



# Prevention of Diabetic Ketoacidosis

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# Vulnerable Situations

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- 1) New onset type 1 diabetes
- 2) Intercurrent illness
- 3) Insulin pump failure
- 4) Insulin omission

# New Onset Diabetes

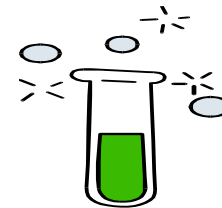
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- Early recognition and referral is key
- DKA in 19% of new onset diabetes\*
  - 40% if age < 3 years; 16 % in older children
  - ~ 40% had physician visits in 2 weeks prior to diagnosis (similar with and without DKA)
  - Common diagnostic codes – GI, GU and URTI codes
- Be alert for polyuria, polydipsia, weight loss
  - ASK about these when children present with GI, GU and even URTI symptoms

\*Bui et al. J Peds, March 2010

If diabetes is suspected

- Simple test



**URINE DIP!!!**

**OR**

**GLUCOSE METER CHECK**

- If positive – refer immediately
- No need for fasting glucose testing



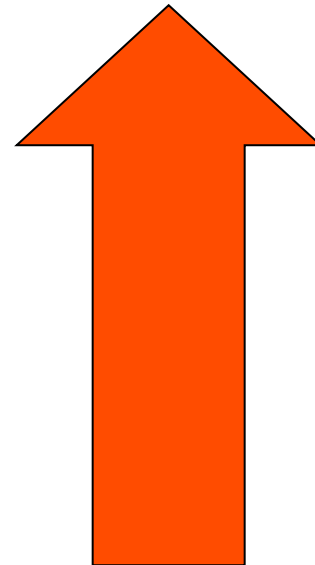
The diagnosis of **type 1** diabetes is an  
**URGENT** problem

Call local diabetes team/physician and refer  
**immediately**



This is a 24 hour, 365 Day a year service at IWK.  
Please call us!

What *usually* happens to insulin requirements during intercurrent illness?



# Sick Days Management

## The 10% rule

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- Do Not omit insulin
- High blood sugars with or without ketones indicate need for more insulin
- Basic rule is to give usual insulin dose

**PLUS**

an **extra 10%** of total daily dose as rapid acting insulin

- Repeat every 2-4 hours as needed

# Sick Days Example

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- 13 year old girl with fever and sore throat, eating poorly
- Glucose 19.3, Ketones moderate
- Usual insulin 80 units/day
  - N 30 H 10 am; H 8 supper N32 hs
- How much insulin should she give
  - If it is lunch time? **8 units Humalog**
  - If it is supper time? **16 units Humalog**

# Hyperglycemia & Insulin Pumps

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Failure of insulin delivery must always be considered

- 1) Insertion site problem!
- 2) Insertion site problem!
- 3) Insertion site problem!
- 4) Usual reasons – illness, forgotten boluses
- 5) Pump failure

## Response to Hyperglycemia with Pump

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- If Glucose  $>15$  mmol/L, check ketones
- No Ketones
  - Give one correction bolus via pump and Recheck in 2 hours
- If not improving or ketones present

**GIVE INSULIN BY INJECTION AND  
CHANGE PUMP SITE!!**

# Adherence to insulin treatment, glycemic control and ketoacidosis

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- Compared insulin prescribed to insulin dispensed for all type 1 patients under 30
- 28% of patients obtained less insulin than prescribed
- Mean deficit 115 insulin days/yr (Range 9-246)
- Lack of adherence was significantly related to HbA1c and hospital admissions

\*Morris, Boyle, McMahon, Greene et al, Lancet 350, Nov 22/97

# Suspected Insulin Omission

- Arrange for a comprehensive team evaluation
  - Including Social work assessment and problem solving
- Encourage Parental observation/ close supervision
- Frequent phone and clinic follow-up helps (to review log book, adjust insulin, offer encouragement)
- Address medical or psychosocial issues as able

# Key Messages in DKA Management

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- Have a **Protocol** on hand and use it
- Bolus conservatively (10cc/kg)
  - Follow-up with rate based on weight
- Add insulin after first hour; usually hold insulin for transport
- Bicarbonate is not recommended
- Add K as soon as it K is normal and insulin started
- Slow correction is the goal