



Bristol Royal Hospital  
For Children



University Hospitals  
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NHS Foundation Trust

# Management of the Ketogenic Diet during Illness

South West Ketogenic Regional Study Day 7<sup>th</sup> May  
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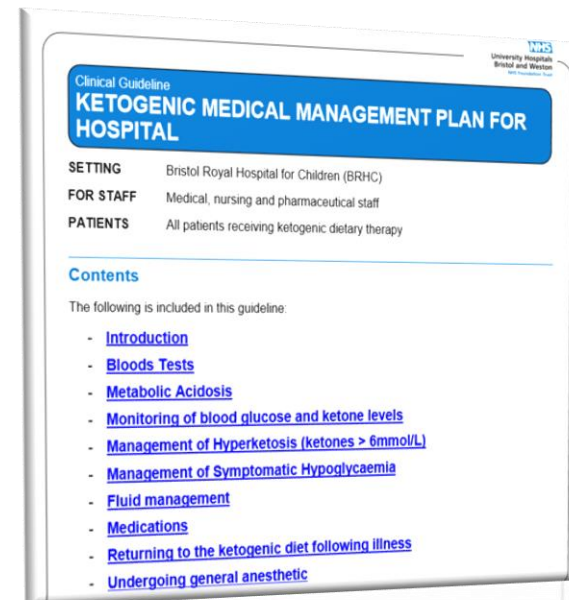
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# Ketone monitoring

- At initiation of the KD, ketones are checked twice per day (pre-breakfast and bedtime)
- A child that is well-established on the KD may only test levels 1-2 times/week
- During periods of illness or nil by mouth (NBM), blood ketones and BGL should be checked **4 hourly**
- In illness, it is not uncommon for ketone levels to fluctuate
- Aiming for a therapeutic range between 2.5-6mmol/L

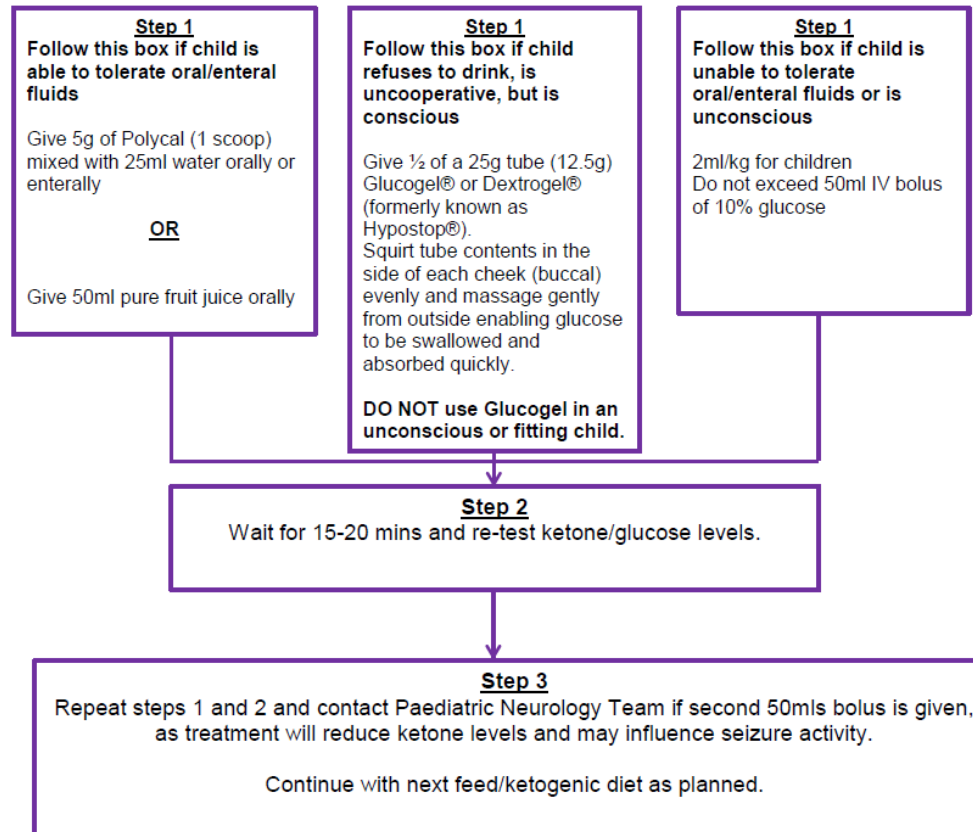


# Hyperketosis

- When ketone levels are  $\geq 6\text{mmol/L}$ , the child can become symptomatic. This most often occurs immediately after starting the diet or during illness
- Symptoms of hyperketosis can include increased heart rate, facial flushing, irritability, rapid breathing/panting, vomiting and excessive fatigue/lethargy
- Hyperketosis needs to be managed by the administration of carbohydrate
- Lower than usual ketone levels are not dangerous

# Management of symptomatic hyperketosis

## Flow Chart Management of symptomatic hyperketosis and or ketones >6 mmol/l

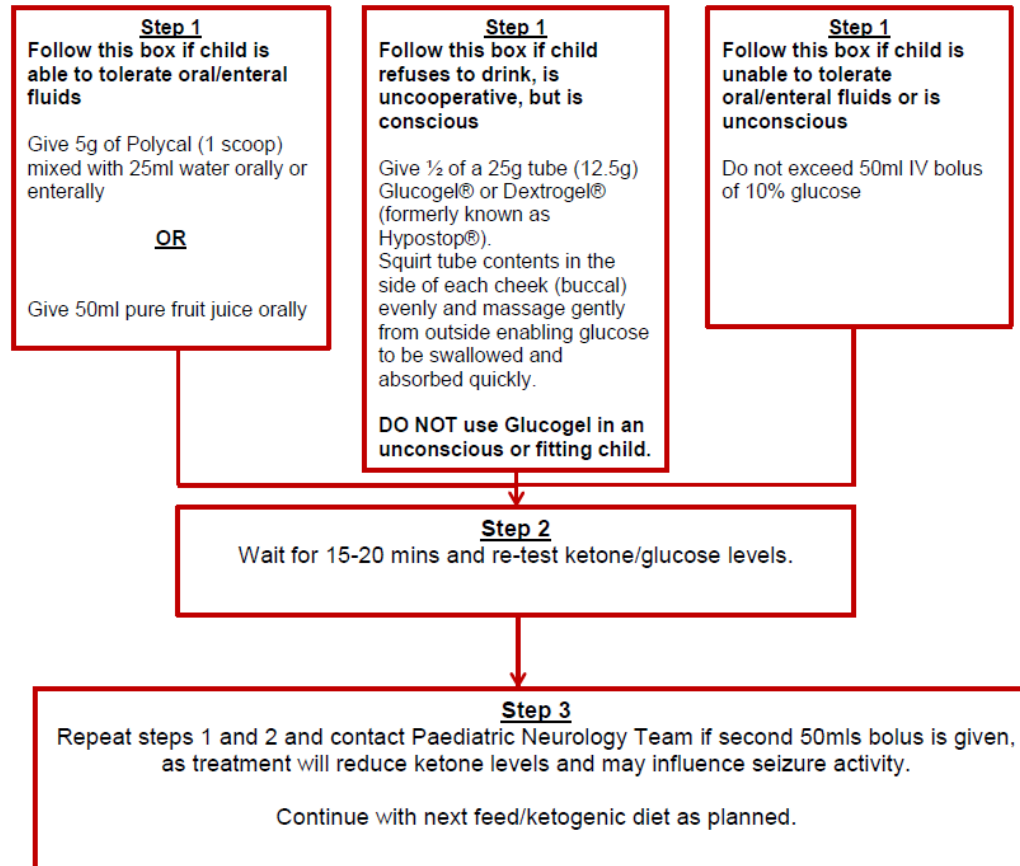


# Hypoglycaemia

- It is not uncommon for children on the KD to experience low blood glucose levels  $\leq 3.0\text{mmol/L}$ , especially if they are less than 12 months old, newly establishing the diet or when acutely unwell
- Symptoms of hypoglycaemia can include sweating, being cold and clammy to touch, confusion and fatigue
- Hypoglycaemia also needs to be managed by the administration of a carbohydrate load

# Management of symptomatic hyperglycaemia

## Flow Chart Management of symptomatic low blood sugar (< 3 mmol/l)



# Fluid management (oral/enteral)

- Acceptable ketogenic fluids include water, carbohydrate-free squash or Ketogenic feed (as recommended by the Ketogenic Dietitian)
- Avoid drinks and feeds containing carbohydrate (eg. fruit juice, milk, soft drinks, standard ONS / feeds)
- Oral rehydration solutions may be used (eg. Dioralyte). 1 sachet contains 3.56g carbohydrate as glucose
- Rehydration is more important than temporary loss of ketosis, but try to balance both





# Re-starting the KD after illness (oral diet)

- Standard hospital menu options unsuitable for KD
- Gradual re-introduction of oral intake will usually include a personal plan, with support from the KD dietitian
- Increase food provided as tolerated until target
- Most children will have a ketogenic meal replacement milkshake recipe calculated by their ketogenic dietitian which may be used as an alternative to solid food when a child is unwell

# Re-starting the KD after illness (enteral nutrition)

- Re-introduce enteral feeds in a stepwise, graded approach
- The feeding regimen should be started at 50% target, increasing to 75% the next day and 100% thereafter (according to tolerance)
- Care should be given to stop any glucose-containing IV fluids as soon as it is safe to do so
- Close monitoring of ketones and BGLs during re-introduction phase

# Summary

- Ketones and BGLs may fluctuate during illness
- Testing of ketones/BGLs **4hrly** when ill
- Treatment of hyperketosis/hypoglycaemia with administration of CHO load
- Check fluids are CHO free
- Resume ketogenic diet as soon as possible post-illness
- Each patient carries a personal illness management plan