

drops per minute, as a maximum dose; 30 drops per minute, I have found in most cases to be sufficient. For children 11 or 12 years of age, I have found that a maximum quantity of 18 drops per minute is sufficient. For children from 7 to 9 years of age, about 15 drops a minute is sufficient. Children about 5 years of age require from 8 to 10 drops a minute. In all cases about one-third the maximum dose is given the first minute; and two-thirds the second minute; the maximum dose never being reached until the third minute from the commencement of the inhalation.

When chloroform is administered by this method, I find that in almost every case there is an entire absence of excitement or struggling on the part of the patient. As a rule, the patients pass quietly under its influence as if they were falling asleep naturally. Children pass under its influence beautifully, and usually without objecting to the administration. And, moreover, I have never in any case, observed that peculiar tremor which is said to mark the commencement of complete narcotism. Another feature in this method of administering chloroform is the very small quantity of chloroform required to produce complete narcotism. I seldom require in any case to administer more than one drachm, unless the nature of the operation requires its readministration.

The next question is this, in administering chloroform by this method, have we any means of ascertaining even approximately, the strength of vapour that is being inhaled at a given time? I think we have. We make about 17 respirations per minute and inhale about 20 cubic inches of air at each inspiration; this amounts to 340 cubic inches per minute. In three minutes we inhale, in round numbers, about 1000 cubic inches. We will suppose that a patient inhales 33 drops per minute and in three minutes 99 drops, or in round numbers 100 drops. I have ascertained by repeated trials that 100 drops of chloroform dropped from a 2-drachm vial are equal to exactly 40 minims. Chemists state that 40 minims of chloroform will produce 45 cubic inches of chloroform vapour; 100 drops of chloroform will therefore produce 45 cubic inches of chloroform vapour; 45 cubic inches of vapour diffused through 1000 cubic inches is equal to

a per centage of $4\frac{1}{2}$. If, therefore, a patient inspires 1000 cubic inches of atmospheric air in 3 minutes and at the same time inspires the whole of the vapour from 100 drops of chloroform, he will be inspiring $4\frac{1}{2}$ per cent of chloroform vapour.

In administering chloroform by this method, there seems to be very little of the vapour wasted, probably from 10 to 20 per cent; if 20 per cent is wasted, that would reduce the $4\frac{1}{2}$ per cent referred to above, to about $3\frac{1}{2}$ per cent, which would be a perfectly safe strength to administer to an adult in whom there did not exist any contra indication for chloroform inhalation; and when we administer 30 drops or less in a minute, the strength is only 3 per cent or less.

The advantages which I think may be justly claimed for this method of administering chloroform are:

1. The ability to attain with apparatus as simple as that of the "ready method," very nearly if not quite the precision attained by Dr. Clover's inhaler;—to commence the administration with an almost imperceptible quantity of the vapour so as to establish *tolerance* in the system; and subsequently to administer the chloroform vapour of known and definite dilution.

2. Being able, with a very few drops, to bring quietly under the influence of the anæsthetic young children who violently resist the strong atmosphere of chloroform-vapour that characterizes the commencement of the administration when conducted by the "ready method," and who would be frightened at an apparatus so formidable as Dr. Clover's inhaler.

I will conclude this paper by adding a few brief rules that should be observed in the administration of chloroform. Examine the general condition of the patient, and observe particularly for symptoms of fatty degeneration of the heart. The patient should abstain from food for about four hours before the administration. A little brandy and water should be given to an old or debilitated patient. The dress should be loose about the neck and chest. The apartment should be comfortably warm (about 60 degrees Fahrenheit). The recumbent position is the best, and should be assumed a few minutes before the administration. The patient should be