

Title: Detecting Awareness in Children using an Auditory Intervention

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Introduction: Awareness in children has been studied by a number of different groups, reporting incidences from 0% to 5% (1-4). The reason for the high incidence is uncertain. It has been suggested to be due to the use of induction rooms. A crucial factor in studying awareness is the certainty that the memory represents true awareness. The detection of true awareness remains imprecise and has relied on allocating an arbitrary probability that a recalled memory actually matches an intra-operative event. The measure is even more imprecise in children, as children can be more suggestible than adults increasing false positive reports. Conversely children may under report awareness as they have difficulty retaining and recalling memory without the interviewer carefully constructing context. Brice was one of the first to research awareness and many studies still use modifications of his original interview (5). Brice also trialed the use of specific auditory stimuli – a fact seldom reported in the awareness literature. The aim of presenting salient and unique auditory stimuli is to provide a way of confirming that any awareness report must be an accurate recall of an intra operative event. Auditory stimuli are not only able to confirm that a report is true; they can also provide evidence for the timing of the awareness. This study aimed to determine the incidence and timing of awareness in children using a series of continuous auditory stimuli.

Methods: An initial pilot study identified 4 sounds that were easily recognizable to children (dog, cat, horse and cow). 24 CDs were then made each having three tracks. One of the four animals was assigned to each track giving 24 combinations. After ethics approval for the study and informed consent from the participants' parents, 460 children between the ages of 5 and 12 scheduled for surgery at the Royal Children's Hospital were recruited into the study. Children were excluded if they were deaf, developmentally delayed or if access to their head was not possible during surgery. Children were randomly allocated one of the 24 CDs. Prior to anaesthesia the children were played a test sound which they were asked to identify (not an animal sound). This was to gain rapport and to test hearing and understanding. Track 1 was played on repeat from induction to disconnection for transfer. Track 2 was played until 5 minutes after reconnection of the anaesthesia circuit in the operating room, and Track 3 from then until anaesthesia was discontinued for awakening. Children were interviewed after they woke up as well as 3 days post-operatively. The interview was constructed to aid the child in creating temporal context without the use of leading questions. Children were asked if they remembered anything that happened during the operation and if they heard anything during the operation. At no stage were children told that noises were to be played during anaesthesia.

Results: 5% of children interviewed claimed to have remembered an intra-operative event, however no child reported any of the 3 animal sounds that were played to them during anaesthesia and therefore no confirmed cases awareness were detected in this study.

Discussion: This result may indicate that previous studies have overestimated awareness due to inaccurate recall. However our low incidence may also be due to anaesthetists at our institution being vigilant for awareness (as they were not blinded) or it may be that the auditory stimulus was not sufficiently sentinel.

References:

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