

"NEW" DRUGS

Recent Advances in Pharmacology and Therapeutics

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Unless one is specializing in the field of pharmacology, critical appraisal of new drugs is difficult or impossible. There are fashions in clothes: that which is popular today may be discarded or replaced tomorrow. In the final analysis the pharmacologist is not the one who sets these fashions. for his rôle is the study of the physiological and toxic effects of chemicals on animals. It is the physician who must exercise his judgment in the selection of a drug for a specific purpose in a specific patient, and, especially in hospital practice, it is the nurse who sees the minute by minute effects and any toxic reactions. Therefore, the nurse as well as the doctor should know new drugs, their purpose, and, in particular, any toxic manifestations that they may cause.

Sulphanilamide. The most important advance in chemotherapy, since Ehrlich introduced the trivalent arsenicals (arsphenamine and its derivatives) for the treatment of syphilis, is the use of sulphanilamide and related drugs in the chemotherapy of coccal infections. Undoubtedly there will be an increasing number of sulphanilamide-like compounds that will be exploited by pharmaceutical houses, and, from the present trend of accumulating knowledge as to their effectiveness in coccal diseases, their place in therapy is more apt to be broadened than restricted in the next few years. It is especially important that their toxic manifestations be recognized, since some of them imply a fatal outcome for the patient.

Vitamin B Complex. Studies on the vitamins, their actions, chemical composition, and synthesis have absorbed the time of numerous workers in many laboratories in recent years. The various constituents of the vitamin B complex have been fairly well segregated and the clinical usefulness of thiamin chloride (vitamin B1) and nicotinic acid (P-P factor) recognized.

Vitamin B1 has been isolated, its chemical structure determined and its synthesis accomplished. Chemically it is called thiamin chloride. It prevents beriberi in man and polyneuritis in animals. The average daily requirement of vitamin B1 is the equivalent of 3.0 milligrams of thiamin chloride. Actually the average American diet does not contain this amount. The usual dose range is from 3.0 to 15.0 milligrams given either orally or parenterally. There are no toxic symptoms in ordinary dosages. Repeated small doses are more effective than single massive doses. Indications are the symptoms of either polyneuritis or beriberi.

Nicotinic acid is the so called P-P factor of the vitamin B complex that prevents pellagra in man and black tongue in dogs.

The disappearance of the beefy soreness of the tongue in pellagra is prompt and dramatic. The optimum dose is not known definitely as yet but apparently lies between 50.0 and 500.0 milligrams daily (either orally or parenterally), depending on the severity of of pellagra in any given patient. The only uncomfortable symptoms are flushing of the face and feeling of warmth. There may be epigastric burning, relieved by water. There are reports of 2,000.0 milligrams having been given daily without any severe toxic symptoms.

The persistence of symptoms in patients with beriberi, polyneuritis or pellagra indicates one of two things: either that there are multiple and inadequately treated nutritional deficiencies or that there is residual damage to the nervous system which is irreparable.

Sex Hormones. Only preparations of the follicular hormone of the ovary have been accepted by the Council on Pharmacy and Chemistry of the American Medical Association. These are estrone or theelin and estriol or theelol. These two substances are very closely related chemically. Estrone is injected intramuscularly, but is effective orally in large doses, while estriol is administered only by mouth.

Estrone is used to treat the symptoms of the menopause (dose 0.2 to 1.0 milligram weekly), kraurosis vulvae (in doses up to 5.0 milligrams weekly), and gonorrheal vaginitis in children (0.02 to 0.2 milligram daily). The main untoward effects of the drug are those of bleeding in the menopause and painful breasts (probably from chronic cystic mastitis). Estrone may be given in vaginal suppositories for senile vaginitis.

Estriol is less active than estrone and its use is restricted to oral administration in the same conditions as described for estrone. The dose ranges from 0.06 to 0.12 milligram, one to four times daily.

A new synthetic estrogenic substance, stilbestrol, should be mentioned because of the considerable work which has been done with it. A preliminary report of the Council on Pharmacy and Chemistry has already been published. Stilbestrol is given orally or parenterally in doses of 0.1 to 5.0 milligrams daily. Different observers have found wide variation in the incidence of such toxic effects as nausea and vomiting. The desired effects of relief of the symptoms of hypogonadism are not disputed. The drug should be reserved for controlled clinical trial only at present.

Recent reports indicate that preparations of testosterone such as testosterone prionate and methyl testosterone may find a permanent usefulness in eunuchism of the pre-adolescent type.

It should be mentioned that a great number of inactive or inadequate preparations of the sex hormones have appeared on the market and will continue to do so. For this reason, only those accepted for 'New and Nonofficial Remedies' or the 'United States Pharmacopeia' should be considered for anything other than controlled experimental use.

NUTRITION

during Pregnancy

Horlicks is rich fresh milk modified by the addition of the nutritive extracts of malted barley and wheat. It contains a balanced rate of first-class body-building and energy-giving food elements, which make it a valuable addition to the diet of expectant and nursing mothers.

It is generally recognised that many cases of morning sickness can be prevented or relieved by modifying the diet and Horlicks is a useful food for this purpose. A Doctor writes :—

"My patients, while suffering from sickness during pregnancy, find Horlicks of the greatest help to them."



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HORLICKS

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Phenylalkylamines. These are the epinephrine-like compounds. There has been an attempt on the part of the investigators to find epinephrine-like drugs which will have a more selective action on various parts of the sympathetic nervous system, such as a drug that will relax the bronchi without raising blood pressure or stimulating the central nervous system, as does epinephrine itself. Several of these drugs have been accepted by the Council on Pharmacy and Chemistry.

Neosynephrin hydrochloride is employed particularly as an agent to shrink the nasal membrane, usually in a 0.25 to 1.0 per cent. solution. While it is an adequate vaso-constrictor, its action is not so strong as epinephrine and there is therefore less after-reaction. The stimulating effects on the central nervous system are also less than those of epinephrine.

Propadrine hydrochloride has been substituted for ephedrine (in the same dosage) in the prevention of asthmatic attacks. Experimentally, the duration of its action in relaxing bronchial muscles is longer. Propadrine stimulates the central nervous system less than ephedrine.

Benzedrine produces the same local effects as ephedrine, either as a spray in 1.0 per cent. solution or as an inhalant. Benzedrine sulphate has been successful in the treatment of narcolepsy, in doses of 5.0 to 20.0 milligrams per day orally, because of its central stimulating action. It has also been used in hypotension. This drug is contraindicated in hypertension and cardiovascular disease and should not be used as a sleep-preventing drug unless prescribed by a physician. One death has been reported in which benzedrine may be partially indicted.

Insulin. The advantages of a long-acting insulin for the treatment of diabetes mellitus are readily appreciated. If the diabetic can be controlled by one or two injections of insulin daily, rather than four or five, and his blood sugar levels are maintained nearer to normal levels, then the stabilization of the patient becomes a much simpler problem. Protamine zinc insulin has its greatest effect in lowering the blood sugar in twelve to twenty-four hours after its injection. It has been shown that in most diabetics, not only the number of injections but also the total number of units of insulin needed per day are decreased when protamine zinc insulin is substituted for regular insulin. Protamine zinc insulin is usually injected subcutaneously in the morning one-half to one-and-one-half hours before breakfast. Hypoglycemic reactions occur at a longer interval after injection than with regular insulin and are more insidious in character. Since these reactions occur frequently at night, the patient should be watched carefully during the early days of his regulations with protamine.

Crystalline insulin or crystalline zinc insulin has a longer action than regular insulin but a shorter action than protamine zinc insulin. Clinical trials have been favourable, but the Council on Pharmacy and Chemistry has not yet accepted this drug for 'New and Nonofficial Remedies.'

Oxygen Therapy. The rational use of oxygen has become general during the past ten years, and more adequate apparatus has been developed which is cheaper for the patient and easier to manipulate and control. The use of oxygen tents is to be deplored unless the oxygen content of the tent is measured frequently; unfortunately, most private hospitals and even some teaching hospitals do not require the interns and nurses to do this. Because of leakage of the oxygen around the mattress and bed, it is often difficult to maintain an oxygen concentration of forty per cent., and yet concentrations lower than this are of little or no benefit to the patient. If the respirations become deeper and more rapid without cyanosis, the soda lime is probably exhausted and is not removing carbon dioxide efficiently. The soda lime should be changed as noted in the directions accompanying oxygen tents. More convenient methods of oxygen administration to adults are by nasal catheter, Bullowa tube or the mask developed by Boothby and others.

An interesting application of oxygen therapy is in the treatment of migrainous headaches, although data are not yet extensive enough to warrant definite conclusions as to its effectiveness in comparison with such other drugs as ergotamine tartrate. In this condition, it is necessary apparently to administer a hundred per cent. oxygen rather than the usual forty to sixty per cent.

Carbon Dioxide Therapy. It has been shown that seven-and-a-half per cent. carbon dioxide produces a maximum increment in respiratory volume. In concentrations over ten per cent., carbon dioxide acts as an anaesthetic drug, depressing the central nervous system including the respiratory centre. Many hospitals still use thirty per cent. carbon dioxide with seventy per cent. oxygen for resuscitation and for post-operative patients—probably because "if a little is good, a lot should be better." More than ten per cent. carbon dioxide is not only disagreeable for the patient but may be harmful rather than beneficial.

Summary

It is impossible in any brief paper to cover more than a few new drugs or methods of therapy. Nurses as well as physicians should realize that one of the important subdivisions of the American Medical Association is the Council on Pharmacy and Chemistry. As acceptable new drugs are introduced, the Council, in the *Journal of the American Medical Association*, reports upon them. Each year, those accepted are discussed in *New and Non-official Remedies*. This volume should be in the library of or available to every nurse.

By courtesy of *The American Journal of Nursing*
