

Alert: Type 1 Diabetes and Ketoacidosis Presentations in the Young during the Coronavirus Pandemic

Increase in number of children and young people diagnosed with Type 1 Diabetes

We appreciate the vital role our Primary Care colleagues have always played in early recognition of Type 1 diabetes. We are also aware of their constant efforts to provide care during the pandemic, balancing the need to socially distance with that of personally assessing the more seriously unwell.

Since early 2020 the GGC Children's and Young People's Diabetes Service (CYPDS) has recorded a **35% rise in patients diagnosed with Type 1 Diabetes**, an activity increase that will have affected both Primary and Secondary Care. We have also noted that the proportion of newly diagnosed Type 1 diabetes patients presenting in **ketoacidosis has increased from 30 to 40%**.

Early diagnosis improves morbidity and mortality

Combined with increased incidence, the rise in number of new patients presenting in life-threatening Diabetic Ketoacidosis (DKA) is of significant concern. Children, adolescents, and young adults in DKA are at greater risk of disability or death from shock, renal failure, and cerebral oedema. Intensive care admissions have increased noticeably since the onset of the pandemic, as have the number of very young children (Under 5 years of age) diagnosed with Type 1 Diabetes.

Early diagnosis of Type 1 diabetes is key to limiting morbidity and mortality, and our colleagues in the Lanarkshire Children's Diabetes Service have issued an alert to their Primary Care partners regarding increased numbers of new Type 1 Diabetes patients and presentations with ketoacidosis. They have cited several papers in the international literature that also report an increased incidence of Type 1 diabetes and higher rates of presentation in Diabetic Ketoacidosis (please see list below).

We endorse the Lanarkshire team's approach of increasing awareness of this serious issue and similarly wish to inform our GGC Primary Care partners of this significant rise in incidence.

"Think, Test, Telephone"

Scotland has the third highest incidence of Type 1 diabetes in the world, and local and national numbers of new patients presenting in ketoacidosis have remained stubbornly high for the last 30 years. While previously 25 to 30% of all Type 1 diabetes diagnoses per annum presented with DKA, in the 20 months since onset of the Coronavirus pandemic this proportion has increased to 40%.

We realise our Primary Care partners have borne the brunt of the pandemic and remain hard pressed. We also appreciate that, in a busy surgery where viral illness in infants, children and adolescents is often seen, it can be very challenging to differentiate the routine from the uncommon diagnosis of diabetes. Despite these difficulties, though, the great majority of referrals for suspected Type 1 Diabetes have been made on the day of first presentation.

Delayed referrals do occur, particularly when investigations more suitable for Type 2 patients are used for the young. Examples include requesting a later return for fasting blood tests, waiting for an HbA1c result or referring a child for an "early" clinic assessment. We wish to emphasise the urgency of diagnosing Type 1 diabetes in the young, particularly as they may decompensate rapidly.

In 2015 an awareness campaign for Type 1 diabetes was released, encouraging us all to:

- **Think:** Raising awareness of the possible diagnosis of Type 1 diabetes in the young,
- **Test:** Simplifying testing, recommending immediate Capillary Blood Glucose analysis, and
- **Telephone:** Emphasising urgent, same day referral of anyone thought to have Type 1 diabetes.

As well as providing details for the **Paediatric Medical Triage Line**, we also attach the “**Think, Test, Telephone**” leaflet. This contains an outline of features and recommended course of action for any suspected of having Type 1 Diabetes. The document’s main recommendations are summarised here:

Think...

1. Consider Type 1 Diabetes in *any* infant, child or young person presenting with these symptoms (the “4 Ts”): **Thirst, Tiredness, Thinner** and **Toileting** more often. **Thrush** also occurs frequently.
2. Younger children may be found to have had **heavier nappies**.
3. Type 1 diabetes should be considered in *any* child with **new-onset bedwetting**.

Test...

1. A **finger-prick Blood Glucose** is recommended as it provides immediate diagnostic information.
2. **Do not** request a *returned* urine specimen, *Fasting* Blood Glucose, HbA1c or an Oral Glucose Tolerance Test. (A urine specimen collected at the time a patient is seen may be useful).
3. A **urine or blood ketone test** is useful but should not delay referral if the diagnosis is suspected.

Telephone...

1. **Call immediately** if your patient’s Blood Glucose is 11 mmol/l or more.
2. **Call 999** for an ambulance if **ketoacidosis suspected** (e.g. deep or rapid breathing rate, sweet smelling breath, abdominal pain, nausea, vomiting, severe dehydration, shock, drowsiness).
3. Call immediately to discuss if diabetes suspected but Blood Glucose under 11 mmol/l.

If fasted for any length of time (e.g., overnight or if fasted before blood testing) young children with early Type 1 diabetes may have either a normal or only slightly raised Blood Glucose. If well enough, a finger-prick glucose from a child after carbohydrate may better identify higher results. Specialist service review on the same day is essential if blood glucose or history suggests Type 1 Diabetes.

Thank you for your support, in both considering this matter and for your efforts during the pandemic.

Yours sincerely,

Dr. Ian Craigie

Dr. Vaiva Kuehne

Dr. Karen Whyte

For and on behalf of the GGC Children’s & Young People’s Diabetes Service.

www.ggc-youngdiabetes.org

<https://www.nhsggc.org.uk/media/253797/diabetes-mellitus-diagnosis.pdf>

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UNDIAGNOSED
TYPE 1 DIABETES
IN CHILDREN IS A
MEDICAL EMERGENCY.

A Healthcare Professionals' guide
to an early diagnosis

DiABETES
SCOTLAND
CARE. CONNECT. CAMPAIGN.

NHS
SCOTLAND

 **healthier**
scotland
SCOTTISH GOVERNMENT

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.

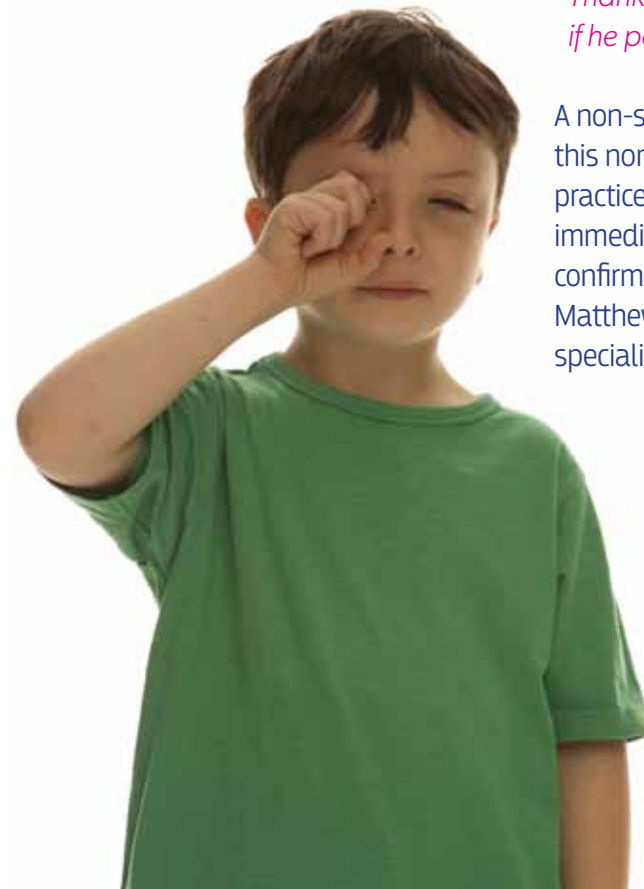
Call your local Diabetes Team for advice if in any doubt about possible diagnosis.

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

PAEDIATRIC MEDICAL TRIAGE LINE



ROYAL HOSPITAL FOR CHILDREN



Telephone Triage Staffed by Senior Paediatric Staff



9AM to 9pm Monday to Sunday



Please use for all Acute Medical Paediatric Referrals

(Routine outpatient referrals should still be via SCI Gateway)



Accessible via the Consultant Connect smartphone app (recommended) or

Contact RHC switchboard and ask for 'Paediatric Medical Triage'

Paediatric Medical Triage – Royal Hospital for Children

This service was introduced at the start of the pandemic, the key aims of this service are to:-

- Provide primary care with easily accessible telephone advice between 9am and 9pm* seven days per week from a senior paediatrician
- Provide early senior paediatrician input into decisions around the need for children to attend the hospital acutely
- Help stream patients efficiently into appropriate services within RHC (for example rapid access clinic appointments)

This service is delivered by senior paediatric medical registrars or consultants for 12 hours each day of the week. We request that all acute medical referrals are made through this service. Outpatient referrals should continue to be made via SCI gateway referral process. Primary care clinicians looking for advice with regard to either acute management or need for outpatient referral of patients can contact this service to discuss cases. This service is available to staff working with NHS 24.

*Activity will be monitored and we may reduce to a 5pm or 6pm service if evening calls continue to be low

Referral Process

- Please contact this service when you wish to make an acute medical referral to or discuss a patient with the General Paediatric team at the RHC
- We strongly recommend use of the smartphone app Consultant Connect – use of this app will ensure calls are answered more promptly. Access to this app is free for all GGC health board practices
- If not able to use consultant connect, please contact RHC switchboard (0141 201 0000) and ask to be put through to “Paediatric Medical Triage”
- Please do not advise children to attend acutely without first calling the triage service to discuss
- Please have the CHI number and name for each patient you are hoping to refer as we will ask you for this information
- This service is available at weekends and we would encourage GP out of hours teams to utilise this
- Overnight calls will not routinely be answered by a doctor and thus you will need to ask to speak to one if you are looking for advice