

# Type 1 diabetes

## Early detection of type 1 diabetes

Failure to recognise the early signs and symptoms of type 1 diabetes such as severe fatigue/tiredness, excessive thirst, frequent urination, and weight loss can mean that diagnosis of type 1 diabetes is delayed and too often these people develop diabetes ketoacidosis (DKA). This is an acute complication which can be life threatening and often requires hospitalisation.

Around one in five people who are newly diagnosed with type 1 diabetes only learn they've got type 1 diabetes after presenting to hospital with DKA.<sup>1</sup>

In the past year, 3186 Australians were newly diagnosed with type 1 diabetes. That means around 640 people end up in hospital before finding out if they have type 1 diabetes. Around half of these newly diagnosed people are children, and half are adolescents.<sup>2</sup>

Internationally, rates of DKA at time of type 1 diabetes diagnosis range from around 11 per cent to 80 per cent. This significant level of variance reflects a number of factors including the successful implementation of education campaigns around the early signs and symptoms of type 1 diabetes.<sup>3</sup>

## Diabetes ketoacidosis

Diabetic ketoacidosis (DKA) is a potentially life-threatening complication of type 1 diabetes caused by a lack of insulin. Without enough insulin, the body's cells cannot use glucose for energy and, to compensate, the body burns fat for energy. This leads to the production of high levels of blood acids, known as ketones, which are also present in the urine.<sup>4</sup>

Signs and symptoms may include dehydration, rapid breathing, vomiting, frequent urination, tiredness, abdominal pain and confusion. In the lead-up to a DKA episode, unexplained weight loss may also be observed. If not treated, urgently DKA can lead to coma, acute kidney failure, cerebral injury or even death.<sup>5</sup> A person's breath may develop a specific, sweet smell. Onset of symptoms is usually rapid.<sup>6</sup>

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<sup>1</sup> Craig, ME, Wong CH, Alexander J et al. 2009. Delayed referral of new-onset type 1 diabetes increases the risk of diabetic ketoacidosis. *Medical Journal of Australia* 190(4):219.

<sup>2</sup> National Diabetes Services Scheme 2017, *Type 1 Diabetes Statistical Snapshot at 31 March 2017*, viewed 31 May 2017, <<https://static.diabetesaustralia.com.au/s/fileassets/diabetes-australia/a6bc2b76-18f8-482d-98a4-b41b20cfdb11.pdf>>

<sup>3</sup> Usher-Smith, J. A. et al. "Variation Between Countries In The Frequency Of Diabetic Ketoacidosis At First Presentation Of Type 1 Diabetes In Children: A Systematic Review". *Diabetologia* 55.11 (2012): 2878-2894. Web.

<sup>4</sup> Craig ME, Twigg SM, Donaghue KC, Cheung NW, Cameron FJ, Conn J, Jenkins AJ, Silink M, for the Australian Type 1 Diabetes Guidelines Expert Advisory Group. National evidence-based clinical care guidelines for type 1 diabetes in children, adolescents and adults, Australian Government Department of Health and Ageing, Canberra 2011.

<sup>5</sup> Australian Institute of Health and Welfare. (2016) *Diabetic ketoacidosis (DKA) among children and young people with type 1 diabetes*. Diabetes series no. 26. Cat. No. CVD 77. Canberra: AIHW.

<sup>6</sup> Misra, Shivani, and Nick S Oliver. "Diabetic Ketoacidosis In Adults". *BMJ* (2015): h5660. Web. 22 May 2017.

## Four T's

To promote awareness of the early signs of type 1 diabetes, the “Four T’s” have been developed (by Diabetes UK).

Everyone should know the 4T's of Type 1 Diabetes:

- Thirst - are they really thirsty and unable to quench that thirst?
- Toilet – are they going to the toilet a lot?
- Tired - are they more tired than usual?
- Thinner - have they recently lost weight?

Early diagnosis and early treatment can help people avoid becoming seriously ill with DKA.<sup>7</sup>

Rates of DKA at diagnosis are reduced if there is a higher level of parental education about the symptoms of type 1 diabetes.<sup>8</sup>

Education campaigns work. A successful type 1 diabetes awareness campaign in Gosford decreased the proportion of children who were presenting with DKA at the time of type 1 diabetes from 37.5 per cent to 13.8 per cent.<sup>9</sup> An Italian awareness campaign slashed these rates from 78 per cent to 12.5 per cent<sup>10</sup>.

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<sup>7</sup> "Do You Know the 4Ts of Type 1 Diabetes?". DiabetesUK. N.p., 2017. Web. 31 May 2017.

<sup>8</sup> Usher-Smith, J. A. et al. "Factors Associated With The Presence Of Diabetic Ketoacidosis At Diagnosis Of Diabetes In Children And Young Adults: A Systematic Review". *BMJ* 343.jul07 1 (2011): d4092-d4092. Web.

<sup>9</sup> King, Bruce R et al. "A Diabetes Awareness Campaign Prevents Diabetic Ketoacidosis In Children At Their Initial Presentation With Type 1 Diabetes". *Pediatric Diabetes* 13.8 (2012): 647-651. Web.

<sup>10</sup> Vanelli, M. et al. "Effectiveness Of A Prevention Program For Diabetic Ketoacidosis In Children. An 8-Year Study In Schools And Private Practices". *Diabetes Care* 22.1 (1999): 7-9. Web.