



Diabetes and  
Developmental  
Disorders

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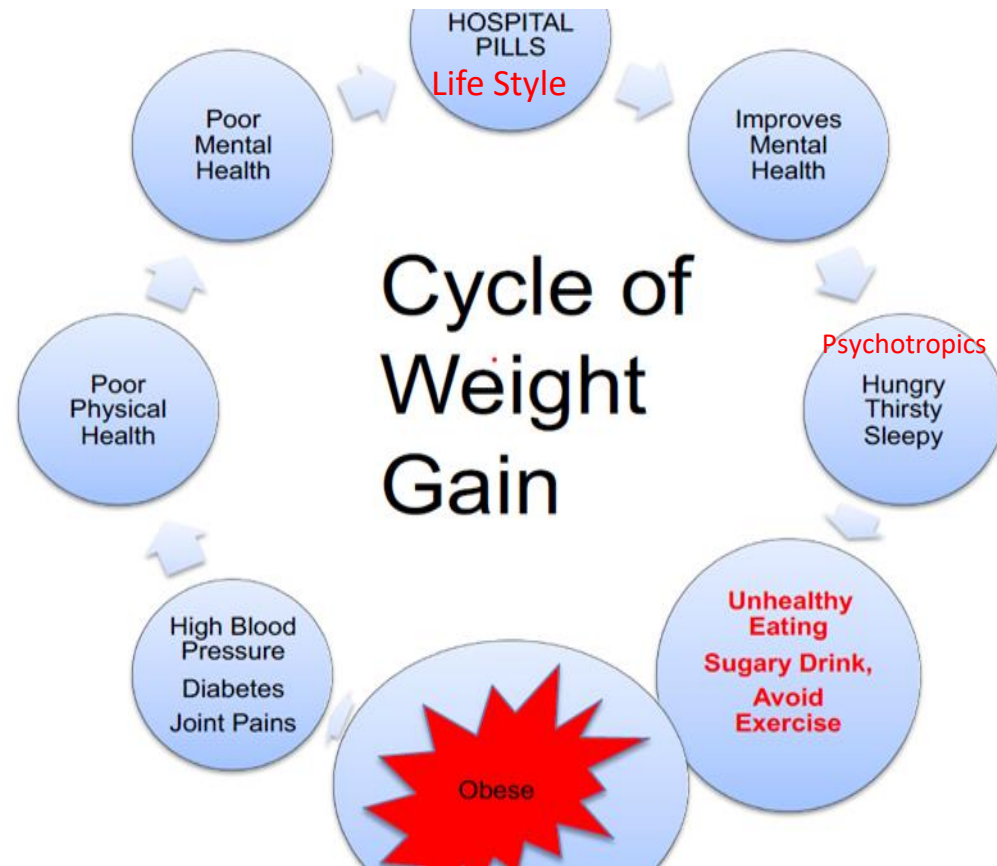
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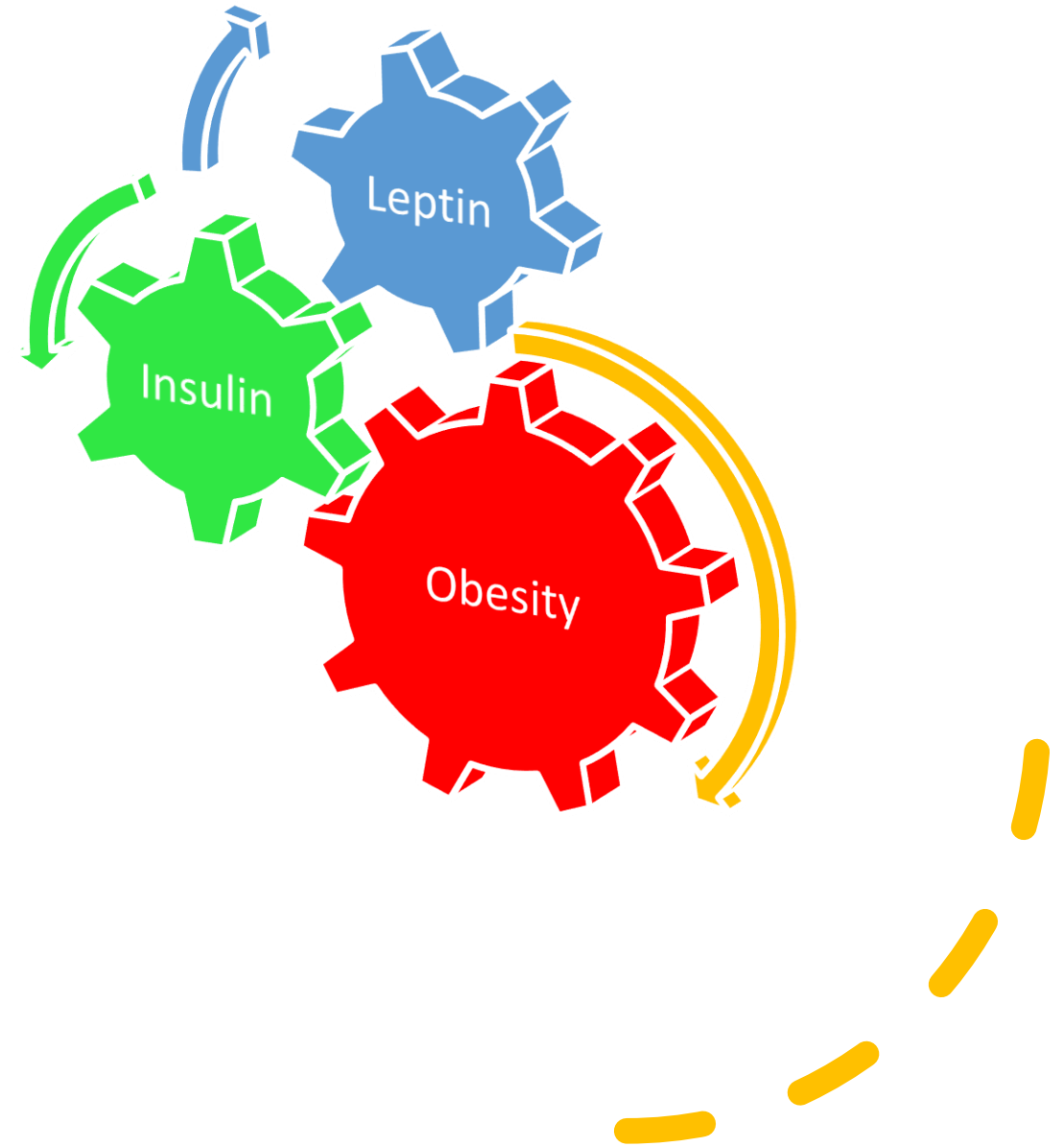
# Introduction

- Diabetes is a common metabolic disorder in which there is under-secretion of insulin that regulates the utilisation of sugar and fats by the body.
- Insulin deficiency and insulin resistance lead to the abnormalities of carbohydrate, fat, and protein metabolism that are characteristic of diabetes mellitus.
- Type 1 diabetes (IDDM)— an absolute insulin deficiency causes persistent hyperglycaemia (insulin activity is normal). Caused by Genetic and environmental factor
- Type 2 diabetes (NIDDM) — **insulin resistance** and a relative **insulin deficiency** result in high Glucose level in blood.
- Risk factors are **Obesity**, metabolic syndrome (raised blood pressure, dyslipidaemia, fatty liver disease, **central obesity**), Family History, Ethnicity

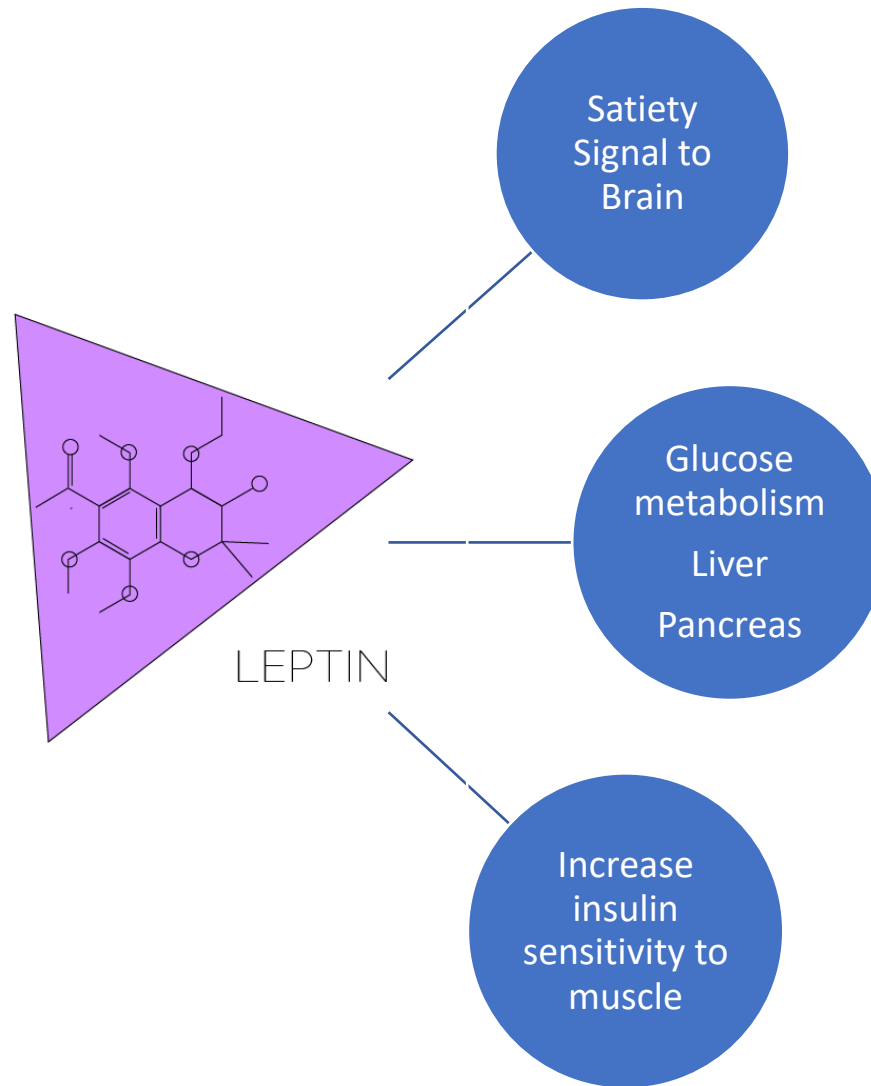
Weight Gain  
Major Risk to  
Physical health



Obesity increases  
Insulin resistance  
and Leptin level



Elevated level of Insulin reduces Leptin mediated signals.  
Leptin decreases Insulin synthesis and secretion



# Prevalence of Diabetes in Developmental Disorder

- There is evidence to support the assertion that people with ID are at high risk of diabetes.
- The global prevalence of diabetes has increased from 4.7% in 1980 to 8.5% in 2014 (WHO). Prevalence rates of DM in people with ID were varied, ranging from 0.4% to 25% (MacRae 2015).
- Chen AY (2010) found that 23.4 percent of **children with autism** and 19.3 percent of **children with ID** are obese, compared with 12.2 percent of other children.
- There are only few research focusing on the prevalence, incidence and impact of diabetes among people with Developmental disorder (McVilly 2014).
- Many health conditions including diabetes are frequently unidentified or remain undiagnosed (Liao2021).
- The risk of Type II DM in **Prader–Willi** is approximately 25% for (mean age at onset 20 years).
- In a Dutch study in children, the risk on DM is **threefold higher** in children with **Down syndrome** compared to those without the syndrome.

# Prevalence of Diabetes in Autism

- It has been proposed that autistic individuals are at an increased risk of type 1 and type 2 diabetes.
- In a systemic review of prevalence of Diabetes in Autism (Samuel et al Dec 2020) found a trend of increase in diabetes in Autism.
- Out of the 19 eligible studies, 15 studies that included a non-autistic control group, 9 reported a higher diabetes prevalence among autistic persons, with a statistically significant difference in 4 studies.
- Studies demonstrating a higher diabetes prevalence in autistic groups had higher average study population sizes and reporting quality ratings.

# Diabetes - Aetiology and Risk Factors in Developmental Disorder

## Genetic

- Deletions on chromosome 16, are associated with Obesity, Learning Difficulty and Major Mental Illness( Beckmaan)
- Down syndrome, Turner Syndrome, Prader Willi Syndrome
- Obese women and those with gestational diabetes are more likely to have children with autism.
- Women with diabetes are known to be at an increased risk of having children with autism. These children may also be predisposed to type 2 diabetes.
- They also note that the gene GLO1, which encodes an enzyme that detoxifies certain byproducts of metabolism, is linked to both autism and type 2 diabetes.
- Individuals with autism may be at greater risk of disorders with autoimmune pathophysiology, such as T1DM

## Environmental

People with developmental disorder are at greater risk of metabolic syndrome, including obesity and dyslipidaemia.

Psychotropic medications, commonly prescribed to people with ID, can increase the risk of diabetes (Buse et al., 2003).

Lifestyle factors - weight, lower physical activity, smoking, alcohol

Barriers to access health care

South Asian

Older Age Group

Obesity as risk factor of for  
Type II DM



# Problems in Diagnosis and Treatment of DM in ID

- **Barriers** in the person and in the system.
- GPs experience problems in fulfilling their roles - gaps are identified in GP training, applicable guidelines and tools, collaborative mental health care (Pauls et al Dec 2021).
- Research suggests that registered nurses (RNs) do not feel adequately prepared to support patients with ID (Appelgren et al Dec 2018)
- Higher dependence on others to recognise signs and symptom
- Communication difficulty - report concerns to health professionals and seek treatment



## Prevention and Early Diagnosis of DM in ID

- Where obesity is a significant problem, use of **personalised weight loss programme**, rather than a more generic lifestyle programme.
- Individuals, who decline support in lifestyle change or weight loss should continue to be offered it and it is important to review capacity, **explore reasons for refusal** and provide reasonable adjustments if required.
- Annual Health Check (AHC) can also be a useful screening tool to identify Type 2 diabetes in this higher risk group. Use of **Learning Disability Annual Health Check electronic clinical template (2017)** by the GP for a systematic approach to the Health Check.

## Management/ Treatment

- **Person Centred Care Plan** - For a person who has diabetes, the Health Care Action Plan (HCAP) should detail how the individual's diabetes will be managed.
- **DESMOND ID** (Diabetes Education and Self-Management for Ongoing and Newly Diagnosed)- A structured education programme for those with a diagnosis of Type 2 diabetes. Study by Taggart et al 2018, shows it is possible to identify, recruit, consent and randomize adults with intellectual disabilities to an intervention or control group.
- **Reasonable adjustment** - Check the person's understanding of diabetes, be aware of their mood in response to diagnosis. An initial assessment meeting can be facilitated by a Learning Disability Nurse. Offered a phased series of appointments. Training community-based Diabetes Specialist Nurses
- **Maintain consistency** of care teams, particularly for successful insulin management in Type 1 Diabetes to avoid hospital admission.

## Reasonable Adjustment for People with Developmental disorder in Management/ Treatment

- **Lifestyle change programmes - accommodate views** of the person, staff/carers about activity targets. The activities and behaviour change techniques should be carried out within **familiar** structures and settings.
- **Weight management programmes** - to feel more comfortable, to be able to be more active, and to be attractive, as well as for the health benefits (Jones et al, 2015) **is possible** to deliver if programmes are **designed and delivered** for the target population.
- The use of colour coded blood glucose monitors and structured education material for people with a learning disability has been seen to be helpful by community Diabetes Specialist Nurses.
- **OK Diabetes Study** (Walwyn 2015) identified the need to establish individual's daily routine and lifestyle including current diet, social/work activity routines, food shopping and food preparation, Current self-reported health and self-management, identifying all supporters and helpers and who the key supporter is and their role in the life of the person with diabetes.
- **Realistic goal setting** in collaboration with the client , aiming to involve the person in any change in diet or other lifestyle changes.

# Use of LESTER UK TOOL for Patients on Antipsychotic

## **Weight Gain**

- BMI  $\geq 25$  kg/m<sup>2</sup> ( $\geq 23$  kg/m<sup>2</sup> if South Asian or Chinese) AND / OR
- Weight gain >5kg over 3 month period

Medication review and lifestyle advice to include diet and physical activity

## **Hb1Ac Monitoring – At High Risk of Diabetes**

HbA1c 42-47 mmol/mol (6.0% - 6.4%) FPG 5.5 - 6.9 mmol/l

- i) Offer intensive structured lifestyle education programme
- ii) If ineffective consider metformin

## **Diabetes**

- HbA1c  $\geq 48$  mmol/mol ( $\geq 6.5\%$ ) FPG  $\geq 7.0$  mmol/l / IRPG  $\geq 11.1$  mmol/l
- Endocrine review
- Follow NICE diabetes guidelines

## Follow NICE guidelines

- Metformin – Renal function before starting treatment and then yearly
- Sulfonylureas – Risk of hypoglycaemia, monitoring of renal function, blood dyscrasia
- GLP-1 receptor agonists – Glutides - needs monitoring – DKA, Liver, Renal and GI disturbances.
- DPP-4 inhibitors – Gliptins – Renal function and LFT monitoring
- SGLT-2 inhibitors – Gliflozins - risk of DKA
- Pioglitazone – LFT monitoring, risk of Heart Failure and Ca Bladder

# Barriers and Enablers to optimal diabetes care

(Cathy et al May 2021)

## Barriers

- Low level of diabetes knowledge and understanding
- Multiple other health conditions
- Formal or informal caregivers lack diabetes knowledge and understanding
- Caregivers do not encourage individual autonomy
- Communal living arrangements
- Independent living
- Felt stigma
- Lack of accessible information
- Systems do not allow reasonable adjustments
- Compromise on ideal diabetes management
- Inappropriate structured self-management programmes
- Inconsistent and disjointed care plans

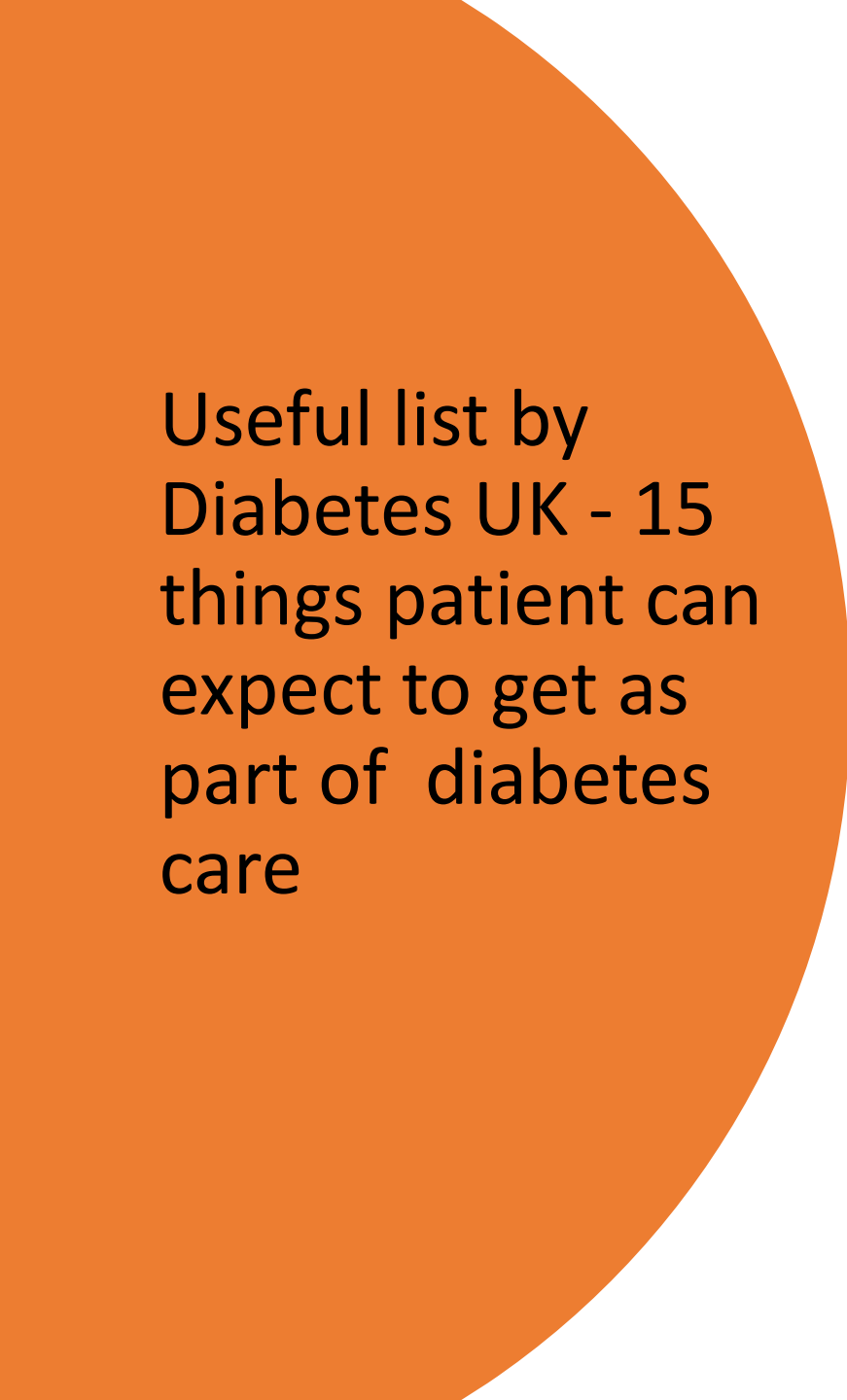
## Enablers

- Motivation to self-manage condition
- High level of diabetes knowledge and understanding
- Presence of formal or informal caregivers
- Close relatives with diabetes
- Peer support
- Autonomy facilitated by caregiver
- Consistent approach from caregivers
- Living in residential care
- Social barriers addressed
- Person-centred planning and reasonable adjustments
- Adapted support programmes
- Collaborative approaches
- Accessible information
- Training for staff and caregivers

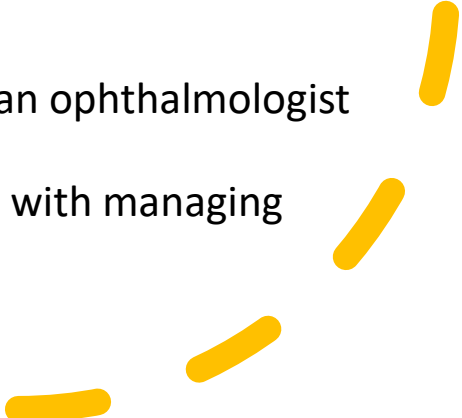
# The National Annual Health Check for people with ID made available to GP(2017)

- Disability Details Specific Syndrome Check
- Additional Support Needs and Reasonable Adjustments - **Consider time, environment, communication & additional health needs.**
- Lifestyle & Health Promotion
- Patient Diet - Patient advised re diet
- Exercise Level - Patient advised re exercise
- Smoking Status - Smoking cessation advice
- Alcohol Consumption - Patient advised about alcohol
- Substance misuse - Lifestyle advice regarding drug misuse
- Diabetes - **Follow Diabetes standard monitoring guidance with Reasonable Adjustment**
- HbA1c ( If not in last 12 months consider test request)
- Latest Diabetic Retinopathy Screening
- **Blood test** - Serum Cholesterol Full Blood Count Serum HDL cholesterol level Thyroid Function Test ( Down Syndrome) Urea & Electrolytes Liver Function Test, Urine Dipstick
- Medication Review – Including STOMP
- **Consider reduction in antipsychotic medication especially if prescribed for behaviour management or where there is no diagnosis of psychosis**




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## Useful list by Diabetes UK - 15 things patient can expect to get as part of diabetes care

1. HbA1c blood test every year to measure your overall blood glucose control.
  2. Blood pressure at least once a year.
  3. Cholesterol at least once a year to measure your cholesterol level.
  4. An annual eye screening.
  5. Podiatrist at least once a year and more if needed.
  6. Two tests for your kidneys each year to check they are working well.
  7. Have your weight checked to see if it is affecting your diabetes.
  8. Get support to quit smoking because this makes diabetes worse.
  9. You get a yearly care plan covering your individual needs.
  10. Attend an education course to help you understand and manage diabetes.
  11. Receive paediatric care if you are a child or young person until you are 18.
  12. Receive high quality care if admitted to hospital.
  13. Get information and specialist care if planning or having a baby.
  14. See specialist diabetes healthcare professionals, like an ophthalmologist (eyes), podiatrist (feet) or dietician (food and diet).
  15. Get emotional and psychological support to help you with managing diabetes.
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# Summary

- Reduce the Barriers and increase Enablers
- Annual Health Check in Community and in the Hospital
- Use LESTER tool Don't just SCREEN – INTERVENE for all patients in the “red zone”
- Personalised Health Care Plan based on needs
- Education and Empowerment – Give the Diabetes UK 15 Healthcare Essential list and discuss during clinical contact
- Teaching and training staff to use the tools in the Primary care
- Effective use of Learning Disability Nurse in the community in managing physical health care

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