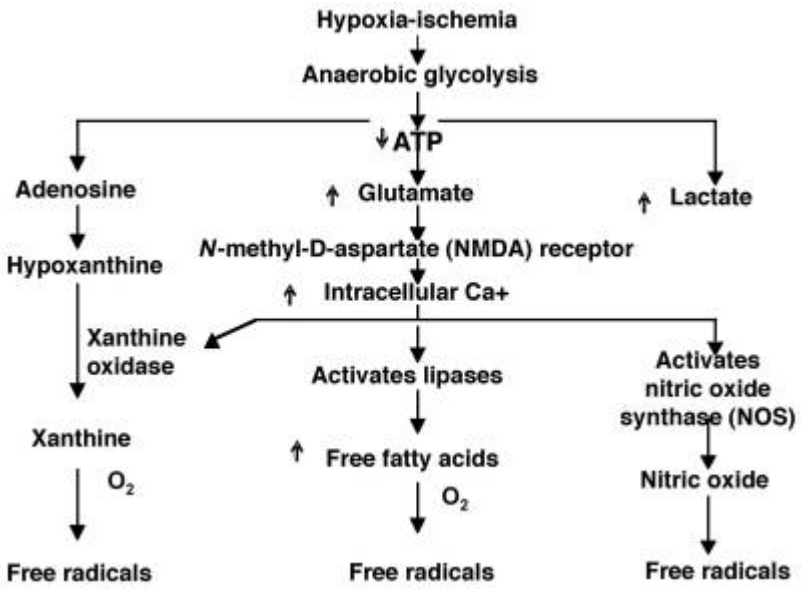
# Hypoxic ischaemic brain injury




Hypoxic ischaemic brain injury is common and usually due to cardiac arrest or profound hypotension. The clinical pattern and outcome depend on the severity of the initial insult, the effectiveness of immediate resuscitation and transfer, and the post-resuscitation management on the intensive care unit. Clinical assessment is difficult and so often these days compromised by sedation, neuromuscular-blocking drug, ventilation, hypothermia and inotropic management. Investigations can add valuable information, in particular brain MRI shows characteristic patterns depending on the severity of the injury and the timing of imaging. EEG patterns may also suggest the possibility of a good outcome. There is no entirely reliable algorithm of clinical signs or investigations which allow a definitive prognosis but the combination of careful repeated observations and appropriate ancillary investigations allows the neurologist to give an informed and accurate opinion of the likely outcome, and to advise on management. Overall, the prognosis is extremely poor and only a quarter of patients survive to hospital discharge, and often even then with severe neurological or cognitive deficits [1].

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In eleven patients (median age of 47 [range 20-71], 8 male and 3 female). There was a linear relationship between ICP and non-invasive estimators of ICP (nICP) with optic nerve sheath diameter ultrasonography (ONSD) ($R = 0.53$ [$p < 0.0001$]), JVP ($R = 0.38$ [$p < 0.001$]) and transcranial Doppler ultrasonography (TCD) ($R = 0.30$ [$p < 0.01$]). The ability to predict intracranial hypertension was highest for ONSD and TCD (AUC = 0.96 [95% CI: 0.90-1.00] and AUC = 0.91 [95% CI: 0.83-1.00], respectively). Jugular venous bulb pressure (JVP). presented the weakest prediction ability (AUC = 0.75 [95% CI: 0.56-0.94]).

ONSD and TCD methods demonstrated agreement with invasively-monitored ICP, suggesting their potential roles in the detection of intracranial hypertension in hypoxic ischaemic brain injury (HIBI) after cardiac arrest [2].

## References

1)

Howard RS, Holmes PA, Koutroumanidis MA. Hypoxic-ischaemic brain injury. Pract Neurol. 2011 Feb;11(1):4-18. doi: 10.1136/jnnp.2010.235218. Review. PubMed PMID: 21239649.
2)

Cardim D, Griesdale DE, Ainslie PN, Robba C, Calviello L, Czosnyka M, Smielewski P, Sekhon MS. A comparison of non-invasive versus invasive measures of intracranial pressure in hypoxic ischaemic brain injury after cardiac arrest. Resuscitation. 2019 Jan 7. pii: S0300-9572(18)30912-2. doi: 10.1016/j.resuscitation.2019.01.002. [Epub ahead of print] PubMed PMID: 30629992.