

## 3 Hydroxy Butyrate

### Relevant disorders

Disorders of fatty acid metabolism  
Hyperinsulinism  
Ketogenic diet monitoring

### Related Metabolic Tests

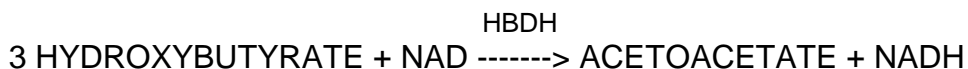
Free fatty acids  
Acylcarnitines  
Glucose  
Lactate

### Indication for Test

Intermediary metabolites (IMs), include lactate, pyruvate, acetoacetate as well as 3-hydroxybutyrate and free fatty acids (or non-esterified, NEFA). All are normally present in blood and have a vital role in energy metabolism. These compounds are linked through a number of different pathways, which interact depending on nutritional status.

During normal nutritional status (i.e. a normal glucose concentration) ketones (3OHB) and free fatty acids (FFA) would not be mobilised as energy will be provided by the breakdown of glucose. During episodes of hypoglycaemia or prolonged fasting, the normal physiological response should be to mobilise these metabolites. Therefore increased levels would be seen, with 3OHB levels greater than FFA. Abnormal patterns in these metabolites can indicate errors in fatty acid oxidation or disease states such as hyperinsulinism.

### Methodology



The increase in absorbance at 340 nm is directly proportional to the  $\beta$  hydroxybutyrate concentration. The presence of oxalic acid in the buffer eliminates interference due to lactate.

## Sample requirements

2 ml Fluoride Heparin blood. Venous or capillary.

Lithium heparin and serum are also suitable for 3-hydroxybutyrates only (free fatty acids require a fluoride heparin sample) assuming samples are separated and frozen immediately. Perchloric acid supernatant may be used for 3-hydroxybutyrates.

EDTA plasma is unsuitable for 3-hydroxybutyrate.

## Transport information

Send by first class post.

## Turn Around Time

1 – 5 days

## Reference Ranges

Interpretation will be provided with the report.

## References

Pitfalls in the measurement of some intermediary metabolites. FM carragher, JR Bonham and JM Smith Ann Clin Biochem 2003; **40**:313-320

McMurray CH et al. Clin Chem 3013 (1984) 421-5

The investigation of hypoglycaemia during childhood. J R Bonham Ann Clin Biochem 1993;30:238-247