

Blood glucose levels (BSL) are maintained within a tight range of 4-7 mmol/L in adults

Hypoglycaemia represents BSL below normal range, and this point varies according to textbook

BSL is normally maintained by a feedback control system controlled by endocrine pancreas secretions. This involves the opposing effects of the large polypeptides

- glucagon (alpha cells) catabolic actions
- insulin (beta cells) anabolic actions

During hypoglycaemia other substrates can be used to continue oxidative phosphorylation

- Glycogen - is broken down to glucose and enters the glycolysis pathway
- Gluconeogenesis - involves the conversion of protein or fat to glycogen
- Other - oxidation of fats converts them to Acetyl CoA which enters the Krebs cycle

Physiological responses

BSL	Symptoms	Endocrine response
4.6		Inhibition of insulin secretion
3.8		Glucagon, Adrenaline, GH secretion
	Autonomic symptoms	Cortisol secretion
2.8	Cognitive dysfunction	
2.2	Lethargy	
	Coma	
1.7	Convulsions	
0.6	Permanent brain damage Death	

Glucagon (fast response)
acts in the liver to cause
glycogenolysis
gluconeogenesis

Adrenaline (fast response)
causes gluconeogenesis in the liver
has direct lipolytic effect increasing fatty acids in plasma by acting on hormone sensitive lipases on fats

Growth hormone and Cortisol (slow response)
inhibit cellular utilisation of glucose
promote fat utilisation