



**UNDIAGNOSED**  
TYPE 1 DIABETES  
IN CHILDREN IS A  
MEDICAL EMERGENCY.

A Healthcare Professionals' guide  
to an early diagnosis

# IMPROVING EARLY DIAGNOSIS OF DIABETES IN THE YOUNG

Nearly all young people with diabetes have **Type 1 diabetes**. **Scotland has the fifth highest incidence** of Type 1 diabetes in the world. Caused by autoimmune destruction of pancreatic beta cells, Type 1 diabetes results in **total insulin deficiency** and **life-threatening ketoacidosis** if diagnosis and treatment are delayed.

Each year in the UK **more than 10 children die** from ketoacidosis and a similar number suffer permanent **neurological disability** after developing cerebral oedema. Type 1 diabetes may occur at any age, and in Scotland approximately **300 new cases under the age of 16 years are diagnosed annually**. More than **one in every four** of these children present in ketoacidosis, and this increases to **one in three** for those under five years of age.

Diabetic **ketoacidosis is preventable** if diabetes is diagnosed and treated sufficiently early. Unfortunately this is often not the case, and **one third** of children with new-onset diabetes have had **at least one medical-related visit prior to diagnosis**. This represents a 'missed opportunity' for early recognition, testing, diagnosis and treatment.

## IS DELAYED DIAGNOSIS OF DIABETES IN CHILDREN REALLY A PROBLEM?

Every Health Board in Scotland has young people present critically unwell with new onset diabetes and tragically several deaths have occurred in recent years. The diagnosis has often not been contemplated or, even if diabetes is considered, inappropriate testing is performed or referral has been delayed.

# HOW CAN WE DIAGNOSE TYPE 1 DIABETES IN THE YOUNG EARLIER?

## THINK. TEST. TELEPHONE.

### THINK DIABETES

The early symptoms of diabetes in a child, adolescent or young adult can be recognised by Diabetes Scotland's **"4 T's"** campaign in a matter of seconds:

#### Thirsty?

- increased, excessive thirst
- drinking more frequently (including overnight)

#### Tired?

- increased tiredness
- increased lethargy

#### Thinner?

- losing or not gaining weight
- looking thinner than usual

#### Using the Toilet more?

- increased urinary frequency (polyuria, nocturia)
- bed wetting in a previously dry child - diabetes must be excluded
- heavier nappies in babies

### Young Children and Unusual Presentations

In the Under 5's, classic symptoms are not always obvious, but any of the following clinical features might suggest a possible diagnosis of diabetes:

- nappies heavier than usual
- blurred vision
- candidiasis (oral, vulval)
- constipation
- recurring skin infections
- irritability, behaviour change

Type 1 diabetes may occur at any age.



## TEST CAPILLARY BLOOD GLUCOSE IMMEDIATELY

- Perform an immediate finger prick capillary glucose test.
- **Do not** request a returned urine specimen.
- **Do not** arrange a fasting blood glucose test.
- **Do not** arrange an Oral Glucose Tolerance Test.
- **Do not** wait for lab results (urine or blood).



If Random BG > 11 mmol/l  
Telephone specialist local diabetes services immediately.

If Random BG < 11 mmol/l  
Consider other possible causes for symptoms.

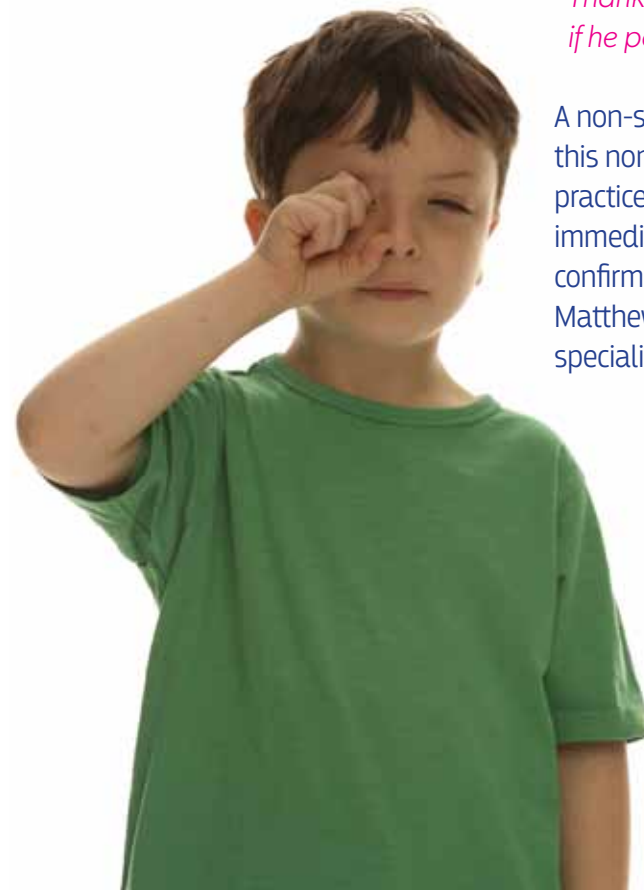
Call your local Diabetes Team for advice if in any doubt about possible diagnosis.

### Gemma's Story

*Gemma was eight years old and presented with a one week history of thirst and urinary frequency. No urinalysis was performed. The child was diagnosed with a "urinary tract infection" and prescribed antibiotics. She deteriorated, developing vomiting, lethargy & weight loss. The out of hours medical service was contacted, and advice given that the diagnosis was likely gastroenteritis. Gemma became increasingly drowsy, and an ambulance was called. On admission she was found to be in severe diabetic ketoacidosis, and required admission for four days.*

## TELEPHONE URGENTLY

- New onset diabetes in a child is a medical emergency.
- Immediately refer to the local diabetes service when Type 1 diabetes is considered possible.
- Call on-call paediatric services (e.g. paediatric registrar) if child presents out of hours.
- Patient review on the same day by specialist children's diabetes services is mandatory.



### Matthew's Story

Matthew was a 14 month old baby. His referral went to a non-urgent general paediatric outpatient clinic:

*"I would appreciate if this young child could be reviewed in a general paediatric clinic. His mother is concerned that he has some symptoms of diabetes, including sleepiness, increased thirst, passing urine frequently, and irritability. He is generally otherwise healthy, and examination was unremarkable. There is a family history of diabetes. Thank you for seeing him to consider if he possibly has diabetes."*

A non-specialist consultant reviewed this non-urgent clinic letter. The GP practice was phoned urgently and an immediate blood test was performed, confirming a diagnosis of diabetes. Matthew was reviewed by the specialist team the same day.

## WHY GETTING IT RIGHT MAKES A DIFFERENCE...

### A Mum's perspective

*"When my son Tom was diagnosed, he was in a coma, had brain swelling and was close to death. He'd been ill for several weeks, but I didn't know the symptoms well enough to insist his doctors test for Type 1 diabetes. Five years later, I spotted the early symptoms of Type 1 in his older brother, Joe. I took him straight to hospital and he was diagnosed very early, before ketoacidosis had set in. When Tom was diagnosed he was in a coma; when Joe was diagnosed he was well enough to go camping."*



## PRACTICE POINTS TO REMEMBER

**OVER 300 CHILDREN UNDER  
16 YEARS ARE DIAGNOSED  
IN SCOTLAND ANNUALLY.**

**TYPE 1 DIABETES OCCURS  
AT ANY AGE.**

**CHILDREN UNDER FIVE YEARS  
OF AGE ARE AT GREATER RISK  
OF KETOACIDOSIS.**

**UNDIAGNOSED AND  
UNTREATED TYPE 1 DIABETES  
RESULTS IN KETOACIDOSIS  
AND DEATH.**



Aims of National Diabetes Awareness  
& Ketoacidosis Prevention Campaign:

- Reduce number of children dying or becoming disabled due to a 'missed' diagnosis.
- Reduce number of new cases of Type 1 diabetes presenting in ketoacidosis.
- Reduce length of time from presentation to diagnosis.
- Reduce hospital admissions and length of stay.

**UNDIAGNOSED  
TYPE 1 DIABETES  
THINK. TEST.  
TELEPHONE.**

Developed by:

**Childhood & Adolescent  
Diabetes Scotland**

# REFERRAL PATHWAY FOR EARLY DIAGNOSIS OF TYPE 1 DIABETES

## THINK SYMPTOMS

- POLYDIPSIA
- POLYURIA
- NOCTURIA
- NOCTURNAL ENURESIS
- WEIGHT LOSS
- TIREDNESS/ LETHARGY



## TEST IMMEDIATELY

URGENT CAPILLARY BLOOD  
GLUCOSE FROM FINGER PRICK

**BLOOD GLUCOSE > 11 MMOL/L?**



CONSIDER OTHER CAUSES OF  
SYMPTOMS OR CALL DIABETES  
SERVICE FOR ADVICE



## TELEPHONE URGENTLY

CALL FOR SAME DAY  
SPECIALIST REVIEW

### KETOACIDOSIS SYMPTOMS?

- NAUSEA & VOMITING
- ABDOMINAL PAIN
- SWEET “KETOTIC” BREATH
- DEEP, “SIGHING” BREATHING
- DECREASED CONSCIOUSNESS
- SEVERE DEHYDRATION/SHOCK



TELEPHONE FOR EMERGENCY  
PAEDIATRIC REVIEW OR DIAL 999