TAKING THE HEAT OUT OF OUR DIABETES HOTSPOT

Western Sydney Diabetes

BEATING DIABETES TOGETHER

phn WESTERN SYDNEY
An Australian Government Initiative

pwc

diabetes nsw & act

NSW GOVERNMENT Health
Western Sydney Local Health District

NSW GOVERNMENT

PURPOSE OF THIS DOCUMENT

This document sets out our proposal to beating diabetes together in western Sydney.

Part 1: Our Problem describes the burden and cost of diabetes in Australia and establishes why western Sydney is a high risk community for diabetes

Part 2: Our Strategy details our proposed strategy to 'take the heat out' of this diabetes hotspot.

Part 3: Our Interventions highlights the details of the current interventions being deployed.

Unless we take this program to scale we will not be able to achieve the results that are possible. To support our approach we have also identified the investment priorities needed to make a big difference and reduce diabetes in western Sydney.

The pillars of our strategy are:

- **Building an Alliance and Testing the Strategy:** We have built an alliance of more than 70 partners across government, business and the community to better understand the problem, engage with decision makers to develop and implement solutions that will tackle the epidemic of diabetes in our region.
- **Primary Prevention:** Securing investment for primary prevention programs and interventions to reduce the development of type 2 diabetes in the community and limit the progression of people at 'high risk' or with pre-diabetes to a formal diagnosis of type 2 diabetes.
- **Secondary Prevention and Management:** Securing investment for secondary prevention and management programs and interventions to slow or stop the development of diabetes complications.
- **Data for Decision Making:** We are building a surveillance and monitoring system that will leverage data and intelligence to continuously evaluate the problems and impacts.
- **Mobilising Public Support:** Our community awareness campaign will inform the community on the risks of diabetes and engage them to do something about it.

This document sets out 'Building an alliance and testing the strategy'. Details of the other pillars are set out in four supplementary documents.

CONTENTS

EXECUTIVE SUMMARY

Diabetes remains one of the most significant health challenges for western Sydney.

The region is now a diabetes hotspot with rates of diabetes more than double that of Sydney's eastern and northern suburbs. Unless we take action, the problems will continue to worsen.

Now more than 60% of the western Sydney population is overweight and at risk of developing type 2 diabetes. It is estimated that 15% of residents (129,000 people) have diabetes. In addition, 35% of the local population (301,000 people) are at 'high risk' of type 2 diabetes with pre-diabetes or high blood glucose.

"This rising tsunami of diabetes in Sydney's western suburbs threatens to overwhelm hospitals within 15 years," said western Sydney Local Health District Chief Executive Danny O'Connor.

Being overweight has become the norm and the majority of patients seeking treatment for serious illness in our hospitals either have diabetes or pre-diabetes. More than a third of people with diabetes do not know they have it. Even worse is a worrying lack of awareness about how serious the threat of diabetes is and how it will lead to serious health complications if left undiagnosed or unmanaged.

Western Sydney is one of the fastest growing populations in Australia but the social determinants of health that promote healthy eating, active living and social inclusion are not working favourably to prevent diabetes and its progression in western Sydney.

If this 'hotspot' is not addressed, within a decade it will cause a very substantial economic and societal burden on the state's healthcare system.

But there is much that we can do to turn these trends around.

If we can encourage adults in western Sydney to lose four kilograms on average, we could turn the diabetes risk clock back 20 years. If adults were to lose two kilograms on average we would reduce our diabetes hotspot to below the New South Wales (NSW) state average and prevent 30% of people at high risk of diabetes from actually developing diabetes.

Working together we can execute a range of strategies to take the heat out of our diabetes hotspot and this document, Western Sydney Diabetes initiative, outlines our response to this challenge.

Our success will require diabetes prevention and management to become everybody's business and leadership and partnership approach are the key pillars of our plan. We also identify opportunities for greater primary prevention through to secondary prevention and integrated management across the community.

Underpinning this strategy is the development of a powerful surveillance and monitoring system for evaluating and managing the performance of the initiative. The insights gained will inform decision makers. Public support will be mobilised, enhancing community awareness and engagement as a catalyst for change.

We will reduce diabetes in western Sydney. We'll show how a collaborative community approach can make the difference when shifting behavior for positive health outcomes. In alignment with Federal and State strategies addressing diabetes, western Sydney will become a real world example of the successful prevention and management of diabetes.

We invite you to join us in **beating diabetes together**.

PART 1: OUR PROBLEM

> Lifestyle diabetes causes suffering for individuals, families and communities. It can stop you from working, playing and looking after those you love. It can be beaten.
>
> Danny O'Connor
> Chief Executive
> Western Sydney Local Health District

PART 1: OUR PROBLEM

Alignment to National and State Government Initiatives

Diabetes is a problem that many parts of the community have an interest in solving. Our Western Sydney Diabetes aligns with the range of federal, state and local government initiatives that are aimed at reducing obesity and diabetes in our communities.

- The Australian National Diabetes Strategy 2016-2020 recognises that "overcoming the many barriers to improving diabetes prevention and care requires a multi-sectoral response led by governments and implemented at the community level".[1] This is a core element of Western Sydney Diabetes.
- The NSW Diabetes Prevention Framework brings together diabetes-related work across NSW, identifies enhancements to evidence-based practice, and sets a range of strategic directions for NSW Health to decrease the risk of developing diabetes or diabetes complications in local populations.[2] Western Sydney Diabetes is part of this framework and has been recognised as an exemplar component.
- The NSW government includes obesity reduction in children in their state-wide priorities and runs programs such as Make Healthy Normal and Get Healthy which are part of the core initiatives of our strategy.
- We are engaged with the Greater Sydney Commission's efforts to design an urban environment in western Sydney that facilitates healthy living and encourages residents to get active.
- Western Sydney Diabetes is also represented in the NSW Health Taskforce for Diabetes, which feeds directly into the NSW 'Leading Better Value Care' program. The Taskforce's focus aligns to our strategy of increasing community programs to better manage type 2 diabetes and better enhanced management of diabetes in hospital.

The Burning Platform of Diabetes in our Community

Diabetes is a growing global, national and local problem. Without collective effort to reduce its prevalence the costs of the problem will grow exponentially.

A Global Epidemic

Diabetes is the world's fastest growing chronic condition and type 2 diabetes has been called the epidemic of the 21st century.[1, 3, 4] Despite this, type 2 diabetes remains under-reported, in part because many people do not realise they have it until they develop complications.

A Worsening Problem for Australia

Diabetes is becoming the largest burden of disease in Australia.

In 2016, around 1.7 million Australians are estimated to have diabetes.[5] This includes all types of diagnosed diabetes (1.2 million known and registered) as well as silent, undiagnosed type 2 diabetes (up to 500,000 estimated).[1, 6] Type 2 diabetes represents the vast majority of diabetes in Australia (85%).[1] In addition, it is estimated that more than two million Australians have pre-diabetes where they are at high risk of developing type 2 diabetes.[7]

Without interventions, approximately 50% of those with pre-diabetes will go on to develop diabetes within 10 years.[8]

ALIGNMENT WITH LOCAL STATE AND FEDERAL INITIATIVES

MAKE HEALTHY NORMAL

Australian National Diabetes Strategy 2016–2020

PREMIER'S PRIORITIES IN ACTION

get healthy Information & Coaching Service

LEADING BETTER VALUE CARE

NSW DIABETES PREVENTION FRAMEWORK

Greater Sydney Commission

TACKLING CHILDHOOD OBESITY

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The prevalence of diabetes in Australia has risen from 1.3% of the population in 1989 to 7.0% in 2016 and it is predicted to rise to 8.5% of the population (aged 20-79) by 2030.[9] The number of Australians diagnosed with diabetes is expected to double to 3.5 million by 2033.[4]

More locally, diabetes is a mounting problem for all of NSW. In 2014, 9.4% of the state's population had diabetes or high blood glucose, up from 6.5% in 2002.[2]

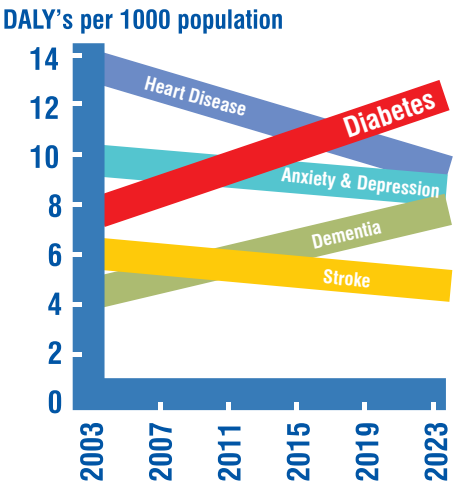
Every 30 seconds, a lower limb is lost to diabetes somewhere in the world.[6] Diabetes is responsible for 60% of all amputations in Australia, and it has one of the worst diabetes-related lower limb amputation rates in the developed world, with nearly 20 per 100,000 people with diabetes losing a limb compared to an average of 12 per 100,000 elsewhere[4]. More recent data suggests that diabetes-related amputations have also increased in Australia by over 30% for the period between 1998 and 2011.[10]

KEY FACTS:

- Somewhere in the world every five minutes a person is diagnosed with diabetes.
- Somewhere in the world every six seconds a person dies from diabetes.
- The number of people with diabetes in Australia is three times higher than 25 years ago.

- **ONE IN FOUR AUSTRALIANS AGED OVER 25 YEARS HAS DIABETES OR PRE-DIABETES.**

DIABETES TRAJECTORY FOR PREVALENCE OVERTAKING OTHER DISEASES



And an Expensive Problem for Australia

Estimates of the cost of type 2 diabetes to the Australian health system range up to $6.57 billion a year. [4, 11, 12]

These costs are not limited to the health costs of the disease itself, but also the costs of associated conditions and the costs of government subsidies and carers.

The total societal cost in Australia is estimated to be $14.6 billion per year.[13] Worryingly, unless more is done to prevent type 2 diabetes and its complications the financial burden of treating this disease could quadruple by 2051 to up to $50 billion per annum.

IT HAS BEEN ESTIMATED:

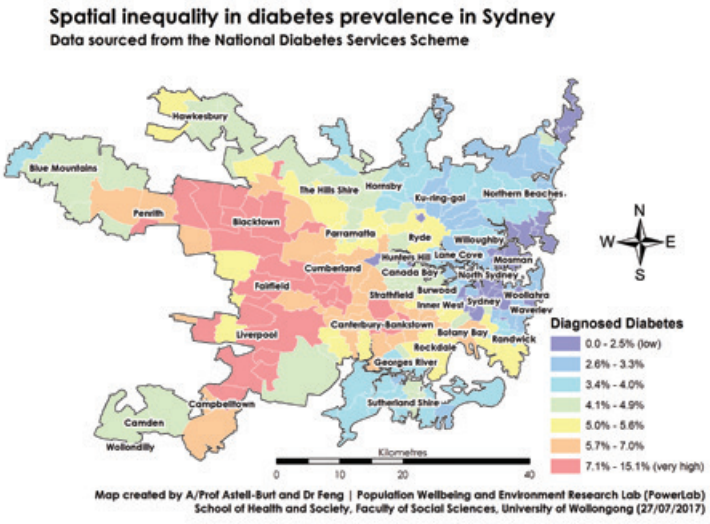
- Type 2 diabetes costs Australia $14.6 billion per year.
- 4% of people who have diagnosed diabetes account for 12% of the total health costs in Australia.

- **THE TOTAL COST OF TYPE 2 DIABETES TO THE COMMUNITY FOR A PERSON WITH NO COMPLICATIONS IS $13,766 A YEAR AND FOR A PERSON WITH COMPLICATIONS THE COST IS $22,156.**

Our Western Sydney Diabetes Hotspot

Western Sydney is a particular 'hotspot' for diabetes and diabetes risk. 60% of western Sydney's population is overweight and at risk of developing type 2 diabetes[14] and rates of diabetes are higher than in other parts of Sydney, as shown on the heatmap[15]

SPATIAL INEQUALITY IN DIABETES PREVALENCE IN SYDNEY



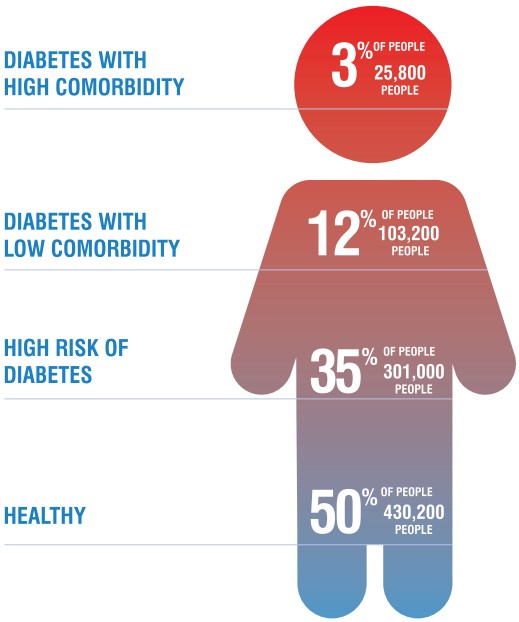
PART 1: OUR PROBLEM

We estimate that of the 860,000 people living in western Sydney, 129,000 (15%) have diabetes; 25,900 (3%) have significant additional diseases such as vascular problems (high comorbidity) and 103,200 (12%) have diabetes with low comorbidity.[16] 85% of these residents will have type 2 diabetes (109,650 people).

Additionally, there are up to 301,000 people (35% of the local population) at 'high risk' of type 2 diabetes with pre-diabetes or high blood glucose.

The area of Blacktown and Mount Druitt has an even greater proportion of residents with diabetes. Screening at the Emergency Department (ED) in 2017 showed alarming rates of 17% of people with diabetes and 29% having pre-diabetes.

If western Sydney mirrors the national trend, without initiatives there will be approximately 220,000 to 260,000 people with type 2 diabetes in 2030.



Why is Western Sydney Such a Hotspot?

People in Western Sydney Have a Higher Risk of Developing Type 2 Diabetes

Factors such as age, family history and place of birth can contribute to an increased risk of developing diabetes and some groups are at even greater risk. Many of these groups are strongly represented amongst western Sydney residents:

- **Indigenous People** – type 2 diabetes is more common and has an earlier onset in this population.[4]
- **People from Asia and Pacific Islands Heritage** – have higher rates of diabetes and develop diabetes at a lower weight and Body Mass Index (BMI).[4]
- **People with Mental Health Problems** – 41.6% of adults with diabetes reported having medium, high or very high levels of psychological distress.[4]
- **Women in their Childbearing Years** – the percentage of gestational diabetes in western Sydney is higher than for NSW. Western Sydney has a higher birth rate, with three out of our five Local Government Areas (LGAs) having higher fertility rates than the rest of NSW.

Western Sydney Residents are Living in a Diabetogenic Environment and 60% of Residents are Overweight

People living in western Sydney are living in a diabetogenic environment where the population, community, local economy and built environment make it difficult for the residents to engage in a healthy lifestyle.

Compared with other Local Health Districts, the physical activity rates in western Sydney are one of the lowest in NSW.[14]

Diet in western Sydney is poor, with only 7.1% of western Sydney residents eating the recommended daily intake of vegetables (compared to 8.4% in NSW).[14]

All of this contributes to 60% of western Sydney's population being overweight and at risk of developing type 2 diabetes. The level of obesity in the district is one of the primary drivers of the diabetes epidemic.

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People in Western Sydney Have Poor Access to Healthy Food

Accessibility to healthy foods in western Sydney is also an issue, with large areas of so-called 'food deserts' where healthy food is not easily available within walking distance of residences in comparison to energy-dense, nutrient-poor foods.

The Population Wellbeing and Environment Research (POWER) Lab at the University of Wollongong has been working with the Western Sydney Diabetes since its inception. They have mapped the prevalence of diabetes and associated risk factors in our local communities.[15]

Their research has shown that the prevalence of known diabetes in the Blacktown postcode is over three fold higher than in the north shore postcode of Mosman.[15] Given that many people with diabetes remain undiagnosed and western Sydney is differentially affected by underlying risk factors, the true ratio may be significantly higher. This inequality is likely to be driven significantly by healthy food deserts, fewer active green spaces and a built environment that necessitates long car-based commutes instead of walking and cycling.

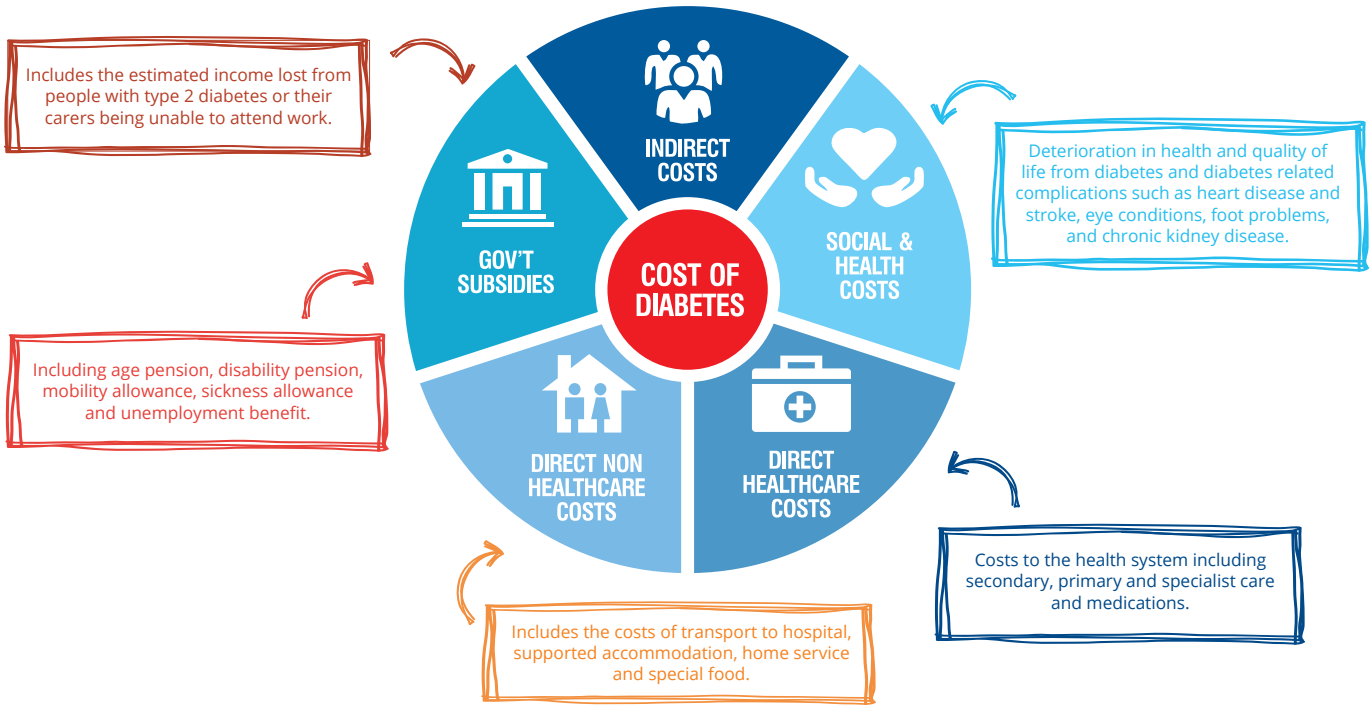
Research indicates:

- Many communities in western Sydney have access to fast food takeaways but no healthier alternatives within a reasonable walking distance.[17]
- A 10 – 13% reduced risk of having diabetes among people who live in suburbs that contain a moderate amount of parkland, compared to those in less green areas.[18]
- People tend to be nearly 1.2 kilograms heavier in areas where there is a ratio of four fast food takeaways to one healthier food vendor.

This research underlines the wider belief that planning and regenerating our communities would enable people to be physically active and eat healthily. This would significantly help in reducing the burden of diabetes and associated risk factors like overweight and obesity. The additional benefit to prevention efforts would likely enable better self-management among people living with diabetes.

The Cost of Diabetes in Western Sydney is Significant

The cost of diabetes in western Sydney includes both the financial and non-financial costs. The financial costs of type 2 diabetes are not limited to the costs of the disease itself but include the costs of associated conditions and other non-healthcare costs.



PART 1: OUR PROBLEM

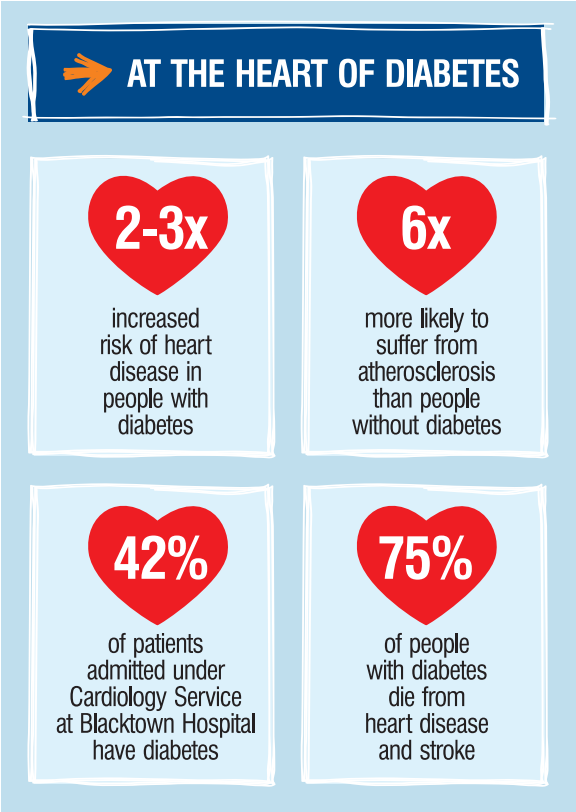
It is estimated that the average annual financial costs of a patient with type 2 diabetes in western Sydney (healthcare and other costs) is $16,124, or $13,766 for those with no complications and $22,156 for those with macro vascular complications.

The Health Consequences of Diabetes are Devastating

Diabetes can affect the eyes, kidneys, lower limbs and can impact on cardiovascular and mental health. If gestational diabetes occurs, there is also a future risk of type 2 diabetes.

Heart Disease and Stroke

Diabetes is also often associated with high blood pressure and high blood fats (cholesterol and triglycerides) and causes an increased risk of heart attack and stroke.[4]



Eye Disease

Retinopathy is a major long-term complication of diabetes. It affects about one in four people with diabetes.[4] The development of retinopathy is strongly related to the length of time diabetes has been present and the degree of blood glucose control. Regular eye checks and treatment can help prevent retinopathy-caused blindness.

Kidney Disease

Diabetes is the fastest-growing cause of kidney failure. It is the leading cause of end stage renal disease. About 30% of people with diabetes will develop kidney disease.[19]

Lower Limbs

Neuropathy or peripheral nerve disease and blood vessel damage may lead to leg ulcers and serious foot problems from which limb amputation may result. Furthermore, mortality data associated with diabetes complications suggests foot complications are the second leading cause of diabetes-related death second only to cardiovascular disease.[10]

Mental Illness

Depression is becoming increasingly common in the general population with approximately one in four people experiencing depression some time in their adult life. For people with diabetes, this figure is even higher with up to 50% of people with diabetes also thought to experience depression or anxiety.[4] There is also evidence to suggest a significant link between diabetes and dementia.[20]

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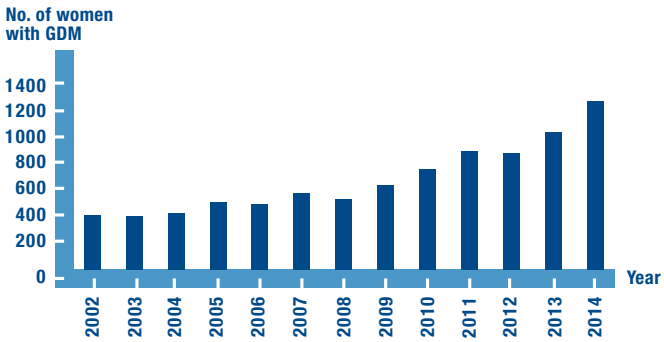
Gestational Diabetes

There is a proven link between gestational diabetes and type 2 diabetes. Gestational diabetes leads not only to ill health for the mother but often leads to premature birth, excessive birth weight, infants who struggle with hypoglycaemia after birth and ongoing health issues for the mother and child including an increased likelihood of obesity and type 2 diabetes later in life. 50% of mothers with gestational diabetes and 30% of their babies will go on to develop type 2 diabetes later in life.

Western Sydney has seen a dramatic surge in gestational diabetes since 2006, with our most vulnerable populations being hit hardest. The statistics are alarming, with the rate now exceeding 15% of all pregnancies.

GESTATIONAL DIABETES IN WSLHD

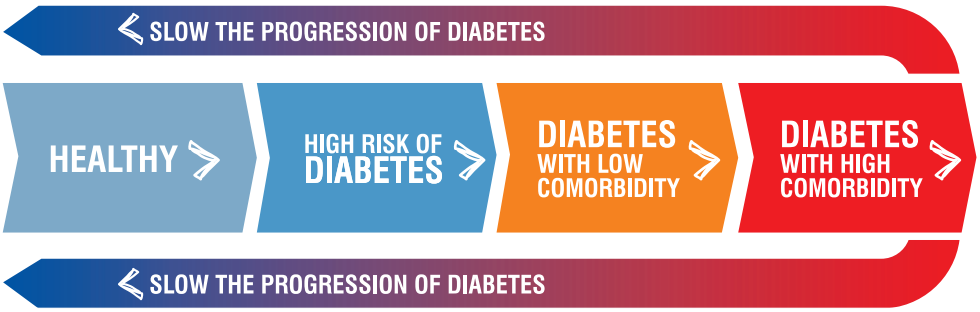


CHILDREN OF GESTATIONAL DIABETES MORE LIKELY TO DEVELOP DIABETES

30%
WILL DEVELOP
T2 DIABETES

PART 2: OUR STRATEGY

> Diabetes knows no boundaries affecting individuals and communities right across western Sydney. The partnership response to this diabetes challenge is both necessary and ground breaking. Our aim is to turn diabetes around and improve the long term health of western Sydney.
>
> Walter Kmet
> Chief Executive Officer
> Western Sydney Primary Health Network



Our Strategy to Reduce Diabetes in Western Sydney

Western Sydney Diabetes framework for action sets out our strategy and plan to take the heat out of the western Sydney hotspot.

Our Goal

The goal of Western Sydney Diabetes is to increase the proportion of the healthy population, slow the progression towards being at risk of diabetes, and reduce the size of the at-risk population.

We aim to prevent and slow health deterioration that can escalate from obesity to pre-diabetes to uncomplicated diabetes to diabetes with devastating co-morbidities.

Framework for Action

Our framework contains the following pillars:

- **Building an Alliance and Testing the Strategy:** We have built an alliance of more than 70 partners across government, business and the community to better understand the problem, engage with decision makers and develop and implement solutions that will tackle the epidemic of diabetes in our region.

PART 2: OUR STRATEGY

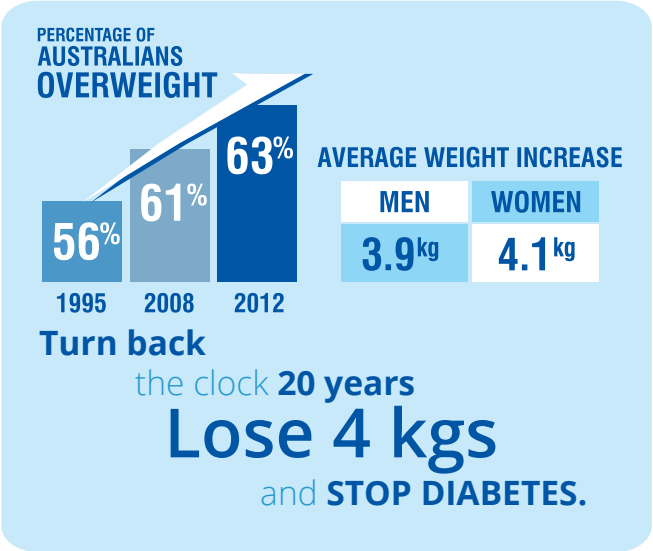
- **Primary Prevention:** Securing investment for primary prevention programs and initiatives to reduce the development of type 2 diabetes in the community and limit the progression of people at 'high risk' or with pre-diabetes to a formal diagnosis of type 2 diabetes.
- **Secondary Prevention and Management:** Securing investment for secondary prevention focusing on management programs and initiatives to slow or stop the development of diabetes complications.
- **Data for Decision Making:** We have built a surveillance and monitoring system that will leverage data and intelligence to continuously evaluate the problems and impacts.
- **Mobilising Public Support:** Our community awareness campaign will inform the community on the risks of diabetes and engage them to do something about it.

There are Some Simple Solutions to Tackling Type 2 Diabetes

There are some simple solutions to tackling diabetes that are included within our strategy.

Reducing Obesity in Children and Adults will Reduce Diabetes

While a range of factors contribute to the likelihood of developing type 2 diabetes, it is substantially preventable by controlling the risk factors which contribute to obesity and being overweight.



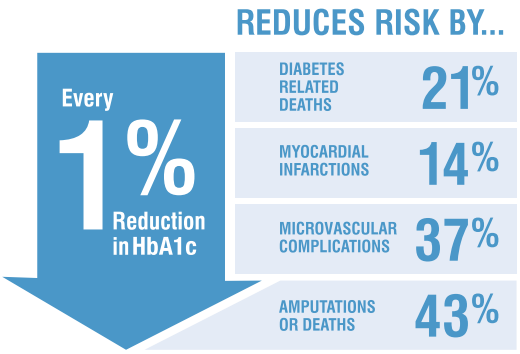
In 2017, almost two-thirds of Australian adults and one in four children are overweight or obese.[9] Whilst type 2 diabetes mostly develops in adults after the age of 45, rising levels of childhood obesity means that diabetes is increasingly being diagnosed in younger adults and even adolescents and children.[9]

In the past 20 years, Australian adults have, on average, gained four kilograms in weight. This weight increase is the primary driver of the diabetes epidemic. An average weight loss of two kilograms in adults will reduce the conversion of people with pre-diabetes to diabetes by 30%. If we can encourage adults to lose four kilograms on average, we will be able to reduce our diabetes hotspot to below the NSW state average.

Better HbA1c Control will Reduce Complications with Diabetes

Many Australians with diabetes have poor control of the disease so their risk of complications is increased. We can test a person's level of control with a simple blood test that measures HbA1c. An HbA1c level below 7% is considered good control, however research shows that nearly half of all Australians with diabetes have levels greater than 7%, putting them at higher risk of diabetes complications.[4]

If we can identify an individual's HbA1c levels with screening, we can work with them to reduce it and evidence shows that every 1% reduction in HbA1c levels significantly reduces the risk of health complications such as diabetes related deaths, myocardial infarctions, micro vascular complications or amputations.[21]



High Level Benchmarks – What Will Success Look Like?

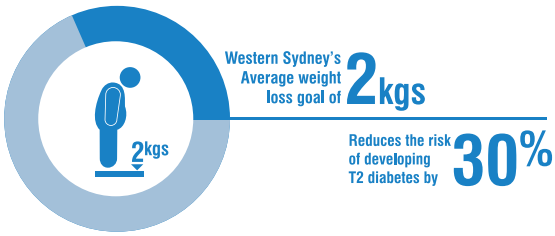
The high level benchmarks for success of the Western Sydney Diabetes initiative have been defined as taking the heat out of the diabetes hotspot by:

- Reducing the average weight of adults in western Sydney by two kilograms.
- Reducing the average HbA1c in patients who have diabetes to less than 7% (recognising that in some patients individualised HbA1c targets should be higher or lower than 7%).
- Reducing the diabetes prevalence to below the NSW State average within five years.

Building an Alliance

We recognise that diabetes prevention and management needs a multi-sector and multi-disciplinary approach as diabetes care occurs in a variety of settings. As such a partnership model is needed to engage decision makers and drive an united effort to secure commitment for more resources to facilitate, educate and motivate residents to adopt healthier diets and incorporate more physical activity into their daily lives.

HEALTHY BENCHMARKS FOR WESTERN SYDNEY



We are well advanced as Western Sydney Diabetes has grown to an alliance of more than 70 partners. It is co-led by Western Sydney Local Health District (WSLHD), Western Sydney Primary Health Network (WSPHN), Diabetes NSW & ACT, NSW Department of Premier and Cabinet (DPC) and PricewaterhouseCoopers (PwC).

Other alliance partners include NSW Departments, Greater Sydney Commission, Western Sydney Region of Councils (WSROC), Councils, private sector, pharmaceutical industry, food companies, the health and fitness industry, non-government organisations, pathology companies, IT industry, Universities, education institutions, hospital specialists, general practices, allied health and pharmacy organisations.

Unless we work together we will not achieve the targets we have set ourselves. Our success depends on collaboration and coordination. Already, senior executives, clinicians and staff from the above organisations have shown their commitment by attending regular WSD forums, workshops, working and project groups over 2016 and 2017.

We also have a clear governance structure to support the alliance. Each year we develop an Annual Plan and a Year-in-Review to report on the achievements of Western Sydney Diabetes. These reports demonstrate the extent of work currently underway by the alliance to tackle diabetes locally.

Our Partnership work has been recognised locally, for example the WSD was honoured with the prestigious 2017 Pemulwuy Prize and the Western Sydney Leadership Award for "Productive Partnerships".

This work and additional efforts of our key partners is further captured and shared through the Western Sydney Diabetes website **www.westernsydneydiabetes.com.au.**

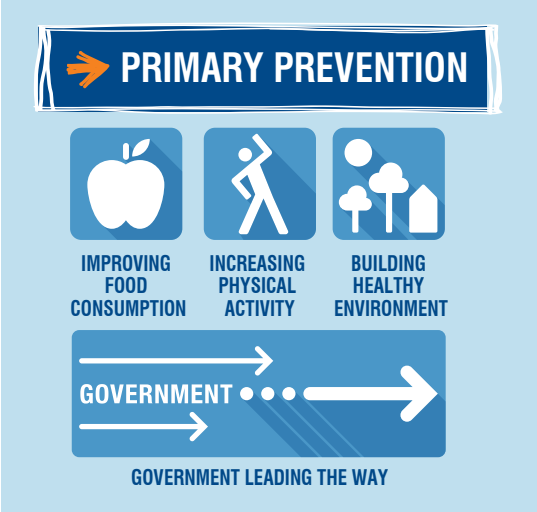
PART 2: OUR STRATEGY

Primary Prevention

Overview of our Primary Prevention Program

We will not be able to hold back the tsunami of the diabetes epidemic without addressing the root causes embedded within the social determinants of diabetes.

Primary prevention aims to reduce the development of type 2 diabetes in the community and limit the progression of people at 'high risk' or with pre-diabetes to a formal diagnosis of type 2 diabetes.



International and local evidence demonstrates that type 2 diabetes can be prevented through lifestyle intervention, weight reduction and changes to diet and exercise.[1, 6] These elements, in combination with a healthy urban environment as well as State and Local Government's commitment to addressing the problem, can create the right conditions for individuals and communities to maintain a healthy lifestyle and prevent the progression of diabetes.

The diagram above sets out the four core elements of our primary prevention program.

Type 2 diabetes and obesity are largely preventable through healthy diet and maintaining moderate physical activity. The aim of the Alliance is to produce a paradigm shift in the local environment allowing residents to purchase and prepare fresh food, to have access to safe areas for physical exercise and to reduce dependency on car travel, through local and government interventions and improved urban design.

- **Improving Food Consumption** – People need to have the skills and knowledge to be able to make healthy food and lifestyle choices for themselves and their families, and positive influences from the early years and throughout life are vital to establishing and maintaining lifelong healthy habits. Our program takes a life-cycle approach to changing eating patterns across the district by increasing food education and access to healthy food.
- **Increasing Physical Activity** – Increased physical activity is one of the most effective preventive measures and treatment for both obesity and type 2 diabetes. We include and promote a variety of exercise and active living programs in our initiative.
- **Building Healthy Environments** – Creating supportive built environments is a well-recognised way of improving health and wellbeing. Creating environments that encourage people to choose walking and cycling as transport modes is one example. Providing better access to recreational open space for exercise is another. The urban environment has a profound impact in getting people active, connecting people and providing access to healthy food options, and this is a key enabler to the WSD Initiative.
- **Government Leading the Way** – The NSW government is a significant employer in western Sydney with many employees living locally. Improving the overall health of government employees will not only contribute to reducing rates of diabetes but also importantly demonstrate leadership and thus encourage community acceptance of the need to make healthy lifestyle choices.

Selecting our Program Interventions

Our primary prevention program sets out a series of interventions and programs under each of the four core elements as described above. Some of these interventions are pre-existing and are detailed in ***Part 3.*** Other interventions are new to the Western Sydney Diabetes and a summary of these interventions is provided in our accompanying document, ***Investment opportunity – Primary Prevention.***

All of the interventions were agreed upon by the alliance partnership and its selected partners following an appraisal of local and international interventions. These international interventions have proved to be the most successful in achieving large scale population responses in the shortest time. Individual working groups were set up dedicated to food, physical activity and urban planning. A series of workshops and planning sessions were held to refine and agree on the final interventions.

Our primary prevention program targets the 35% of people in western Sydney who are at 'high risk' of developing diabetes. It also targets the 50% of the population who are healthy, including children, to encourage them to live more healthy lives.

The primary prevention interventions are aimed across the population and life-spectrum of pregnancy and infancy through to adulthood. Some initiatives, for example, lifestyle coaching, are targeted at specific cohorts of individuals who will be identified by a review of current health records and increased screening in hospitals and general practice. Other initiatives are based on an 'all of population' approach.

But More Investment is Required to Take This to Scale

In order to deliver the goals of the Western Sydney Diabetes, we need to expand the size and reach of our current interventions to a wider population and complement them with new additional interventions that will require investment and implementation from the ground up.

Our current capacity is limited and we therefore require additional funding to build the resources and technology to deliver the scale required and achieve our high level benchmarks. Our case for expansion and investing in our primary prevention program is set out in our accompanying document, ***Investment opportunity – Primary Prevention.***

Our investment case is supported by a robust economic case that sets out the investment required over the next 14 years and the net benefits that arise from each initiative. Our economic case is supported by global research that demonstrates that diabetes prevention programs are cost-saving or cost-effective and result in better health outcomes.

Blacktown Pilot

Because current resources for this work are very limited, we have started with a targeted Blacktown Focus. We will concentrate on a number of low cost interventions aimed at the prevention and treatment of diabetes in this area to demonstrate the positive impact that this can have on the health of our residents.

If this delivers the results we will then roll out to other districts in western Sydney. Leaders from health, non-government and the private sector along with the Mayor of Blacktown Council have all committed their support for our initial Blacktown focus.

The Blacktown focus will allow organisations to extend and evaluate work that is already being carried out in Blacktown as well as providing new collaborative opportunities to initiate additional interventions.

PART 2: OUR STRATEGY

Secondary Prevention and Management

Overview of our Secondary Prevention and Management Program

Secondary prevention aims to slow or stop the development of diabetes complications, through lifestyle modifications and healthy lifestyle changes that reduce the risks of developing diabetic complications.

The majority of international and local health economic studies available demonstrate that secondary prevention strategies that implement integrated care type interventions, improve diabetes management and reduce patient's HbA1c levels are recognised to be either cost-saving or cost-effective.[4, 22, 23]

Slowing the progression of type 2 diabetes benefits both the patients in terms of increasing life expectancy and quality of life as well as the economy in terms of reducing the cost to government and society. If the rate of growth of type 2 diabetes can be reduced, then there will be substantial savings across a range of health areas, including heart disease and stroke, eye conditions, foot problems, and chronic kidney disease.

The diagram (below) sets out the core initiatives of our secondary prevention and management program. These cover a range of programs including lifestyle interventions, enhanced diabetes management in the community, and specialised consultation in hospital.

Selecting our Program Interventions

Our secondary prevention and management program targets the 3% of people in western Sydney with diabetes and high comorbidities, the 12% of people with diabetes and low comorbidities and also the 35% of people who are at 'high risk' of developing diabetes.

A strong evidence base supports our case that the selected interventions in the diagram can have a positive impact on preventing the progression of diabetes for these cohorts.

All of these interventions are pre-existing and the great achievements and inroads that have already been made to date are all detailed in *Part 3*.

But More Investment is Required to Take This to Scale

In order to deliver the goals of the Western Sydney Diabetes interventions, we need to expand the size and reach of our current interventions to a wider population. Our current capacity is limited and we therefore require additional funding to build the resources and technology required to deliver the scale required and achieve our high level benchmarks. Our case for expansion and investing in our secondary prevention and management program is set out in our accompanying document, *Investment opportunity – Secondary Prevention and Management.*

Our investment case is supported by a robust economic case that sets out the investment required over the next eight years and the net benefits that arise from each initiative. Our economic case is supported by global research that demonstrates that diabetes prevention programs are cost-saving or cost-effective and result in better health outcomes for individuals.

More Support for our General Practitioners

General Practitioners (GPs) are at the forefront of the 'diabesity' epidemic and are in a privileged position to modify the traditional hospital-based paradigm of type

2 diabetes treatment. Yet obstacles remain in engaging patients in diabetes management in primary care, such as the expanding options of pharmacological agents available, as well as the ever-changing landscape of treatment guidelines. Addressing this is key to the success of tackling the diabetes epidemic.

Research in a number of countries has identified that diabetes care is often compromised by a lack of experience and confidence of GPs, particularly regarding insulin initiation and dose escalation [24-28], especially since approximately 50% of patients with type 2 diabetes will ultimately require insulin. Nearly half of Australians with diabetes have an HbA1c level of 7% or higher[5], reflecting an inertia in general practice to add additional oral agents or to initiate insulin.

We believe that type 2 diabetes is best managed by General Practice and Allied Health in the community, leaving the specialised hospitalised services to manage the more complex cases of type 2, type 1 and gestational diabetes. However, when the patients need specialist care or hospitalisation, the journey should be better connected.

As the more integrated enhanced model of care for diabetes evolves in our district it is providing an opportunity to also change the in-hospital and out-patient diabetes services and connect them better with the community care.

In western Sydney, we have developed an innovative approach involving a more integrated diabetes management system that includes the components described below.

BUILDING CAPACITY IN THE COMMUNITY TO BETTER MANAGE DIABETES

Data to Underpin Decision Making

We recognise that it is critical to build a supporting surveillance system to monitor and evaluate the Western Sydney Diabetes and to provide data for decision making.

Analysis of the data available allows us to understand the size and characteristics of the problem and also to monitor the success of our programs in addressing the issues.

There are numerous ways to collect data to measure our success: from patients, from General Practice, from hospitals either routinely or through periodic surveys. The preferred way is to identify and select quality or proxy indicators, measure coverage of interventions and then track changes periodically over time through a surveillance system.

Our approach to this is set out in the accompanying document, *Data for decision making – Building a surveillance system to monitor and evaluate.*

Mobilising Public Support

In western Sydney the general public are largely unaware of the true threat that diabetes poses for them and are not engaged enough to address the issue.

Unless we are able to drive a campaign to bring our communities together, build awareness about diabetes and explain the life changes that many need to take, we will fail to achieve the progress that is required to reduce the cost of this problem on families and communities.

Our high level approach to developing and delivering a community awareness campaign is set out in the accompanying document, *Mobilising public support – Building diabetes awareness and engagement.*

PART 2: OUR STRATEGY

A Call to Action to Reduce Diabetes in Western Sydney

Addressing the challenge of diabetes will be a major undertaking for Australia as it is for the rest of the world. Western Sydney, in particular, faces some significant challenges as the social determinants of well-being that promote healthy eating, active living and social inclusion are not working favourably to prevent diabetes and its progression.

Overweight has become the norm and the majority of patients seeking treatment for serious illness in our hospitals, either have diabetes or pre-diabetes. More than a third of people with diabetes do not know they have it. There is a lack of awareness about how serious this threat is and how it will lead to serious health complications if left undiagnosed or unmanaged.

But we can take the heat out of this diabetes hotspot if we focus our effort and work together.

If we can encourage western Sydney adults to lose four kilograms on average, we could turn the diabetes risk clock back 20 years. This would take western Sydney below the NSW state average.

More worryingly, if we do not act now, within a decade it will cause an unsustainable economic and societal burden on the state's healthcare system.

Achieving this shift requires diabetes prevention and management to become everybody's business. The Western Sydney Diabetes initiative is mobilising key leaders and champions in health and beyond to come together to recognise and address this problem. We are engaged with federal, state and local leaders to join the effort.

We are engaging non-government organisations, the private sector, hospital specialists, GPs, allied health and pharmacy to join in. We are utilising digital technology such as eHealth and smartphone apps to help patients, doctors and other healthcare providers to share information and better manage diabetes and prevent complications.

We want western Sydney to move from being a hot spot for diabetes and at the same time to show the rest of our nation how to tackle this issue at a local community level.

We invite you to support us and be part of the movement to reduce the serious problem of diabetes in western Sydney.

Western Sydney Diabetes
Beating Diabetes Together

PART 3: OUR INTERVENTIONS

> Type 2 diabetes is slow, silent and deadly. Its impact on society is increasing and we can no longer pretend that current responses are sufficient. It is imperative that we shine a very bright light on the issue and take meaningful steps now, to change the trajectory.
>
> Sturt Eastwood
> Chief Executive Officer
> Diabetes NSW & ACT

Primary Prevention – Current Interventions

In the previous section we introduce the four components of the primary prevention strategy, below are some of the current initiatives that support these components.

Ministry of Health's Healthy Eating and Active Living (HEAL) Strategy

The NSW Ministry of Health's HEAL Strategy 2013-18 is a strategic, coordinated investment across agencies and sectors of the NSW government to change environments and support individuals to achieve and maintain a healthy weight throughout life to prevent the development of type 2 diabetes and cardiovascular disease.

These programs are implemented in Early Childhood Education Centres, Family Day Care Providers and schools.

Live Life Well @ School

Live Life Well @ School is a joint initiative between the NSW Department of Education and NSW Ministry of Health to get more students, more active, more often and to focus on healthy eating habits. All government, Catholic and independent primary schools are eligible to participate.

Live Life Well @ School assists schools to develop whole school strategies that support physical activity and healthy eating. This is done by improving the teaching of nutrition and physical education, fostering community partnerships and providing opportunities for more students to be more active, more often.

Local Health Districts provide ongoing support to Live Life Well @ School trained schools via site visits, phone calls and email follow-ups. Local Health Districts provide assistance through planning, supporting, providing information and access to teaching resources. Currently the program reaches 170 of the 230 schools (80%) in the district.

Other programs supported include:

- STAR Canteen (Support, Training, Action, Results): for primary & secondary schools
- PDHPE Network for teachers: NESA accredited, delivered twice per term

Munch & Move

Munch & Move is a NSW Health initiative that supports the healthy development of children from birth to five years by promoting physical activity, healthy eating and reduced small screen time.

Munch & Move offers training and resources to educators working in NSW early childhood education and care services. The training aims to assist educators to implement a fun, play-based approach to supporting healthy eating and physical activity habits in young children.

This program now has 92% reach, with 76% 'fully adopting' the program. This is being taken into new settings of 108 Family Day Care providers, with 13% already trained.

Go4Fun

The Go4Fun program is a healthy lifestyle program for families with children who are overweight. The program runs a ten-week healthy lifestyle program for children aged seven to 13 years, run by qualified health professionals. Sessions are two hours long and held after school, once a week running parallel with school terms.

The program aims to improve the health of the child through the development of healthy lifestyle behaviours, as well as educating and positively affecting children's attitude to food and exercise. The program includes nutritional information, support and advice, personal improvement and fun games.

These evidence-based programs, which aim to increase levels of physical activity and promote healthy eating habits are delivered at scale.

PART 3: OUR INTERVENTIONS

Healthy Workers Initiative

get healthy
Information & Coaching Service
1300 806 258

A strong start to this campaign has been achieved in western Sydney. This will be further built upon by supporting the implementation of the Get Healthy at Work Program through all government agencies.

Get Healthy Information and Coaching Service

Get Healthy is a free six-month telephone coaching service conducted by qualified health coaches to enable participants to reach their health goals. Major expansion of this program is possible through promotion in workplaces, community groups and the CALD community. Priority will be given to increasing the number of referrals from health professionals to this service.

Healthy Older People

We promote physical activity in the ageing population through the Healthy Older People's program which targets isolated residents living independently. In partnership with 38 NGOs and other government organisations, 3,345 staff or clients have been trained in Strength & Balance exercise and balance programs.

Improving Food Environments

There are a number of initiatives underway in WSLHD, schools, workplaces and community groups to promote healthy eating and water consumption. The Rethink your Drink campaign in WSLHD pioneered a reduction in the availability of sugary drinks at outlets within health care facilities. In addition, we are partnering with Sydney Water to provide more free drinking water outlets in our hospitals.

Walk 21

Our three largest councils have signed up to the Walk 21 Charter partnership and we have begun work on auditing current walking activity as recorded in the NSW Travel survey in Blacktown Local Government Area (LGA).

Fostering a Healthy Built Environment and Opportunities for Physical Activity

WSLHD is engaged in a number of other programs which share the ambition of promoting healthy eating and creating a built environment conducive to physical activity. There are various strategies in Parramatta and Blacktown to address urban density, redevelopment and active transport connections.

The Students As Life Style Activists (SALSA) Program

Engage.
Empower.
Excite.
SALSA
Students As Lifestyle Activists

High schools are the ideal place to encourage teenagers to adopt healthy behaviours. At this stage in their lives teenagers are greatly influenced by their peers, are less reliant on food prepared in the home and often reduce their physical activity. The behaviours established during these years often persist into adulthood, making this a critical period for early prevention of diabetes, yet few health interventions are aimed at this age group. The SALSA program fills the gap in prevention for this age group and should be adopted by all high schools in western Sydney.

The strength of the SALSA program is in the peer-led education model, which engages, empowers and excites high school students. The program aims at increasing fruit, vegetable and water consumption, and daily physical activity, in high schools students. Its innovative approach sees university students trained as SALSA educators, who then educate Year 10 peer leaders about the importance of good food and lifestyle choices. The Year 10 peer leaders then educate Year 8 students in a fun school environment through videos, games and activities.

The students look at barriers to a healthy lifestyle and how to overcome them. They then compile personal health goals and action plans for their schools to make living a healthy lifestyle part of every day. The program also provides young people with the opportunity to develop leadership skills and become student advocates in the community.

With a limited budget, the program has reached over 15,000 students and demonstrated improvement in teens' fruit and vegetables intake, daily breakfast eating, reduced

sugary drink intake and increased physical activity. Funding is required to expand the youth-led training capacity and resources to allow the program to increase from 23 to all interested high schools in western Sydney.

The SALSA program won an AMA Excellence in Health Care Award in 2015 and three WSLHD Quality Awards in 2014.

"I gained knowledge and skills like speaking in front of a class and healthy eating which I can use in my everyday life."
Year 10 SALSA peer leader, 2016

PowerLab

Associate Professor Thomas Astell-Burt and Dr Xiaoqi Feng, Founding Co-Directors of the Population Wellbeing and Environment Research Lab (PowerLab) at the University of Wollongong, have been working with the WSD initiative since its inception. Our relationship began at a specially organised diabetes forum in NSW Parliament where they presented maps showing well above average rates of diabetes and obesity in Blacktown and Mount Druitt. Their role in our partnership began initially as to map the prevalence of diabetes and associated risk factors in our local communities.[15] This has since grown to include the provision of epidemiological and statistical expertise across a range of projects, as well as leadership in the publication and communication of our research findings in international health and medical journals.

The goal of the PowerLab is to enhance understandings of how people and equity orientated changes in our urban environments can enable population wellbeing through supporting mental and physical health across the life course. Under Drs Astell-Burt and Feng's leadership, the PowerLab has attracted over $5.3M in category 1 research funding since 2016, including NHMRC and Heart Foundation fellowships and an NHMRC project grant investigating environmental influences on diabetes prevention and management. Collaboration between the PowerLab and the WSD initiative on these grants and related translational activities has been a significant component of our mutual successes in research to date and helped to drive the WSD initiative's engagements with local communities, practitioners, NGOs and industry, such as our public fora in Blacktown and Parramatta on the state of the obesogenic and diabetogenic environments in western Sydney.

Our research has shown that the prevalence of known diabetes in the Blacktown postcode is over 3-fold higher than in the north shore postcode of Mosman (7.3%/2.2%=3.32).[29] Given that many people with diabetes

remain undiagnosed and western Sydney is differentially affected by underlying risk factors, the true ratio may be significantly higher. This is one of the core motivations for the use of HbA1c testing to detect undiagnosed diabetes in Blacktown and Mount Druitt emergency departments. Drs Astell-Burt and Feng both played a central role in the design and evaluation of our successful pilot program[30], which have led to changes in daily practices not only in our hospitals, but also inspired similar detection programs to be set up in many general practices.

The diabetes inequality between Sydney's east and west is likely to be driven significantly by socioeconomic disadvantage, healthy food deserts, fewer active green spaces and a built environment that necessitates long car-based commutes instead of walking and cycling. Drs Astell-Burt and Feng have published research indicating a 10%-13% reduced risk of having diabetes among people who live in suburbs that contain a moderate amount of parkland, compared to those in areas with less green space.[18] They have also shown that many communities in western Sydney have access to fast food takeaways but few or no healthier alternatives within a reasonable walking distance.[17] Their recent work also indicates that people tend to be nearly 1.2kg/m^2 heavier in areas where there are modest ratios of fast food takeaways to vendors of healthier choices.[31]

Their research underlines our wider belief that planning and regenerating our communities to enable people to be more physically active and eat more healthily will help to reduce the burden of diabetes and associated risk factors like overweight and obesity. These large-scale interventions will benefit people with and without diabetes, not only aiding prevention efforts, but likely also enabling better self-management among people living with diabetes. Our partnership with Drs Astell-Burt and Feng was recognised in 2016 by the University of Wollongong's Vice Chancellor with the award for Outstanding Achievement in Research Partnership and Impact (above).

PART 3: OUR INTERVENTIONS

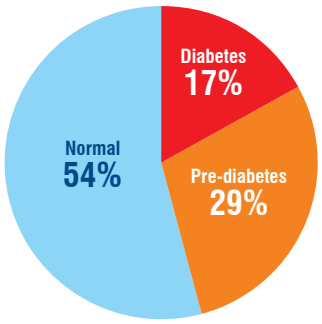
Secondary Prevention and Management – Current Interventions

Detecting Prediabetes and Diabetes with HbA1c Testing

HbA1C Testing in the Emergency Department

In 2014, a pilot study was undertaken in the Emergency Departments (ED) of Blacktown and Mount Druitt Hospitals using a 2 step screening process designed to detect levels of diabetes or prediabetes.[30] It was noted that 38% had diabetes, 27% had pre-diabetes and 32% were unaware of their diagnosis.

Given the significant findings, testing for diabetes became routine in June 2016 for all individuals presenting to the ED's of Blacktown and Mount Druitt Hospitals where a valid blood sample was available.[30] Testing undertaken for a year (approximately 30,000 tests) has revealed the presence of pre-diabetes in 29% and diabetes in 17%.[32] It is intended that a similar process will begin in Westmead Hospital in the near future.



Distribution of HbA1c % measurements to June 2017

Previous hospital coding of Diagnosis Related Groups suggested an inpatient diabetes prevalence rate of 11% but with the advent of HbA1c testing, we have established that this is closer to 19% at Blacktown and Mt Druitt Hospitals. In the Cardiology service, the prevalence rate has been documented to be as high as 42%.

People with diabetes have significantly increased costs compared to those with normal HbA1c. As people progress from normal to pre-diabetes to diabetes, their average cost goes from $4,541 to $5,445 to $7,358 for a single hospital admission. People with diabetes also have a 40 hour longer average length of stay than those with a normal HbA1c, reflecting the complexity of the admission and the impact to their hospital experience. This large and growing burden paints a stark picture of the difficulties facing the hospital system. With our ever-growing epidemic of diabetes, these numbers will only continue to grow.

Identification of people at risk with HbA1c testing allows the promotion of lifestyle intervention programs to work in conjunction with medications to improve diabetes control. At Blacktown Hospital, this process is reinforced by a Support Nurse who is tasked with contacting individuals (and their GPs) with abnormal HbA1c tests by telephone. The aims is to facilitate a consultation between patient and GP in the hope of progressing their management.

There is strong international evidence that enrolling patients with diabetes into comprehensive management programs decreases costs and improves patient outcomes. Moreover, evidence from the NHS indicates that HbA1c testing as a screening tool has a significant cost-benefit to patients derived from a reduction in QALYs lost to diabetes complications.[22]

HbA1c Testing in General Practice

Testing in hospital EDs reaches many people, but given that only a small proportion of the population attends a hospital each year, it is vital that we reach communities outside of a hospital setting.

WSD has begun collaborating with GP clinics across western Sydney to identify people with diabetes and pre-diabetes through routine HbA1c testing, and to enrol them in lifestyle modification programs. We have extended our reach enormously, with over five practices representing more than 100,000 people already on board and many more setting up their own routine screening programs. We know that identifying people with diabetes early is the best way to prevent complications down the line, and with help from GPs across western Sydney, we can do this for our entire population.

Providing Lifestyle Coaching Opportunities

Patients identified as having or at high risk of developing diabetes are being encouraged to enrol in the Get Healthy telephone coaching service. This service, provided by the Ministry of Health, offers qualified health coaches to provide up to ten free coaching calls over a six month period. The focus is on assisting the patient to set and achieve healthy lifestyle goals in terms of healthy eating, physical activity and achieving a healthy weight.

Whilst Get Healthy is the preferred option, some patients favour alternative programs. A list of additional local programs has been included on the WSD website.

The focus is on low cost or free interventions that are easily accessible and include exercise programs, support groups, local facilities, online programs and self-management programs which may be utilised either alone or in conjunction with the Get Healthy program.

Joint Specialist Case Conferencing (JSCC)

The aim of JSCC is to build the clinical skills, confidence and capacity of GPs and practice nurses to better manage diabetes in primary care. The Blacktown Hospital Outpatient Diabetes Specialist and Credentialled Diabetes Educator visit general practices and sit with the GP and patient to discuss management options and treatment targets and come to a mutually agreed plan of diabetes management for that patient.

More than 1,250 patients have participated in the case conferences involving more than 180 GPs from 60 different general practices. Early evaluation of this program found that three to six months post-session, the patients showed a clinically significant reduction of 0.87% in HbA1c, along with beneficial effects on systolic blood pressure, weight and lipid profile. Long term follow up of these patients three years after initial JSCC showed sustained statistically significant reductions in HbA1c (0.93%) along with total cholesterol and diastolic blood pressure.[33]

50 patient evaluations were collected with 90% reporting the JSCC was useful. GPs reported the program improved the relationship and communication between the GPs and specialist. As the majority of GPs reported more confidence in managing diabetes, this program is expected to decrease referrals to specialist services.

This work is further enhanced by the WSPHN practice support team's ongoing activity to build practice capability and capacity including alignment to the Patient Centred Medical Home principles.

JOINT SPECIALIST GENERAL PRACTICE DIABETES CASE CONFERENCES

> Very high standard of knowledge and expertise totally applicable to everyday GP management. I appreciate the involvement and have gained valuable knowledge and management reassurance.
>
> Dr Anthony Seage
> North Rocks Family Medical Practice

PART 3: OUR INTERVENTIONS

HealthPathways

HealthPathways is a web-based information portal supporting primary care clinicians to plan patient care through primary, community and secondary health care systems within western Sydney. It is like a 'care map', so that all members of a health care team, whether they work in a hospital or the community, can be on the same page when it comes to looking after a particular person.

HealthPathways is designed to be used at the point of care, primarily for General Practitioners but is also available to Hospital Specialists, Nurses, Allied Health and other Health Professionals within Western Sydney. Diabetes HealthPathways were the first to be developed and are maintained through periodic review.

GP Support Line

Communication between community healthcare providers and hospital based specialist teams is vital to the success of integrated care. After commencing joint case conferencing it was clear that consultation was needed beyond the times of these visits so WSD opened up a 24/7 opportunity for GPs to call the Community Advanced Trainee Endocrine Registrar or Consultant. As the Integrated Care Demonstrator program developed this was merged with the GP support line for other chronic diseases. When patients are seen in hospital based Diabetes Clinics or as in-patients the clinical team will now more often than not pick up the phone to discuss shared care or ongoing management by General Practice. The direct conversations between clinicians is the glue that helps make this all work.

WSD Self-Management Application

Digital technology is transforming the healthcare landscape by empowering patients to track, manage and improve their health. We are building a WSD App to be a forefront of this change. As patients can at best only see their GPs for a few hours a year, the WSD App will complement clinical care by providing education and support for patients on a daily basis to encourage self-management of their condition. This innovative consumer portal will be unique in that it will link patients with the core health care system and incorporates their data into their care plans, thus improving both self and clinical management. This will be coupled with ongoing two-way communication between the patient and their GPs, allowing patients to share data updates and goals and receive results and feedback, all from their smartphone or tablet.

This app is expected to greatly benefit those in the most need especially populations that are poorly educated, have poor health literacy, and lower socio-economic backgrounds. Feedback and advice on their clinical data, including alerts to seek medical assistance, as well as reminders to update their data, will increase compliance and improve medication use.

Patients will be aware that their GPs are monitoring their results and will be able to use the app to receive reminders for regular check-ups. The app will allow the patient to receive:

- Feedback on their progress towards predetermined goals, as well as management and motivational support on a regular basis will improve self-monitoring. As an example, a drop off in exercise may prompt a check on whether the patient is unwell.
- Relevant educational material specific to their condition and results will improve their health literacy.
- Enhanced control through coordination of healthcare provider services – the ability to receive reminders on health services: from foot and eye checks, to care plans and medication management.

WSLHD has just completed a six months tendering process to identify an IT partner to work with to develop the concept into a prototype for 2000 patients in Western Sydney. This will initially be used over the next two years. Business negotiations are now underway for this work.

Community Pharmacy

Pharmacy plays a pivotal role in the diabetes management jigsaw, providing advice, education, monitoring and screening for patients. A pharmacy forum in 2016, 'Pharmacy's contribution to diabetes care in western Sydney' was the first step to engage the peak bodies for pharmacists and pharmacy owners to engage with WSD to provide more integrated and comprehensive diabetes care. Over 80 people attended the forum with evaluations showing pharmacists want to be involved with the Western Sydney Diabetes initiative.

A pharmacy working group now meets quarterly with representation from the Pharmacy Guild of Australia, Pharmaceutical Society of Australia, Diabetes NSW & ACT, WSPHN and WSD to promote screening, contribute to educational events, share resources, collaborate with various projects and improve communication.

WSPHN has commissioned the deployment of clinical pharmacists who have been working in 19 practices for over a year. An analysis was performed by UTS of the 493 patients involved from the 19 participating practices over six months during 2016 and 2017. Quantitative data collected by the participating pharmacists showed that the average number of medications for each patient was 9.1 and patients in the evaluation had a total of 984 drug related problems (DRPs), many of these patients having diabetes. Improvements were recommended by the clinical pharmacist in relation to procedures and the current model, and 71% of these were accepted.

The evaluation demonstrated the benefits of inter-professional collaborative care and provides evidence to support the ongoing implementation of the intervention in practice. Pharmacists have a valuable role to play in reducing and resolving DRPs, improving chronic disease state management and supporting the general practice team.

Practice Nurse Training

Practice Nurses can play a pivotal role in prevention and management of diabetes in general practice leading to improved patient outcomes, improved team work and revenue for the practice. Over the past two years a comprehensive program of diabetes education has been delivered for practice nurses, with over 60 nurses attending one or more sessions.

The program aims to provide education and promote a better understanding of the practice nurses' role in identifying diabetes, ie., when to refer patients to specialist services, and to provide basic self-management diabetes education. It also aims to give the nurses confidence to educate their patients about diabetes progression and the importance of good control to prevent complications.

Practice nurses reported improvements in confidence to screen for, and manage several aspects of diabetes care which were statistically significant.

PART 3: OUR INTERVENTIONS

Shared Health Summary and LinkedEHR

LinkedEHR (LEHR), developed by Ocean Health Systems in partnership with Western Sydney Primary Health Network, is a platform where the care plan connected to the GP's clinical record is shared with their multi-disciplinary team (MDT). The care plan is created by a GP for patients with a chronic disease and is based on the diagnoses held in the GP's Clinical Management System.

LinkedEHR records goals, targets, referrals and activities for each diagnosis so patients will receive the right level of care required to manage their chronic condition(s). The referred activities are updated by the recipient in real time and GPs see all updates.

Presently there are 1600 patients with an LEHR care plan in western Sydney, many of these with diabetes. These care plans are being created by the 255 GPs currently registered and accessed by over 250 practice nurses and allied health providers who contribute to patient care via the care plan. A viewable version of LEHR is also available within WSLHD settings. Care facilitators assigned to patients with complex and chronic needs as part of the Western Sydney Integrated Care Demonstrator, can review patient goals and clinical metrics, thus tracking changes over time, to enable ongoing management and support.

LinkedEHR, HealthPathways and the My Health Record are integrated to provide many clinical management and referral resources to support the goals and activities for each patient's care plan. Developments currently underway with LEHR will see integration of a novel patient education and self-management App as well as an integrated, secure tele-health capability allowing patients to communicate easily and securely with their extended care team via any smart device.

LEHR will be a key enabler for the next phase of Integrated Care and the Health Care Home trials due to begin in December 2017 in western Sydney with a target of creating care plans for a forecast 7,500 patients over the next 18 months, many of these with diabetes.

Save a Leg

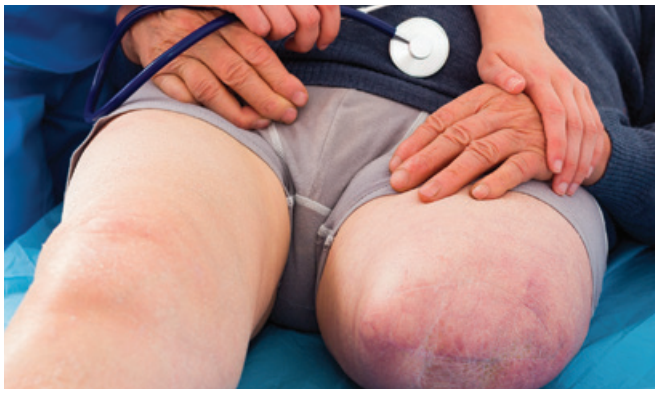
Diabetes-related foot complication results in a longer average length of hospital stay when compared to all other diabetes-related complications.

Amputations and foot ulcers are consistently the second and third most expensive acute diabetes complications respectively to treat in terms of both hospital and out-of-hospital costs.[34]

WSLHD has fragmented diabetes foot services and inconsistent foot screening and risk stratification. The WSD initiative, through this redesign project, is therefore aiming to:

- Increase screening rates of patients with diabetes and reduce the variation of screening practices in western Sydney.
- Increase patient awareness of diabetic foot complications and to empower the patient to seek active treatment in a timely manner.
- Increase timeliness and appropriateness of complexity of referral of patients into Hospital Podiatry Services in accordance with foot screening (risk stratification).

A 60-second diabetes foot screening tool was developed and educated patients, nurses and clinicians on the importance of using the tool and conducting regular foot checks at least annually. Electronic referral templates and clinical pathways were also developed, to facilitate the improvement of timely access to hospital foot services.



Community Eye program

Key statistics on diabetic eye disease:

- Diabetic eye disease is one of the most common complications of diabetes.
- Diabetic retinopathy is one of the major causes of blindness and vision impairment in Australia.[4] More than a third of people with diabetes will develop diabetic eye disease in their lifetime.
- Almost everyone with type 1 and more than 60% of those with type 2 diabetes will develop some form of diabetic eye disease within 20 years of diagnosis.[35]
- Currently, up to 50% of Australians with diabetes do not undergo eye examinations at the recommended frequency of every two years.[4]

The WSD Eye Screening Project is developing a standardised referral system with adequate medical information for GPs to provide to optometrists. Following screening, a standardised comprehensive diabetes eye screening report has been developed in consultation with the Westmead Eye Service and ACI C-Eye-C project team for optometrists to report back to the GP.

The use of electronic referral system using Linked EHR and incorporating the standardised referral system from both general practice and optometrists will be available. This will facilitate easy tracking of reports, which will help GPs to accurately update the diabetes annual cycle of care of their patient thus improving health outcomes, and potentially benefitting the general practice by increasing Service Incentive Payments.

Updating the referral system process in HealthPathways would provide an easy access to the referral process, and updating the NHMRC guidelines in HealthPathways will increase awareness of the diabetes eye screening and management as per the guidelines.

Rapid Access and Stabilisation Clinics

Traditionally diabetes clinics tended to accumulate patients referred for management and see patients on a regular cycle often every six months or 12 months. Diabetes Clinics at Blacktown and Mount Druitt hospital worked that way until about two years ago. Patients are now discharged back to GP care for type 2 diabetes unless they remain complicated with end stage renal disease or other serious more difficult medical comorbidities. The clinics now accept patients needing urgent care from General Practice, ED or on discharge from hospital to be stabilised before returning them to management by General Practice.

The wait list time for the clinic has dropped significantly over the past six months and urgent patients can be seen within a few working days. The clinics have become more multi-disciplinary with Diabetes Nurse Educators, a Dietician and a Podiatrist available for consultation.

New Tools to Support Management Decisions

CGM for Diagnostics

Continuous Glucose Monitoring (CGM) is an established utility in the management of type 1 diabetes but is evolving in type 2 diabetes to show that it is useful to not only improve glycaemic control, but also help in the modification of diet and exercise, identification of hyperglycaemia excursions and detection of unrecognized hypoglycaemia.

The use of CGM has been piloted at Blacktown Hospital to improve management of type 2 diabetes in complex patients. This study recognised that CGM provides a teaching opportunity and educational tool for patients on diet or activities. CGM detected unrecognised glycaemic excursions and influenced both pharmacological and lifestyle management and is a tool to allow faster optimisation of glycaemic control so that patients could be returned to the care of their GPs sooner. Preliminary cost-benefit analysis has also been promising for this tool. We aim to seek funding to use CGM on a routine basis for patients with complex diabetes in Blacktown Hospital.

PART 3: OUR INTERVENTIONS

Health2Sync App for Insulin Stabilisation

The Health2Sync App is currently under trial to provide a novel option for patients who require weekly contact with a diabetes educator to review blood glucose levels between hospital clinic appointments. This weekly review reduces the length of time it takes to get a patients glucose levels to target.

Traditionally, stabilisation has been done via a weekly phone call with the health care team. While this option remains available, we are now able to offer a choice to patients. The app allows a secure, easy communication channel with an educator at a time that is convenient to the patient. Advice is sent back to the patient via the app, and can be viewed at any time by the patient. Early indications suggest the app is preferred by patients who are working, and where English is a second language.

Integrated Care

The NSW Health Integrated Care Strategy defines integrated care as such.[36]

"Integrated Care involves the provision of seamless, effective and efficient care that responds to all of a person's health needs across physical and mental health, in partnership with the individual, their carers and family. It means developing a system of care and support that is based around the needs of the individual, provides the right care in the right place at the right time, and makes sure dollars go to the most effective way of delivering health care for the people of NSW".

As part of the NSW Integrated Care Strategy announced by the Ministry of Health in 2014, western Sydney is one of three lead demonstrator sites across NSW engaged in developing an innovative, system wide and sustainable service model for providing coordinated and integrated care services. The Western Sydney Integrated Care Demonstrator (WSICD) project focuses on patients with a variety of chronic conditions, including diabetes, and aims to provide an integrated care environment consisting of the primary care team, a care facilitator, the specialist team, and community based healthcare providers.[37] Patients are managed and monitored by their GP, who is supported by the various surrounding teams, and provides a coordinated patient-centred care program for patients with chronic disease in western Sydney. WSICD is a partnership initiative with the WSPHN.

This initiative provides a new model of care for the management of chronic disease. To be eligible for this service, patients must have at least one of the chronic diseases (diabetes, COPD, or congestive cardiac failure), and risk stratified as being at significant risk of requiring hospital care. Patients within this cohort were enrolled by either primary care, community or hospital specialist teams, depending on the point of first contact and registered in a patient registry. A range of coordinated interventions and clinical services were implemented to improve the health care management of these patients. Services were provided by a range of health professionals, including Primary Care teams, Care Facilitators and MDTs, in an integrated fashion.

WSD was a leading contributor and participant in this program so elements of WSD that came before the WSICD were merged within this program and many of the aspects that were part of this program remain. Some of the eHealth solutions associated with WSICD are still in evolution. The sharing of eHealth care plan between primary care and hospitals are not yet fully operational or adopted.

Health Care Homes

Western Sydney PHN is a lead site for the Health Care Home trials being introduced by the Commonwealth as a key health reform in primary care. In 2017, 22 practices have had offers to take this up and the first 12 will start in October and the remaining in December. This is the next phase of Integrated Care and many of the interventions developed by WSD will be offered to these practices. Most of the selected practices are already participating in joint case conferencing.

In the Health Care Home patients are enrolled and care is determined by a proactive plan, delivered by a team and paid for under a managed care plan rather than just fee for service arrangement. This is a new policy direction by the Commonwealth Department of Health to be tested and refined, then rolled out nation-wide.

Enhancement of Care In-Hospital

In 2013, Inpatient Diabetes Management Services (IDMS) were established at Westmead and Blacktown Hospitals. The objective of this service was to improve diabetes management in hospital, particularly for surgical patients as high glucose levels increase the risk of infections and poor wound healing. Westmead has demonstrated that better glucose control can be achieved with this service and the length of stay in hospital is reduced for these patients.

A pilot study conducted in 2014 through the ED of Blacktown Hospital confirmed the high rates of diabetes present in hospital.[30] As a result, testing for diabetes in patients presenting through the ED is now routine practice at Blacktown and Mount Druitt Hospital (BMDH).

This assessment has been a pillar of the Diabetes Detection and Management Strategy (DDMS) at BMDH, which has several aims:

To Improve the Inpatient Management of People with Diabetes

The routine testing currently undertaken allows for the detection of individuals with prediabetes and diabetes.

The IDMS consists of a dedicated nurse and doctor reviewing newly diagnosed individuals and those with suboptimal glycaemic control. Based on need, they coordinate the involvement of other members of the diabetes team such as the podiatrist, diabetes educator and dietitian. Individuals requiring additional assistance with insulin therapy are streamlined into our Stabilization clinics, facilitating an earlier discharge from hospital.

Work is currently being undertaken to build an in-hospital surveillance system to capture clinical metrics relating to the entire cohort of admitted patients with diabetes. This digital dashboard will make use of existing IT systems extending from the triage desk in ED (FirstNet), the HbA1c testing in ED and to the wards (Cerner). It will also incorporate the newly introduced electronic medication system (eMEDS), linking daily glucose measurements with therapy information. The data will improve the identification of patients requiring assistance and allow for a targeted approach towards managing diabetes in hospital.

Opportunistic screening for complications of diabetes is encouraged when patients are admitted to hospital. This also provides an educational opportunity to the patient.

Improving the documentation in the electronic medical record of a diabetes diagnosis and the related complexity that accompanies the management of these patients is critical. This accurate coding according to their Diagnosis Related Groups by the Health Information Records Services is vital to attract the appropriate remuneration for the LHD.

To Increase the Capacity to Manage Diabetes within WSLHD

The routine testing for diabetes and the rapid availability of the results has resulted in an unprecedented awareness of the existence of diabetes within the hospital. This has resulted in a marked increase in workload for a small team which is not sustainable in the long term. Investing time and energy to build everyone's capacity to manage diabetes is paramount and key to sustainability.

Targeted education has commenced to address this issue. This has included a structured five day educational program for nursing staff encompassing both the Blacktown and Mount Druitt campus, teaching sessions with the Junior Medical Staff and ED staff. Other potential cohorts include allied health and senior medical staff.

More novel educational approaches are being explored, including tailored education for specific teams, IDMS attendance during the ward rounds of other specialities in the spirit of a 'joint case conference', and possibly intranet based education.

The increased consultative workload generated from the HbA1c testing and the Stage 2 development of the Blacktown campus dictates that additional resources will be necessary to maintain current services.

To Promote Integration with Other Services or Programs

The Integrated Care Demonstrator has brought some resources that have been useful in the management of people living with diabetes. The availability of Rapid Access and Stabilization clinics has complemented the services that were already in existence and has allowed the more efficient flow of individuals through the doors of the hospital. The ability to rapidly assess and institute management in a non-ED setting has been tremendous with most patients being reviewed within two to five days of referral.

PART 3: OUR INTERVENTIONS

Since more than 20% of patients admitted from ED have diabetes, it is important that the capacity of all clinical services to better manage diabetes be enhanced. This is currently being piloted with the Mental Health Service (especially patients requiring Clozapine and more long-term follow-up). Endocrinologists and Diabetes Educators are seeing patients in joint consultation with care teams from these services to build their capacity to manage patients with diabetes – similar to the GP case conferencing approach.

Cardiovascular 'Snapshot' at Blacktown Hospital

Given that people with diabetes are two to three times more likely to die of cardiovascular disease, we carried out a clinical audit of the prevalence and management of all patients admitted under the cardiology service at Blacktown Hospital in September 2016 involving several clinicians.[38]

THE RESULTS WERE UNEXPECTED:

- 42% of patients admitted to the cardiology wards had type 2 diabetes.
- No patients were treated with diabetes therapies of proven cardioprotection.
- Diabetes patients spent 43 hours longer in hospital and cost more.
- **15% WERE A NEW DIAGNOSIS – NONE OF THESE PATIENTS HAD PLANS FOR TREATMENT OR PLANS TO MANAGE THEIR DIABETES ON DISCHARGE.**

We are currently working to engage our colleagues at the cardiology department to better screen, manage and incorporate safety mechanisms to allow for efficient and safe implementation of management plans in all patients with diabetes. This is particularly important in light of newer drug therapies available in Australia for patients with diabetes that have a particular benefit in preventing cardiovascular death and hospitalisation from heart failure.

Diabetes Education Services

Diabetes education plays an important role in the management of patients with diabetes and serves to lay the foundations for future self-management.[39] This is particularly important in all individuals that are newly diagnosed with diabetes. The education team consists of Credentialled Diabetes Nurses and Dietitians. They are multi-skilled and provide comprehensive education on all aspects of diabetes at Westmead hospital and at both Blacktown and Mount Druitt hospitals. The education is tailored to the patients' needs, taking into account the type of diabetes, co-morbidities, health literacy, need for healthcare interpreters and stage of disease process. Due to resource constraints, the hospital focus is primarily on patients with complex type 2 diabetes, insulin treated type 2 diabetes, all patients with type 1 diabetes and all women with diabetes in pregnancy. All individuals in these categories should be referred for Diabetes Education. The use of diabetes technology is rapidly expanding in our population. Support for the use of continuous glucose monitoring and insulin pumps are also provided by the service.

General diabetes education for uncomplicated pre diabetes and type 2 diabetes should occur in primary care. This can be coordinated by the general practitioner who can liaise with practice nurses, dietitians in private practice and exercise physiologists and facilitated through the Medicare reimbursed Enhanced Primary Care Plan. Enrolment in lifestyle programs such as Get Healthy and local group programs are also invaluable.

In addition to the ambulatory care work, inpatient education is also provided whilst patients are admitted to hospital. Members are also involved in the daily running of the Inpatient Diabetes Management Service and surveillance of poorly controlled patients in hospital identified by the HbA1c measurements in the emergency department. In addition to patient education, the team is also responsible for providing diabetes education to the hospital staff and participation in clinical research pertaining to their individual clinical areas of interest.

Bariatric Surgery and Obesity Clinic

When primary prevention fails, surgery has a modest but critical role in managing type 2 diabetes with and without associated obesity. About 75% of patients attending Westmead Hospital Obesity Clinic meet current criteria for bariatric surgery. One third of patients seen need bariatric surgery because it is the only treatment that will allow them to lose enough weight to improve their comorbidities.

Metabolic surgery is readily available for the privately insured, but 65% of patients who attend the Clinic cannot afford surgery if they must pay for it. Until recently the bariatric surgery standard was lap banding which required hospital admission for implantation of a $4,000 device and lifelong follow up. The current standard operations for severe obesity with co-morbidities are now laparoscopic sleeve gastrectomy and gastric bypass, which require a skilled surgical team performing a surgical procedure, but no expensive implant.

Surgery is highly effective in producing durable glycaemic control and disease remission with reductions of up to 92% in diabetes related mortality.[40] With appropriate patient selection by an MDT process the cost of surgery to WSLHD can expect to be recovered in one to two years from reduced medical costs.

We are fortunate in Blacktown Hospital to have been given overwhelming support to commence publically-funded metabolic surgery (primarily laparoscopic sleeve gastrectomy) under the combined oversight of both senior surgical and medical clinicians spearheaded by a well-represented working party. Surgery is planned for September 2017 and two to four surgeries are being planned on a weekly basis (50 cases for 2017) eventually reaching full capacity in 2018 with an aim to perform 200 surgeries per year.

This is an exciting time for Blacktown Hospital and complements the intensive lifestyle and pharmacologic therapies currently being employed in the diabetes clinics and in case conferencing. Surgeries are currently also servicing patients from Nepean and Westmead Hospital respective obesity clinics.

We are currently in the process of realising the full vision in Blacktown; to have a publically-funded, fully operational multi-disciplinary, intensive (metabolic) rehabilitation clinic, comprising allied health (dietician, psychologist, exercise physiologist, physiotherapist, diabetes educator) medical staff, surgical stream, and administrative support. The program will be able to appropriately implement lifelong lifestyle challenges, manage diabetes and its comorbidities and on regular review, offer appropriate, highly-motivated patients for metabolic surgery. Post-operative care and monitoring would also be carried out by the clinic. Establishment of such a service, with a full surgical arm, is a rare opportunity in Australia and fortunately, is a high priority for the WSLHD. It sets Blacktown Hospital and the Western Sydney Diabetes initiative on a level that is rarely seen elsewhere in Australia and globally.

PARTNERS

> We are proud to be a part of this critical initiative and we believe firmly that this alliance approach will be the difference in finally orienting our health system to a more collaborative one focused on keeping people healthy and well. The risk of taking a traditional approach to the diabetes challenge is too great not to act now.

Nathan Schlesinger
Partner, PricewaterhouseCoopers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Notes

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