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12

Monitoring methods: SNAP

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The SNAP electroencephalogram (EEG) monitor, described as an interesting, innovative EEG tool that samples raw EEG signals and uses its own unique algorithm, analyses both high- (80–420 Hz) and low- (0–20 Hz) frequency components of the signal. This is termed the SNAP index, and it ranges from 100 (arbitrarily representing the fully awake state) to 0 to provide functional data points for patient management. The SNAP is the first commercial EEG-monitoring tool to use Personal Digital Assistant computer technology. The first version of SNAP index was introduced in 2002, and so far there has been little experience with the SNAP device reported in the literature. Compared with other EEG devices, there is no evidence that SNAP is superior to others in generating more specific information about 'depth of sedation'. Moreover, the influence of high-frequency electromyographic activity on the SNAP needs to be clarified.

Key words: SNAP index; EEG monitoring.

INTRODUCTION

The SNAP monitor is based on a Personal Digital Assistant (PDA) associated with a small module that 'snaps' into the PDA. The first version of the SNAP device was introduced in the USA and Europe in 2002 by manufacturer Nicolet Biomedical Monitors (Madison, WI, USA), but minimal demand resulted in the end of its production. Everest Biomedical Instruments Company (Chesterfield, Missouri, USA) recently acquired the SNAP and reapplied the monitor as the SNAP II device. Everest is now in process of finalising its manufacturing and regulatory approvals, so the only information available on SNAP is that from Nicolet Biomedical Monitors.

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THE SNAP CONCEPT

According to the manufacturer, the algorithm underlying the SNAP derived from experiences in volunteer students who were sleep-deprived for several days. The bandwidth of electroencephalogram (EEG) registration was opened up beyond the typical range of 40–1000 Hz. An area of activity in the higher-frequency range of between 80 and 450 Hz corresponded to drowsiness. After some years of work, the algorithm to monitor anaesthetic effects on the EEG during surgery was developed.

SNAP EQUIPMENT

The SNAP is a monitor system attached to a normal VISOR PDA (Handspring; Mountain View, CA, USA). The SNAP index, the graphic trend and the original signal of the spontaneous EEG can be displayed. Because of its small size and ease of use, the SNAP is convenient in the operating room. The EEG is registered by the SNAP electrode strip (Nicolet Biomedical, Madison, WI, USA). This electrode strip is placed over the left or right temporo-frontal area of the forehead (Figure 1). Following electrode application, an impedance check is automatically performed. Electrode impedance is kept below 10 kW.

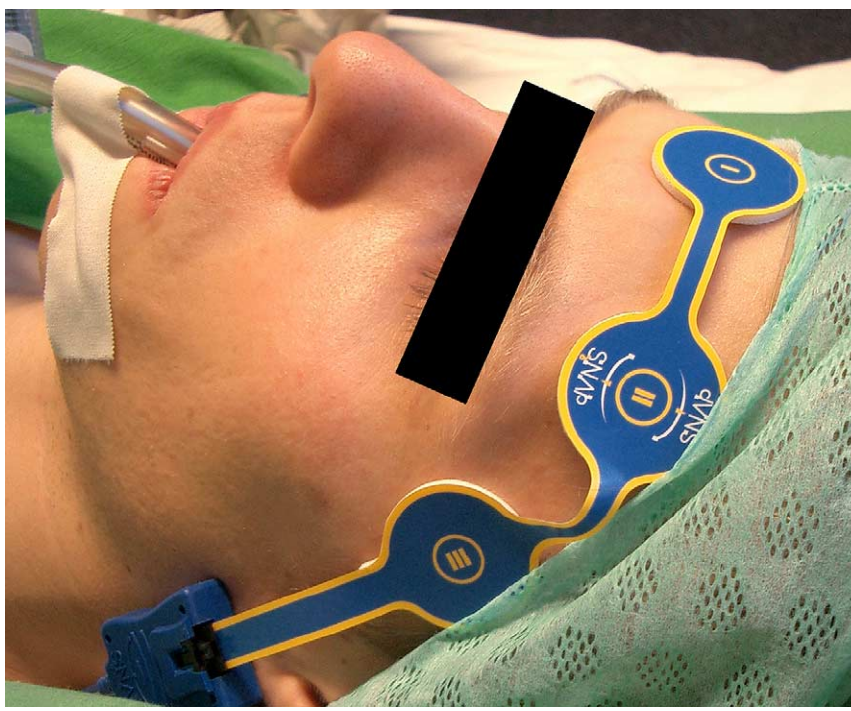

Figure 1. Placement of the SNAP electrode strip over the left forehead to 70%.