

LETTER TO THE EDITOR

Karl Eckhardt, M.D., St. Mary Medical Center, Walla, Washington, USA

Samuel Aseno, M.D., Director, International Anaesthesia Training Centre, Kilimanjaro Christian Medical Centre, Moshi, Tanzania

The Individually Fitted Earpiece

Sir,

There is world wide agreement that ventilation and circulation of the anaesthetised patient must be monitored. The ideal situation of continuous monitoring is, indeed, difficult to achieve without electronic aids such as oximetry and capnography. However, the continuous auscultation of breath sounds and heart sounds is greatly underutilised as a technique of monitoring cardiopulmonary performance. It has several advantages over the more sophisticated and vastly more expensive electronic monitors. It is simple, mechanical (does not require electricity), cannot break, and does not need maintenance.

Why is auscultation not used more often? The use of a normal stethoscope for more than a few minutes becomes painful! This obstacle can be overcome by the use of an earpiece which is custom made for the individual anaesthetist's ear. This allows the continuous use of a monaural (single ear) stethoscope with no discomfort. Making this earpiece does require the use of some technical skills, but the materials are readily available, and anyone with the skills necessary to make a set of dentures can make the finished earpiece.

An important advantage of the monaural stethoscope is that it leaves the other ear free to listen to the other sounds in theatre that should be observed: communication with the surgeon and other theatre personnel; the suction; any other monitor or alarm sounds that exist.

The earpiece may be connected to a stethoscope in a number of ways. The esophageal stethoscope is a remarkably loud and clear source of heart and breath sounds. Michael Dobson¹ describes a very simple and effective method of making an esophageal stethoscope using a nasogastric tube and the finger of a rubber glove. Commercially available ones are relatively cheap and sturdy



Figure 1. A single ear stethoscope in use

enough so that, with proper cleaning, they can be reused many times. In situations where Doppler monitoring is not available, the esophageal stethoscope will be the best means of early detection of venous air embolism. Also the esophageal stethoscope can do a few things that electronic monitoring cannot: detect the onset of wheezing and identify secretions that need to be removed by suction. In



Figure 2. Positioned for monitoring breath sounds during ketamine anaesthesia

small children a stethoscope over the heart is an effective monitor of both breath and heart sounds.

Auscultation of air exchange by taping a stethoscope over the trachea can dramatically improve both the detection and correction of soft tissue airway obstruction in the patient breathing spontaneously without an endotracheal tube in place. Manipulations which improve the airway will be readily detectable.

The monaural stethoscope may be placed over the brachial artery and used for measuring blood pressure. A 3-way tap can be used to link and quickly change the connection of the earpiece between 2 stethoscopes (one over the artery and the other used for listening to breath and heart sounds).

An individually fitted earpiece begins with making an impression of the ear canal. As one normally holds the mask with the left hand and operates the reservoir bag with the right hand, the body is angled so that the left ear faces the surgical field more than the right. It may be easier to hear the sounds in the room if that left ear remains unobstructed and the right ear selected for the stethoscope. After checking the meatus is clear, a foam ear canal blocker is placed about midway in the ear canal. The impression resin is mixed and injected in one continuous stream. The person making the mold and then the final earpiece will most likely be someone with skills similar to a dental technician who makes plastic dentures. In large cities, a hearing aid laboratory can easily perform this job.

Reference

1. Anaesthesia in the District Hospital. World Health Organisation 2001