Clinical and other Notes

EVIPAN SODIUM INTRAVENOUS ANÆSTHESIA.
A REPORT ON FIFTY TRIAL CASES.

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I was privileged by the War Office to try out this new preparation of Bayer Products, Ltd., for short anaesthesia. The first administration was carried out on August 5, 1933, and this barbiturate has since been used for all short operations at the Royal Victoria Hospital, Netley.

The fifty trial cases were made up as follows:

- Tonsillectomy, antrostomy (maxillary) and drainage of frontal sinuses, turbinotomy..... 37 cases
- *T.B. abscess sternum (removal of sequestrum and drainage)..... 1 case
- Cyst chest (cysticercus). Excision..... 1 case
- †Sebaceous cyst (supra-orbital). Removal..... 1 case
- Groin abscess. Incision and drainage..... 1 case
- Varicoccele. Radical cure..... 1 case
- Necrosis, terminal phalanx, index finger. Removal..... 1 case
- Multiple fractures inferior maxilla. (Extraction of teeth and taking dental impressions)..... 2 cases
- Foreign body hand (steel wire)..... 1 case
- Incomplete abortion. (Dilatation and curettage)..... 1 case
- Perineal cyst. Excision..... 1 case
- Cystoscopy..... 1 case
- ‡Sigmoidoscopy..... 1 case

Total 50 cases

Six cases were not prepared in any way prior to the operation; some of these had breakfast as usual.

Six cases (tonsils and adenoids) were given $\frac{1}{4}$ grain atropine twenty minutes prior to operation.

Six cases were given alopec $\frac{1}{6}$ grain + scopolamine $\frac{3}{15}$ grain one hour prior to operation.

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There was only one failure; case marked * and this patient had on a previous occasion been given $N_2O$ and was found to be gas resistant. The operation was carried out, however, by the addition of $N_2O + O_2$.

The case marked † was operated upon under peracine spinal anaesthesis for an inguinal hernia, and at the termination was given evipan sodium, ten-cubic centimetres. There was no subsequent fall in blood-pressure nor any effect on respiratory function and he made a normal recovery.

The case marked ‡ had, in addition to $\frac{1}{6}$ grain alopec + $\frac{3}{15}$ grain scopolamine, twenty minims of tinct. opii. by the mouth a few minutes before coming to the theatre. This case remained anaesthetized for a period of forty minutes.
In three of the cases an additional anaesthetic was contra-indicated: one was a case of active tuberculosis of the lungs with a dry cough, and two were multiple fractures with displacement of the inferior maxilla with septic mouths, oedema of the tongue, lips and neck, owing to contusion and haemorrhage.

The smallest dose given in this series was 5 cubic centimetres and the largest 12 cubic centimetres. One case was given 5 cubic centimetres as an initial dose and a further 5 cubic centimetres at the expiry of seven minutes with a satisfactory prolongation of anaesthesia.

A few notes on evipan sodium may not be out of place:

Evipan sodium is the sodium salt of N-methyl-C-C-cyclo-hexenyl-methyl barbituric acid and dissolves freely in water, but this watery solution is not stable after an hour or so. It is another member of the group of barbituric compounds of which veronal, luminal, phanodorm and prominal are members; some noted for their narcotic and sedative action, others for their anti-epileptic action. The action of evipan sodium by intravenous injection seems to open up a new path for investigation as to the nature of anaesthesia, whether blood-borne by action on nerve cells, by virtue of fat or water solubility. It is a well-recognized fact that the effects of the barbiturates depend on their fat and water solubilities (Overton and Mayer). The action of these drugs is not considered to be a chemical one as they are too stable to undergo a chemical change in the short period preceding narcosis. The ratio of fat and water solubilities is known as the partition co-efficient "K" which measures the ratio of the concentration in the blood and in the fat of the nerve-cells. The pharmacological action is considered to be physical in kind, that is to say, absorption by the cell wall with consequent interference with normal cell functions. This co-efficient "K" is only an indication of the type of the narcosis produced, the quantitative effect depends upon the rate of destruction or elimination of the drug.

**Dosage.**

The regulation of dosage, as outlined in the "Technique of Evipan Sodium Narcosis" recommended by Bayer Products was followed in the first 15 cases: viz., exact observation of the patient during the injection and maintaining a constant rate of injection (one cubic centimetre in fifteen seconds) till the patient falls asleep and then injecting a further similar amount; that is to say if the patient falls asleep after 4 cubic centimetres then a further 4 cubic centimetres are injected making a total of 8 cubic centimetres. With subsequent cases observation of a constant rate of injection was not followed as it was found that a deeper and better anaesthesia was obtained by injecting the full 10 cubic centimetres in forty-five to sixty seconds, thereby ensuring a full fifteen to twenty minutes perfect anaesthesia. The patients are instructed to commence counting slowly aloud when they feel the needle prick and most cease before 45 is reached. Some go as far as 9 or 10, others between 30 and 40, and a
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few got to 55. A closed gag is placed between the teeth just before the injection into the vein is made. Soldiers and airmen require more than women or ordinary civilians, and it is for this reason that I have asked Messrs. Bayer if ampoules of 1·5 grammes of the powder could be supplied and would mix satisfactorily in the 10·5 cubic centimetre ampoules of distilled water. There would then be no necessity to prepare a second ampoule or to have to refill the syringe during an injection. No children have been anaesthetized in this series.

REMARKS.

Evipan sodium for intravenous anaesthesia is an excellent anaesthetic for operations that can be completed in fifteen minutes with certainty. The rapid onset of the anaesthesia, the simplicity of administration, the absence of any after-effects, and the great saving of time in induction should make this most recent barbiturate useful to dental surgeons, gynaecologists, and surgeons in military or civil practice where a short anaesthesia is required.

The rapidity of onset of complete anaesthesia is dramatic, some patients literally count themselves out. The onset of anaesthesia is signalled by a yawn, then a snore, and the anaesthetist has only to keep the airway clear by supporting the lower jaw and keeping the tongue from falling back into the pharynx. The period of anaesthesia varies with the dosage, but with an ordinary dose of ten cubic centimetres a full fifteen minutes can be relied upon provided no asphyxial symptoms have been allowed to occur prior to the commencement of the operation.

It is well to wait for two minutes after dissolving the powder in the ampoule with the distilled water to ensure solution and it is advantageous to wait for a minute or two after the injection has been completed if the patient is not fully relaxed.

The evipan sodium as supplied by Bayer Products Ltd., Africa House, Kingsway, London, W.C.2, is issued in powder form in ampoules of 1 gramme with an ampoule of 10·5 cubic centimetres distilled water. The powder is dissolved by adding 10 cubic centimetres distilled water by means of the syringe, and by emptying and refilling once or twice it becomes completely dissolved and ready for injecting. Any suitable vein is selected and the injection given as already described. It is better to have an assistant to hold the arm and forearm steady as occasionally the patient may twitch or move before the injection is completed.

EFFECTS AND AFTER-EFFECTS.

There is a slight quickening of the pulse-rate but this is only transient, the blood-pressure falls slightly for a short period and the respirations are less deep to begin with but gradually return to their normal depth. Slight twitching of the facial and other muscles has occurred in some cases, and jactitations of the limbs (upper and lower). The degree of muscular
relaxation varies. The pupils are dilated but react to light and the corneal and conjunctival reflexes disappear when full anaesthesia is reached.

In no case so far has there been any serious respiratory depression and the patient's colour has not altered. There are no unpleasant after-effects and the drug is rapidly detoxicated by the liver. It has been stated that a rabbit can decompose half the narcotic dose in thirteen minutes. There is no disturbance of the patient's mental state after the operation.

All the patients stated that they could not remember anything after the first prick of the needle and were quite unable to remember the number to which they counted. As evipan is not a volatile anaesthetic like ether the narcosis must be regarded as non-controllable but owing to its rapid detoxication by the body it is almost brought into line with a controllable anaesthetic. As in the case of many other anaesthetics when pushed too far, the respiration is the first system to be affected. Many of the cases in this series had been anaesthetized in other ways in other hospitals but all agree that they will ask for evipan in the future for short operations.

I am again greatly indebted to Major-General J. W. West, C.M.G., O.B.E., K.H.S., for his help, interest and valuable suggestions in the compilation of the report.

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**Travel.**

**ULM-VIENNA, 1900.**

BY MAJOR OSKAR TEICHMAN, D.S.O., M.C., T.D.

The Easter term was nearly over and we were in training for the Mays. It had been a good term, in those halcyon days when summer was always summer. Edward and I were sitting in his rooms above the eternally-closed great gate of Caius, discussing plans for a holiday abroad. Below us the King's Parade shimmered under the midday sun, and the horses in the hansom rank stood listless and apathetic. The raucous cry of a passing newsboy proclaimed that Lord Roberts had entered Pretoria; but this news left us cold as Mafeking had been relieved a few weeks previously and been followed by a gigantic bonfire in the Market Place fed with the shutters of long-suffering Cambridge tradesmen. For weeks we had been keyed up to a pitch of excitement by the siege of Mafeking, as evinced by the rustle of newspapers during our daily ten o'clock lecture—and now the occupation of Pretoria was somewhat of an anti-climax.

"I should like to explore one of the great rivers of Europe," remarked Edward.

Various rivers were discussed. The Seine was too short, the Rhone too rapid, the Volga too far away.