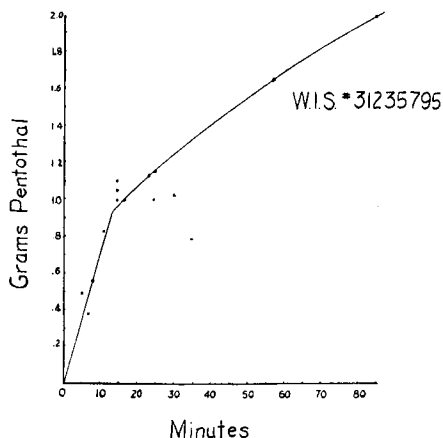


used were not constant but when analyzed for each anesthetic in relation to its position on the accompanying graph, no conclusions or impressions were gained. The final result of this therapy was that the patient became ambulatory and returned to the United States for further treatment.



The scatter points on the graph seem to indicate that in this case the time for induction of anesthesia and establishment of

equilibrium between the brain, blood and tissues was about fourteen minutes (a straight-line curve). After this equilibrium was obtained, the amount of pentothal required to balance a constant stimulus decreased and as time progressed a diminishing dose increment per duration increment was evident (a gentle curve). This graph agrees closely with that of Collins, except for spatial comparisons. Unfortunately in this one case an inadequate number of observations were made to plot a curve by the method of the least number of squares and so formulate a precise equation. My impression in this case is that there was no evidence of tolerance or cross-tolerance despite an average of anesthesia (pentothal or gas-oxygen-ether) every fourth day.

#### REFERENCE

1. Collins, V. J.: Endotracheal Anesthesia with Sodium Pentothal for Maxillofacial Surgery: Report on 48 Cases, *Anesthesiology* 9: 62-72 (Jan.) 1948.  
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### A TECHNIC FOR MARKING VINYL PLASTIC ENDOTRACHEAL CATHETERS

The danger of performing an endobronchial intubation is ever present. It is quite possible that every anesthesiologist has inadvertently inserted an endotracheal catheter in the right bronchus. Usually the disturbance in respiration is noted and the condition corrected at once. If this is not done, massive collapse of the left lung will occur. This accident is more likely to happen in children in whom the margin of safety is less owing to the shortness of the trachea. Tracheitis is another postoperative complication following the insertion of an endotracheal catheter. The possibility of this occurring is greater if the catheter is inserted farther into the trachea than is necessary. The optimum distance that the catheter should be inserted is that distance which will ensure an airway and will prevent the catheter from coming out

before extubation is desired. After the tip of the catheter has been inserted between the vocal cords, it is difficult to estimate the distance it has passed into the trachea. As the laryngoscope is being removed from the mouth there is a tendency to insert the catheter still farther.

Because of these factors it was deemed advisable to place a mark on the catheter so that the distance it had been inserted into the trachea would be known. Rubber catheters can be marked with silver nitrate but the vinyl plastic (Portex) variety is resistant to this method. The following technic was found to be satisfactory.

Lotio viridis malachiti, two parts, and acetone, one part, was found to be an excellent marking agent. It was used to mark a ring around the catheter the desired distance from the tip. An ordinary

straight pen was found to be suitable for this purpose. A copper wire was inserted into the catheter to give it stability. The dye was then fused into the plastic by rotating the catheter rapidly 3 inches above an alcohol flame. Too much heat distorted or burned the catheter. As soon as the plastic assumed a shiny character the dye was fused and the heat was discontinued. The catheter was then placed in hot water to re-establish the desired curve, followed by immersion in cold water to fix it in that position. The circular ring was bright green in color, readily visible during intubation, and resistant to boiling, alcohol, or ether.

The various distances, from the tip of the catheter to the circular mark, which were found to be satisfactory are listed in table 1.

When the circular mark was placed at the level of the vocal cords, endobronchial intubation or accidental extubation did not occur.

This technic is a valuable safeguard where residents are undergoing instruction. If at any time there is doubt as to how far the catheter has been inserted, it is a simple matter to check the distance by looking for the circular mark. If it is not visible, the catheter may be withdrawn until the green ring comes into view, without the fear of extubating the patient. Similar markings may be placed on the other end of the catheter to act as a guide for distance of insertion during blind intubation.

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TABLE 1

Size of Catheter (Magill)	Distance from Tip of Catheter to Mark, cm.
0	2
1	2.5
2	3
3	3.5
4	4
5	4.5
6	5
7	5.5
8	6
9	6.5
10	7

## CORRESPONDENCE

### *To the Editor:*

In the May issue of *ANESTHESIOLOGY* there appears a communication by Dr. B. L. Steinberg in which he comments upon a technic for induction and intubation with sodium pentothal for thoracic surgery as described by Dr. Alexander and myself in the January 1947 issue of *ANESTHESIOLOGY*. He states that he tried this method on about a dozen patients and has given it up because he encountered cardiac irregularities immediately following intubation.

Dr. Steinberg is to be congratulated for this clinical observation. However, because of the small quantity of cases observed ("about a dozen"), it can only give him a

clinical impression. It happens that some of my associates and I have just completed electrocardiographic studies during endotracheal intubation using most of the common anesthetic agents in 103 patients. This report, which will be sent in for publication soon, will demonstrate many interesting features. One fact, concerning the present issue, is that endotracheal intubation during intravenous pentothal sodium is *not* attended by more cardiac irregularities than when any other agent is employed.

I should like to reiterate that the technic of induction and intubation described in the article referred was that used for thoracic surgery in an army hospital over-