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A DIRECT READING PRESSURE GAUGE TO MONITOR ENDOTRACHEAL CUFF PRESSURE IN INTENSIVE CARE PATIENTS

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The monitoring of cuff pressure is a vital task in intensive care since over inflated cuffs can cause tracheal damage. Tissue isachemia complications, such as tracheal stenosis and tracheoesophageal fistula occurs when the cuff pressure exceeds 30mmHg. Therefore, monitoring of cuff pressure is important because then the pressure can be adjusted to a safe level. Pressure gauges to measure cuff pressure are not available locally. We have therefore, designed and constructed a low cost, direct reading, portable and reliable electronic pressure gauge to monitor cuff pressure.

The input stage of this electronically operated pressure gauge consists of a piezo resistive differential pressure transducer (sensitive in the 0-5 psi range) which is used as the pressure sensor, a instrumentation amplifier and digital panel multimeter. The transducer converts the cuff pressure into voltage. The output of the pressure transducer is amplified by the differential amplifier with a high CMRR.

The output stage consists of a 7-segment LCD digital panel multimeter display unit so that the pressure could be read directly in units of cm of water or mm Hg. The entire instrument was powered by a 9V battery.

The pressure gauge was designed, constructed and calibrated against a mercury manometer in the pressure range of interest; i.e. from 0 - 50 mm Hg. The variation of pressure vs. resulting voltage for the transducer was found to be linear. The instrument also has the following properties:

estimated error	1%
total current drawn	10mA
weight of the instrument	200g
size of the instrument	3cm * 7cm *12.5cm
total cost	Rs. 4000/-

This can be powered by an ordinary 9V battery. The size and weight of the instrument is small and therefore, it is portable. Also, it is reliable and the pressure can be read directly from the LCD display.