

SECOND INSULTS – PREHOSPITAL/ADMISSION Systemic and Intracranial

SISAdm-Hypox = Second Insults Systemic Prehospital/Admission: Hypoxia

SISAdm-Hypotens = Second Insults Systemic Prehospital/Admission: Hypotension

SISAdm-Hypotherm = Second Insults Systemic Prehospital/Admission: Hypothermia

SISAdmCA = Second Insults Systemic Prehospital/Admission: Cardiac Arrest

SIIAdm-Seiz = Second Insults Intracranial Prehospital/Admission: Seizures

SIIAdm-NW = Second Insults Intracranial Prehospital/Admission: Neuroworsening

1. CDE Variable	<p><i>SISAdm-Hypox</i> = Second Insults Systemic Prehospital/ Admission: Hypoxia: any hypoxic episode occurring prior to admission to study hospital, e.g. prehospital or in the emergency room</p> <p><i>SISAdm-Hypotens</i> = Second Insults Systemic Prehospital/ Admission: Hypotension: any hypotensive episode occurring prior to admission to study hospital, e.g. prehospital or in the emergency room</p> <p><i>SISAdm-Hypotherm</i> = Second Insults Systemic Prehospital/ Admission: Hypothermia: any documented hypothermia occurring prior to admission to study hospital, e.g. prehospital or in the emergency room</p> <p><i>SISAdmCA</i> = Second Insults Systemic Prehospital/Admission: Cardiac Arrest: any episode of cardiac arrest requiring cardiopulmonary resuscitation prior to admission to study hospital</p> <p><i>SIIAdm-Seiz</i> = Second Insults Intracranial Prehospital/ Admission: Seizures: any witnessed or documented seizure prior to admission to study hospital</p> <p><i>SIIAdm-NW</i> = Second Insults Intracranial Prehospital/ Admission: Neuroworsening: any deterioration in neurological status (level of consciousness, pupillary deficit, the occurrence of focal deficits) developing between the time of injury and admission to study hospital</p>
2. CDE Definition	
3. Recommended instrument for assessment	N/A.
4. Description of measure	Categorical/binary; unique entry.
5. Permissible values	<p><u>Hypoxic episode, hypotensive episode, hypothermia:</u> No/suspect/definite/unknown</p> <p><u>Cardiac arrest:</u> no/yes/unknown</p> <p><u>Seizures:</u> no/yes (basic)</p>

	<p>No/partial or focal/generalized/unknown (intermediate/advanced)</p> <p><u>Clinical deterioration</u>: no/yes/unkown</p> <p>A definite hypoxic episode is defined as: PaO₂ < 8 kPa (60mmHg) and/or SaO₂ < 90%. A definite hypotensive episode is defined as: Systolic blood pressure < 90mmHg Definite hypothermia is defined as: Core temperature < 35°C</p>
6. Classification:	
Basic/Intermediate/Advanced	
7. Procedure	
8. Comments/Special instructions:	<p>The category 'definite' should only be marked if the occurrence of an episode of systemic second insults has been documented by an objective measurement (e.g. arterial blood gas analysis, oxygen saturation, blood pressure or temperature). In the prehospital setting however, it may not always be possible to document the occurrence of episodes of systemic second insults, but these may be suspected from clinical signs; if a strong clinical suspicion exists for second insults, the bubble 'suspect' should be marked.</p>
9. Rationale/justification:	<p>Second insults may be systemic (extracranial or intracranial). Second insults aggravate processes of secondary damage in a brain already rendered vulnerable by the primary injury. The occurrence of second insults occurring before hospital admission in patients with more severe injuries, is frequent: oxygen saturation below 90% is found in 44 to 55% of cases and hypotension in 20 to 30%. The occurrence of second insults is strongly associated with poorer outcome.</p> <p>Seizure activity in the brain may cause focal or generalized vasodilation with increased cerebral blood volume and high intracranial pressure. Moreover, metabolic requirements are increased in a situation where brain metabolism is already compromised. Seizures are therefore an important second insult following TBI.</p> <p>Clinical deterioration is indicative of progressive damage, and frequently caused by raised intracranial pressure. Although it may be debatable whether clinical deterioration in itself constitutes a second insult, it signifies the development of a mass lesion, progressive damage and raised intracranial pressure and thus may be a cause of further secondary damage. In the in-hospital situation the variable 'neuroworsening' is defined according to strict criteria. Not all of these criteria are applicable to the prehospital situation and we therefore chose to include the variable 'clinical deterioration', permitting a broader definition.</p>
10. References:	<p><i>McHugh GS, Engel DC, Butcher I, et al.</i> Prognostic value of secondary insults in traumatic brain injury: results from the IMPACT study. <i>J Neurotrauma</i>. Feb 2007;24(2):287-93.</p> <p><i>Silverstone P.</i> Pulse oxymetry of at the road side: a study of pulse oxymetry in immediate care. <i>BMJ</i>. Mar 1989;298(6675):711-13.</p> <p><i>Stocchetti N, Furlan A, Volta F.</i> Hypoxemia and arterial hypotension at the accident side in head injury. <i>J Trauma</i>. 1996;40:764-67.</p> <p><i>De Witt DS, Jenkins LW, Prough DS.</i> Enhanced vulnerability to secondary ischaemic insults after experimental traumatic brain injury. <i>New Horizon</i>. Aug 1995;3(3):376-383.</p>
Recommended time for assessment:	
On admission to study hospital.	