A Combined Bubble Trap and Arterial Line Monitor

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A number of bubble trap level detectors and arterial line monitors were evaluated in our Unit; none proved entirely satisfactory. The main criticisms were:

1. The level detectors were unreliable when frothing occurred in the bubble trap.

![Diagram](image)

**Figure 1. Diagram of the combined monitor**
The adjustment of the sensitivity was unsatisfactory owing to poor voltage stabilisation.

Separate external monitoring units were required.

It was decided, therefore, to design a combined bubble trap and arterial line monitor (Figure 1) which could be incorporated within any of the existing single patient monitors with a minimum of alterations.

DESCRIPTION

An arterial line monitor microswitch is incorporated in the side of a Watson-

Figure 2. The arterial line monitor

Figure 3. The electronic package
Marlow blood pump, with a small plate to hold the fistula sac (Figure 2). A multicore cable carries the power to the pump and the switching current from the microswitch to the electronic package inside the single patient monitor (Figure 3). Collapse of the fistula sac results in the triggering of visual and audible alarms and stopping of the blood pump. An override switch is provided for commencing dialysis or whenever a shunt is used without a pump.

Figure 4. The bubble trap monitor

The level detector (Figure 4) consists of a light source and a photocell in a nylon 'head', connected to the single patient monitor by a multicore cable. A cheap lens ended light source is used and can be easily replaced. The voltage supply to the light source and photocell amplifier is fully stabilised and a sensitivity adjustment is provided. This system results in a level detector which will readily distinguish between frothing and whole blood. A fall in the blood level results in an audible and visual alarm, the blood pump stops and there is also provision for activating a blood line clamp if required. A lamp failure alarm is provided and an override switch allows the commencement of dialysis.