

## Premedication of Children for Ambulatory General Anesthesia

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■ The premedication of a child for an ambulatory general anesthetic is a difficult matter and certainly an area in which no hard and fast rules can be laid down. The method of premedication is as variable as the psychological and physiological make-up of the child, plus the personality and the experience of the doctor.

In the practice of dentistry, general anesthesia is utilized in short duration anesthetics for minor oral surgery and in long duration anesthetics for surgery or operative restorative dentistry. Of course, during the administration of an anesthetic, regardless of its duration, the physiology of the patient must be properly maintained. There are, however, increased physiological demands associated with a lengthy anesthetic. Thus the technic of premedication may be different.

### Goals of Premedication

Pre-anesthetic medication may be broadly defined as any technic or

drugs used before anesthesia to facilitate the procedure. It is the anesthesiologist's hope that the following goals, as outlined by Stephen<sup>1</sup>, will be accomplished:

1. To allay fear and apprehension; to reduce the psychic insult.
2. To lessen the amount of secretions during the induction; abundant secretions may produce respiratory obstructions that cause anoxia.
3. To decrease the amount of anesthetic drugs required during the operation (an adequate oxygen supply can be provided when using less potent anesthetic agents such as nitrous oxide and trichlorethylene).
4. To minimize vagal reflexes.

### Methods of Premedication

There are two principal methods of accomplishing these goals—psychological preparation and drug therapy. A combination of both methods may also be advisable.

#### *Psychological premedication*

All youngsters are fearful when they come into a strange environment. A frightened child may resist all efforts at induction, develop marked secretions, increase the amount of anesthetic needed and

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develop dangerous hyperirritable reflexes. The opposite can be accomplished if a child trusts the doctor and understands the situation. This child can then be gently induced with nonirritating nitrous oxide and oxygen. A smooth induction can be accomplished with a reasonable child, where a kind, honest explanation, in terms of his understanding, will usually produce enough cooperation.

Five minutes of time spent by the doctor in introducing himself, chatting with the youngster and playing games such as blowing up the balloon (for full face mask), jet pilot (for nosepiece), oxygen therapy (for older children) and other possible variations can result in a cooperative and, at times, enthusiastic patient. An intelligent, unemotional parent standing by or holding the patient's hand sometimes helps the child retain a sense of trust and security, also aiding a smooth induction.

These psychological approaches may be all the premedication that is necessary, especially in short duration cases for average children. However, where the doctor's personality prevents him from establishing rapport with the average patient; where a patient does not respond to a personal approach; where a child is mentally defective

or physically incapable of muscular control — then drug premedication is indicated for the short as well as the long anesthetic case.

#### *Drug premedication*

*Hypnotic* drugs reduce fear and apprehension by depressing the cerebral cortex, the site of consciousness. The barbiturates are the most widely used hypnotic drugs and, in proper dosage, produce drowsiness and amnesia. Nembutal<sup>®</sup>, a rapid-acting barbiturate, is quite effective, but on occasion causes confusion or disorientation of the child with resultant difficulty in anesthetic induction (though the episode is likely to be obliterated from memory). In the presence of mild pain, the barbiturate should be combined with an analgesic agent, such as the salicylates. In cases of severe pain, a *narcotic* such as Demerol<sup>®</sup> should be substituted. The narcotic raises the pain threshold and depresses the cerebral cortex.

To reduce secretions and decrease vagal reflexes, the parasympatholytic *belladonna* derivatives are commonly employed; e.g., scopolamine and atropine. For long duration cases scopolamine may be preferred to atropine because it has a cerebral depressant effect, a longer drying action and a minimal effect

on the heart rate. If an intravenous barbiturate or muscle relaxant is used for anesthesia, it is wise to administer intravenous atropine routinely for premedication for its antivagal reflex action.

A number of different routes may be used to administer premedicant drugs. *Orally*, premedicant drugs can be used in the form of elixirs, tablets or capsules. The taste of drugs can be masked by a corn syrup mixture which will leave an adequate store of glucose in the body, but no residue in the stomach. The barbiturates and scopolamine should be administered about one to one and a half hours prior to anesthetic induction; atropine, one hour or less.

*Rectally*, the required dose of premedicant agents should be double the usual oral requirement. A prescription is written in which the desired drugs are incorporated into a suppository for the parent to insert into the child's rectum about one and a half to two hours before induction. It is also possible to perforate both ends of a capsule and insert rectally.

*Intravenous, intramuscular or subcutaneous injections* can be used, but may be accompanied by physical and psychological difficulties;

therefore, they are not recommended except under special circumstances. Of course, following gentle anesthetic induction, the intravenous route can be used for the administration of atropine for its vagal blocking action.

There is a never-ending search for new and more adequate drugs. One new drug being widely used at the present time is the potent antihistamine, *promethazine* (Phenergan®), which, when combined with a barbiturate or narcotic and a belladonna drug, appears to be ideal. According to Sadove<sup>2</sup>, "a desirable calming effect is produced. The patient, while not actually asleep, lies in a state of tranquility, without interest in his environment and unaffected by external stimuli, but with the ability to respond readily to questions." The added advantages seem to be antiemetic action, little or no interference with medullary functions, decreased dosage of barbiturate due to independent sedative action and a potentiating effect. However, there are reports that unpredictable breathing patterns can result.<sup>3</sup> It is our feeling that this drug is still in the experimental stage of clinical evaluation and should be used with care. However, Spiro<sup>4</sup> states: "The value of adding Phenergan® to the barbitu-

rate and belladonna drugs has been evident in a greater number of patients coming into the operating room than before in a more quiescent, tranquil state with varying degrees of sedation and amnesia. The dynamic factors observed were the increased absence of postanesthetic nausea, vomiting and disorientation. They seem to be more aware of their surroundings when Phenergan® is used with resultant lowering of the dosage of the barbiturate."

### Dosage of Drugs

Monheim<sup>5</sup> writes, "the preoperative medications should not be routine, but should be chosen and utilized to suit the individual pa-

tient and circumstances. The drug administered and the dosage should be determined by the age, sex, weight, physical condition of the patient and the nature of the proposed operation." Thus the physiological age of the child and his emotional nature should be guides in determining dosage. There is a great possibility of error in determining the proper amounts of premedicant drugs for children, as the range of accuracy is narrow. Special attention should be paid to the child whose growth pattern is markedly variant from his chronological age.

The following dosage tables are suggested as rough guides. It is

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### AGE-WEIGHT CHART (Leigh and Belton)<sup>6</sup>

2 years to 3 years	27-30 pounds
3 years to 5 years	30-40 pounds
5 years to 8 years	40-55 pounds
8 years to 10 years	55-65 pounds
10 years to 12 years	65-80 pounds
12 years to 14 years	80-90 pounds

### DOSAGES FOR ORAL PREMEDICATION

AGE	NEMBUTAL® DOSAGE (Monheim)	SCOPOLAMINE, ATROPINE DOSAGE (Schaffer)
1 year to 3 years	24-32 mg.	0.1 to 0.15 mg.
3 years to 8 years	50-65 mg.	0.15 to 0.25 mg.
8 years to 12 years	65-100 mg.	0.25 to 0.4 mg.

### DOSAGES FOR RECTAL PREMEDICATION (Spiro)

AGE	NEMBUTAL®	SCOPOLAMINE	PHENERGAN®
2 years to 3 years	45 mg.	0.15-0.2 mg.	14-20 mg.
3 years to 5 years	60 mg.	0.25-0.3 mg.	30-35 mg.

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strongly advised that all patients be weighed and then the proper chart consulted as an additional aid in determining dosage.

### Conclusions

The use of proper premedication for the ambulatory anesthetic case is urged, so that the desired anesthetic level can be reached with minimal psychic and physical disturbance to the child. The approach to preoperative medication should be individualized and both psychological and drug premedication are recommended.

### References

1. Stephen, *Elements of Pediatric Anesthesia*, Charles Thomas, 1954, pp. 1-12.
2. Sadove, M., "Promethazine in Surgery", *J.A.M.A.*, Oct. 20, 1956.
3. Eckenhoff, Helrich and Rolph, "The Effects of Promethazine upon Respiration and Circulation of Man", *Anesthesiology*, Sept.-Oct., 1957.
4. Spiro, Stanley, Personal communications.
5. Monheim, Leonard M., *Local Anesthesia and Pain Control in Dental Practice*, The C. V. Mosby Company, St. Louis, 1957, pp. 217-227.
6. Leigh and Belton, *Pediatric Anesthesia*, The Macmillan Company, N.Y., 1948, pp. 1-12.

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