

## An Aid for Blind Naso-Endotracheal Intubation

BENJAMIN I. SCHNEIDERMAN, M.D.\*

Naso-endotracheal intubation was facilitated through the use of an indicator which consists of a two-inch long, clear plastic tube, with an internal diameter of one quarter inch and an outside diameter of  $\frac{3}{16}$  inch on which are mounted a male and a female adapter (fig. 1).

In practice, the indicator is attached to the male adapter of a well lubricated naso-endotracheal tube and after adequate topical anesthesia of the nasopharynx, the tube is inserted into the nostril and advanced progressively as long as moisture condenses on the indicator during expiration and clears on inspiration. If the condensate does not form during expiration and clear on inspiration after the tube has been advanced, it is withdrawn until the sign again appears. The tube, head or larynx, is manipulated and the tube is again advanced as long as the sign appears until the trachea is entered, at which time proper placement will be indicated by cough, increased respiration and the condensation or evaporation of moisture on the indicator.

Should the administration of oxygen or anesthetic gases be desired during the procedure, it can be accomplished by attaching the source

to the male adapter of the indicator by means of a T tube.

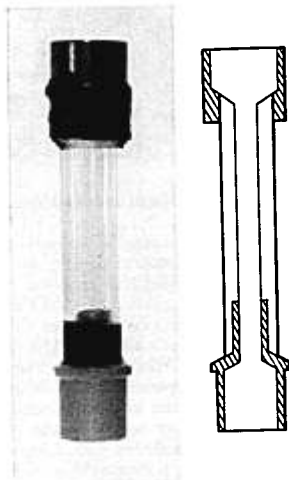


FIG. 1.

\* Cedars of Lebanon Hospital, Los Angeles, California.

## A Simple Method for Direct Arterial Pressure Measurement

LEE H. COOPERMAN, M.D., AND PHILIP E. G. MANN, M.D.\*

The measurement of arterial pressure by the usual indirect sphygmomanometric method may be unsatisfactory or difficult in certain circumstances. Direct intra-arterial measurement by electronic means may not always be

readily available. A simple device based on the "air-spring" principle and made from readily available materials is described here.

A tube, closed at its distal end, is connected proximally to an arterial cannula. The distal end of the tube contains air; the proximal end contains saline. Changes in arterial pressure are reflected in variations in length of the air column in accordance with Boyle's law. Devices based

\* Division of Anesthesiology, Clinical Center, National Institutes of Health, U. S. Department of Health, Education and Welfare, Public Health Service, Bethesda, Maryland.

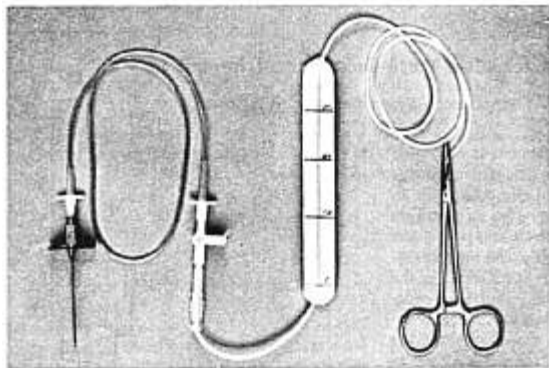


FIG. 1. At left an arterial cannula (Courmand) is connected to the three-way disposable stopcock via an extension tube. The tongue blade graduated in mm. of mercury and bearing Baxter R33 extension tube is shown between hemostat and stockcock.

on this principle have been described by Fink<sup>1</sup> and De Bono.<sup>2</sup>

Arterial cannulation may be made with an 18- or 20-gauge Courmand needle or with Teflon catheters inserted after cutdown. The arterial cannula is connected to a 10 French, 20 inch i.v. extension tube. This, in turn, is connected via a three-way stopcock to a 30 inch extension tube (Baxter R33). The system is filled with heparinized saline to a distance of 4 inches distal to the stopcock prior to connection with an arterial needle. The distal tube is then occluded with a hemostat creating an air-saline junction. This length of tubing is then mounted on a tongue blade with transparent tape (fig. 1).

The device is calibrated initially using an aneroid or mercury manometer, suitable graduation being marked on the tongue blade. With uniform construction, succeeding devices can employ the same graduated scale without recalibration. Flushing, when necessary, can be done through the stopcock using heparinized saline solution. With good arterial cannulations this is required approximately every 15 minutes.

Simultaneous values given by this device

and a Statham pressure transducer have been obtained in 6 patients. Systolic pressure values with the two systems were in close agreement. Values correlated within 10 mm of mercury of each other in most instances. Diastolic pressure values, however, tended to be 10 to 25 mm. of mercury higher in the air-spring technique. The difference appeared most marked during tachycardia probably because the frequency response of the air-spring technique was lower.

This arterial pressure monitoring device is made of materials routinely available in an anesthetic department. All materials, with the exception of the arterial cannula itself, are low in cost and disposable. Assembly is rapid and uncomplicated. The device is unbreakable. Its operation is unaffected by position and requires relatively little attention.

#### REFERENCES

1. Fink, B. R.: Pneumatic monitor for arterial blood pressure, *ANESTHESIOLOGY* 24: 872-873, 1963.
2. De Bono, E. F.: A simple method of intra-arterial pressure measurement, *Lancet* 1: 1142, 1963.