

# Cerebral metabolic effects of strict normoglycaemia versus current clinical glycaemic control following severe traumatic brain injury

<b>Submission date</b> 28/09/2007	<b>Recruitment status</b> No longer recruiting	<input type="checkbox"/> Prospectively registered
<b>Registration date</b> 28/09/2007	<b>Overall study status</b> Completed	<input type="checkbox"/> Protocol
<b>Last Edited</b> 29/01/2018	<b>Condition category</b> Injury, Occupational Diseases, Poisoning	<input type="checkbox"/> Statistical analysis plan
		<input checked="" type="checkbox"/> Results
		<input type="checkbox"/> Individual participant data

**Plain English summary of protocol**  
Not provided at time of registration

## Contact information

**Type(s)**  
Scientific

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## Additional identifiers

**Protocol serial number**  
N0544183600

## Study information

**Scientific Title**

Cerebral metabolic effects of strict normoglycaemia versus current clinical glycaemic control following severe traumatic brain injury

### **Study objectives**

This study aims to establish whether strict control of blood glucose, which has many benefits for critically ill, can be safely applied to patients with brain trauma without causing negative influence on brain glucose levels and energy state. This will be done by comparing the effects of strict glucose control and current 'loose' control on brain chemistry and energy production.

### **Ethics approval required**

Old ethics approval format

### **Ethics approval(s)**

Cambridgeshire 2 Research Ethics Committee, 25/08/2006, ref: 06/Q0108/215

### **Study design**

Randomised controlled trial

### **Primary study design**

Interventional

### **Study type(s)**

Treatment

### **Health condition(s) or problem(s) studied**

Injury, Occupational Diseases, Poisoning: Traumatic brain injury

### **Interventions**

High blood sugar (glucose) levels are common during critical illness and are strongly linked to poor outcome. Large scale study has now demonstrated that strict control of blood glucose with insulin can reduce the risk of death and complications and improve recovery in surgical intensive care patients. However, after head injury glucose is the most important nutrient required by the brain. The energy demands of the injured brain are higher than those in the normal brain and strictly normal blood glucose levels acceptable for general intensive care patients may be too low for a patient with severe head injury. If injured brain does not receive enough glucose its energy production could deteriorate which may put brain at risk of further injury or delayed recovery. This study aims to establish whether strict control of blood glucose, which has many benefits for the critically ill, can be safely applied to patients with brain trauma without causing negative influences on brain. This will be done by comparing the effects of strict glucose control and current loose control on brain chemistry and energy production, assessed using monitoring devices, all of which are in the routine clinical use.

The study will be performed prospectively and will involve 30 patients.

Patients will be randomly (by chance) divided into two groups.

In the first group of patients strict maintenance of normal blood sugar will continue for the first 24 hours and then the current protocol ('loose control') will be used for the following 24 hours. In the second group of patients the order of the treatment protocols will be reverse (ie initial 24 hours of current 'loose' control will be followed by 24 hours of strict normoglycaemia). The whole duration of the study for the individual patient will be 48 hours. Monitoring parameters, that represent brain metabolism and which are routinely captured at the bedside will be used to compare the effects of two blood sugar control protocols. Appropriate statistical methods will

be applied to detect significant differences.

If there is no difference in brain monitoring parameters between strict normoglycaemia and current protocols the former will be considered to be safe to use in patients with head injury and will replace our current protocol for glucose control. However, if the study demonstrates that strict normoglycaemia has an adverse effect on brain metabolism it will be avoided in future in patients with head injury and current ('loose control') protocol will continue to be used.

**Intervention Type**

Other

**Phase**

Not Specified

**Primary outcome(s)**

1. Differences in cerebral monitoring parameters between current 'loose' and intensive glycaemic control periods. Parameters used for comparison will include, cerebral extracellular glucose, lactate, pyruvate, lactate to pyruvate ratio (LP), glutamate and glycerol; brain tissue oxygen (PbO<sub>2</sub>) and intracranial pressure
2. Glucose levels in each protocol group and the frequency of episodes of hypoglycaemia and hyperglycaemia

**Key secondary outcome(s)**

Not provided at time of registration

**Completion date**

01/08/2011

**Eligibility****Key inclusion criteria**

1. Traumatic brain injury requiring intensive care management with intracranial pressure monitoring
2. Age = 16 years old
3. Absence of exclusion criteria

**Participant type(s)**

Patient

**Healthy volunteers allowed**

No

**Age group**

Child

**Upper age limit**

16 years

**Sex**

Not Specified

## **Key exclusion criteria**

1. Insulin Dependent Diabetes Mellitus
2. Life threatening injury (not expected to survive > 48 hrs)
3. Pregnancy

## **Date of first enrolment**

01/08/2006

## **Date of final enrolment**

01/08/2011

## **Locations**

### **Countries of recruitment**

United Kingdom

England

### **Study participating centre**

**Addenbrooke's Hospital**

Cambridge

United Kingdom

CB2 2QQ

## **Sponsor information**

### **Organisation**

Record Provided by the NHSTCT Register - 2007 Update - Department of Health

## **Funder(s)**

### **Funder type**

Government

### **Funder Name**

Cambridge Consortium - Addenbrooke's (UK), Own Account NHS R&D Support Funding

## **Results and Publications**

Individual participant data (IPD) sharing plan

## IPD sharing plan summary

Not provided at time of registration

### Study outputs

Output type	Details	Date created	Date added	Peer reviewed?	Patient-facing?
<a href="#">Results article</a>	results	25/01/2018		Yes	No
<a href="#">Participant information sheet</a>	Participant information sheet	11/11/2025	11/11/2025	No	Yes