



Diabetes Research &
Wellness Foundation

United Through Diabetes 2023

**Diabetes and Sick
Day Rules...**

**Not a mission
impossible!**

**Dr Mayank Patel and
Paula Johnston**



Celebrating
25 Years





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Type 2 or 3c Diabetes: Sick Day Advice...



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**Hope for the best, plan for the
worst...**

Mission Briefing



‘I’m Not Feeling Well...’



Big Stock Photo

**Preparing for
Mission...**

Mission Briefing...

Aims of this talk...

- To outline the effect of illness on the body in diabetes
- To provide guidance on being prepared for illness
- To outline what happens in Diabetic Ketoacidosis (DKA)
- To suggest actions to consider taking when unwell to help prevent DKA

Sick Day Rules...

Declassified..!



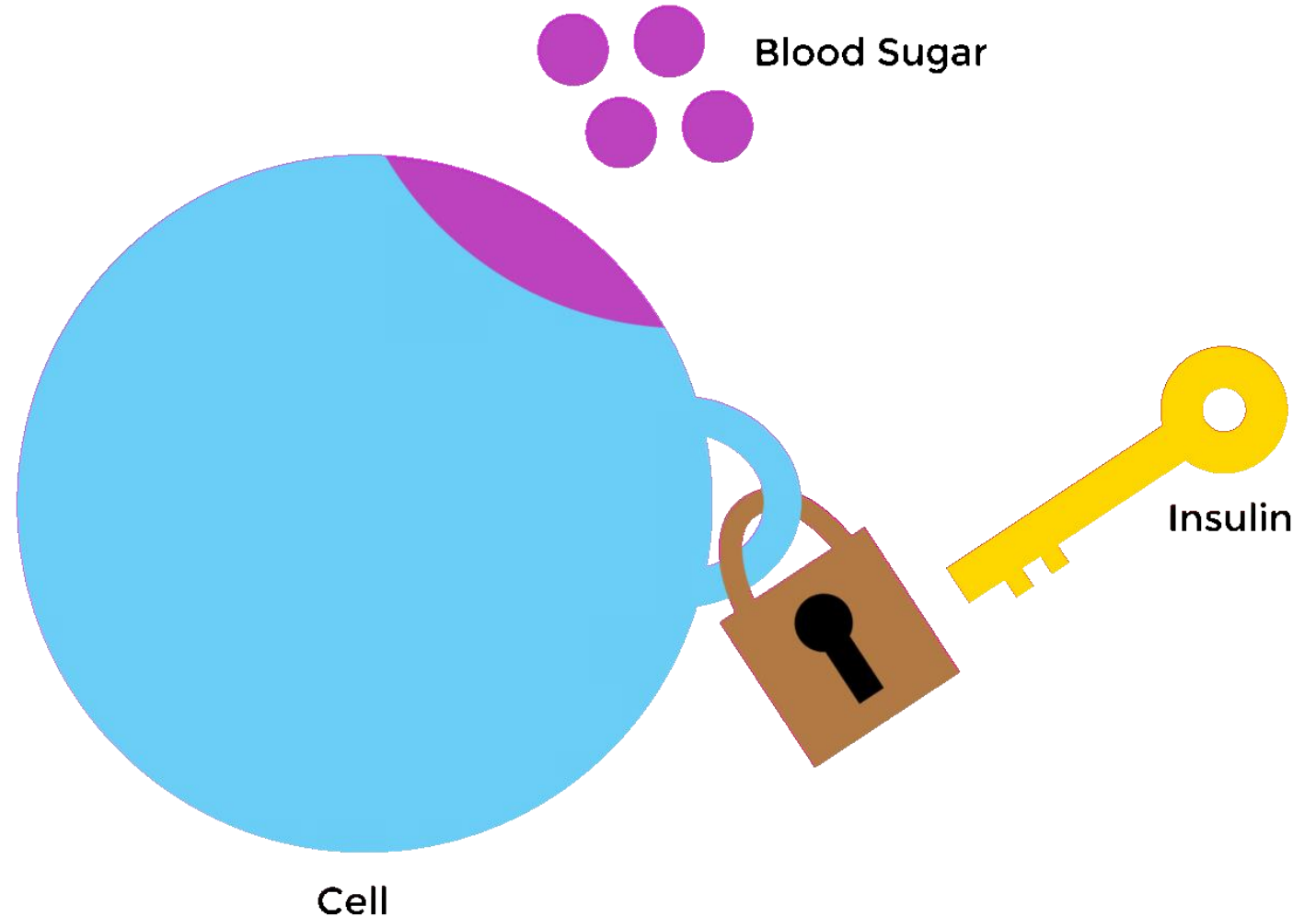
MISSION POSSIBLE:



NOT

So, what does **insulin** actually do?

Insulin



Illness can upset
diabetes...



**Type 2 or 3c
Diabetes?**



Diabetes: and Illness...

Yes, and...?

- The **physical stress** of illness (e.g., flu, chest infection or a stomach upset) or recovery from an operation can result in more glucose being deposited into the blood
- The body becomes more **resistant** to the effects of produced or administered insulin
- Both of the above can result in blood glucose levels being higher than usual (even if **not** eating) in diabetes.

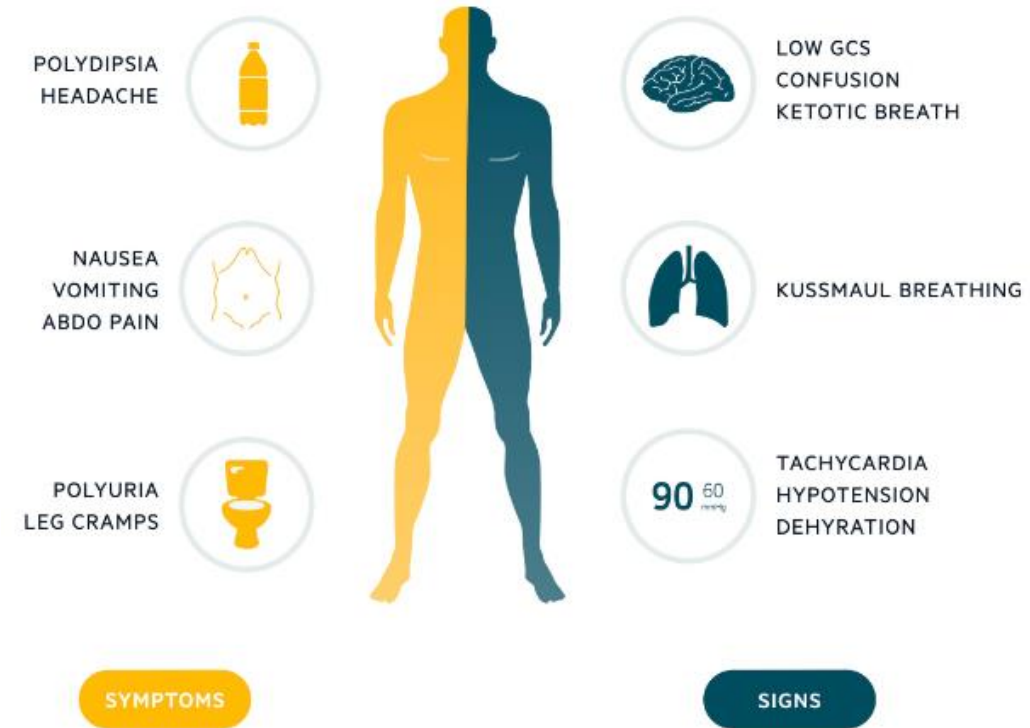


Stress of Sickness

The Stress of Sickness in diabetes

Can increase...

- **Insulin Resistance**
- Risk of **Hyperglycaemia**
(‘4T’ symptoms, dehydration risk)
- Risk of **DKA** (rarer than Type 1)



Preparing for Mission I'm not Feeling Well...

Suggested equipment



Medications:

- Over the counter painkillers, cough syrup (does not need to be 'sugar free')
- At least 2 weeks supply of regular medications
- Vaccines up to date?

Food items:

- Liquid or 'light' carbohydrate (sugar) based foods that are more easily digestible when unwell, e.g., fruit juice cartons, yoghurt, ice-cream, milk, thick soups, non-diet sugary drinks
- Glucose tablets or sweets (hypo kit)



Preparing for Mission I'm not Feeling Well...

Suggested equipment

Insulin related:

- Working pens and 'in date' insulin cartridges or vials, needles, glucose testing strips
- Insulin - working sensors (Libre, Dexcom)
- Up to date note of the average **total daily insulin doses (TDD)** (units)
- Precise guidance on insulin dose adjustment

General information:

- Contact numbers for local healthcare teams (GP, pharmacist, Diabetes team etc)
- Up to date medications list (including current insulin names and doses in case hospital admission needed)
- A care plan?





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DKA?

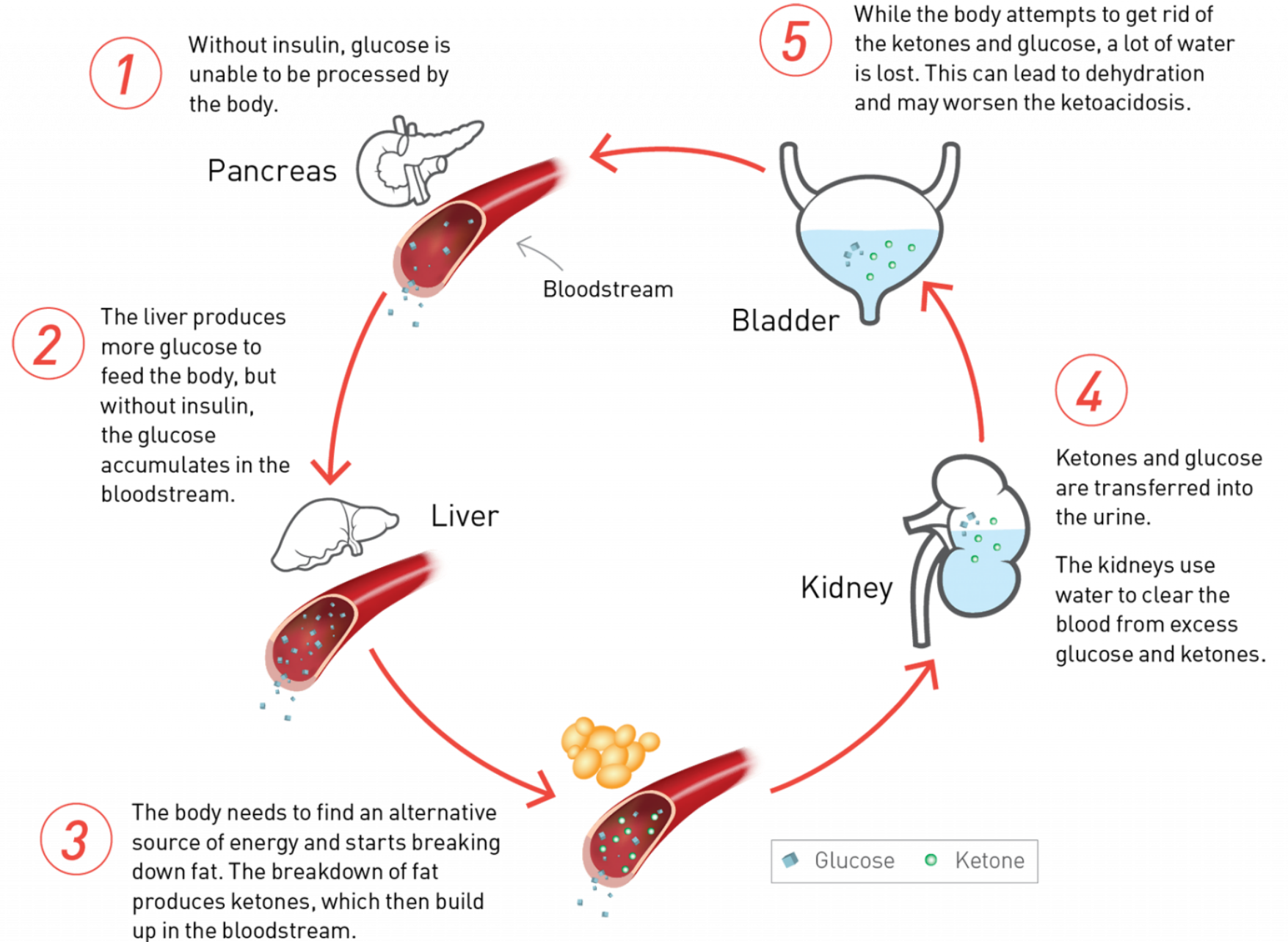
What is **Diabetic Ketoacidosis**?



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DKA The Science



DKA Risk in Type 2 Diabetes

When...?

- If on SGLT2 inhibitor tablets (**'Flozins'**)
 - If drinking excessive alcohol (more than 14 units/week)
 - If consuming less than 50 grams carbohydrates/day
 - If unwell +/- dehydrating illness
 - If recovering from an operation and not eating/drinking properly
- If on ketogenic (low/no carbohydrate diet)



DKA. What to Know...

What to Know about Diabetic Ketoacidosis (DKA)

DKA is a serious condition that can result from untreated or undiagnosed diabetes or from too little insulin. It can lead to a diabetic coma or even death.

EARLY SIGNS OF DKA

LATER, EXTREME SIGNS



Feeling very thirsty



Urinating often



High blood glucose levels



High ketone levels in urine



Feeling weak or constantly sleepy



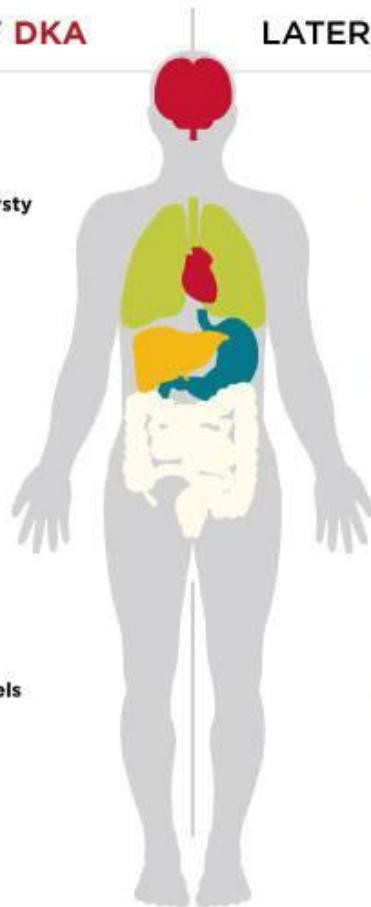
Dry/flushed skin



Nausea, vomiting, pain in the abdomen



Difficulty breathing, fruity-smelling breath



KNOW THE SIGNS, SAVE LIVES.

Learn more about diabetic ketoacidosis and appropriate emergency treatment at diabetes.org/dka.

If you think you have diabetic ketoacidosis, contact your doctor IMMEDIATELY, or go to the nearest hospital emergency room.

Mission 'I'm Not Feeling Well' should be accepted

Ill?



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Need to Rest



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Strenuous activity can increase glucose levels



- At least 100ml/hr
- Sugar free liquids
- Avoid alcohol

Hydrate



Consume liquid or light **carbohydrates** (at least 50 grams/24 hours) if unable to eat regular meals

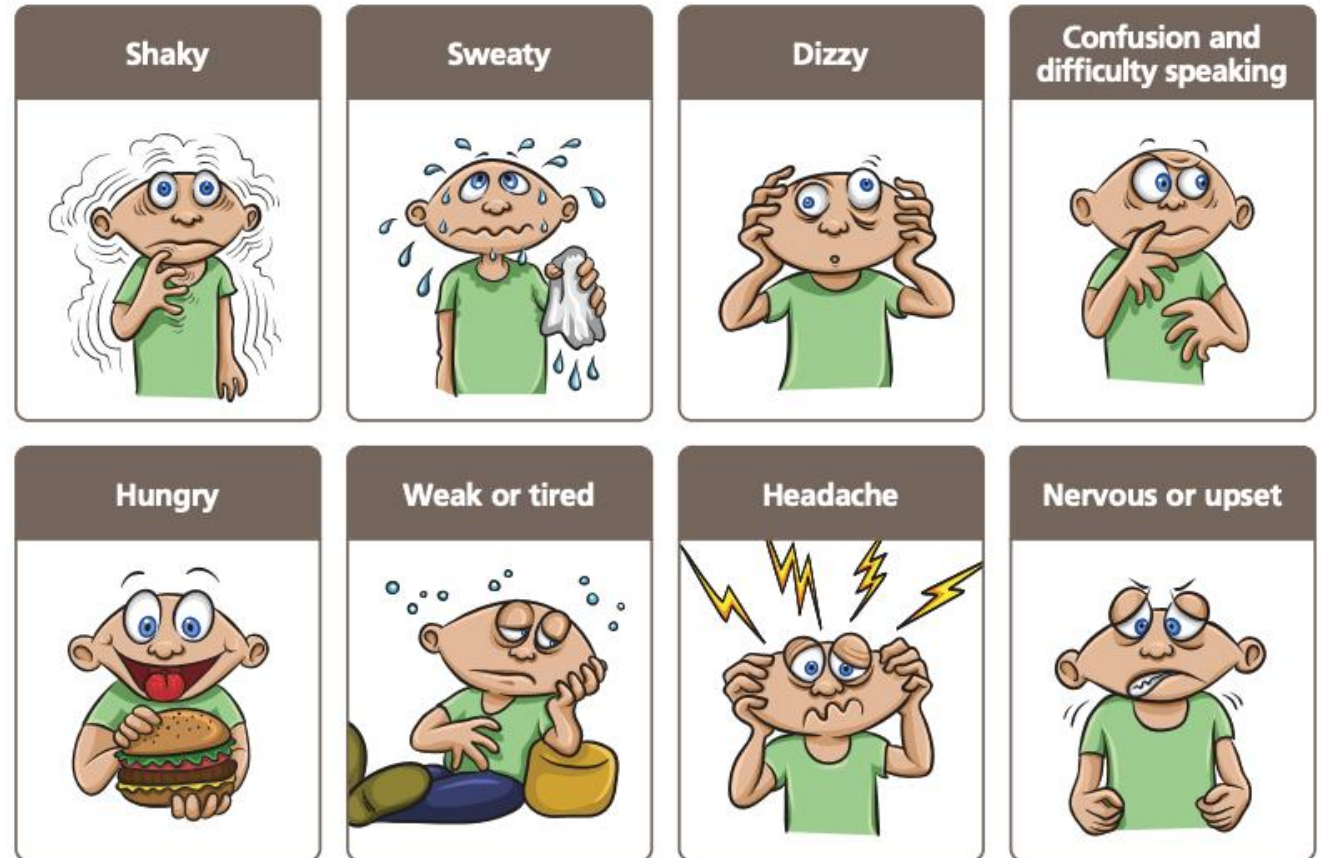
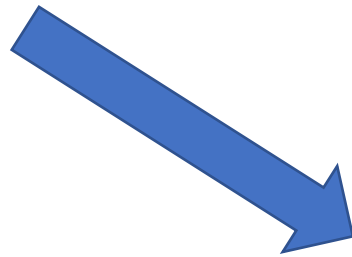


**Eat and
Drink**

Low glucose levels?

Hypos

- Recognise low glucose levels
- Common symptoms
- Reduced intake with diarrhoea and/or vomiting could also reduce glucose absorption and low glucose levels could occur
- Caution if on Sulphonylurea tablets (e.g Gliclazide, Glimiperide)



Drugs to suspend when unwell

- **SGLT-2 inhibitors** (e.g., canagliflozin, dapagliflozin, empagliflozin)
- **Metformin**
- **Water tablets** ('diuretics', e.g., frusemide, bumetanide)
- **Blood pressure tablets** (if names end in '-pril' (e.g., ramipril), -azide (e.g., bendrofluazide), -sartan (e.g., losartan))
- **Certain over the counter painkillers** ('NSAIDs' – e.g., diclofenac, ibuprofen)
- **Non-insulin injections** (daily or weekly, names end in 'tide', e.g., dulaglutide, semaglutide)

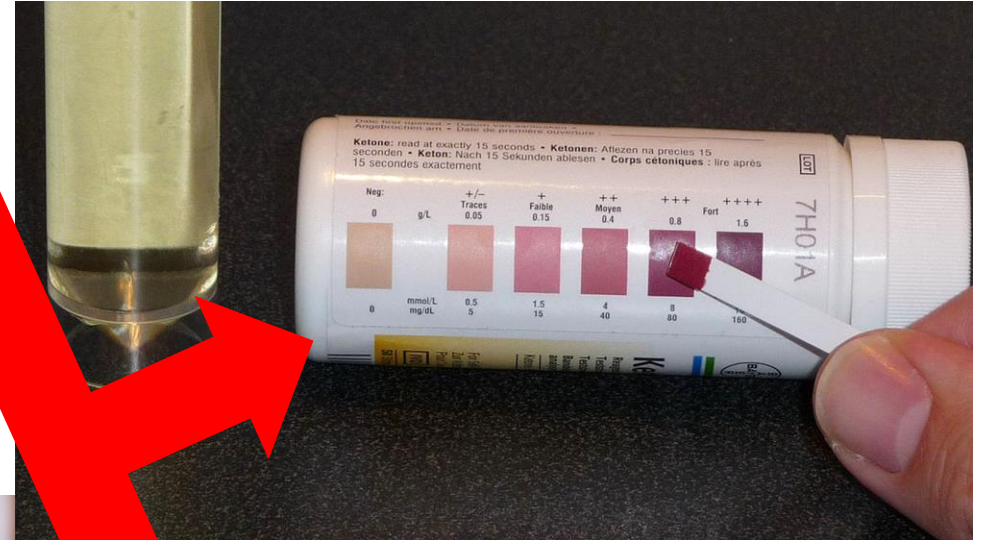
Resume 24-48 hours after recovering AND eating/drinking sufficiently

**should never be stopped when
unwell, even if not eating
normally**

Insulin...



Monitoring : Glucose +/- Ketones



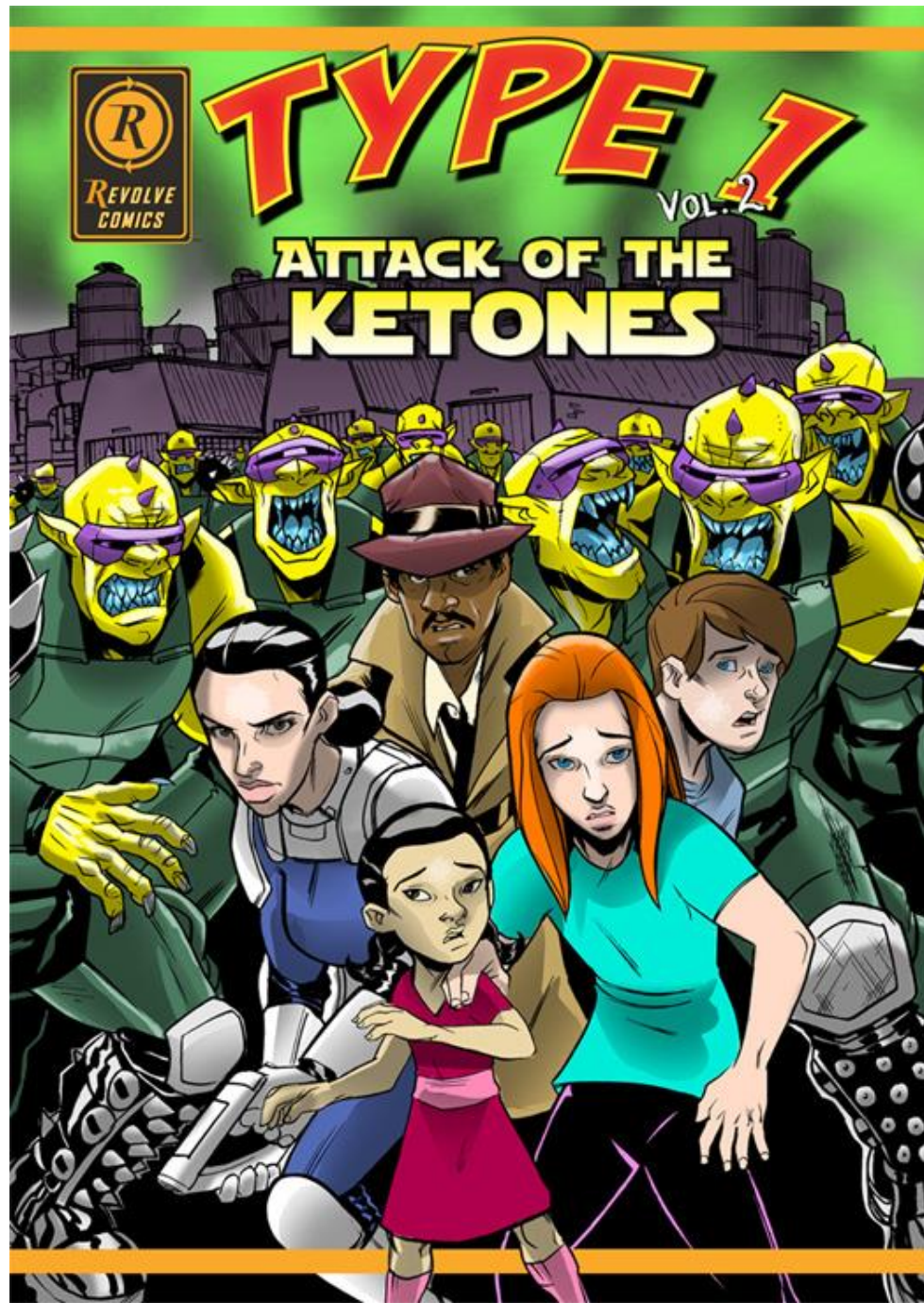


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Elevated ketones



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When to consider calling for medical backup...

Contact **usual healthcare provider** if unwell (e.g., outside of normal working hours) and are:

- Unsure of what to do
- Unable to keep food and liquids down for at least 4 hours
- Experiencing continuous diarrhoea and vomiting, with or without fever
- Experiencing persistent measured blood glucose readings above 14mmol/L AND/OR worsening symptoms of high blood glucose (table 3), despite additional insulin doses where applicable
- Known to have **type 3c diabetes (on insulin)**, with blood glucose readings above 14mmol/L (despite additional insulin dosing) AND blood ketone readings persistently above 1.5mmol/L or urine ketone readings of +2 or more, as both strongly suggest an increased risk of Diabetic Ketoacidosis developing (see table 4)
- Increasingly drowsy, short of breath, infected foot and/or stomach pains (all could suggest a diabetes emergency state (e.g., **DKA, HHS**))



In the Ketone Zone?

Ketone test Result

Blood ketones < 0.6mmol/L = NORMAL
Urine ketones UNDETECTABLE = NORMAL

Result significance and recommended action

Retest in 4 hours

In the Ketone Zone?

Ketone test Result

Blood ketones $< 0.6\text{mmol/L}$ = NORMAL
Urine ketones UNDETECTABLE = NORMAL

Blood ketones **0.6 – 1.5mmol/L**
Urine ketones TRACE



Result significance and recommended action

Retest in 4 hours

Increased risk of DKA
Increase fluid intake
Increase insulin (eg 2 units/dose)
Retest glucose and ketones in 2 hours

In the Ketone Zone?

The 10 or 20% rule of additional Insulin dosing

Ketone test Result

Result significance and recommended action

Blood ketones < 0.6mmol/L = NORMAL
Urine ketones UNDETECTABLE = NORMAL

Retest in 4 hours

Blood ketones **0.6 – 1.5mmol/L**
Urine ketones TRACE

Increased risk of DKA
Increase fluid intake
Increase insulin (eg 2 units/dose)
Retest glucose and ketones in 2 hours

Blood ketones **1.6 – 2.9mmol/L**
Urine ketones **+1 or +2**

Further increased risk of DKA
Increase fluid intake
Increase insulin (**10% of TDD** every 2 hours)
Retest glucose and ketones in 2 hours

In the Ketone Zone?

The 10 or 20% rule of additional Insulin dosing

Ketone test Result

Result significance and recommended action

Blood ketones < 0.6mmol/L = NORMAL
Urine ketones UNDETECTABLE = NORMAL

Retest in 4 hours

Blood ketones **0.6 – 1.5mmol/L**
Urine ketones TRACE

Increased risk of DKA
Increase fluid intake
Increase insulin (eg 2 units/dose)
Retest glucose and ketones in 2 hours

Blood ketones **1.6 – 2.9mmol/L**
Urine ketones **+1 or +2**

Further increased risk of DKA
Increase fluid intake
Increase insulin (**10% of TDD** every 2 hours)
Retest glucose and ketones in 2 hours

Blood ketones **3mmol/L or HIGHER**
Urine ketones **+3 or more**

Significant increased risk of DKA
Increase fluid intake
Increase insulin (**20% of TDD** every 2 hours)
Retest glucose and ketones in 2 hours
Emergency medical review advised

**There's no 'I' in team?
You, family, carer, GP,
nurse, diabetes team...**



Don't be left hanging...





TOM
CRUISE



Don't go 'Rogue', to help reduce risk of 'Fallout'...

Trying to prevent:

Mission: 'I Don't Feel Well' turning into Mission: 'I Need Hospital'...

Diabetic "sick days" rules



1. Prevent dehydration
2. Continue feeding
3. Treat nausea
4. Rest & avoid exertion
5. Frequent BS monitoring
6. Check ketones
7. Give schedule insulin
8. Extra insulin as needed
9. Know when to call doctor



Thanks for listening and accepting the mission if needed

Stay well

Stay safe

Stay prepared

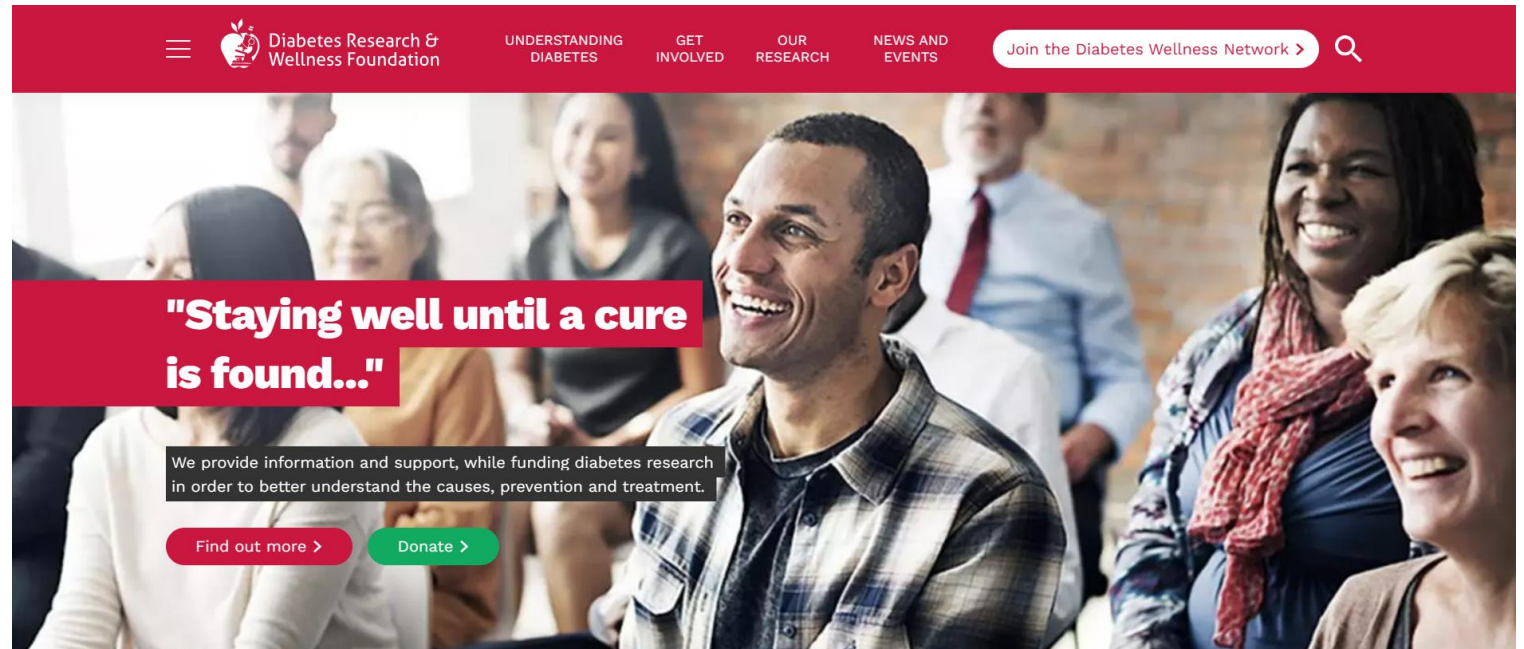
Stay alert...



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Learn about diabetes on our
website

www.drwf.org.uk



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