It is suggested that many cases of so-called post-maturity are really examples of slow maturation of the foetus and placenta, and that as good or better perinatal mortality rates can be got in these cases without induction.

Others may be due to the occurrence of conception in a very long menstrual cycle.

The higher foetal mortality in post-mature as compared with term babies can be adequately explained by the larger size of the infants in the former and the longer duration of labour.

If, because of the larger size of the baby, there is disproportion, the case should be treated by trial of labour. Induction of labour is not the modern treatment for disproportion, at least in primigravidae.

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"The Health of Scotland" was the theme of a speech made last week by Mr. J. NIXON BROWNE, M.P., Joint Parliamentary Under-Secretary of State for Scotland, at the annual conference of the Scottish Branch of the British Red Cross Society. In 1949–50, the first full financial year of the National Health Service, £40m. was spent on the Service in Scotland; in 1956 the figure was £53m. Since 1949 the number of staffed hospital beds had risen from 58,700 to 63,000. Of these about 40% were reserved for mentally ill and mentally defective patients. In 1956 hospital out-patients numbered 7¼ million, compared with 5 million in 1949; 4½ million pairs of spectacles had been issued since 1948, and 671,827 sets of false teeth since the charges for them were introduced in 1952. The number of family doctors in the Service had risen from 2,314 in 1949 to 2,603 in 1956, and there had been an encouraging growth of partnerships and group practices. The average number of patients per doctor, however, had fallen from 2,147 to 1,980. One feature in Scottish health statistics which had failed to improve much during the last 25 years was mortality among middle-aged males. The two main reasons for this were deaths from coronary thrombosis and from cancer, particularly lung cancer. The health record of Scotland was in some respects worse than that of England. One possible reason which had been suggested for this was that, according to the National Food Survey in 1954, "the Scots were inclined to indulge in a rather less nutritious diet than the English," eating more carbohydrates and less fruit, fresh vegetables, and meat.

SEDATION OF CHILDREN AS OUT-PATIENTS FOR DENTAL OPERATIONS UNDER GENERAL ANAESTHESIA

TRIAL OF METHYLPENTYNOL, BUTOBARBITONE, AND CHLORPROMAZINE

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Pre-operative sedation for dental out-patients requiring general anaesthesia is not commonly used, but is strongly advocated by Macintosh and Bannister (1952). It may not be necessary in adults, but the assumption that it is of value in the management of young children is widely held. It has been advocated as a method of reducing the emotional disturbances within a child about to undergo what otherwise may be a very frightening experience and as a way of reducing the outward expression of such emotions. It has also been suggested that the prevention of pre-operative terrors would remove the danger of post-operative emotional upsets.

The value of premedication for child in-patients has long been recognized. Basal narcosis has provided a satisfactory answer to the problem, except in the case of operations on the upper respiratory tract (Barnes, 1952). No safe and effective premedication technique has yet been devised for ambulatory children. Methylpentynol, however, has been claimed in both the medical and the lay press to be the ideal agent for this purpose. The statement by the makers of a brand of methylpentynol that their preparation has the "unique property of allaying fear and apprehension within a few minutes of its administration" suggested that its use as a premedicating drug for children should be carefully investigated.

The investigation described here was designed to study the effect of the pre-operative administration of three drugs to child out-patients attending hospital for dental extractions under general anaesthesia.

Conditions of Experiment

In Guy's Hospital two sessions each week are reserved for children between the ages of 2 and 15 years who require dental extractions under general anaesthesia. The children come from all parts of London and the neighbouring counties and from all classes of homes. A few require teeth extracted because of overcrowding of the mouth, but the majority require extractions because extensive caries has made the conservation of the teeth impracticable. A small number of teeth are removed for the immediate relief of pain.

The children are first seen in the dental department. If they need to have teeth extracted, instructions are given that they should be brought, without having had

breakfast, to the out-patient department at 8.30 a.m. on the day of the first convenient session, accompanied by a responsible adult. On arrival the children are given into the care of a nurse. After going to the lavatory, they wait together in a special room away from their parents for their turn to enter the theatre. The house-surgeon takes each child, in order of arrival, into the theatre, seats him in the chair, examines the mouth, and inserts a prop if it is required. The anaesthetist then takes charge of the child and begins induction of anaesthesia.

A senior dental surgeon is responsible for the surgical work. In selected cases, student dressers carry out the treatment under his instruction and supervision. The anaesthetist, in addition to his primary responsibility to the patient, teaches the practice of anaesthetics to student dressers and in suitable cases directs them to administer the anaesthetic under his supervision. Normally there are two surgical dressers and two anaesthetic dressers present in the theatre. With the addition of a nurse and a surgery assistant, this makes a total of nine persons in attendance on the patient.

After the operation the child regains consciousness in the dental chair. He is then handed over to a nurse, who looks after him and takes him to the recovery room. When the child's condition is satisfactory the recovery-room nurse takes him back to his parent, who has been waiting in the reception hall.

Two essential conditions had to be observed in this investigation: firstly, the obvious one that it should in no way cause any harm to the children; and, secondly, that it should not interfere with the normal conduct of the sessions.

Problem of Assessing Effect of Pre-operative Sedation

An essential requirement of any clinical trial is a criterion by which responses to applied measures may be judged (Gaddum, 1954). There is no yardstick readily available by which the effects of pre-operative sedation can be measured. This is probably because the object of this pre-medication is to modify an emotional state which in itself is unobservable. While it is recognized that mental stress can be manifest in bodily changes such as a faster heart rate, a raised blood pressure, a drying of the mouth, or an outbreak of cold sweating, the interpretation of such physical changes in terms of emotions has so far proved impossible. The claims that certain drugs dispel anxiety and apprehension have not therefore been based on objective studies.

An assessment of the degree of anxiety in a patient may be made at an interview. The reliability of the assessment will depend upon the extent to which the subject can communicate his feelings, the length of the interview, and the experience and prejudices of the interviewer. Because so many of the children were of an age at which they were unable adequately to describe their feelings, and since the necessary interviewing time could not be fitted into the normal programme of working of the children's extraction sessions to cover a large number of children, such a technique could not be used here.

Preliminary observations in the theatre revealed that, from the point of view of the anaesthetist and the surgeon, the principal advantage of pre-operative sedation was that it would reduce disturbed behaviour in the patients, thus facilitating the induction and maintenance of anaesthesia. If it is assumed that the patient's lack of co-operation arises from apprehension, then it is fair to judge the effectiveness of the pre-operative sedation by the way in which it influences the behaviour of those receiving it. Even if the direct relationship between fear and truculence is denied, a harmless drug promoting co-operative behaviour before operations would be of considerable value.

We therefore decided to make an arbitrary scale of behaviour, with calm co-operation at the top, violent obstruction at the bottom, and one intermediate grade. By this scale the behaviour of each child was to be recorded before and after premedication. If the sedation were effective the children at the top of the behaviour scale on arrival would stay there as the time of operation approached. Those who were lower down the scale on arrival might be expected to be upgraded with the passage of time.

Preliminary Trial of Method of Assessment

A preliminary trial of the behaviour-grading procedure was made by one observer (A. C. K.) watching a series of 114 children undergoing dental extractions as described above. The behaviour grading was made at two distinct stages: firstly, immediately the child entered the theatre, and, secondly, when the presentation of the anaesthetic was begun, which is presumably a time of increased stress.

The children who appeared unmoved by the proceedings were graded calm. Those who were overactive or obviously tense, who sobbed, cried, or indulged in delaying tactics, but who yielded readily to suggestion, were put in the disturbed category. Children who refused to co-operate or were actively obstructive were classified as turbulent. The method was found to be practicable, and the results obtained are shown in Fig. 1. It can be seen that with the approach of the anaesthetic some of the calm children became disturbed and some of the disturbed became turbulent.

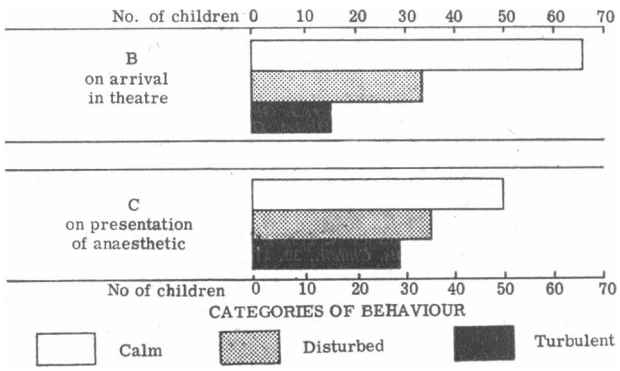

FIG. 1.—Behaviour shown at two stages by 114 unpremedicated children who were about to receive a general anaesthetic.

When two observers (A. C. K. and A. C.) in the theatre made independent assessments of pre-anaesthetic behaviour in terms of the scale, their ratings for each child observed were found to be in close agreement. It was concluded, therefore, that the procedure as outlined was relatively free from personal bias in a clinical assessment of behaviour.

Selection of Drugs

The neurophysiology of apprehension and anxiety is obscure. Rational pharmacology is therefore impossible and drug treatment is largely empirical. If it is assumed that fear is a function of mental activity, then a drug which depresses the central nervous system should logically promote tranquillity.

Methylpentynol.—Those concerned with the clinical investigation of methylpentynol as a hypnotic have observed that "one of the most valuable characteristics of the drug was to produce a state of quiescence accompanied by mental relaxation and a diminution of restlessness." Brookfield (1955), Trotter (1953), Nebel (1953), and Simmons (1954) have claimed good results from methylpentynol given to adults and children prior to dental extractions undertaken with general anaesthesia, and Bourne (1954) has written similarly about his experiences with methylpentynol in obstetrics. Simmons (1954) and Gusterson (1955) were

enthusiastic about the value of this drug before tonsillectomy, but Rendell (1954), Butler (1955), and Rollason (1955) reported otherwise. Because of its alleged clinical virtues and because it appeared to be a very safe drug, it was chosen for use in the present study with children. The dosage adopted—namely, 75 mg. per stone (11.8 mg. per kg.)—was arrived at from the manufacturer's advertised dosage of 250 mg. for a 5–10 years' old child.

Butobarbitone.—This barbiturate is often employed as a pre-operative sedative in dental surgery. For full basal narcosis the accepted standard dosage of a barbiturate such as butobarbitone is 40 mg. per stone (6.3 mg. per kg.). For the sedation of ambulatory patients there is no agreement about dosage. It was arbitrarily assumed, and subsequently confirmed, that 20 mg. per stone (3.1 mg. per kg.) would be a dose which could be given without danger of delaying the patient's recovery and discharge.

Chlorpromazine.—This drug, closely related chemically to the antihistamine promethazine (" phenergan "), is said to be of " unusual interest in psychiatry." In overactive and excitable patients it is said to promote resignation without clouding of consciousness—the so-called " medical leucotomy," and is being widely used in psychiatric practice. Its use as an oral premedicant does not appear to have been studied. In a single dose it has a wide therapeutic ratio and it is unlikely to give rise to those toxic complications encountered with prolonged administration. Its choice in the present investigation seemed, therefore, justified. The dosage, however, had to be arbitrarily adopted, since there was no precedent to serve as a guide. The manufacturers suggested a dosage of 2.5 mg. per stone (0.4 mg. per kg.) as being completely safe, although possibly below an effective level. This amount was given in the pilot trial, and, in view of the lack of evidence that the drug was acting, the dosage was doubled for the full-scale trial.

Design of Clinical Trial

The hospital dispenser prepared four solutions as nearly as possible alike in appearance and taste. One was a placebo and the other three contained the various drugs in such a concentration that the appropriate dose of each could be given by measuring 1 ml. per stone (0.16 ml. per kg.) body weight. Each solution was given a code letter by the dispenser and he alone knew the distribution.

At each session the children were received by one of us (R. G.). A serial number was entered on the patient's record ticket and a note made of the behaviour grading according to the scale described. The child was then weighed and given one of the preparations according to weight. The allocation of the solutions was randomized and the time of administration was recorded together with the other details.

Two observers in the theatre, one a psychologist and one a physiologist, working independently of each other and of the observer in the waiting-room, made two serial classifications of the behaviour of each child according to the scheme described above. Along with their assessments, they noted any particularly interesting events and recorded the type and duration of the anaesthetic. The anaesthetics in this series were either nitrous oxide and oxygen from a standard Walton apparatus or vinyl ether using the Oxford modification of the Goldman inhaler.

In the recovery room a nurse kept a third set of records in which she noted the time when the patient was fit to return to his escort and go home, and the reason for any undue delay in discharge.

Finally, all these records were passed to a secretary who, having obtained the key of the code from the dispenser, transferred all the data to punched cards.

Results of Pilot Study

As a practical test of the design of the trial, a pilot study was carried out. The results are charted in Fig. 2. Examination of this figure suggests that the distribution of behaviour was identical in the first three " treatments," but that in the fourth, given chlorpromazine, disturbed behaviour was more frequent—possibly because nine of these children were under 6 years of age. The method, having been tested and found satisfactory, was then used on a larger series of patients.

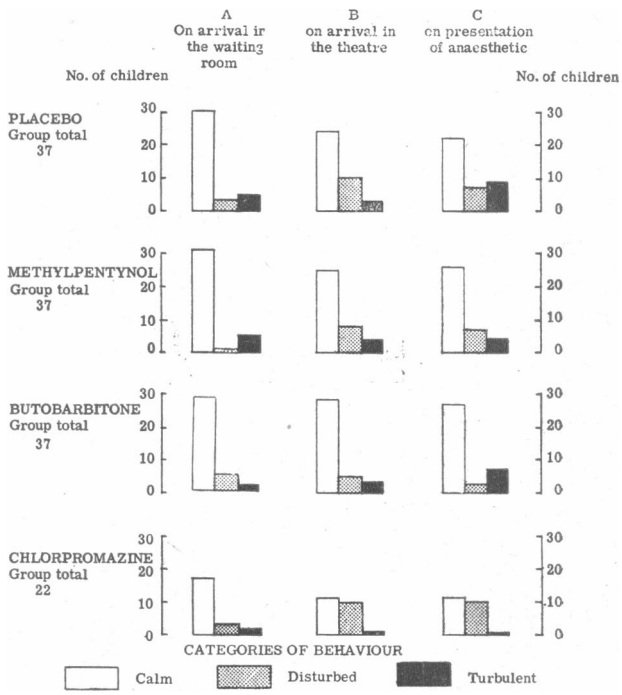

FIG. 2.—Behaviour shown at three stages by 133 children who were about to receive a general anaesthetic. The children are grouped according to their premedication.

Results of Trial

Of the 410 children premedicated and observed as described, 357 were watched by both A. C. K. and E. M. W. in the theatre. Table I shows the distribution of the children among the four treatments and the interval of time between swallowing the solution and entering the theatre. The children for whom this time interval was less than 15 minutes have been excluded from the results.

Table II shows the age distribution of the remaining 338 children according to the treatments they received. In each treatment the age distribution is approximately the same.

TABLE I.—*Distribution of Premedication Intervals for 357 Children Arranged in Four Treatment Groups*

	Interval in Minutes Between Having Treatment and Entering Theatre						Total
	0–14	15–29	30–44	45–59	60–74	75–89	
Placebo ..	4	31	34	14	6	2	91
Methylpentynol	7	27	36	10	10	1	91
Butobarbitone..	2	27	34	16	8	2	89
Chlorpromazine	6	23	35	16	4	2	86
Total ..	19	108	139	56	28	7	357

TABLE II.—*Distribution of Age by Treatment Groups in Children Who Had Their Premedication more than 15 Minutes Before Entering Theatre*

	Age in Years						Total
	2	3	4	5	6	7–13	
Placebo ..	3	7	13	10	10	44	87
Methylpentynol	5	7	11	10	9	42	84
Butobarbitone..	3	8	9	9	12	46	87
Chlorpromazine	4	5	9	6	6	50	80
Total ..	15	27	42	35	37	182	338

The behaviour gradings for the four groups at the three stages of observation are shown in Fig. 3. No differences between the four treatments are obvious, but the charts may conceal improvements or deteriorations in the behaviour of individual children. In order to study the change of individual behaviour with time, the following method of analysis was used.

Fig. 4 shows the change in behaviour with time of children who were graded "calm" on arrival. Those who were still graded "calm" on entry to the theatre are shown in Fig. 4, *a*. It can be seen that most of them remained calm on the presentation of the anaesthetic, but about 15% of them showed disturbed behaviour. Fig. 4, *b* shows that the children who were calm on arrival and disturbed on entering the theatre, sometimes improved, but generally remained in the disturbed category. A marked change from "calm" on arrival to "turbulent" on entry to the theatre was shown by only two children (Fig. 4, *c*).

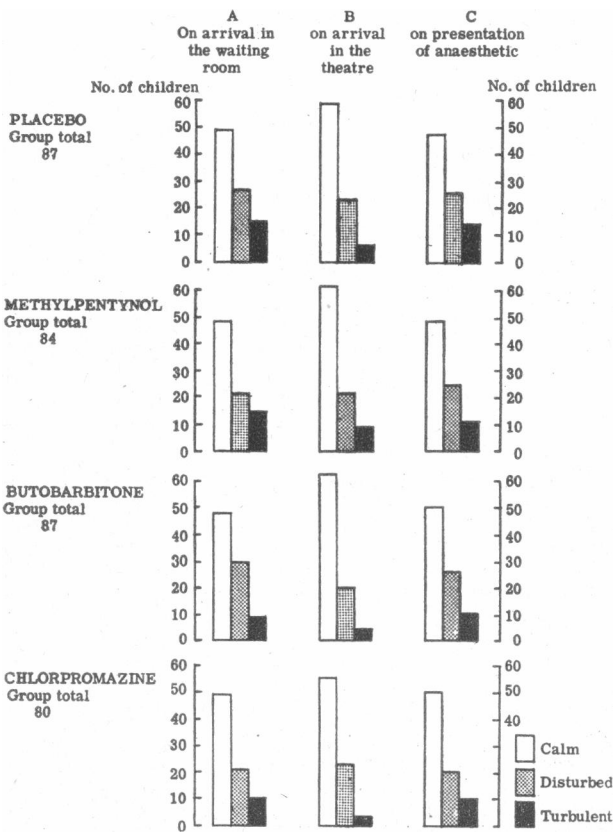

FIG. 3.—Behaviour shown at three stages by 338 children who were about to receive a general anaesthetic. The children are grouped according to their premedication. The distribution of the three types of behaviour was similar in all four groups.

When the four treatment groups are compared in this way there is still no suggestion of a difference which might be due to the effect of any particular treatment.

The data for the children who were graded disturbed on arrival in the waiting-room are similarly treated in Fig. 5, *a*, *b*, *c*, whilst the progress of those assessed in the waiting-room as turbulent is followed in Fig. 6, *a*, *b*, *c*.

In each treatment, improvements and deteriorations can be seen to have occurred, but there was no suggestion that any of the three premedication treatments was more effective than the placebo.

It was obvious during the trial that disturbed behaviour was much more frequent in the younger children. In Fig. 7 the data for each treatment group are presented in two sets—one for the children up to and including 6 years of age, and the other for the older ones. Within one group, no significant differences were found, but between the two age groups a marked difference in the distribution of types of behaviour was revealed.

Whereas in the older children roughly two-thirds were graded calm throughout the period of observation, in the younger group only about one-third maintained that standard of behaviour.

Comparison of Findings of Two Independent Observers

Whilst it is reasonable to assume that the design of the trial precluded the possibility of an observer being biased for or against any particular drug, one observer might have made subjective errors so that his results were unreliable. The probability that two independent observers would both repeatedly make the same subjective errors in the conditions of this study is small. If agreement is found between the assessments of two independent observers watching the same event the results can therefore be taken as reasonably reliable.

Table III is an attempt to show the extent of agreement between two such observers. There is close agreement between observers in grading calm or turbulent children, but E. M. W. showed a tendency to place the children on entry to the theatre in a higher grade than A. C. K. This tendency, however, was not maintained at the second grading,

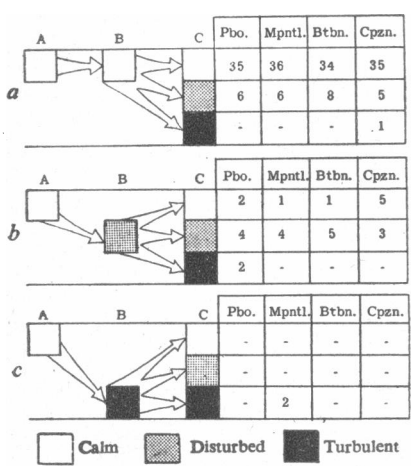

FIG. 4.—Subsequent behaviour of children graded calm on arrival at the waiting-room. A, B, C=times of grading as in Figs. 2 and 5. Pbo.=placebo; Mpntl.=methylpentynol; Btbn.=butobarbitone; Cpzn.=chlorpromazine.

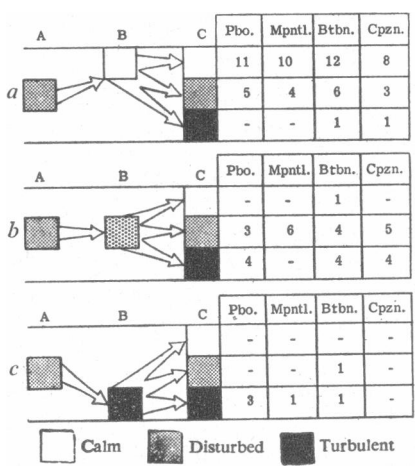

FIG. 5.—Subsequent behaviour of children graded disturbed on arrival at the waiting-room. Explanations as in legend to Fig. 4.

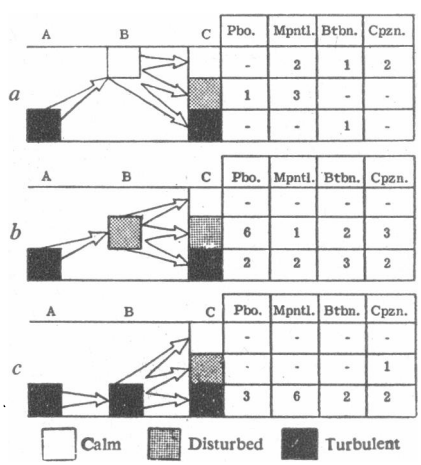

FIG. 6.—Subsequent behaviour of children graded turbulent on arrival at the waiting-room. Explanations as in legend to Fig. 4.

and the differences were small in proportion to the agreements, and varied evenly on either side. Where disagreements occurred they were distributed evenly among the treatment groups.

We do not feel that the disagreements were serious enough to invalidate the method. When the observations of E. M. W. were analysed in the same way as A. C. K.'s in Fig. 3, the distribution of behaviour was the same.

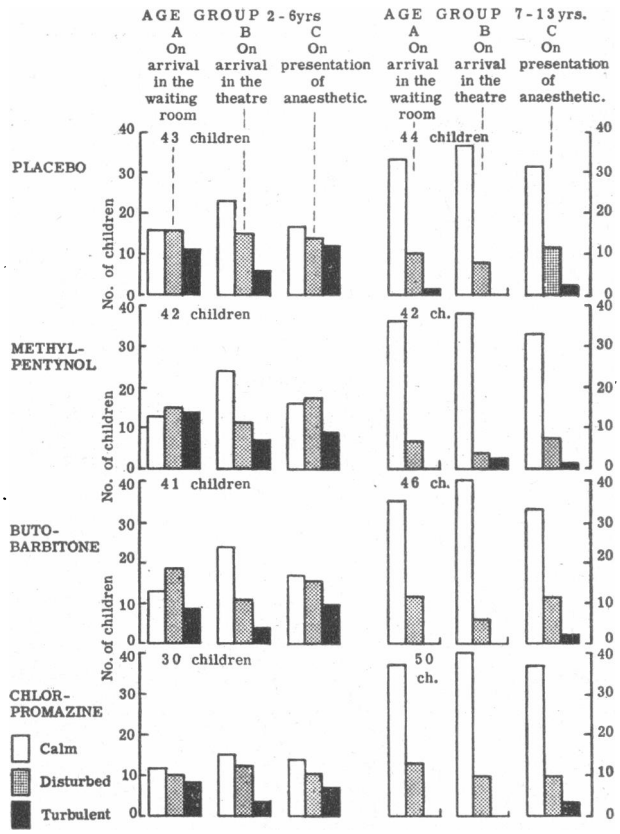

FIG. 7.—Behaviour shown by the younger and the older children before general anaesthesia.

TABLE III.—*Comparison of Findings of Two Observers who were Assessing the Behaviour of* 390 *Children About to be Anaesthetized. The Percentage Occurrence of Agreements and Disagreements Between the Observers are Shown, Taking A. C. K.'s Assessments as the Baseline. Agreements are Shown in Bold Type*

A. C. K.'s Observations		How E. M. W. Graded the Same Children		
Grading	No. of Children	Calm %	Disturbed %	Turbulent %
Observations at Child's Entry to the Theatre				
Calm	273	**99**	1	—
Disturbed ..	87	29	**63**	8
Turbulent ..	30	—	23	**77**
Observations at Beginning of Presentation of Anaesthetic				
Calm	222	**91**	9	—
Disturbed ..	110	13	**77**	10
Turbulent ..	58	—	21	**79**

Recovery Period

Careful attention was paid by the nurse in charge of the recovery room to any unusual behaviour on the part of the patients throughout the trial. There was no evidence that the medication either caused any unusual behaviour or delayed their recovery to a stage when they were fit to leave the hospital.

Discussion

The absence of any measurable effect on behaviour in the medicated children may be due to various causes.

Firstly, dosage may be a critical factor. The distributors of methylpentynol recommended in their advisory leaflets that for pre-anaesthetic medication a child of 5 years of age should receive 250 mg. This age group proved almost modal for the children with whom we had to deal and this standard was accordingly taken as a basis. If a child of 5 years weighs, on an average, a little less than 3 stone (19 kg.) (Sutcliffe and Canham, 1950), then the dose adopted was worked out at 75 mg. per stone (11.8 mg. per kg.) of body weight. For butobarbitone no recognized figure was available. 30 to 40 mg. per stone of body weight is employed for full basal narcosis—a state to which it would be dangerous to proceed with ambulant out-patients. 20 mg. per stone (3.1 mg. per kg.) of body weight appeared to be about the largest dose which could be given under these circumstances. The fact that there was no evidence of excessive sleepiness in the children receiving this drug suggests that more might have been given. The problem with a barbiturate of this sort, however, is to settle on a dose which achieves sedation without at the same time impairing co-operation. The danger of restlessness with butobarbitone described by some authorities (Lucas, 1954) served as a further caution against the use of this drug, though fortunately we did not encounter this complication.

For chlorpromazine there was no precedent. The dose of 5 mg. per stone (0.8 mg. per kg.) of body weight was used for the trial proper, at which level no undesirable side-effects were seen.

That the doses used in this trial, particularly of methylpentynol and chlorpromazine, were inadequate is a possible criticism. But other workers (Trotter, 1953) have claimed undoubted success, at least with methylpentynol, at a dosage no greater than that which we followed.

Absorption of the drug must also be taken into account. Data relating to those children who received their medication less than 15 minutes before the induction of anaesthesia were excluded from consideration. As the drugs were all administered in fluid form on an empty stomach, reasonable absorption should have taken place by this time, allowing for the excitement due to the occasion. The manufacturers of methylpentynol have stated, moreover, that 10 to 20 minutes before operation is an adequate interval.

To be examined also are the standards of assessment by which the behaviour was judged. They may not have been sufficiently delicate or precise. Yet by reference to these standards a contrast in behaviour between the various age groups was strikingly demonstrated, while the findings of the two independent observers closely agreed. The criteria were therefore adequate in certain respects, and it is clear that by such yardsticks, whatever changes may have been brought about among the younger children, these were never sufficient to give them the poise of the more mature subjects.

It is clear that, within the conditions of this trial, methylpentynol, butobarbitone, and chlorpromazine could not be distinguished from a placebo by their effect on the behaviour of out-patient children about to undergo general anaesthesia for dental extractions. What, in fact, seems to be much more important than attempted pre-anaesthetic sedation by means of drugs is the age of the children concerned. Those over 6 behave in an almost unexceptionable manner, and for them premedication is almost unnecessary. From observations made in a clinical trial, a value may be ascribed to one or more drugs which, in fact, ought rather to be ascribed to age differences, unless these are carefully taken into account as well.

We would make it clear that our study has been concerned with behaviour—not anxiety. The latter is much more difficult to assess, and we wonder, for reasons already set out in the introduction to this paper, whether other workers are entitled to draw conclusions about anxiety when

often they have failed to appoint independent observers even of behaviour, and less still have they made thorough investigations into the psychological state of their patients. Our experience, we think, emphasizes the importance of design in a trial of this kind and draws attention to the paucity of evidence on which claims are made about drugs alleged to allay apprehension.

So far as overt conduct is concerned, we are of the opinion, from our present findings, that for children 6 years of age and over preliminary sedation before dental extractions undertaken with a general anaesthetic is usually unnecessary. Below this age any method of improving behaviour would be an advantage. Methylpentynol, butobarbitone, and chlorpromazine scarcely provide the answer, at least in the doses we used, and there is the risk that with higher doses side-effects might be manifest. Moreover, many "elixirs" are unpalatable, and often their administration may itself contribute to loss of confidence.

Summary

The case for the pre-operative sedation of children before general anaesthesia for dental operations as out-patients is examined.

The problem of assessing the effect of a pre-operative sedative drug is considered. A method of solving it by using a behaviour-grading process was evolved and tested.

Methylpentynol, butobarbitone, and chlorpromazine were selected as potentially useful premedicant drugs.

Using the "double blind" technique and our method of assessment, a pilot trial and a major trial of these three drugs were carried out within the framework of the routine dental gas session in Guy's Hospital.

A very marked difference was shown between the patterns of behaviour of the older and the younger children.

None of the three drugs could be distinguished from a placebo by their effect on the behaviour of the children about to be anaesthetized.

Possible explanations of this negative result are discussed.

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CARDIAC ARREST DURING TRICHLORETHYLENE ANAESTHESIA

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In this country trichlorethylene is widely used as an anaesthetic or analgesic agent. Many regard it as suitable for almost all types of surgery (Ostlere, 1953). Its value lies in providing a non-inflammable supplement to nitrous oxide and oxygen, enabling light anaesthesia to be produced without restriction of oxygen. Although bearing some resemblance to chloroform, it appears to lack the dangers of this drug. In particular, despite its widespread use, primary cardiac failure during trichlorethylene anaesthesia has seldom been reported.

Such a mishap, however, occurred recently in this hospital. Discussion of this case has brought to light several similar unpublished episodes which we feel will be of interest to all who have occasion to use this drug.

Survey of Literature

Twenty cases of cardiac arrest during trichlorethylene anaesthesia have been reviewed by Ostlere (1953). In only three of these is he prepared to incriminate trichlorethylene —namely the cases originally reported by Haworth and Duff (1943), de Soldenhoff (1949), and Rait Smith (personal communication to Ostlere).

Details of the second case illustrate the characteristic features. The patient was a healthy young girl undergoing tonsil dissection. The premedication was morphine ⅛ gr. (11 mg.), and atropine 1/100 gr. (0.65 mg.). Anaesthesia was maintained by endotracheal nitrous oxide, oxygen, and trichlorethylene. Anoxia and respiratory obstruction were absent. In the course of the operation the pulse was noted to be mildly irregular, and almost immediately after this cardiac and respiratory arrest occurred. Resuscitative measures, including cardiac massage, were of no avail.

Another five cases of Ostlere's series are sufficiently similar to the above to merit further consideration.

1. Hewer and Hadfield (1941) reported the death of a young adult operated on for drainage of empyema under nitrous oxide, oxygen, and trichlorethylene anaesthesia. Cardiac arrest occurred during skin closure. As this was the first fatality of its kind reported during trichlorethylene anaesthesia it is not surprising that Hewer should look elsewhere for the cause of death. The suggested alternative of air embolism seems hardly justified in view of the post-mortem findings. Now, fifteen years later, this would appear to be a case of primary cardiac failure similar to that described above.

2. Stout (1951) reported a case of forequarter amputation in a 37-year-old man under thiopentone and endotracheal nitrous oxide, oxygen, and trichlorethylene anaesthesia. Cardiac and respiratory arrest occurred suddenly after 15 minutes of surgery. Ostlere describes this as a case of "forequarter amputation without transfusion" and states that "shock and haemorrhage seem the more likely causes [of death]": this in spite of the fact that Stout in his report states, "Progressive onset of shock was absent. One pint of

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