do. In the WSD clinic things are immediate, rather than lag.*

This contrast is not only observed by clinic staff, but also by referring GPs:

*When a patient goes out to see a specialist and then comes back the care's much more fragmented. So this model provides more of the holistic care. The patient has seen the dieticians, or a diabetes educator or spoken to them individually, and they can see everyone working as a team. And I think that's a positive thing for the patient.*

Clinicians also see value in the model providing patients with options for how they can participate, rather than having a fixed delivery mode that can only be accessed in one modality.

The emphasis on insulin stabilisation is noted not only as an effective treatment approach, but also as a motivational one for patients. Clinicians also report that the use of CGM has helped patients learn more about how their personal eating habits impact their health.



*CGM insertion*



### 5.3 Referring GP experiences of the clinic

The overall experience of referring GPs with the model has been consistently positive. Particular strengths reported here include

- the quality of the information provided and received
- the efficiency of the multi-disciplinary communication, with everyone in the room
- creating a 'healthcare neighbourhood' around the patient, in which the GP retains a central role
- their capacity to participate in meetings

*Communication is probably the biggest difference. As a GP when I refer patients to specialists I often just get a letter back from the specialist a few weeks later. But this clinic is different. The GP feels part of the team. As we're talking [in the case conference] about making medication changes I can see [the referring GP] making those changes in their own software. It's immediate.*

The capacity-building impact of the model for referring GPs is also well-acknowledged, with GPs having access to direct specialist expertise as well as learning from observing interaction between specialists and patients. There is also evidence of the model having intended effect of 'trickle down' benefits in referring GPs' skills and confidence to manage diabetes in their other patients:

*I think it's been really good, especially because of the explosion in options for diabetes management, medically speaking, over the last couple of years. To try and keep on top of it has been challenging, especially with all the PBS changing requirements. So to have the input of the GP VMOs who are working specifically in that area with the specialists has been really valuable to look at trying to find the best and the most affordable medication for the patient.*

*I found it very useful for that patient and also for my education for other patients.*

Referring GPs reported that the experience of virtual care appointments has largely been positive, although not without its challenges.

- The clinic model requires GPs to prioritise the case conference and take themselves 'offline' for other business in their practice. This requires discipline, particularly when they have walk-in patients in their waiting room.
- One GP incorrectly assumed that the online consultations would be recorded (this is not the case).
- The initial setup of technology and devices with myVirtualCare was a little challenging for some GPs – a potential challenge for any GP using this technology for the first time:

*I don't know how you would fix that. General practices all have different software and different level of, you know, computers and different age of computers.*

### 5.4 Future directions for the clinic

When asked to consider future areas of practice development, clinicians identified four main areas to consider:

- expanded use of video-based education resources
- expanded capacity
- additional multi-disciplinary services
- expanded communication and promotion.

These are discussed further in Section 8.1.

## 6 Clinical outcomes

This section of the report discusses the impact of the MDCDC on clinical outcomes in the management of diabetes, drawing on clinical data.

### Preamble

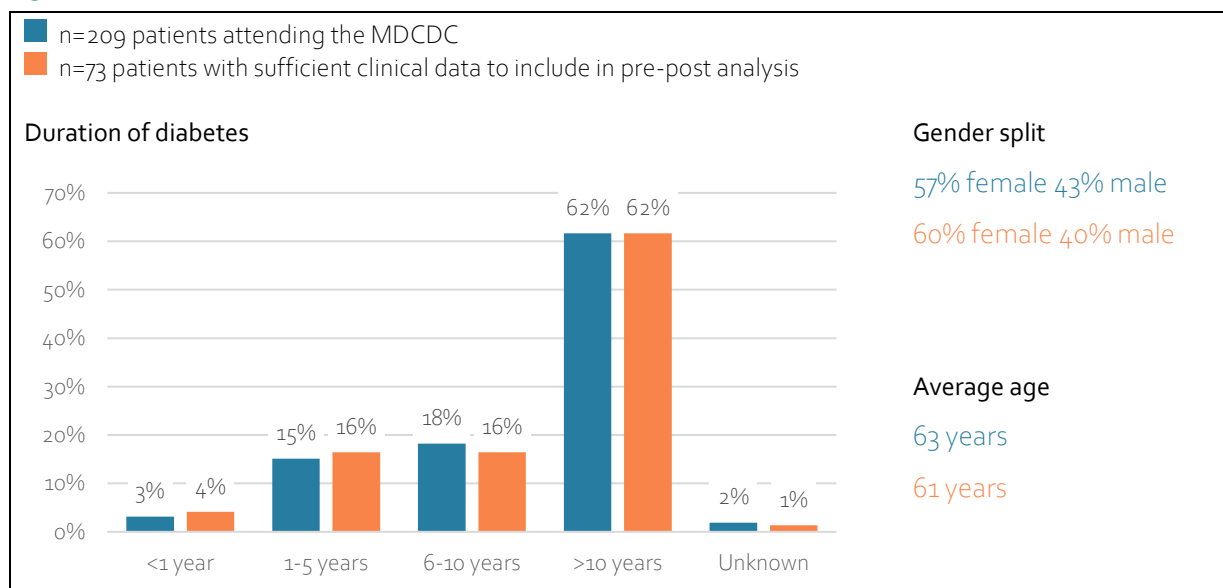
As noted in Section 2, this analysis does not compare client outcomes with those of a control group. This is partly due to difficulties in identifying an appropriate comparator group for patients accessing 'usual care', but also because an Australian clinical trial has already shown that patients receiving integrated clinical care for diabetes experience similar or better outcomes than patients receiving usual care.

Note also that self-reported or perceived changes in clinical outcomes after accessing the community clinic have already been discussed in Section 4 (patient experience) and Section 5 (clinician experience).

### Sample size and composition

To examine the changes in clinical parameters for MDCDC patients, analysis was conducted for **73 patients who had sufficient clinical follow-up data to be included in this pre-post analysis.**<sup>6</sup> Demographic characteristics and diabetes history of the sub-sample (n=73) almost identically matched those of the broader pool (n=209) (Figure 3).

Figure 3: Patient characteristics



### Findings

The findings from this analysis are encouraging:

- Patients attending the clinic saw **a large and statistically significant improvement in HbA<sub>1c</sub> levels**, dropping from an average of 9.6% to 8.3% over the course of their treatment ( $p < 0.0001$ ). A clinically significant reduction in HbA<sub>1c</sub> is generally considered to be anything greater than 0.5; here the average decline was 1.3.
- On average, **there was no significant difference between pre and post eGFR values** ( $p = 0.32$ ). This is considered by clinicians at the clinic to be a positive result, as normally when diabetes is poorly

<sup>6</sup> For example, patients whose first appointment was through virtual care had to self-report their initial weight; this was treated as missing data due to uncertain reliability

managed eGFR values will decline over time. Of the 54 people with pre and post values for eGFR, 70% either saw an improvement in their values (35%, n=19) or saw these values hold steady (35%, n=19). The remaining third (30%, n=16) saw a decline between their initial and follow-up appointments.

- The **use of newer medications increased** among clinic patients attending the clinic. On presentation, 36% of the patients were on SGLT2 inhibitors, with 18% on GLP-1 receptor agonists. After attending the clinic, this lifted to 45% on SGLT2 inhibitors and 49% on GLP-1 receptor agonists. Meanwhile sulfonylurea use dropped from 27% of the population to 5% at follow-up. All of these are changes in the right direction.
- **Insulin use improved** as well, with patients' average daily dose dropping from 31 units per day to 25 units per day between the initial consultation and the follow-up ( $p=0.005$ ).
- Patients experienced a **2kg average weight loss** on average. Of the 75 patients with reliable pre-post weight measures, 47% recorded weight loss: 39% losing between 2kg and 10kg and 8% losing more than 10kg. A further 36% maintained the same weight, within +/-2kg of their original starting point. This leaves 18% who recorded weight gain: 15% who gained between 2kg and 10kg and 3% (2) who gained more than 10kg.

## 7 Value for money

This section of the report discusses the question of whether the continued use of the MDCDC for diabetes care is a good use of resources. This draws on a quantitative analysis as well as perceived value for money through the eyes of clinic staff and referring GPs.

### The cost of running the MDCDC

Running the MDCDC required an initial investment in both staffing and consulting rooms.

The total annual staffing cost for the 2020-21 financial year came to a little over \$367,000, as set out in Table 5. Most of this cost was managed using existing funding, with cost of the GP VMOs sourced in addition to existing funding.

**Table 5: Staffing costs (estimate)**

Role	Allocation	Cost
Staff specialist	0.1 FTE	\$25,940
Diabetes Educator (Nurse Practitioner)	1.0 FTE	\$152,233
GP VMOs	0.4 FTE	\$151,000
Dietitian	0.2 FTE	\$23,035
Administration	0.2 FTE	\$15,301
<b>Total</b>		<b>\$367,508</b>

While the monetary cost has largely been concentrated in staffing, there are also accommodation and infrastructure costs that are also important for replication of this model in other areas. The MDCDC has required the use of six consulting rooms: five for the specialist and the four GP VMOs (one day a week, all on the same day), and one for the diabetes educator (occupied every day of the week). The venue at Mount Druitt required modifications to convert a meeting room, storage room and large office into three consulting rooms, at a cost of approximately \$110,000.

The clinic would also not have been possible during COVID-19 without online facilities and the use of MyVirtualCare, developed by eHealth NSW.

### Value for money from the community clinic in the management of diabetes

The MDCDC achieved a national weighted activity unit (NWAU) of 55 for the 2020-21 financial year, all but achieving the target of 56 NWAU that was set when the clinic was established.

Overall the clinic operated with an average staffing cost of \$172 per occasion of care in the 2020-21 financial year. As seen in Table 6, this comes in *below* the equivalent figure of \$183 per occasion of care at the complex diabetes clinic at Blacktown Hospital. Overall this shows that, in simple throughput terms, the MDCDC is a more efficient service model than the traditional complex diabetes clinic.

**Table 6: Annual staffing cost per occasion of care**

	Annual staffing cost (est)	Occasions of care, 2020-21 financial year	Staffing cost per occasion of care
MDCDC	\$367,508	2,130	\$172
WSD complex diabetes clinic at Blacktown hospital*	\$1,037,299	5,670	\$183

\* Staffing cost for complex diabetes clinic at Blacktown Hospital is based on 0.8 FTE staff specialist and 3.0 FTE nurse practitioner time, as well as registrar and resident assistance.

## The effect of implementation on service efficiency

Clinicians who are familiar with the broader range of diabetes clinics available in the local area have reported that the waiting list for non-WSD endocrine appointments has eased due to the expanded services provided by WSD. However, they report that these non-WSD clinics still have a waiting time of 2-3 months on average, compared to 8-10 days in the WSD clinics.

## Possible further efficiencies

Data linkage and shared care software may be a worthwhile direction for the streamlining the service and making its operations more efficient. The current estimate is that half of the diabetes educator's time goes on 'chasing information'. Accurate case information is a core requirement for the clinic, and a well-implemented shared care platform would be able to provide everyone with real-time access to such information in a more efficient manner.

## 8 Implications for practice and scaling

### 8.1 Key findings from this evaluation

The Mount Druitt Community Diabetes Clinic has demonstrated its value on a number of fronts, including:

- strong acceptance of the clinical model among clinic staff, referring GPs and patients (Section 4 and 5)
- capacity-building outcomes for clinic staff and referring GPs (Section 5)
- the timely and seamless service experience for clients (Section 4 and 5)
- clinical outcomes for patients, as observed by clinicians (Section 5) and indicated by pre-post data (Section 6)
- the efficiency of the practice model, operating at a similar (slightly smaller) cost per occasion of service than comparable clinic models while delivering a range of compelling additional benefits.

The success of the clinic is notable given the challenging conditions in which it was launched, i.e. during the COVID-19 pandemic. The virtual care modality has shone brightly in this context, enabling the clinic to adapt its operations as the public health restrictions have tightened, loosened and tightened again over time. Arguably, the acceptance of virtual care may in fact have been *assisted* by the pandemic making such arrangements a necessity.

### 8.2 Next steps for the MDCDC

The clinic offers a promising model of practice that is worthy of continued development.

#### Optimising the hybrid model

As the service model matures, there will be an ongoing need to monitor the blend between virtual care and in-person care, optimising the balance to provide appropriate care that suits patients and maximises efficiency within whatever lockdown conditions may be imposed over time. Further adaptation on this front may also be needed as other parts of the health system rebound from the COVID-19 pandemic.

#### Expanded use of video-based patient education resources

WSD has developed around 100 education bundles, each of which has short (2 minute) educational video and fact sheets for patients to help self-management. Consultation for this evaluation revealed limited awareness and familiarity with these resources.

Referring GPs are interested to learn more about what is available and are keen to see their patients to take advantage of these resources. When viewed together during consultations, patient-focused videos also have the capacity to help communicate some of the complex clinical terms and concepts (see Section 4).

#### Expanded capacity

If more resourcing were available, clinicians believe there would be demand for an expanded insulin stabilisation service, as well as the capacity to offer CGM for patients who are close to going onto insulin (rather than limiting it only to those on insulin). There would also be value in expanding the Diabetes Nurse Practitioner role to review patients with diabetes attending local wound clinic.

#### Additional multidisciplinary services

Clinic staff and others at the community health centre noted that there are a number of other potential speciality supports that could be useful to integrate into the service model. Specifically, this includes:

- additional access to dietitians



- social work, possibly to take some of the existing case coordination load from the diabetes educator
- psychology, in support of mental health plans and to address diabetes distress

*'We unearth lots of psych issues in our work and have to raise this with the GP to make a referral.'*

- support with alcohol and other drugs
- exercise physiology
- occupational therapy
- physiotherapy
- wound care.

Clinic staff also suggested that additional transport options (e.g. a pickup service) for those without a licence or vehicle would be a valuable extension of the service, to address barriers to accessing in-person appointments.

## Additional rotations

The clinic currently provides 6-monthly rotations for four GP VMOs. One possible area of development could be introducing other rotating positions, such as a nursing rotation. The benefit of this would be to broaden the capacity-building effect of the clinic for other health professionals. One risk to manage would be the need to keep the core team stable enough to maintain continuity and operational efficiency.

## Expanded communication and promotion of the clinic to GPs

Referring GPs play a critical role both in the operation of the clinic model and in its success. Clinic staff were in agreement that more could be done to raise awareness and deepen engagement among this group. For **general promotion**, the main suggestions involved:

- Enlisting the support of Wentwest, the Western Sydney Primary Health Network, to help promote the clinic and provide a platform for broader GP engagement.
- Focusing on authentic GP-led communication, e.g. a networking night or a masterclass in which GP advocates who have experienced the model explain the process and extol its benefits:

*A brochure is never going to have as much impact as peer-peer contact.*

- Highlighting the advantages of a multidisciplinary approach:

*If a GP hasn't been in case conferencing before, it might feel a bit burdensome.*

- Revisiting the current written material to ensure that everything has been explained well, and succinctly

This need for clarity of communication was underscored by the comments of one referring GP, who mistakenly assumed the MDCDC is self-contained stand-alone program (which it is not) and suggested that it integrates with other health promotion or related initiatives, e.g. the Get Healthy telephone based health coaching (which it already does).

Clinicians other main suggestion for strengthening GP engagement was to revisit **the referral pathway forms and documentation** used by the clinic. These are seen as key documents, as they provide the framework for the process and help establish and confirm the roles and responsibilities.

*Because our model is so different, we could perhaps have our own referral process – a template like the metabolic clinic.*

### 8.3 Broader implications for practice in other settings

Lessons from this evaluation will be applicable to a variety of service and clinical contexts beyond the diabetes community. The audience for this evaluation should extend to those with an interest in:

- team based care
- physical access to care
- GP capability building
- virtual care
- working with complex and vulnerable populations.

Clinicians involved in the MDCDC agree that the model could feasibly be replicated outside of western Sydney and/or in a range of different clinical contexts. For example, some have seen similar models for hepatitis care in south-western Sydney.

*It's a flexible model for complex cases. I think plenty of people would be interested.*

However, this model is not necessarily suitable everywhere, for everything. MDCDC clinicians recommend application of the model in contexts with:

- **specific health conditions** – one that presents a high burden of disease and whose treatment benefits from multidisciplinary care
- a clear **need for capacity building** in the primary health workforce (e.g. due to the pace of change and innovation in the treatment of this health condition)
- other **limitations in the existing care system** that can be addressed by the model (e.g. delays in receiving specialist care, coordination challenges between different health practitioners)
- **strong clinical leadership** from respected local specialists and other clinical champions, including a passion for capacity-building and innovation
- an **entrepreneurial spirit** and 'can-do attitude' among these clinicians, as well as among executives in their auspicing agency
- a **suitable venue** that is welcoming, convenient and community-oriented.

MDCDC clinicians also believe the model is better suited to **lower socio-economic areas**. This is partly due to the higher burden of disease and greater need for improved access to care in these areas. In addition, MDCDC clinicians believe that – from a financial perspective – GPs in bulk billing practices (i.e. the majority of practices in less affluent areas) will be more open to multidisciplinary case conferencing than those who charge a gap.

If a regional community were to show interest in this model, MDCDC clinicians are confident that, based on the current maturity and acceptance of virtual care technology, **specialists from out of town** would be able to support a local multidisciplinary team in remote delivery of care.

## Appendix A: Detailed evaluation questions and sub-questions

Implementation	
Key question	Sub-questions
1. What are the major facilitators of and barriers to implementation of the MDCDC?	1.1 How has the community clinic impacted service patterns (compared to usual care), e.g. initial appointment, follow up, did not attend, general practice uptake (in different services and patient groups)? 1.2 How well do general practitioners engage with the program and utilise the clinic? 1.3 To what extent are the multidisciplinary components used? 1.4 Are there particular clinical needs that were not able to be well managed within the clinic and if so were any other strategies trialled? 1.5 Are there specific patient groups that were not able to access the community clinic? And if so why? 1.6 Are there other notable aspects of the implementation of the community clinic since May 2020?

Patient experience	
Key question	Sub-questions
2. What is the patient experience of receiving care via the MDCDC?	2.1 To what extent do patients accept the community clinic as an alternative to care as usual? 2.2 Do patients feel more confident with their diabetes management after accessing the community clinic? For those who have attended usual specialist clinics, is this any different? 2.3 What is the patient experience of attending the community clinic (including virtual care)? 2.4 Do patients have any challenges in using the community clinic as opposed to regular specialist services? 2.5 Do patients perceive any benefits from the community clinic? 2.6 For patients who did not engage or attend after being referred, what were the reasons?

Clinician experience	
Key question	Sub-questions
3. What is the clinician (GP VMO and specialist) experience of providing care in the MDCDC?	3.1 To what extent do clinicians accept the community clinic? 3.2 Do clinicians feel as confident with assessment and treatment via the community clinic as they do with usual specialist services? 3.3 What is the clinician experience of providing services in the community clinic? 3.4 Did clinicians have particular challenges or concerns with the community clinic? 3.5 Do clinicians perceive any benefits to patient care via the community clinic? 3.6 Do clinicians have concerns about any specific patient groups in accessing or benefiting from the community clinic? 3.7 According to clinicians should the community clinic be retained in the care of people with diabetes and if so which parts? Which parts don't work?

## Clinical outcomes

Key question	Sub-questions
4. Does the MDCDC affect clinical outcomes in the management of diabetes?	4.1 Have patients experienced any improvements in clinical outcomes after accessing the community clinic?

## System integration and capacity

Key question	Sub-questions
5. Does the MDCDC strengthen capacity and connections between general practitioners and specialists?	5.1 Are there facilitators or barriers to general practitioners engaging with the community clinic? 5.2 Is general practitioner confidence and capacity to manage people with diabetes improved? 5.3 Is general practitioners' ability and likelihood to care for people with diabetes improved? 5.4 Are there any additional benefits to integration and strengthened relationships between general practitioners and WSLHD?

## Value for money

Key question	Sub-questions
6. Is the continued use of the MDCDC for diabetes care a good use of resources?	6.1 What are the costs associated with set up? 6.2 What are the recurrent costs likely to be? 6.3 What effect does implementation have on service efficiency? 6.4 Does the community clinic provide good value for money in the management of diabetes? 6.5 Are there further efficiencies that can be identified?

## Implications for practice and scaling

Key question	Sub-questions
7. What can be learned from rollout for practice in the WSLHD and more broadly?	7.1 What lessons are there for virtual care that could lead to system improvement: <ul style="list-style-type: none"> <li>• In WSD and its clinical networks?</li> <li>• In other contexts in NSW?</li> <li>• In relation to diabetes care?</li> <li>• For care delivered virtually or via a mixed model, for other conditions or patient groups?</li> </ul>

The following issues were out of scope for this evaluation, but may be the subject of further research in future:

- Comparing clinical outcomes for patients of the MDCDC with an equivalent group and/or to 'usual care' via a clinical trial
- Suitability of the myVirtualCare platform developed by NSW eHealth and ACI
- Detailed economic evaluation incorporating changes in patient outcomes (e.g. productivity, workforce participation, hospital avoidance).

## Appendix B1: Interview guide for clinic patients

*Introduce self to the participant and if anyone else present to each other.*

*Suggest they might want to have a glass of water available while they do the interview, while you set up.*

### **Reiterate the participant information sheet:**

**Introduction:** *Thank you for agreeing to be interviewed. We are doing an interview study to explore patients' experiences, both good and bad, of using Western Sydney Diabetes Virtual Clinic (WSDVC) for diabetes attending Mt Druitt Community Diabetes clinic. We need your feedback to help improve WSDVC, Mt Druitt Clinic services, GPs' experiences and patients' healthcare and experiences in western Sydney.*

**Confidentiality/recording:** *Everything you say will be strictly confidential. Your name will be removed from the written transcript, which will be made from an audio recording of the interview. Any identifying names will be removed from the transcript. The interview includes looking at the WSDVC (myVirtualCare platform and explain as telehealth/AV conference) and Community diabetes clinic model.*

**The Interview:** *The interview will take approximately 45 minutes. If you'd prefer not to answer any of the questions just let me know and we'll move on to the next question. You can also stop the interview at any time. The interviews will be recorded using a voice recorder and transferred to a secure electronic storage folder in WSLHD drive.*

*Does that sound ok? Do you have any questions before we start?*

**Consent:** *If you are happy to start could you please sign the consent form (if it hasn't been signed before).*

*We have been using a virtual care platform for joint specialist, GP and patient consultations since the beginning of the pandemic in 2020. The new Community Diabetes Clinic model was established in Mt Druitt Community Health Centre in May 2020, which was precisely during the peak pandemic. This new model embarked fully on to virtual care. Therefore it is very important that this platform / virtual care solutions are integrated well with your GP, healthcare team and yourself, as everyone plays an important role in your diabetes care. This interview is focussed on hearing from a patient's perspective and experiences and how we can continue to adapt, improve/implement the virtual care in Western Sydney.*

**\*\*\*START RECORDER\*\*\***

### Part 1: Virtual Care Appointment

1. Is this your first or follow up appointment?
2. What was the wait time to get an appointment booked?
3. Were you able to get an appointment time that suited you?  
Yes / No / didn't have an appointment booked in advance (walk in?)
4. How many times have you been contacted by the booking/online support team?
5. Who did you see during your virtual care appointment?
  - Specialist
  - Doctor
  - Diabetes educator
  - Dietitian
  - Podiatrist
  - Mental Health Professional
  - Psychologist

- Other healthcare professional(s)
- 6. What type of virtual care method did you use at your appointment?
  - myVirtualCare – audio & video
  - myVirtualCare – audio only
  - Telephone only – mobile or landline
  - Other
- 7. Did you experience any problems with the connection or technology during this appointment?  
Yes or No
- 8. Did you receive technical support from our online/technical support (concierge) team to help you participate in your virtual care appointment?  
Yes / No / don't know or can't remember
- 9. Were you adequately prepared for this appointment – technically as well as having records/results/sugar readings etc?  
Yes / to some extent / No
- 10. Did your GP join this appointment? If yes did you join this appointment together with your GP?

### Part 2: Care and treatment

- 11. WSD has extended their services with opening a new community diabetes clinic in Mt Druitt. How do you think this new service with virtual care is helping your care and treatment?
- 12. Do you see this new model of community diabetes clinic as a combined approach for your care and treatment?  
Do you see any problems with this approach?
- 13. Were you involved as much as you wanted to be in decisions about your care and treatment?
- 14. Do you think your privacy was maintained during/before/after your virtual care appointment?
- 15. WSD provides/sends education bundles (videos and fact sheets) to patients phone or email for ongoing education.
  - a. Did you get any of the bundles?
  - b. Have you seen any of the bundles?
  - c. Do you have any suggestions to make the contents better?
- 16. Many patients were offered a subsidised continuous glucose monitor (CGM) to improve their blood glucose profile.
  - a. Are you aware of this?
  - b. Did you learn from this?
  - c. How could we make this better?

### Part 3: Overall experience

- 17. Did the care and treatment received through virtual care help you?



18. How did you experience with virtual care with what you are used to going to the doctor before COVID?

What aspects did you like more?

What did you like less?

Would you use virtual care again?

19. Thinking about your experiences

a. In terms of virtual care, what have been:

- the benefits for you?
- the challenges for you?

b. In terms of the new community clinic in Mt Druitt, what have been:

- the benefits for you?
- challenges for you?

20. Do you have any additional feedback regarding VC?

21. Do you have any suggestions for additional services for people with diabetes that could be integrated with this service?

#### Part 4: About You

*I would like to finish this interview by asking a few general questions about you. This will be used to describe the whole participant group, and will not be recorded with your interview [turn recorder off].*

22. What year were you born?

23. In which country were you born?

If not Australia: In what year did you move to Australia to live?

24. What is your gender?

- Male
- Female
- Other

25. What is the highest level of education you have completed?

26. Are you of Aboriginal and/or Torres Strait Islander origin?

- No
- Yes – please specify: \_\_\_\_\_

27. Do you speak another language at home other than English?

- No
- Yes – please specify: \_\_\_\_\_

## Appendix B2: Interview guide for providers

*Introduce self to the participant and if anyone else present to each other.*

*Suggest they might want to have a glass of water available while they do the interview, while you set up.*

### **Reiterate the participant information sheet:**

**Introduction:** *Thank you for agreeing to be interviewed. We are doing an interview study to explore providers' in particular GPs' experiences, both positive and negative, of using WSDVC in managing patients with type 2 diabetes. This study is for those of your patients who have recently attended the new Community Diabetes Clinic in Mt Druitt Community Health Centre. We need your feedback to help improve WSDVC, Mt Druitt Community Clinic services and patients' healthcare and experiences in western Sydney.*

**Confidentiality/recording:** *Everything you say will be strictly confidential. Your name will be removed from the written transcript, which will be made from an audio recording of the interview. Any identifying names will be removed from the transcript. The interview includes looking at the myVirtualCare platform and community diabetes clinic model.*

**The Interview:** *The interview will last approximately 30 minutes. If you'd prefer not to answer any of the questions just let me know and we'll move on to the next question. You can also stop the interview at any time. The interviews will be recorded using a voice recorder and transferred to a secure electronic storage folder in WSLHD drive.*

*Does that sound ok? Do you have any questions before we start?*

**Consent:** *If you are happy to start could you please sign the consent form (if hasn't been signed before).*

*We have been using a myVirtualCare platform for joint specialist, GP and patient consultations since the beginning of the pandemic in 2020. The new Community Diabetes Clinic model was established in Mt Druitt Community Health Centre in May 2020, which was precisely during the peak pandemic. It is very important that this platform and virtual care solutions are integrated well with the patient's GP, the GP VMOs and specialist team of WSD as this new model of integrated approach plays an important role in diabetes care. This interview is focussed on hearing from a GP's perspective and experiences and how we can continue to adapt, improve/implement the VC and community diabetes model in Western Sydney.*

**\*\*\*START RECORDER\*\*\***

### Part 1. Information resources and infrastructure

1. What do you already know or what information have you received about telehealth or WSD Virtual Care for appointments with WSD?  
(Prompt for WSD telehealth brochure, websites, OST phone / email services).
2. What types of equipment/devices do you have to use for virtual care appointment?
3. Did you experience connection or technical problems for VC appointments?
4. Does your practice support video conferencing or only telephone conferencing with the patient or the specialist?  
(prompts: your practice embrace this new video technology or feel that it was just too hard to use at the time COVID had so many other demands)

## Part 2: Concierge support and experience

5. Were you aware that WSD has a 'concierge' service to assist the patient and the practice to join the WSD waiting room and be ready to join the consultation with the WSD team?
6. How did you find the myVirtualCare training and support provided to you and your practice staff by the WSD 'concierge' service?  
(prompt/follow up) What aspects of support helped or hindered the implementation?
7. Was the process efficient and timely or was there a large amount of time lost in getting the technology to connect and for everyone who needed to be able to come together efficiently?
8. 30 minutes has been allocated for the joint consultation (specialist, patients and GP) on the platform. Was this time about right? Too long or too short?
9. The Specialist team spent time talking with you and also talking with the patients. Was that the right approach or would you like more or less time to talk with the specialist team?
10. Were you able to bill Medicare for the online consultation?

## Part 2. Care and experience

11. Do you think your patients had a positive experience of care through the WSDVC clinic?
12. WSD has adapted to virtual care and has extended their services with opening a community diabetes clinic in Mt Druitt. This model has GP VMOs and specialist team having a joint consult with you and your patient in the same appointment to discuss the care plan.
  - What do you feel or think about this new model of joining the consultation with VMOs?
  - Is it helping you to deliver care efficiently?
13. One of the aims of the virtual care is to save the practitioner and patients time and effort where possible whilst maintaining a high quality of care.
  - Do you see this as a useful feature?
  - What problems/risks do you foresee with this approach?
  - Did this create a problem with time management at the practice to make this feasible?
  - How could this be improved?
14. Joint consultations has two aspects, one is for WSD Specialist team to jointly manage the patient with you and second is to provide information to you so you could better manage all your patients with diabetes.
  - Was this balanced approach working/worked well for you?
  - Was it the right balance?
  - How could we make it better?
15. Some patients may have been sent education bundles (videos and fact sheets) to their phone or email for ongoing education.
  - Are you aware of these bundles?
  - Did you see any of the bundles?
  - How could we make the contents of the education bundles better?

- How could we use or make the dissemination of the education bundles better?
16. Many patients were offered a subsidised Flash Glucose Monitor (CGM) to improve their glycaemic profile.
- Are you aware of this?
  - Did the patient learn from this?
  - Did you learn from this?
  - How could we make this process better?
17. Our Educator provides insulin stabilisation of Blood Glucose Level service for several weeks for certain patients.
- Are you aware if any of your patients use/used this service?
  - Do you have any suggestions to make this service better?
18. Do you have any additional feedback regarding virtual care?
19. Do you think any other service that could be integrated with this service for management of your patients with diabetes?

### Additional questions

*I would like to finish this interview by asking a few general questions about you. This will be used to describe the whole participant group, and will not be recorded with your interview [turn recorder off].*

20. What year did you qualify as a doctor?
21. What is your medical specialty?
22. What is your gender?
- Male
  - Female
  - Other
23. In which country were you born? \_\_\_\_\_  
If not Australia: In what year did you move to Australia to live?
24. Are you of Aboriginal and/or Torres Strait Islander origin?
- No
  - Yes (please specify)
25. Do you speak another language at home other than English?
- No
  - Yes (please specify)

## Appendix C: Study protocol: Effectiveness of Virtual Care for Diabetes – patients and providers insights

### Investigators

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### Background

While previously diabetes management was primarily the remit of specialist services, increasingly patients are being managed in primary healthcare settings, although some people with diabetes still have to attend regular follow up treatments in outpatient specialist clinics (1). Furthermore, it is increasingly clear that the conventional outpatient care - that occurs generally less than 3 times per year - is not sufficient for optimal management of diabetes (2). Telemedicine use has been rising worldwide for diabetes management, due to its potential to improve health care access and clinical outcomes (3).

A systematic review of studies on several information technologies used included internet, mobile phones, telemedicine and self-management support techniques showed that there is distinct need for more comprehensive interventions to be able to manage diabetes. The review identified that most studies do not adequately report patient satisfaction or explicitly evaluate issues relating to technology adoption by patients (4).

Western Sydney has a very high rate of diabetes, with an estimated 12% of the adult population have either known or unknown diabetes. Recent diabetes detection using HbA<sub>1c</sub> in adults attending General Practices showed diabetes rates as high as 17% of people tested (5). Mt Druitt, with highest rate, is the hottest diabetes 'hotspot'.

Western Sydney Diabetes (WSD) established an innovative model of care for patients with type 2 diabetes in the community, bringing together acute and community based specialist services in Mt Druitt in May 2020. This model provides care for local patients with type 2 diabetes closer to home. This tertiary diabetes clinic, coordinated by a Transition Nurse Practitioner and led by endocrinologists supporting four General Practitioner (GP) -Visiting Medical Officers conduct a joint consultation with referring GPs to manage patients. Whilst providing a better management of diabetes for the patients, this model has been upskilling GPs through an integrated approach with a multi-disciplinary team.

With the onset of COVID-19 pandemic, the number of presentation to Emergency Departments was almost 25% lower in 2020 than in 2019 (6). Suspension of outpatient clinics and public anxiety have reduced in-person consults and people with diabetes have stayed away from attending hospitals. COVID-19 is a significant risk for people with diabetes, with doubled relative risk of death for people if infected. (7)

Western Sydney Diabetes (WSD) is an early adopter of Virtual Care (VC) as a solution to the COVID-19 pandemic to cope with increasing demand for diabetes management, especially with the huge shift to virtual outpatient clinical services. The model, though not yet perfect, but very effective and improving gradually. A new 'concierge' service for supporting patients and GPs to be technically ready and joining the virtual waiting room was an essential part to this new model of care.

NSW Health has supported Telehealth through Activity Based Funding and the Commonwealth Government with Medicare Benefit Scheme (MBS) billing for 'Case Conferences' and new COVID-19 telehealth item numbers have made this economically feasible. The additional funds made available during

COVID-19 has allowed for the set-up of VC infrastructure. WSDVC uses the *myVirtualCare* platform developed by NSW eHealth and Agency for Clinical Innovation.

## Aim

The aim of this study is to explore the experiences of patients and health providers to inform the design of the WSD Virtual Care (WSDVC) and new Mt Druitt Community Diabetes Clinic model. Analysis of qualitative interviews will provide insights into the specific benefits, expectations and positive and negative experience of patients with diabetes and health care providers in western Sydney community using WSDVC and community clinic. These findings will then be incorporated with the latest evaluation and research on:

- WSD digital health solutions and interventions
- WSDVC hybrid integrated model of services
- Behaviour change techniques and theories

This will help the WSDVC and community diabetes clinic model of care to be tailored to suit the western Sydney community and implementation in a scalable approach.

## Method

Semi-structured qualitative interviews will focus on patients and providers behaviour such as willingness to use VC platform, attending appointments, interaction with care team, and perceive VC as one-stop-shop for their management of diabetes. 20 patients and 20 providers including 15 general practitioners, 2 staff specialists, 2 community diabetes educators and 1 dietitian will be interviewed. Interviews may take place remotely via zoom or skype, in person at home, at GP practice or Mt Druitt Community Centre as per participants' preferences. Interview procedure and questionnaires are attached.

## Inclusion / exclusion criteria

Participants under 18 are not eligible. Patients with type 2 diabetes attending Community Diabetes Clinic, Mt Druitt Community Health Centre. Healthcare providers including General Practitioners who have referred and consulted with WSD through myVirtualCare Platform. Participants with insufficient English proficiency will be included provided an accredited Interpreter in preferred language is available

## Recruitment of participants

Western Sydney Diabetes has established a significant relationship with many General Practitioners through the joint specialist case conference program and various other educational forums. General practitioners who have been referring their patients to WSD and have joined an appointment via myVirtualCare, will be invited to participate in the study by the specialist team and the Transition Nurse Practitioner.

Patients with type 2 diabetes, who have had an appointment with WSD Community Diabetes clinic in Mt Druitt Community Health Centre and used myVirtualCare, will be then be invited through their General Practitioners or by the Transition Nurse Practitioner.

Study information sheet and consent form for the study will be provided to the participants by the WSD specialist team including the Transition Nurse Practitioner.

Participants will be followed up and consented by the researcher. An interview date and time as per participants' preference will be organised by the researcher.



## Bias

To avoid any potential bias, the study will look at both positive and negative experiences of using myVirtualCare appointments. We could use purposive sampling for this to recruit a few patients and providers who have used WSDVC initially and have not used it anymore. This can be accessed through the database of patients and providers referred to WSD and those who have joined a virtual care appointments and then a follow up appointment in person.

## Location

The participants will be recruited from WSD Complex Type 2 Diabetes clinics in Mt Druitt Community Health Centre, WSLHD:

- Patients consulting through Virtual Care platform or attending in person
- GPs and providers using WSDVC.

The interview for the participants will be designed to take between 30 mins and 45 mins to explore patients and providers experience in understanding VC platform, adapting to its usage, benefits and impact on their quality of care and self-management. The interviews will help with in depth understanding of their experience and satisfaction.

## Expected outcomes

This study will provide insights on the aspects of benefits, perceptions and experience of patients and providers using WSD virtual care and/or attending Mt Druitt Community Diabetes Clinic in person. The views and needs of patients and GPs could be applied to optimise the VC and inform a hybrid approach of delivery of care that is more relevant and motivating.

## Timeline

Once the ethics approval is granted, the study is expected to commence in April 2021 and expected to finish by September 2021.

## Risk/s

It is possible that patients could experience distress while discussing their health condition; in which case the researcher will refer the feedback to the health care team to contact the participant and organise a follow up consult or counselling session as appropriate.

## Data monitoring

Data will be entered using a WSLHD laptop and saved to a database on WSLHD servers. Data will be monitored by the principal investigator and data analyst of Western Sydney Diabetes.

## Reporting

The study results or outcomes will be communicated to the research team and executives of WSLHD. The results will also be presented at national and international conferences and academic publications.

## Analysis and dissemination

The interviews will be transcribed verbatim and thematically coded using the Framework Analysis method. An external transcriber contracted through University of Sydney will be used to transcribe the interviews. Confidentiality Disclosure Agreement has been obtained from the external transcriber.

Sample size of 20 interviews per group (healthcare providers and patients with diabetes) is likely to give sufficient data based on our previous research experience in primary care, however also use purposive sampling to ensure diversity in participants (e.g. age, gender, ethnicity, experience).

Interviews will be conducted via online (zoom or skype) or in person by the researcher and responses will be audio recorded.

The interviews will be stored as digital recording and the interview transcripts will be de-identified and stored as electronic PDF files in password protected folders in the WSLHD WSD shared drive. For audio recordings, any potentially identifying information (e.g. names) mentioned by a participant will be removed from the transcript.

All copies of the recordings will be deleted from the voice recorded once it is transferred to the WSLHD drive.

Paper based interview notes (containing ID numbers but otherwise de-identified) will be kept in a locked cabinet in WSD Office separate from the consent forms. Paper copies of GP and Patient Participant Consent Forms will be stored in a locked filing cabinet in a locked office Western Sydney Diabetes, Level 3, Admin & Education Building Blacktown campus.

Upon completion of the study, the consent forms, word/PDF-transcripts and excel-quantitative data will continue to be stored in a locked filing cabinet in a locked office of Western Sydney Diabetes, Level 3, Admin & Education Building Blacktown campus.

A 5-year storage period has been chosen based on legislation from the State Records Act of NSW and NHMRCs Australian Code for Responsible Conduct of Research requirements.

Papers in peer reviewed medical/public health journals and conference presentations will be used to share the results of the data collected through this study from GPs and patients.

### Statement of ethical issues

There are no anticipated ethical issues with the project as outlined above.

### References:

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3. Lee JY, Lee SWH. *Telemedicine Cost-Effectiveness for Diabetes Management: A Systematic Review.* Diabetes Technol Ther. 2018 Jul;20(7):492-500. doi: 10.1089/dia.2018.0098. Epub 2018 May 29.
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6. Andrew W Kam, Sarah G Chaudhry, Nathan Gunasekaran, Andrew JR White, Matthew Vukasovic, Adrian T Fung. *Fewer presentations to metropolitan emergency departments during the COVID-19 pandemic* Med J Aust 2020; 213 (8): 370-371. doi: 10.5694/mja2.50769
7. Shi Q, Zhang X, Jiang F et al. *Clinical characteristics and risk factors for mortality of COVID-19 patients with diabetes in Wuhan, China: a two-center, retrospective study.* Diabetes Care. 2020; 43: 1382-1391

## Appendix D: Workshop discussion guide for clinic staff and collocated allied health professionals

*Purpose:* The primary purpose of the evaluation is to inform local service delivery improvements in WSD. It is also intended that the evaluation will assist ACI and NSW Health to inform the potential roll-out of future virtual models of care elsewhere in NSW.

*Place of workshop in evaluation process*

- Qualitative interviews with clinic staff, referring GPs and patients
- Analysis of clinical data
- Analysis of financial data
- Data workshop
- Workshop to test findings

*Timing:* Strict one hour window so we will race through

*Zoom suggestions:* Put comments in chat

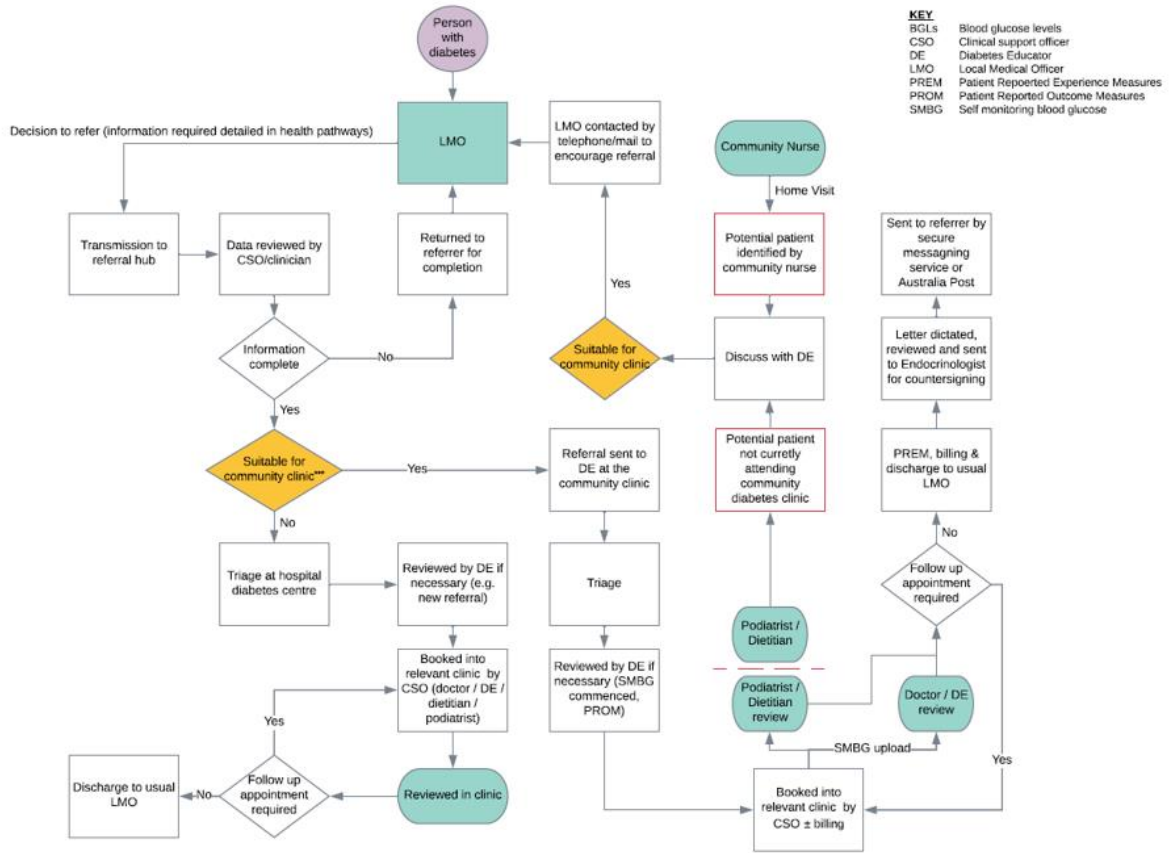
*Recording:* Confirm group is happy for the session to be recorded for note-taking purposes.

1. **Positives and benefits of Mt Druitt Community Diabetes Clinic**
  - What worked well for you as clinicians here?
  - What benefits are there for referring GPs?
  - What benefits are there for patients?
2. **Challenges and areas for improvement**
  - What challenges were there for you as clinicians here?
  - How can the clinic increase GP awareness, engagement and capacity?
  - What can the clinic do better for patients in future?
  - What other multidisciplinary services might be useful in future?
  - Are there patient groups who may have missed out?
3. **Specific issues – prompt as necessary**
  - Uptake of multidisciplinary services
  - Awareness/uptake/engagement of referring GPs
  - Capacity building among referring GPs
  - Tech/IT issues
    - Concierge service
    - MyVirtualCare platform
    - Billing
  - Virtual care bundle
    - Educational resources
    - Joint specialist/GP case conference service
    - Continuous home glucose monitor
    - Healthy living advice
4. **Other aspects of implementation or ideas for improvement**
5. **Lessons for scaling and virtual care**
6. **Final comments**

Appendix E: Original MDCDC Operational Model (November 2018)

COMMUNITY DIABETES CLINIC - OPERATIONAL MODEL

Version 3 Tien-Ming Hng | November 14, 2018



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