Tackling Diabetes Together
Reference & information pack

To be read in conjunction with the
*GM Diabetes Strategy*
and the
*Draft GM Diabetes Service Specification*

This pack contains:

- Additional information on diabetes & it’s prevalence in Greater Manchester
- Proposed actions to support achievement of the strategic aims
- Proposed pathways to achieve the desired care outcomes
- References, evidence links & bibliography

November 2017
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**Note**

This support pack has been written to compliment the Greater Manchester Diabetes Strategy and should be read in conjunction with that overarching document.
1. Introduction

1.1 The Greater Manchester Diabetes Strategy

The Greater Manchester (GM) Diabetes strategy was developed in 2017. It is a high level document setting out a vision for the improvement of diabetes care and support services over the period to 2023. The GM Diabetes Strategy sets out a vision, mission and goals focussing on reducing unwarranted variation and improving care and services for people with or at risk of diabetes on four key levels:

- Prevention of onset
- Prevention of progression
- Prevention of complications
- Additional risk factors

During the development of the strategy, it became clear that underlying detail, reference material and evidence would be of relevance to the reader. That additional material is provided in this document.

1.2 Achieving the strategic aims

As well as expanding on some of the detail referenced in the strategy, this document provides links to further information along with proposals for action which will support achievement of the vision and goals set out in the strategy. These proposals build on existing good practice and support improvement of diabetes care in a consistent manner across GM. This document also sets out more refined/detailed proposals (noting potential actors and timescales) to illustrate potential delivery options. These proposals are listed at the end of chapters 3, 4, 5 and 6 respectively and the detailed implementation suggestions are included in the tables A1 to A4 in Appendix 1.
2. Background

2.1 What is diabetes?

Diabetes is a life-long health condition where the amount of sugar in the blood becomes too high because the body cannot use it properly. This is the result of either the pancreas not producing any of the hormone insulin, or producing insulin that does not work effectively. Insulin serves as a key to open the body’s cells and allows the body to use glucose for energy. When this system does not work, it can cause complications and eventually pose a number of serious health risks including heart attacks, strokes, sight loss, gum disease, limb loss and kidney failure. There are two main diabetes conditions and they are referred to as; type 1 diabetes (T1D) and type 2 diabetes (T2D).

T1D is an autoimmune condition where the body’s defence system mistakes the insulin-producing cells located in the pancreas as harmful and attacks them, leading to the body being unable to produce sufficient insulin. T1D can occur at any age, and usually appears in people under 40 years, especially in childhood (6 months – 5 years). It is the most common type of diabetes found in childhood.

T2D develops when the insulin-producing cells in the body are unable to produce enough insulin, or the cells in the body not responding to the insulin produced resulting in the insulin not working properly (known as insulin resistance). Often referred to as “adult onset” diabetes, it usually develops after the age of 35, (although it is also increasingly becoming more common in children, adolescents and young people of all ethnicities). It is attributed to lifestyle factors such as obesity, poor diet and lack of physical exercise as well as genetics. Because of this attribution, T2D is thought to some degree preventable.

2.2 Diabetes in Greater Manchester

In recent years the number of people diagnosed with diabetes in England has risen dramatically. By 2025 it is estimated that five million people will have diabetes, most of whom will have T2D. Around 80% of diabetes costs are currently being spent on treating its complications; many of which are avoidable.

Figure 1: Diabetes 17+ prevalence in GM

![GM diabetes prevalence (+17 years)](http://digital.nhs.uk/catalogue/PUB30142)

Figure 2: Diabetes proportional spend

![Diabetes proportional spend](http://www.diabetes.co.uk/cost-of-diabetes.html)

In Greater Manchester (GM), there are approximately 159,000 people living with either T1D or T2D. Around 11,000 have T1D and 148,000 have T2D or other type. An equivalent number are also thought to be at high risk of developing T2D. If incidence continues at the same rate or more, there will be over a quarter of a million people living with diabetes in GM by 2025.

Currently, health outcomes vary with some areas having higher than average emergency admissions, amputations and medication errors. Good practice exists across GM and there continues to be a number of initiatives that aim to improve care. However, the initiatives are not co-ordinated and good practice is not always effectively shared or embedded across GM.

2.3 Enablers in the GM system

The GM Diabetes Strategy recognises several key factors will influence actors’ ability to make improvements in the system over the period covered by the strategy (2018 to 2023) These include:

- **Leadership, accountability and governance:** A system of agreed responsibility and accountability will be central to ensuring change happens locally.

- **Workforce:** An appropriately skilled workforce that fully supports the concept of having person centred care and is there to help the person with their on-going care plans.

- **Information management and technology:** Integrated care records to facilitate shared care planning and report on local performance.

- **Consistent standards:** To reduce unwarranted variation in service delivery, there needs to be an agreed set of standards in diabetes care.

- **Finance and infrastructure:** A new approach to financing diabetes care pathways to support person centred integrated care.

- **Partnerships and networks:** Multidisciplinary care teams, peer support and areas working together to produce services where there is demand and facilitate continued learning and provide additional support.

- **Innovation and research:** Dissemination of research, sharing emerging evidence to help maintain high standards and aid policy change. Innovative approaches to using technologies will play an important role in helping people with diabetes continue to learn and plan their care.
Figure 3 below illustrates how the proposals put forward in this document would sit within the GM architecture.

**Figure 3: Operational delivery flow diagram: Diabetes proposals**
3. Prevention of onset

3.1 Incidence in GM

In GM, there are approximately 159,000 people are living with diabetes; 5.4% of the total population and 6.8% of adults. Around 11,000 currently have T1D (7%) and 148,000 (93%) have T2D or other type. Over 14,000 people are newly diagnosed with diabetes a year; the vast majority with T2D. If incidence continues to grow at the same rate or more, by 2025 over a quarter of a million people will be living with diabetes in GM.

Figure 4: Prevalence by CCG

Figure 5: Proportion by type (17+ yrs)

The impact this will have on peoples’ health and on health care services is difficult to predict. Diabetes management differs from person to person and as a consequence progresses at different rates. However, we do know the increased risks diabetes brings to health. Aside from glycaemic episodes, there is a 55% higher chance of having a myocardial infarction if you have diabetes; a 34% increased risk of having a stroke; a 164% increased risk of having renal replacement therapy; a 221% increased risk of having major amputation above the ankle and a 337% increased risk of having a minor amputation. Sight loss is common with diabetic retinopathy affecting a third of people. Many people develop depression and anxiety following diagnosis and many women give birth to large pre-term babies that are often separated from their mothers to recover in neonatal intensive care units.

Direct medical costs are high and include both the costs of treating diabetes, such as medication, testing supplies and GP visits, and the costs of treating its complications. One study estimated the approximate cost of a person diagnosed with T2D aged between 25 and 44 to be over £80,000 over their lifetime.

If onset could be prevented or the risk of developing diabetes be reduced in GM, there would be enormous benefits to population health and to health services. One of the keys to achieving this will be to improve awareness and understanding of diabetes.

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3 Based on the 2015/16 NDA registrations recalculated if 100% participation
4 Based on the 2015/16 NDA newly diagnosed recalculated if 100% participation; GP registered populations taken from QoF
3.2 Health in children

The benefit of leading a healthy lifestyle needs to be instilled in the values of young people as early as possible. Several studies have shown that our behaviours are linked to our values and that our values are formed early in our early years. Educating children in schools on the benefits of leading a healthy lifestyle and the consequences of not doing so will empower young people to make long term healthy lifestyle choices.

It is important for teachers responsible for educating children all to convey consistent messages. And schools would benefit from having appointed staff members trained in dealing with serious childhood conditions such as diabetes, asthma and epilepsy to reduce (where possible) complications.

3.3 Identification and behavioural intervention for those at risk

All health professionals are in a position of identifying those at risk of diabetes through lifestyle factors, obesity, age, and ethnicity. Dentists and opticians are in a good position to identify people with periodontal disease or retinal haemorrhage who may be showing risk factors for diabetes but who have not previously been identified.

People with non-diabetic hyperglycaemia (HbA1c 42-47 mmol/mol) have an increased risk of developing T2D. In recent years, emerging evidence has suggested that offering a lifestyle intervention programme similar to that offered to people with diabetes has benefits that include reduced HbA1c and weight. One systematic review concluded a 26% reduced incidence rate in those that undertook the intervention (3).

In 2016, GM secured a bid to ensure that from 2017 all localities offer those identified with non-diabetic hyperglycaemia lifestyle intervention where appropriate. By early 2019, the programme will be fully rolled out and an estimated 14,000 people a year will be offered an intervention (with an expected uptake of around 30%).

3.4 Planning for pregnancy

As many as 9 out of every 100 pregnant women will develop a condition known as gestational diabetes mellitus (4). Gestational diabetes not only increases the risk of later developing T2D (5), but just like T2D it can cause a number of complications during pregnancy such as large babies (increasing the chance of requiring a caesarean), having the baby pre-term, too much amniotic fluid causing problems during labour, pre-eclampsia and still birth (6).

A number of factors increase the risk of someone developing gestational diabetes (eg certain ethnic backgrounds, being overweight, having a family member with diabetes, being aged 25 or older, having gestational diabetes in an earlier pregnancy (4)).
3.5 Health incentives

As part of ongoing work to improve population health, GM will be reviewing means to incentivise people to look after their health more effectively (7). Evidence shows incentives can work to improve health behaviours such as losing weight and quitting smoking (8), however, the challenge is maintaining those behaviours when the incentives stop (9). Digital technologies are being explored as well as existing offers in localities such as reduced membership to weight loss classes, taster sessions for dance classes, sporting activities and exercise on prescription to encourage positive changes in lifestyle.

3.6 Actions to prevent onset

The following actions would support the prevention of onset of diabetes in GM:

1. To support the education of children in schools on the importance of leading a healthy lifestyle
2. All primary care practitioners to identify and refer people with suspected diabetes or at risk of diabetes to relevant services
3. All primary care practitioners to identify and offer behavioural intervention to all those found to be at risk of developing T2D
4. Having a structured preconception service across Greater Manchester
5. To offer incentives to people with or at risk of developing diabetes to look after their health

See Table A1 in Appendix 1 for detail on these implementation proposals
4. Prevention of progression

4.1 Incidence in GM

Diabetes progression is typically characterised by increased fasting blood glucose; higher body mass index (BMI), blood pressure, and triglycerides. These factors in turn increase the risk of developing micro and macro vascular complications and having a cardiovascular event. To assist in slowing down the rate of progression, diagnosis needs to occur as early as possible and the person with diabetes needs to learn about their condition, how they can manage it effectively and the options available to them. Once they understand their diabetes and their options, they are much better placed to work with supporting clinicians and make the positive changes required to prevent or reduce diabetes progression. In GM, achievement of all three NICE treatment targets for blood glucose, blood pressure and cholesterol is similar to the national average (Figs 6 & 7). T1D achievement ranges from 14% to 22% and T2D 38% to 47%.

Both good glycaemic control and reduction in blood pressure substantially reduce macrovascular and microvascular complications and reducing cholesterol reduces macrovascular complications. The National Diabetes Audit (NDA) uses the proportion of patients achieving levels set out in Figure 8 to measure quality of care.

### Figure 6: Type 1 achievement by CCG

<table>
<thead>
<tr>
<th>CCG</th>
<th>T1D % achievement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Highest in England</td>
<td>40</td>
</tr>
<tr>
<td>Oldham</td>
<td>35</td>
</tr>
<tr>
<td>Bolton</td>
<td>30</td>
</tr>
</tbody>
</table>
| T1D % achievement against treatment targets by CCG
| T2D % achievement against treatment targets by CCG

### Figure 7: Type 2 achievement by CCG

<table>
<thead>
<tr>
<th>CCG</th>
<th>T2D % achievement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Highest in England</td>
<td>50</td>
</tr>
<tr>
<td>Oldham</td>
<td>45</td>
</tr>
<tr>
<td>Bolton</td>
<td>40</td>
</tr>
</tbody>
</table>
| T2D % achievement against treatment targets by CCG
| T1D % achievement against treatment targets by CCG

Both good glycaemic control and reduction in blood pressure substantially reduce macrovascular and microvascular complications and reducing cholesterol reduces macrovascular complications. The National Diabetes Audit (NDA) uses the proportion of patients achieving levels set out in Figure 8 to measure quality of care.

### Figure 8: Levels used to measure quality of care

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Target</th>
</tr>
</thead>
<tbody>
<tr>
<td>HbA1c</td>
<td>&lt;=58mmol/mol</td>
</tr>
<tr>
<td>Blood Pressure</td>
<td>&lt;=140/80</td>
</tr>
<tr>
<td>Cholesterol</td>
<td>&lt;5mmol/L</td>
</tr>
</tbody>
</table>

However NICE recognises that many patients should try to achieve lower levels than those used by the NDA if, for patients with T2D, that can be achieved by changes in lifestyle and adherence to metformin. For other patients with T2D, unless there is a contraindication to metformin, intensification of medication should only be considered for those with HbA1c >58mmol/mol. For patients with T1D, some patients achieve very good control much below 58mmol/mol which is desirable if not at the expense of having hypoglycaemic attacks.
Local diabetes service modelling suggests that even modest improvements in blood glucose control could result in significant benefits with one model proposing over five thousand fewer leg ulcers, thirteen hundred fewer amputations and almost a thousand fewer cases of renal failure over the next 25 years (10).

4.2 Continued learning for those with diabetes

Learning about diabetes is fundamental to effective self-management and this learning can be typically viewed on three levels:
- Level one: Initial information following diagnosis
- Level two: Ongoing supportive information
- Level three: Evidence based structured education

In GM, learning could be improved. At present there is a wide range of courses and material available but there is a lack of consistency in the approach to learning. This may explain why some people have received a substantial amount of information about their diabetes whilst others have historically reported receiving very little. Currently, there is no consensus as to what information should be provided following diagnosis or the most effective ways to re-enforce these messages despite (11) (12). There is limited provision for those with sensory impairments, learning difficulties and for those where English is not their first language (13). In addition, uptake of structured education content varies (Figs 9 & 10), and is often viewed as a once in a lifetime intervention.

**Figure 9: T1D attendance rates**
Approximate attendance rates of diabetes education rates in GM (T1D)

- 73% Recorded attendances by local programmes 15/16
- 27% Approximate newly diagnosed in GM a year (based on 14/15 & 15/16)

**Figure 10: T2D attendance rates**
Approximate attendance rates of diabetes education rates in GM (T2D)

- 85% Recorded attendances by local programmes 15/16
- 15% Approximate newly diagnosed in GM a year (based on 14/15 & 15/16)

*Source: Returns on questionnaires sent to providers and data obtained from the Health and Social Care Information centre 2015/2016.*

People need to have access to consistent, high quality information from diagnosis onward and learning needs to be available in a variety of formats and languages accompanied with accessible self-support tools tailored to differing needs. Structured education and learning should not be viewed as a one off but considered as part of ongoing care planning so that people have access to a variety of tools that can help to them make positive changes or plan for pregnancy. Education programmes need to include close family members and/or carers to ensure there is a holistic approach.
4.3 Continued learning for clinicians that support those with diabetes

There is often an assumption that health care professionals already have these skills. However, in 2016 as part of stakeholder engagement, clinicians in GM highlighted the need to have more accessible and targeted healthcare professional training. One of the main reasons being clinical inertia; a concern highlighted in a number of diabetes studies (14) (15). Clinical inertia often results in delays to treatment intensification where there is sub optimal glucose control. This can cause diabetes progression and ultimately avoidable complications. Some clinicians do not feel confident or supported with complex cases and others believe the training they receive is often pitched at the wrong level and more appropriate training and mentorship would not only educate them, but help them achieve more with the people they are trying to support.

4.4 Continued care planning and person centred care

Care planning is a continuous process that offers people active involvement in deciding, agreeing and owning how their diabetes will be managed. It replaces current routine care (16). The principle is underpinned by partnership working (17) and works best through negotiation and shared decision making (SDM) in which both the person with diabetes and the healthcare professional make a contribution to the consultation. In the case of children this will include a parent and/or someone with a responsibility for their care. In the case of people who are being cared for at home, this may include a close family member or carer to ensure the planning is holistic.

A well-defined process is critical to its success and it does require support from the wider system, clear pathways, training and enablers of integrated diabetes care. A good example is the ‘two visit’ concept articulated in the Year of Care model, which can be mapped onto the core principles of care planning (Figure 11). Once the process has been embedded it can demonstrate considerable improvements in diabetes outcomes (16). It also works toward ensuring care is person centred; a concept we believe should be central to empowering people with or at risk of diabetes in GM.

*Figure 11: How the two visit model maps onto the principle of care planning (16)*
Although person-centred care goes beyond that which health services can alone deliver (e.g. family engagement, workplace health and tackling stigma), it can be addressed through health services by ensuring we provide a quality consultation experience that includes:

- Seeking the views of people with or at risk of diabetes and their carers/families
- Providing people with the opportunity to make suggestions about their care
- Fully explaining treatment options and possible effects
- Offering choice
- Providing relevant information

So a structured care planning process that facilitates an ongoing partnership working with those with or at risk of diabetes and those clinicians supporting them is required. Such a process needs to be evidence-based, focussing on the needs of the individuals as well as the wishes of the clinician to form a thorough and accessible care plan that will be reviewed regularly (minimum annually). To strengthen person-centred care, education and support for people with or at risk of diabetes should mirror that of healthcare professionals (Figure 12).

**Figure 12: Mapping patient education onto that of HCPs**

<table>
<thead>
<tr>
<th>Health care professional training</th>
<th>Person with or at risk of diabetes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Initial education</td>
<td>Access to validated/structured education</td>
</tr>
<tr>
<td>Training</td>
<td>Informal/refresher ongoing learning</td>
</tr>
<tr>
<td>Specialist training</td>
<td>Learning built on individual needs</td>
</tr>
<tr>
<td>Mentoring</td>
<td>Buddying/peer support</td>
</tr>
<tr>
<td>Networking</td>
<td>Peer support/local groups</td>
</tr>
</tbody>
</table>

### 4.5 Bariatric surgery in T2D treatment

Bariatric surgery is cited as a potentially effective treatment for T2DM\(^6\). NICE guidance CG189\(^7\), which updates previous guidance CG43\(^8\), recommends:

“Offer an expedited assessment for bariatric surgery to people with a BMI of 35 or over who have recent-onset type 2 diabetes as long as they are also receiving or will receive assessment in a tier 3 service (or equivalent).”

And NICE quality standard QS127\(^9\) states that:

“Adults with a BMI of 35 or more who have been diagnosed with type 2 diabetes within the past 10 years are offered an expedited referral for bariatric surgery assessment.”

One study also indicates that, if bariatric surgery is carried out, then the earlier it is done the better\(^10\).

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\(^{6}\) [http://www.bmj.com/content/353/bmj.i2955?variant=full-text&hwoasp=authn%3A1511959402%3A5634889%3A3573159780%3A0%3A0%3ApvRqmzGwBHOASKA%2FCOuFMO%3D%3D](http://www.bmj.com/content/353/bmj.i2955?variant=full-text&hwoasp=authn%3A1511959402%3A5634889%3A3573159780%3A0%3A0%3ApvRqmzGwBHOASKA%2FCOuFMO%3D%3D)

\(^{7}\) [https://www.nice.org.uk/guidance/cg189](https://www.nice.org.uk/guidance/cg189)

\(^{8}\) [https://www.nice.org.uk/guidance/cg43](https://www.nice.org.uk/guidance/cg43)

4.6 Care processes and other supportive care

People with diabetes should expect a number of healthcare tests and offers as part of their ongoing care. Historically these have been referred to as the diabetes care processes. Adults should receive HbA1c, cholesterol and blood pressure measurements, in addition to having blood and urine estimation of kidney function, their eyes screened, their body mass index calculated, their feet checked. Also they should be offered support pertaining to cessation if they smoke. All should happen annually, although it is recommended glycaemic control is checked a minimum four times a year.

Just like adults, children should expect HbA1c a minimum four times a year. They should also expect screening for coeliac and thyroid disease, their body mass index calculated and an offer of psychological support. Those over twelve years should have kidney function tests, eye screening, blood pressure tests and their feet checked.

Relatively very few people have all the care processes carried out annually. In most cases fewer than fifty percent of adults with diabetes have their eight care processes (Figs 13 & 14), excluding eye screening, carried out and there appears to be a particular challenge with kidney function tests in both types of diabetes and foot surveillance in T1D.

![Figure 13: T1D adult care processes](image)
![Figure 14: T2D adult care processes](image)

Traditional care processes need to be expanded to ensure that:

- Learning and education is considered annually for all ages
- Psychological and emotional support is considered annually as part of an adult’s care planning process
- Flu vaccine should be offered annually and the pneumonia vaccine (as a one off) to all those that are eligible

The opportunity to discuss sexual dysfunction should be given at annual reviews as should preconception advice and support where appropriate. A periodontal health status check should be included to inform ongoing care planning. All patients with

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10 [https://jamanetwork.com/journals/jamasurgery/fullarticle/2526246](https://jamanetwork.com/journals/jamasurgery/fullarticle/2526246)
diabetes over the age of 65 need to be screened for atrial fibrillation when the care processes are being undertaken. As all patients over 65 with diabetes will have a CH2DS2-VASc score of at least 2, they should be prescribed anticoagulation.

To ensure these care processes (listed in Appendix F) are carried out, existing prompts such as those used for immunisation need to be improved and local reasons why some people do not get offered these need to be explored. New models that make offers more convenient and accessible, to both people with diabetes and the clinicians involved in their care, need to be developed.

4.7 Engaging high risk groups

Certain cohorts of people run a higher risk of diabetes progression and subsequent complications because they are not as engaged with services as they could be. One group includes people transitioning from children’s diabetes services to adult services.

Most people transition between the ages of sixteen and nineteen years (18). However, the annual measurement of blood sugar (HbA1c) decreases considerably in the years that follow (twenty to twenty four). This correlates with the findings the HbA1c treatment target is less likely to be reached post transition (18). Whilst pre and post transition differences do not appear to be influenced by gender, ethnicity, or living in a deprived area, it does suggest either people disengage with services during these years or the services are not appropriately placed or signposted to support them.

While the path to adulthood is a continuous one, the path through clinical services may not be so smooth (Figure 15). There are built-in transitions between different elements of the service; transitions which can lead to gaps, through which individuals may fall.

*Figure 15: Transition in care is not as continuous as the transition into adulthood*

There is substantial evidence that such gaps can impact on patient outcomes and experience. If the mission is to inform, empower and enable all people with or at risk of diabetes, the system must ‘mind the gaps’ and work to support young people
transitioning to adult services. There are other groups that do not engage too. Those with co-morbidity such as dementia or mental health problems, people from ethnic minority backgrounds, the LGBT (lesbian, gay, bisexual & transgender) communities, people with sensory or physical impairments and those with learning difficulties. Reasons vary from amongst these groups that range from not understanding the seriousness of their condition to not having provision appropriate to their needs.

Services need to be more equitable and accessible. This will involve improving the transition from childrens to adult services as part of wider GM initiatives. Tools are required (building on those already in place) to help support those with co-morbidities and to address concerns about the side effects of medications as well as upskilling health care professionals in the community and in care homes. Information and education needs to be in multiple languages and utilise a range of tools that can be accessed locally or in the home. Exploration into engaging those at high risk of progression and complications is required; perhaps using care-calls, interactive messaging or other methods such as health apps to support them in managing their diabetes and to offer advice and support to reduce diabetes progression.
4.8 Actions to prevent progression

The following actions would support the prevention of progression of diabetes in Greater Manchester:

6. Ensuring structured patient education is an integral part of ongoing diabetes care by recommending courses include a refresher or alternative learning as part of an annual review of care process
7. Improving attendance on structured education programmes by reviewing and addressing the reasons why people do not currently attend
8. Learning being offered in a variety of formats and media for all (including those with learning difficulties, sensory impairments, non-English and for those unable or unwilling to attend structured education)
9. Providing a minimum standard of information to all people diagnosed with diabetes and carers
10. Improving the management of cardiovascular risk factors
11. Ensuring psychological and emotional support is assessed as an annual care process
12. Ensuring the flu vaccine is offered as an annual care process (and pneumococcal vaccine as one off)
13. Reviewing reasons why care processes are not carried out and exploration of local models to improve uptake of care processes and act on findings
14. Developing a structured care planning process for diabetes (and other long term conditions) and standards for care plans
15. Ensuring healthcare professionals responsible for treating people with or at risk of diabetes are trained and evidence the appropriate capabilities
16. Having a structure in place to enable diabetes specialist leads in the community to advise and help treat those with complex care needs
17. Having wide availability of peer support for both people with or at risk of diabetes
18. Improving medication adherence for people taking antidiabetic drugs and other medicines
19. Engaging high risk groups through care calls and messaging services or through other innovative means

See Table A2 in Appendix 1 for detail on these implementation proposals
5. Prevention of complications

5.1 Financial impact of complications

Complications as a result of diabetes have a profound impact on those living with them, as well as their families and their carers. Be it a cardiovascular event, renal failure, visual impairment, erectile dysfunction, gum disease or a wound resulting in amputation; the results are often life changing and people require considerable support from all involved in looking after them.

In 2010/11 a comprehensive analysis of diabetes costs concluded that around £7.7bn (80% of the direct costs) was spent treating complications nationally (Figure 16) (19) equating to around £400 million in GM. The most significant proportion of this spend was due to treating cardiovascular events whilst the second highest proportion was spent on excess bed days. Inpatient’s with diabetes often exceed the NHS tariff paid to hospitals by up to 8.5% (19) due to increased length of stay. Readmission rates are high (59% higher than in age matched populations without diabetes (20)) and there are thousands of emergency call-outs for and presentations in accident and emergency departments.

*Figure 16: Costs of diabetes complications*

![Graph showing costs of diabetes complications](image)

Source: Cost of Diabetes Report v2 (2014)

In GM unplanned admission rates vary across the patch (Figure 17) with some areas nearly twice that of others and it is not clear why.

*Figure 17: Unplanned admissions by CCG*

Unplanned hospital admissions for diabetes <19 years (per 100,000)

14/15

![Unplanned admissions by CCG](image)

Source: SUS data.
Major amputation rates also vary too with a proportional prevalence up to 81% higher than that of the national average in some places. Eye screening and kidney function tests are below optimum and it has been reported that in excess of 60% of inpatients with diabetes have medication errors (Figure 18) during their stay in hospital (21) (22) (23).

*Figure 18: Inpatient medication by CCG*

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<thead>
<tr>
<th>Reported Inpatient Medication Incident Errors 2016</th>
</tr>
</thead>
<tbody>
<tr>
<td>Manchester Inc M.R.I, Royal Eye Hospital, St Mary's</td>
</tr>
<tr>
<td>Wythenshawe Hospital</td>
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<td>Stepping Hill Hospital</td>
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<td>Royal Oldham Hospital</td>
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<td>Tameside General Hospital</td>
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<td>Salford Royal</td>
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<td>Fairfield General Hospital</td>
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<td>Royal Bolton Hospital</td>
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<td>North Manchester General Hospital</td>
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<tr>
<td>Wrightington, Wigan and Leigh NHS Foundation...</td>
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<tr>
<td>Trafford General Hospital</td>
</tr>
</tbody>
</table>

Source: National Diabetes Inpatient Audit.

### 5.2 Actions to prevent complications

The following actions would support the prevention of complications of diabetes in Greater Manchester:

20. Improving access to and the uptake of eye screening by reviewing and sharing best practice and how it could be adopted locally.
21. Improving access to, and the uptake of, kidney function tests by reviewing and sharing best practice models and how they could be adopted locally.
22. Ensuring periodontal care is considered as part of wider diabetes and roll out of a new practitioner’s tool kit.
23. Exploring the common reasons for emergency call out and presentations (i.e. DKA, hyperglycaemia) and developing management strategies to prevent these where not already in place.
24. Identifying and managing people at high risk of developing lower limb problems with a new model of care to ensure they receive the right care, the right time and at the right place.
25. All people with diabetes that are suitable have access to personal insulin pumps and technologies and other approved technologies across GM.
26. Introducing an inpatient bundle of care to improve the quality of care, reduce length of stay and reduce inpatient medication errors.

*See Table A3 in Appendix 1 for detail on these implementation proposals*
6. Additional risk factors

6.1 Reducing unwarranted variation

Variation in healthcare is often unavoidable because of its complexity and the difficulties in controlling all the variables that contribute to it. Some can be explained by the characteristics of the local population, individual patients or by differences in the capability of healthcare professionals (24). Often differences occur when there are local innovations benefiting smaller numbers and dissipate when the innovations become more widespread. The important thing for us to understand is whether the variation is unwarranted.

The term ‘unwarranted clinical variation’ has been described as ‘care that is not consistent with a patient’s preference or related to [their] underlying illness (24).’ This can relate to substandard care around access to services and outcomes. To limit unwarranted variation in diabetes care, we have to outline a set of minimum standards people should expect from our services.

In GM this is supported by:
- The GM Diabetes Strategy
- The draft GM diabetes services specification
- The development of agreed pathways and processes (see Appendices 2, 3, 4 & 5).

The draft service specification defines the minimum components of high quality diabetes care and should not limit local innovation. The pathways and processes aim to incorporate all necessary components of care and recommendations in this strategy, but not limit the local service models to deliver them. Combined these deliverables will support commissioners and local care organisations to review service provision and support the provision of quality diabetes care that is sustainable. At the same time, the diabetes health outcomes are evaluated needs to be improved in order to provide a greater understanding of what constitutes optimum, the reasons behind local variation, and what markers truly indicate a move in the right direction. Data recorded and collected needs to be consistent and up-to-date.

6.2 Actions to combat additional risk factors

The following actions would combat additional risk factors related to diabetes in GM:

27. Developing a GM diabetes service specification for adoption
28. Developing GM as a learning community and active test bed for new innovation and research
29. Improve the way we currently evaluate diabetes health outcomes so we can target and assist local areas in further need of support

See Table A4 in Appendix 1 for detail on these implementation proposals
**APPENDIX A**

**Strategic proposals to support the prevention of onset, progression and complications**

*Table A1: Proposals to support the prevention of onset*

<table>
<thead>
<tr>
<th>Relevant Taking Charge Theme</th>
<th>No</th>
<th>Proposal</th>
<th>How?</th>
<th>Goal(s)</th>
<th>Contributes toward</th>
<th>Proposed timescale</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Theme 1. Radical upgrade in population health prevention</strong></td>
<td>1.</td>
<td>To support the education of children in schools on the importance of leading a healthy lifestyle</td>
<td>Schools having a well developing Personal Health and Social Education curriculum. The NHS and Local Authority will support this curriculum as required.</td>
<td>To reduce cardiovascular risks To reduce complications</td>
<td>Reduction in prevalence of obesity, smoking and premature cardiovascular events.</td>
<td>Action: By 2022</td>
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<tr>
<td></td>
<td>2.</td>
<td>All primary care practitioners to identify and refer people with suspected diabetes or at risk of diabetes to relevant services</td>
<td>GP, dentists, optometrists and pharmacists to identify individuals at risk of diabetes or with suspected diabetes and refer appropriately in accordance with agreed pathways (e.g. healthy gums do matter toolkit for dentists). Also participation in the Healthy Living Programme specifically designed for primary care. Risk factors present in an individual should trigger a regular review – this will be done across providers with data shared using Datawell allowing a combined primary care focus on delivering the maximum positive outcome / risk reduction.</td>
<td>To improve blood glucose control To reduce cardiovascular risks To reduce complications To improve safety To improve experience of diabetes services</td>
<td>Reduction in prevalence of diabetes, and diabetes progression.</td>
<td>Action: From 2018</td>
</tr>
<tr>
<td>Relevant Taking Charge Theme</td>
<td>No</td>
<td>Proposal</td>
<td>How?</td>
<td>Goal(s)</td>
<td>Contributes toward</td>
<td>Proposed timescale</td>
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</tbody>
</table>
| **Theme 1. Radical upgrade in population health prevention** | 3. | All primary care practitioners to identify and offer behavioural intervention to all those found to be at risk of developing T2D | GP, dentists, optometrists and pharmacists to identify individuals at risk of diabetes or with suspected diabetes and refer appropriately. Commissioners continue to work with NHS England and their local GP Practices on the implementation of the National Diabetes Prevention Programme. Additionally, there will be support to both primary and secondary care to give brief advice to encourage people at risk of developing T2D to change their lifestyle. | *To improve blood glucose control*  
*To reduce cardiovascular risks*  
*To reduce complications*  
*To improve safety*  
*To improve experience of diabetes services* | Reduction in blood glucose, BMI, blood pressure, cholesterol and smoking. Reduction of incidence of T2D  
Improved experience of services. | Action:  
From 2018 |
| **Theme 1. Radical upgrade in population health prevention** | 4. | Having a structured preconception service across GM | Through distributive leadership and dissemination of knowledge, over time, all health care practitioners in contact with women with diabetes who are of child bearing age will be given education and support to deliver preconception advice. | *To improve blood glucose control*  
*To reduce complications*  
*To improve experience of diabetes services* | Reduction in pre-term babies, large gestational babies, babies being admitted to intensive care, diabetes related pre-eclampsia and diabetes related still birth. | Action:  
From 2018 |
| **Theme 1. Radical upgrade in population health prevention** | 5. | To offer incentives to people with or at risk of developing diabetes to look after their health | Commissioners continue existing health incentives provided as part of their programmes (e.g. taster sessions for dance classes, reduced gym membership) or provide additional support i.e. fit bits linked to emerging technological solutions. If there is no robust evidence base for the intended intervention, evaluation will be built in at the planning stage. | *To improve blood glucose control*  
*To reduce cardiovascular risks*  
*To reduce complications* | Reduction in BMI, and incidence of T2D and improved lipid profile. | Action:  
From 2018-19 |
### Table A2: Proposals to support the prevention of progression

<table>
<thead>
<tr>
<th>Relevant Taking Charge Theme</th>
<th>No</th>
<th>Proposal</th>
<th>How?</th>
<th>Goals</th>
<th>Contributes toward</th>
<th>Proposed timescale</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Theme 2: Transforming community based care and support</strong></td>
<td>6.</td>
<td>Ensuring structured patient education is an integral part of ongoing diabetes care by recommending courses include a refresher or alternative learning as part of an annual care process</td>
<td>Commissioners embed this as part of the GP standards and an agreed education cycle will be shared through GP networks via tools currently available or being developed.</td>
<td><strong>To improve</strong></td>
<td><strong>Reduction in HbA1c and BMI. Improved lipid profile. Improved knowledge and confidence to manage condition.</strong></td>
<td><strong>Action:</strong> By 2019</td>
</tr>
<tr>
<td></td>
<td>7.</td>
<td>Improving attendance on structured education programmes by reviewing and addressing the reasons why people do not currently attend</td>
<td>Commissioners work with local care providers in understanding why those referred do not attend or complete the programmes. Commissioners will lead negotiations with local providers around their flexibility and any adjustments.</td>
<td><strong>To improve</strong></td>
<td><strong>Reduction in HbA1c and BMI. Improved lipid profile. Improved knowledge and confidence to manage condition.</strong></td>
<td><strong>Action:</strong> From 2018</td>
</tr>
<tr>
<td>Relevant Taking Charge Theme</td>
<td>No</td>
<td>Proposal</td>
<td>How?</td>
<td>Goals</td>
<td>Contributes toward</td>
<td>Proposed timescale</td>
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<tr>
<td><strong>Theme 2:</strong> Transforming community based care and support</td>
<td>8.</td>
<td>Learning being offered in a variety of formats and media for all (including those with learning difficulties, sensory impairments, non-English and for those unable or unwilling to attend structured education)</td>
<td>SCN to lead collaboration and explore digital solutions for diabetes and other LTC’s. Examples; My City Salford as a pilot for diabetes or the adoption of specific evidence based solutions such as <a href="http://www.mydiabetesmyway.scot.nhs.uk">www.mydiabetesmyway.scot.nhs.uk</a>.</td>
<td>To improve blood glucose control</td>
<td>Reduction in BMI; Improved lipid profile and experience of services.</td>
<td>Action: From 2018-19</td>
</tr>
<tr>
<td><strong>Theme 2:</strong> Transforming community based care and support</td>
<td>9.</td>
<td>Providing a minimum standard of information to all people diagnosed with diabetes and carers</td>
<td>Localities embrace social prescribing and ensure use of information prescriptions already embedded in GP systems.</td>
<td>To improve blood glucose control To reduce cardiovascular risks To reduce complications To improve experience of diabetes services</td>
<td>Reductions in HbA1c and BMI. Improved lipid profile through lifestyle changes and improved knowledge and confidence to manage condition.</td>
<td>Action: From 2018-19</td>
</tr>
<tr>
<td>Relevant Taking Charge Theme</td>
<td>No</td>
<td>Proposal</td>
<td>How?</td>
<td>Goals</td>
<td>Contributes toward</td>
<td>Proposed timescale</td>
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<tr>
<td><strong>Theme 2:</strong> Transforming community based care and support</td>
<td>10.</td>
<td>Improving the management of cardiovascular risk factors</td>
<td>Primary care practices to have access to a community diabetes specialist nurse (DSN) supporting clinical staff to achieve optimal CVD risk factor levels. Every patient to have access to their care process results (HbA1c, blood pressure and cholesterol) through novel IT solutions. Interventions at practice level be individualised to include targeted staff training and support, access to clear protocol-driven care pathways for glucose, blood pressure and lipid management, optimal levels of insulin and GLP-1 initiation in primary care, community DSN clinics and MDTs involving secondary care teams.</td>
<td><strong>To improve blood glucose control</strong>&lt;br&gt;<strong>To reduce cardiovascular risks</strong>&lt;br&gt;<strong>To improve safety</strong></td>
<td>Reduction in cardiovascular morbidity and mortality; improved life expectancy.</td>
<td>Action: From 2018</td>
</tr>
<tr>
<td><strong>Theme 2:</strong> Transforming community based care and support</td>
<td>11.</td>
<td>Ensuring psychological and emotional support is assessed as an annual care process</td>
<td>Commissioners embed this as part of the GP standards and link it with local plans on IAPT.</td>
<td><strong>To improve blood glucose control; To reduce cardiovascular risks</strong>&lt;br&gt;<strong>To reduce complications</strong>&lt;br&gt;<strong>To improve safety</strong></td>
<td>Reductions in HbA1c, BMI, blood pressure and improved lipid profile through lifestyle changes and improved mental health.</td>
<td>Action: From 2018-19</td>
</tr>
<tr>
<td><strong>Theme 2:</strong> Transforming community based care and support</td>
<td>12.</td>
<td>Ensuring the flu vaccine is offered as an annual care process (and pneumococcal vaccine as one off)</td>
<td>Commissioners embed this as part of the GP standard and red flag patients on their systems to invite them back when appropriate.</td>
<td><strong>To reduce complications</strong>&lt;br&gt;<strong>To improve safety</strong></td>
<td>Reduced incidence of flu and/or diabetes and complications as a result of flu and pneumococcus.</td>
<td>Action: From 2018-19</td>
</tr>
<tr>
<td>Relevant Taking Charge Theme</td>
<td>No</td>
<td>Proposal</td>
<td>How?</td>
<td>Goals</td>
<td>Contributes toward</td>
<td>Proposed timescale</td>
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<tr>
<td><strong>Theme 2:</strong> Transforming community based care and support</td>
<td>13.</td>
<td>Reviewing reasons why care processes are not carried out and exploration of local models to improve uptake of care processes and act on findings</td>
<td>SCN work with commissioners to explore variation themes through the development of a data dashboard to review GP data more regularly. Commissioners explore new models of care to improve delivery of care processes using evidence based best practice.</td>
<td>To improve blood glucose control To reduce cardiovascular risks To reduce complications To improve safety To improve experience of diabetes services</td>
<td>Contributes to reduction in HbA1c; BMI; sight loss; smoking; co-morbid depression; flu and complications of flu; improvement in lipid profile blood pressure; &amp; knowledge and confidence to manage condition; prevention of lower limb complications; eye problems and renal complications; periodontal disease.</td>
<td>Action: 2018</td>
</tr>
<tr>
<td><strong>Theme 2:</strong> Transforming community based care and support</td>
<td>14.</td>
<td>Developing a structured care planning process for diabetes (and other long term conditions) and standards for care plans</td>
<td>The adoption of evidence based care planning models i.e. Year of Care</td>
<td>To improve blood glucose control To reduce cardiovascular risks To reduce complications To improve safety To improve experience of diabetes services</td>
<td>Reduction in HbA1c and BMI, Improvement in lipid profile and blood pressure; Improved knowledge and confidence to manage condition Improved preparation for pregnancy, Fewer complications.</td>
<td>Action: From 2018-19</td>
</tr>
<tr>
<td><strong>Theme 2:</strong> Transforming community based care and support</td>
<td>15.</td>
<td>Ensuring healthcare professionals responsible for treating people with or at risk of diabetes are trained and evidence the appropriate capabilities</td>
<td>Using shared capability frameworks; local gap analysis and training tools. SCN hosting cross cutting training workshops for clinicians treating those with comorbid dementia, or end of life care. Using the diabetes HCP toolkit (see appendix 8)</td>
<td>To improve blood glucose control To reduce cardiovascular risks To reduce complications To improve safety To improve experience of diabetes services</td>
<td>Reduction in HbA1c, BMI, and complications; Improvement in lipid profile, blood pressure, Preparation for pregnancy, knowledge and confidence to manage condition.</td>
<td>Action: From 2018-19</td>
</tr>
<tr>
<td>Relevant Theme</td>
<td>No</td>
<td>Proposal</td>
<td>How?</td>
<td>Goals</td>
<td>Contributes toward</td>
<td>Proposed timescale</td>
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<tr>
<td><strong>Theme 2:</strong> Transforming community based care and support</td>
<td>16.</td>
<td>Having a structure in place to enable diabetes specialist leads in the community to advise and help treat those with complex care needs</td>
<td>Through the adoption of the GM diabetes service specification and the adoption of a structured framework similar to that of the Super 6 model.</td>
<td>To improve blood glucose control To reduce cardiovascular risks To reduce complications To improve safety</td>
<td>Fewer complications.</td>
<td>Action: From 2018-19</td>
</tr>
<tr>
<td><strong>Theme 2:</strong></td>
<td>17.</td>
<td>Having wide availability of peer support for both people with or at risk of diabetes</td>
<td>Having expert patients as part of the diabetes service</td>
<td>To improve blood glucose control To reduce cardiovascular risks To reduce complications To improve experience of diabetes services</td>
<td>Increased confidence to manage condition.</td>
<td>Action: From 2019</td>
</tr>
<tr>
<td><strong>Theme 2:</strong></td>
<td>18.</td>
<td>Improving medication adherence for people taking antidiabetic drugs and other medicines</td>
<td>Continued care planning will help; switching on information prescriptions (eg Scripswitch) on GP systems and creating short videos re the side effects and concerns with certain meds; annual medication utilisation review</td>
<td>To improve blood glucose control To reduce cardiovascular risks To reduce complications To improve safety</td>
<td>Reduction in HbA1c; Improvement in lipid profile and blood pressure.</td>
<td>Action: From 2018</td>
</tr>
<tr>
<td>Relevant Taking Charge Theme</td>
<td>No</td>
<td>Proposal</td>
<td>How?</td>
<td>Goals</td>
<td>Contributes toward</td>
<td>Proposed timescale</td>
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<tr>
<td></td>
<td></td>
<td>Engaging high risk groups through care calls and messaging services or through other innovative means</td>
<td>Transformation Theme 1 leads are exploring care call systems but also through targeting/following up those on practice registers</td>
<td>To improve blood glucose control To reduce cardiovascular risks To reduce complications To improve experience of diabetes services</td>
<td>Reduction in HbA1c; Improvement in lipid profile, blood pressure, knowledge and confidence to manage condition.</td>
<td>Action: From 2018-19</td>
</tr>
</tbody>
</table>

**Theme 2: Transforming community based care and support**
### Table A3: Proposals to support the prevention of complications

<table>
<thead>
<tr>
<th>Relevant Taking Charge Theme</th>
<th>No</th>
<th>Proposal</th>
<th>How?</th>
<th>Goals</th>
<th>Contributes toward</th>
<th>Proposed timescale</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Theme 2:</strong> Transforming community based care and support</td>
<td>20</td>
<td>Improving access to and the uptake of eye screening by reviewing and sharing best practice models and how they could be adopted locally</td>
<td>Screening to include eye conditions with an increased prevalence in people with diabetes ie diabetic retinopathy and glaucoma. A combination of primary care encouragement for screening and reminders from providers should increase uptake.</td>
<td>To reduce cardiovascular risks To reduce complications To improve experience of diabetes services</td>
<td>Reduction in diabetic eye complications and advanced eye disease Improved access to eye screening</td>
<td>Action: By 2018</td>
</tr>
<tr>
<td><strong>Theme 2:</strong> Transforming community based care and support</td>
<td>21</td>
<td>Improving access to, and the uptake of, kidney function tests by reviewing and sharing best practice models and how they could be adopted locally</td>
<td>Models include combining kidney function tests with other care processes. There should be a review of such combinations to inform local decisions on how renal screening should be done.</td>
<td>To reduce cardiovascular risks To reduce complications To improve experience of diabetes services</td>
<td>Reduction in renal complications as a result of diabetes</td>
<td></td>
</tr>
<tr>
<td><strong>Theme 2:</strong> Transforming community based care and support</td>
<td>22</td>
<td>Ensuring periodontal care is considered as part of wider diabetes care and roll out of a new practitioner’s tool kit</td>
<td>Periodontal health to be incorporated in care pathways (see appendices 1-4) and GM diabetes service specification. The GM dental commissioning team will oversee the roll out of the practitioner's tool kit.</td>
<td>To improve blood glucose control To reduce complications To improve experience of diabetes services</td>
<td>Reduction in HbA1c, and in advanced periodontal disease</td>
<td>Action: From 2018</td>
</tr>
<tr>
<td>Relevant Taking Charge Theme</td>
<td>No</td>
<td>Proposal</td>
<td>How?</td>
<td>Goals</td>
<td>Contributes toward</td>
<td>Proposed timescale</td>
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<tr>
<td><strong>Theme 2: Transforming community based care and support</strong></td>
<td>23.</td>
<td>Exploring the common reasons for emergency call out and presentations (i.e. DKA, hyperglycaemia) and developing management strategies to prevent these where not already in place</td>
<td>A group consisting of primary, community and secondary care, commissioners, ambulance trusts, industry and the SCN to review emergencies across GM</td>
<td>To reduce complications</td>
<td>Reduction in emergency admissions and call outs to ambulance teams</td>
<td>Action: From 2018</td>
</tr>
<tr>
<td><strong>Theme 2: Transforming community based care and support</strong></td>
<td>24.</td>
<td>Identifying and managing people at high risk of developing lower limb problems with a new model of care to ensure they receive the right care, the right time and at the right place</td>
<td>Incorporating diabetic foot standards in to GM diabetes service specification and SCN outlining the model for lower limb presentations (refer to appendix 10). Commissioners adopting the model locally.</td>
<td>To reduce cardiovascular risks</td>
<td>Reduction in major amputations, admissions related to lower limb complications; Improved knowledge and confidence to manage condition</td>
<td>Action: From 2018</td>
</tr>
<tr>
<td><strong>Theme 3: Standardising acute and specialist care and clinical support services</strong></td>
<td>25.</td>
<td>All people with diabetes that are suitable have access to personal insulin pumps and technologies and other approved technologies across GM</td>
<td>Using national guidance and sharing local policies to reach a consensus set of minimum standards</td>
<td>To improve blood glucose control</td>
<td>Increased access to insulin pumps</td>
<td>Action: From 2018</td>
</tr>
<tr>
<td><strong>Theme 3: Standardising acute and specialist care and clinical support services</strong></td>
<td>26.</td>
<td>Introducing an inpatient bundle of care to improve the quality of care, reducing length of stay and preventing inpatient medication errors</td>
<td>Embedding inpatient care bundle (see appendix 11). Sharing evidence based best practice; incorporating standards in to GM diabetes services specification; embedding standards under the avoiding harm agenda in hospitals.</td>
<td>To improve blood glucose control</td>
<td>Reduction in medication errors, prescription errors, insulin errors, management errors, length of stay, hyperglycaemia, and an improvement in patient experience.</td>
<td>Action: From 2018</td>
</tr>
</tbody>
</table>
### Table A4: Proposals to combat additional risk factors

<table>
<thead>
<tr>
<th>Theme Taking Charge</th>
<th>No</th>
<th>Proposal</th>
<th>How?</th>
<th>Goals</th>
<th>Contributes toward</th>
<th>Proposed timescale</th>
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</thead>
<tbody>
<tr>
<td>Theme 5: Enabling better care</td>
<td>27.</td>
<td>Introducing a GM diabetes service specification for adoption</td>
<td>Using existing national specification and editing in accordance with local recommendations and updated guidance.</td>
<td>To improve blood glucose control To reduce cardiovascular risks To reduce complications To improve experience of diabetes services To improve safety</td>
<td>Reduced unwarranted variation in service delivery</td>
<td>Action: From 2018</td>
</tr>
<tr>
<td>Themes 1 to 5</td>
<td>28.</td>
<td>Developing GM as a learning community and active test bed for new innovation and research</td>
<td>Using pharmaceutical industries, Health Innovation Manchester and third sector organisations to develop a GM diabetes research, innovation and information hub.</td>
<td>To improve blood glucose control To reduce cardiovascular risks To reduce complications To improve experience of diabetes services To improve safety</td>
<td>Potentially a wide variety of diabetes outcomes</td>
<td>Action: From 2018</td>
</tr>
<tr>
<td>Themes 1 to 5</td>
<td>29.</td>
<td>Improve the way we currently evaluate diabetes health outcomes so we can target and assist local areas in further need of support</td>
<td>Health Informatics team at the University of Manchester to set new approach. Formulating a group to review performance data; and to develop a performance dashboard that is fit for purpose and can be utilised to inform commissioning intentions</td>
<td>To improve blood glucose control To reduce cardiovascular risks To reduce complications To improve experience of diabetes services To improve safety All metrics</td>
<td>Identify unwarranted variation; improved health outcomes through targeted support; improved data and reporting</td>
<td>Action: From 2018</td>
</tr>
</tbody>
</table>
A number of key performance indicators have been identified that could be used to measure progress against the proposals set out in tables A1 to A4. These are listed below along with the proposals which would contribute to their achievement.

Table A5: KPIs and the proposals (Tables A1 to A4) to which they contribute.

<table>
<thead>
<tr>
<th>Key performance indicators</th>
<th>Proposals contributing to improvement</th>
</tr>
</thead>
<tbody>
<tr>
<td>HbA1c</td>
<td>1,2,3,4,6,7,9,10,11,13,14,16,18,19,20,23</td>
</tr>
<tr>
<td>Body Mass Index</td>
<td>1,4,5,6,7,8,9,11,13,14</td>
</tr>
<tr>
<td>Lipid profile</td>
<td>5,8,10,13,19,20</td>
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<tr>
<td>Blood pressure</td>
<td>10,13,14,19,20</td>
</tr>
<tr>
<td>Knowledge to manage diabetes</td>
<td>1,3,4,6,7,9,13,17,18,20</td>
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<tr>
<td>Taking 5mg folic acid in pregnancy planning</td>
<td>14</td>
</tr>
<tr>
<td>Improved HbA1c during pregnancy</td>
<td>14</td>
</tr>
<tr>
<td>Unplanned admissions</td>
<td>24</td>
</tr>
<tr>
<td>Depression and anxiety</td>
<td>13</td>
</tr>
<tr>
<td>Major lower limb amputations</td>
<td>13,25</td>
</tr>
<tr>
<td>Medication errors</td>
<td>26,27</td>
</tr>
<tr>
<td>Experience of services</td>
<td>3,8,27</td>
</tr>
<tr>
<td>Sight loss</td>
<td>12,21</td>
</tr>
<tr>
<td>Smoking</td>
<td>1,13</td>
</tr>
<tr>
<td>Renal problems</td>
<td>13,22</td>
</tr>
<tr>
<td>Prevalence</td>
<td>1,2,3</td>
</tr>
<tr>
<td>Gum disease</td>
<td>2,13,23</td>
</tr>
<tr>
<td>Pre-term babies</td>
<td>4,14</td>
</tr>
<tr>
<td>Babies admitted to Neo-natal intensive care</td>
<td>4,14</td>
</tr>
<tr>
<td>Pre-eclampsia</td>
<td>4,14</td>
</tr>
<tr>
<td>Still birth</td>
<td>4,14</td>
</tr>
<tr>
<td>Knowledge and confidence</td>
<td>1,3,4,6,7,9,13,17,18,20</td>
</tr>
<tr>
<td>Flu/pneumonia</td>
<td>12,13</td>
</tr>
</tbody>
</table>
APPENDIX B
Prevention of onset:
Proposed pathway for those at high risk of developing T2D (non diabetic hyperglycaemia)
APPENDIX C
Prevention of progression & complications
Proposed pathway for T1D patients
APPENDIX D
Prevention of progression & complications
Proposed T2D pathway

- Offer structured education within 3 months to newly diagnosed and invite close family or carers where appropriate.
- Review results and initiate the information gathering and sharing for the continued care planning process.
- Review following education; commence shared decision making as part of care planning process; review medication, feedback from dentists and other specialists and refer where appropriate to other healthy lifestyle support.
- Formation of care plan and agreed goals.
- Care plan review in accordance with individual need; repeating care processes annually (including structured education cycle) with continued care planning.
- Refer to NICE guidance NG18 and NG28 on the management of HbA1c, cholesterol, diet, blood pressure, drug treatment and complications that include gastroparesis, diabetic neuropathy, erectile dysfunction and eye disease.
- Refer to healthy gums matter pathway where periodontal disease and periodontal therapy required.
- Refer to NICE guidance CG182 diabetic kidney disease is suspected.
- Refer to NICE NG19 for the management of diabetic foot.
- Refer to lower limb pathway where peripheral arterial disease is suspected or there is a wound.
- Refer to NICE guidance CG90 and CG91 where clinical depression.
- Refer to local pathways and protocols on smoking cessation, weight management and flu vaccinations.
APPENDIX E
Annual diabetes education cycle

1. Taster session (where available)
2. Multi session structured course (1st choice for those not previously educated and where no taster session is available)
3. Refresher
4 & 5. Online or 121 or other alternative support

Yes

No

Attend?

Prompt

Referred back GP Practice

Review session include outcomes

Continued care planning and offer additional support to person and relatives or carer where appropriate

Offer of patient education and carer support

Accept

Decline
## APPENDIX F
Summary of proposed GM care processes

<table>
<thead>
<tr>
<th>Children &lt;12 years</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. HbA1c</td>
</tr>
<tr>
<td>2a. Thyroid screening (T1D)</td>
</tr>
<tr>
<td>2b. Lipid profile (T2D)</td>
</tr>
<tr>
<td>3. Weight and Height – Body Mass Index</td>
</tr>
<tr>
<td>4. Education review</td>
</tr>
<tr>
<td>5. Psychological and emotional assessment</td>
</tr>
<tr>
<td>6. Flu vaccine</td>
</tr>
<tr>
<td>7. Pneumonia vaccine</td>
</tr>
<tr>
<td>8a. Blood pressure measurement (T2D)</td>
</tr>
<tr>
<td>9a. Kidney function assessment – Blood and Urine (T2D)</td>
</tr>
<tr>
<td>10. Periodontal health assessment</td>
</tr>
<tr>
<td>- Serological testing following diagnosis only (T1D)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Children and young people aged 12 to 17 years</th>
</tr>
</thead>
<tbody>
<tr>
<td>All care processes above for &lt;12 years plus:</td>
</tr>
<tr>
<td>8b. Blood pressure measurement (T1D)</td>
</tr>
<tr>
<td>9b. Kidney function assessment – Blood and urine (T1D)</td>
</tr>
<tr>
<td>11. Advice to support prevention of smoking or smoking cessation services where applicable</td>
</tr>
<tr>
<td>12. Diabetic eye screening</td>
</tr>
<tr>
<td>13. Foot examination</td>
</tr>
<tr>
<td>14. Pre-conception advice where appropriate</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Adults aged 18 years and over</th>
</tr>
</thead>
<tbody>
<tr>
<td>All care processes above for children and young people plus:</td>
</tr>
<tr>
<td>2c. Lipid profile (T1D)</td>
</tr>
<tr>
<td>15. Discussion on sexual dysfunction where appropriate</td>
</tr>
</tbody>
</table>

### Further information on the above noted care processes:

**Children and young people <12 years**

1. **Blood glucose level measurement (HbA1c)**
   Offer Children and young people with T1D measurement of their HbA1c level 4 times a year (more frequent testing may be appropriate if there is concern about suboptimal blood glucose control) NG18:1.2.71. Measure HbA1c levels every 3 months in children and young people with T2D NG18:1.3.28. Ideal target 48mmol mmol/mol NG18:1.2.67.

2a. **Thyroid Screening for T1D**
   Offer children and young people with T1D diabetes monitoring for thyroid disease and annually thereafter until transfer to adult services NG18:1.2.110.
2b. Cholesterol for T2D
Offer children and young people with T2D diabetes annual monitoring for
dyslipidaemia starting at diagnosis NG18:1.3.43.

3. Serological Testing for T1D (at diagnosis only)
Offer serological testing for coeliac disease to people with T1D at diagnosis NG20.1.1.1.

4. Weight and height check
Aim for a healthy weight between a BMI of 18.5 and 24.9 kg/m2.

5. Education Review
Offer ongoing education and review at least annually using Education cycle (see appendix 5) NG18.

6. Psychological and Emotional Assessment
Offer children and young people with T1D and their family members or carers (as appropriate) timely and access to mental health professionals with an understanding of diabetes because they may experience psychological problems NG18:1.2.98.

7. Flu vaccination
Explain to children and young people with diabetes and their family members or carers (as appropriate) that the Department of Health’s Green Book recommends annual immunisation against influenza for children and young people with diabetes over the age of 6 months. NG18:1.2.16.

8. Pneumococcal vaccination
Explain to children and young people with diabetes and their family members or carers (as appropriate) that the Department of Health’s Green Book recommends annual immunisation against pneumococcal infection for children and young people with diabetes NG18:1.2.17.

9a. Blood pressure measurement T2D
Offer children and young people with T2D diabetes annual monitoring for hypertension starting from diagnosis NG18:1.3.43 (<140/80 mmHg with no kidney, eye or cardiovascular disease; <130/80 mmHg with evidence of kidney, eye or CV damage).

10a and 11. Kidney function testing (Albumin Creatinine Ratio – Urinary ACR) T2D and Serum creatinine
Offer children and young people with T2D annual monitoring for moderately increased albuminuria (albumin:creatinine ratio [ACR] 3-30 mg/mmol; ‘microalbuminuria’) to detect kidney disease, starting at diagnosis.
Children and young people aged 12-17 years

All the above plus:

9b. Blood pressure measurement T1D
Offer children and young people with T1D monitoring for hypertension annually from 12 years NG18: 1.2.110.
<140/80 mmHg with no kidney, eye or cardiovascular disease; <130/80 mmHg with evidence of kidney, eye or CV damage.

10b and 11. Kidney function testing (Albumin Creatinine Ratio – Urinary ACR) T1D and serum creatinine
Offer children and young people with T1D monitoring for moderately increased albuminuria (albumin: creatinine ratio [ACR] 3-30 mg/mmol; ‘microalbuminuria’) to detect diabetic kidney disease annually from 12 years NG18: 1.2.110.

12. Smoking status
Offer a smoking status check at annual review and smoking cessation services where appropriate.

13. Eye examinations
Offer eye screening for diabetic complications at least annually.

14. Foot examinations
Offer a full foot check for diabetic complications at least annually.

For young people with diabetes who are 12–17 years, the paediatric care team or the transitional care team should assess the young person's feet as part of their annual assessment, and provide information about foot care. If a diabetic foot problem is found or suspected, the paediatric care team or the transitional care team should refer the young person to an appropriate specialist. NG19: 1.3.2.

Adults 18 years and over

1. Blood glucose level measurement (HbA1c)
Measure HbA1c levels every 3–6 months in adults with T1D NG17: 1.6.1
Consider measuring HbA1c levels more often in adults with T1D if the person’s blood glucose control is suspected to be changing rapidly; for example, if the HbA1c level has risen unexpectedly above a previously sustained target. NG17: 1.6.2.

Support adults with T1D to aim for a target HbA1c level of 48 mmol/mol (6.5%) or lower, to minimise the risk of long-term vascular complications. NG17: 1.6.6.

In adults with T2D, measure HbA1c levels at 3–6-monthly intervals (tailored to individual needs), until the HbA1c is stable on unchanging therapy or 6-monthly intervals once the HbA1c level and blood glucose lowering therapy are stable. NG28: 1.6.1.

2a. Thyroid Screening for T1D
Measure blood thyroid-stimulating hormone (TSH) levels in adults with T1D at annual review NG17: 1.15.40.
2b. Cholesterol
Assess cardiovascular risk factors annually, including: full lipid profile (including HDL and LDL cholesterol and triglycerides) NG17: 1.13.2. Cholesterol of <4 mmol/L and LDL of <2 mmol/L is recommended in patients with diabetes.

3. Serological Testing for T1D (at diagnosis)
Offer serological testing for coeliac disease to people with T1D following diagnosis NG20.

4. Weight and height check
Use clinical judgement to decide when to measure a person's height and weight. Opportunities include registration with a general practice, consultation for related conditions (such as diabetes and cardiovascular disease) and other routine health checks NG189: 1.2.1.

5. Education Review
Offer all adults with type 1 diabetes a structured education programme of proven benefit 6 - 12 months of diagnosis NG17: 1.3.1. If a structured education programme has not been undertaken by an adult with T1D diabetes by 12 months after diagnosis, offer it at any time that is clinically appropriate and suitable for the person, regardless of duration of T1D NG17: 1.3.2. Offer structured education to adults with T2D and/or their family members or carers (as appropriate) at and around the time of diagnosis, with annual reinforcement and review. Explain to people and their carers that structured education is an integral part of diabetes care NG28: 1.2.1.

6. Psychological and Emotional Assessment
Members of diabetes professional teams providing care or advice to adults with T1D should be alert to the development or presence of clinical or subclinical depression and/or anxiety, in particular if someone reports or appears to be having difficulties with self-management. NG17: 1.15.41.

7. Flu vaccination
Offer annual flu vaccination annually.

8. Pneumococcal vaccination
Offer vaccination for pneumonia annually.

9a. Blood pressure measurement
Assess cardiovascular risk factors annually, including blood pressure NG17: 1.13.2.

Intervention levels for recommending blood pressure management should be 135/85 mmHg unless the adult with T1D has albuminuria or 2 or more features of metabolic syndrome, in which case it should be 130/80 mmHg NG17: 1.13.8.

Measure blood pressure at least annually in an adult with T2D without previously diagnosed hypertension or renal disease. Offer and reinforce preventive lifestyle advice NG28: 1.4.1.
10a and 11. Kidney function testing (Albumin Creatinine Ratio – Urinary ACR) and Serum creatinine
Ask all adults with T1D with or without detected nephropathy to bring in the first urine sample of the day (‘early morning urine’) once a year. Send this for estimation of albumin:creatinine ratio. Estimation of urine albumin concentration alone is a poor alternative. Serum creatinine should be measured at the same time NG17: 1.15.11

12. Smoking status
Give adults with T1D who smoke advice on smoking cessation and use of smoking cessation services, including NICE guidance‐recommended therapies. Reinforce these messages annually for people who currently do not plan to stop smoking, and at all clinical contacts if there is a prospect of the person stopping. NG17: 1.13.5
Advise young adult non-smokers never to start smoking. NG17: 1.13.6.

13. Eye examinations
On diagnosis, GPs should immediately refer adults with T1D to the local eye screening service. Perform screening as soon as possible and no later than 3 months from referral. Arrange repeat structured eye screening annually NG17: 1.15.1. Depending on the findings, follow structured eye screening by routine review annually or earlier review or referral to an ophthalmologist NG17 1.15.2.

14. Foot examinations
For adults with diabetes, assess their risk of developing a diabetic foot problem at the following times: When diabetes is diagnosed, and at least annually thereafter (see recommendation 1.3.11); If any foot problems arise; on any admission to hospital, and if there is any change in their status while they are in hospital. NG19 1.3.3.

15. Sexual Dysfunction
Offer both sexes the opportunity to discuss sexual dysfunction. Offer men with T1D the opportunity to discuss erectile dysfunction as part of their regular review NG17: 1.15.37. Offer men with T2D the opportunity to discuss erectile dysfunction as part of their annual review NG28: 1.7.13.
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