475438 - THE 'INTEGRATED MONITOR IN ANESTHESIA (IMA)' TM : A NOVEL CONCEPT OF DISPLAYING THE THREE COMPONENTS OF ANESTHESIA - EVALUATION OF 4 DIFFERENT INTERFACES

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Introduction: The 'Integrated Monitor in Anesthesia (IMA)' TM was designed as stand-alone monitor to display the 3 components of general anesthesia: hypnosis, analgesia and neuromuscular blockade. Monitoring parameters for hypnosis and neuromuscular blockade are standard in daily practice and for research purposes (bispectral index and phonomyography were used in this study); recently, we presented a novel score called 'Analgoscore' (patent pending) to assess intraoperative pain on a scale of -9 to 9 (1). The focus of this study was to assess 4 different monitor interfaces in terms of workload, effort and performance to use them, and further to evaluate the reaction time of anesthesiologists to recognize 20 different clinical scenarios whilst using the different interfaces.

Methods: Staff anesthesiologists and residents were presented 4 interfaces and were asked to detect anesthesia level abnormalities. Four interfaces were presented: 1) a mainly numerical one, 2) A mixed numerical / graphical, 3) A mostly graphical and 4) A composite graphical one. Five scenarios (3 scenarios with one abnormality, 2 scenarios with multiple clinical abnormalities) in each interface were presented in a random order. Observations were video recorded for further analysis. The reaction time, appropriate detection of abnormalities and the visual circuits were recorded. The anesthetist scored the interfaces using the NASA task load index (NASA TLX). Total NASA-TLX ranged from 0 (most easy to use) to 1500 (worst interface). Data were analyzed using SAS.

Results: 10 anesthetists with a median of 10 (range 1 to 30) years of experience were investigated. There was no relationship between the years of practice and reaction time and there was no inter individual variability. Correct response rate was 80% in scenario involving a single abnormality and 59% when multiple abnormalities were present ($P < 0.0029$). Abnormality detection time was longer for complex scenarios (10.8 seconds 95% CI(9.4 - 12.1) versus simple scenarios (8.6 seconds (7.6 - 9.6), $P = 0.009$). The mixed numerical-graphical interface was associated with significantly lower demand than the other designs (Figure).

Discussion: A mixed graphical - numerical interface reduces abnormalities detection delay and is the less demanding. The incomplete or failed response rate requires further education and improvement of the interface's ergonomic aspects.

References: 1 Can J Anesth 2006 53: 26410