

DIABETES IN CHILDREN: DON'T EVER FORGET GLUCOSE

This presentation has been developed by the Children and Young People's National Diabetes Network and is aimed at health professionals in primary care.

It should take no more than 5 minutes to read and may help save a life.



DiABETES UK
KNOW DIABETES. FIGHT DIABETES.

PCDS
Primary Care Diabetes Society

DIABETES IN CHILDREN



- Most diabetes in children is type 1 diabetes
- It is caused by immune destruction of the islet cells in the pancreas, leading to insulin deficiency
- Diabetes in children progresses FAST
 - Sometimes there are only a few days between symptoms developing and the child developing Diabetic Ketoacidosis (DKA)



FACTS AND FIGURES

- 2019-20: In England and Wales, 2799 children under 16 were diagnosed with type 1 diabetes
- What percentage do you think were in DKA at diagnosis?

Source: National Paediatric Diabetes Audit



- The answer is 38.5%
- That is **1078 children** who could have avoided DKA if diagnosed earlier



IMPACT OF DKA

- Diabetic Ketoacidosis is **DANGEROUS**
- Many children will be admitted to HDU – some will go to ITU
- Complications of DKA include:
 - Cerebral oedema
 - Permanent brain injury
 - Renal failure
 - Limb ischaemia and amputation
 - Death
- Long term impacts:
 - Anxiety, post-traumatic stress symptoms
 - Association with poorer longer term glycaemic control
 - May affect long term cognitive scores/brain growth



THE KEY SYMPTOMS OF TYPE 1 DIABETES

• The Diabetes UK 4Ts campaign promotes awareness of the four key symptoms of Type 1 Diabetes. Do you know what they are?

• **Toilet**

- Passing urine more than normal
- May present with new onset bedwetting
- In babies may note very heavy nappies

• **Thirsty**

- Drinking more than normal

• **Tired**

• **Thinner**

- Parents often don't notice their child is losing weight – they think they are growing. Ask if they are getting thinner instead.

The infographic has a blue background. At the top, it asks 'DO YOU KNOW THE SIGNS OF TYPE 1 DIABETES?'. Below this are four panels: 1. 'TOILET' with an illustration of a person in a blue uniform. 2. 'THIRSTY' with an illustration of a hand holding a glass of water. 3. 'TIRED' with an illustration of a person sleeping at a desk. 4. 'THINNER' with an illustration of a person looking at a scale. Below the panels is a paragraph of text: 'We call them the 4Ts. If you or your child are weeing more often, constantly thirsty, more tired than usual, or losing weight for no reason, it could be a symptom of type 1 diabetes. If left undiagnosed, type 1 diabetes can be fatal. If you're experiencing any of the 4Ts, ask your doctor for a test immediately.' At the bottom left is the 'DIABETES UK' logo with the tagline 'KNOW DIABETES. FIGHT DIABETES.'. At the bottom right is the text 'Scan the QR code to find out more about type 1 diabetes.' and a QR code.

Also think about diabetes in children with:

- Recurrent oral thrush
- Persistent nappy rash

SPOTTING DKA



- **Children who have developed DKA may show the following additional symptoms:**
 - Tired, sleepy or confused
 - Deep sighing breathing
 - Abdominal pain – may present as acute abdomen
 - Vomiting
 - Breath that smells fruity (like pear drop sweets or nail polish remover)
- **Be careful not to mistake the deep sighing breathing pattern of DKA for pneumonia or asthma.**

MAKING THE DIAGNOSIS



- Children with suspected diabetes should have an immediate finger prick blood glucose tested on a blood glucose meter
- Urine dipstick for glucose may show glycosuria but is less sensitive
- All GP practices should ensure they have a blood glucose meter available
- Ensure equipment is calibrated and that strips are available and in date

WHY MIGHT THE DIAGNOSIS OF DIABETES BE MISSED BY CLINICIANS?



- Don't think about diabetes
 - This is particularly common in children with isolated weight loss who haven't developed thirst/urination symptoms.
- Don't believe it's diabetes
 - Children can still look really well despite very high blood glucose levels. Children can't be "too young" to have diabetes, it can present in infants and toddlers.
- Think diabetes is rare
 - Most GPs/nurses will only diagnose diabetes in a child a few times in their career – but make sure you don't miss it!
- Testing is delayed
 - Children with diabetes can go into DKA very quickly. If they have **any** one of the symptoms of diabetes make sure you do a test the **same day**:
 - **Do:** Finger prick blood glucose
 - **Don't:** Send for outpatient HbA1c - this will delay diagnosis

CASE 1



- 8 year old boy consults with 2 months of weight loss
- Bloods tests are normal but diabetes is not considered and not tested
- Consults again with 4 day history of excessive thirst and going to toilet 2 times a night
- Diabetes is considered and blood test for HbA1c booked for next week
- While awaiting blood tests child develops vomiting and drowsiness – admitted in DKA
- pH 6.9 on admission, acute kidney injury with creatinine of 200, requires 48 hour admission to HDU

CASE 1 – LEARNING POINTS



- Always think about diabetes in a child with unexplained weight loss
- When suspecting diabetes do a test the SAME DAY:
 - Finger prick blood glucose
- Don't send for outpatient HbA1c – this will delay diagnosis

CASE 2

- 2 year old boy consults with increased thirst
- Clinician considers diabetes but child looks very well, running around the room
- Increased thirst attributed to hot weather

- 3 days later child deteriorates – vomiting, pale, quiet
- Admitted in DKA
- Early into treatment develops severe headache – CT shows cerebral oedema
- GCS deteriorates despite IV mannitol – intubated and transferred to PICU



CASE 2 – LEARNING POINTS



- Children with diabetes can look very well
- If there is a symptom of diabetes then do a test the SAME DAY:
 - Finger prick blood glucose
- Don't attribute symptoms to another cause without ruling out diabetes first



CASE 3

- 6 year old child brought to GP with breathlessness
- GP notes deep sighing breathing pattern not typical of chest infection – considers diabetes
- Further history – 2 weeks of increased thirst and bedwetting
- Finger prick blood glucose test – 30 mmol/L

- Transferred urgently to ED – DKA confirmed
- IV access very difficult and has multiple cannulation attempts
- Develops anxiety after discharge, flashback to time in HDU, referred to team psychologist

CASE 3 – LEARNING POINTS



- Always consider DKA in a breathless child
- Asthma and pneumonia do not typically present with deep, sighing respiration – think DKA
- The smell of ketones may be a clue to DKA but be aware not all people can smell these
- Think about diabetes in children with new onset bedwetting



IN SUMMARY

- In children with **ANY** one of the 4Ts:
 - Toilet, Thirsty, Tired, Thinner
- Don't Ever Forget Glucose
- Test **SAME DAY** for diabetes:
 - Finger prick blood glucose
- Blood glucose above 11 mmol/L indicates diabetes:
 - Transfer **IMMEDIATELY** to hospital for further assessment
- Blood glucose 7-11 mmol/L or glycosuria with diabetes symptoms:
 - Discuss **SAME DAY** with paediatric team

FURTHER INFORMATION



- National Children & Young People's Diabetes Network
 - www.cypdiabetesnetwork.nhs.uk/national-network/dka-prevention-at-diagnosis/
- Diabetes UK
 - www.diabetes.org.uk/The4Ts
 - [Diagnosing type 1 diabetes - Pathway HCPs - Diabetes UK Shop](#)
- NICE: Diabetes (type 1 and type 2) in Children and Young People: Diagnosis and Management
 - www.nice.org.uk/guidance/ng18

You are welcome to copy sections of this work to include in your own presentations, but please do not edit this slide set when distributing.

DiABETES UK
KNOW DIABETES. FIGHT DIABETES.

PCDS
Primary Care Diabetes Society