

General, this bureau has served only certain Western districts of London. The new milk bank at Cardiff, which the municipal authorities have installed on the London pattern, will despatch human milk over long distances.

Other cities and towns in Britain are expected to follow this example shortly, and every new milk bank opened will be a further step to combat the infant mortality rate.

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Chemotherapy

(Reprinted from the "Nursing Mirror".)

The Sulphonamides :

The sulphonamides were developed from the discovery of a German chemist, between the two wars, that a red dye—prontosil rubrum—was harmful to bacteria. More important, that its action, when given systematically to an infected animal, was greater than in test-tubes, and it was a selective action, since it did not harm the tissues. Thus, its qualities approached those of the ideal antiseptics mentioned in our last article, with this difference. Whereas ordinary antiseptics are most efficient in the laboratory and are hampered by the presence of living tissue, the combination of sulphonamides and tissues is more effective than either alone. Thus, the sulphonamides cannot be antiseptics in the ordinary sense. How, then do they work? They have been well described as bacteriostatic, i. e., as slowing up the vital processes of the bacteria. This they do by so interfering with their respiratory and digestive powers that the organisms either die of inanition or fall easy victims to the natural defences of the body. This is why the sulphonamides work better inside the body than outside it. It is as if by some means, a burglar could be paralysed during his marauding and held helplessly until the householder called in a policeman to make the final arrest.

From the original prontosil we have evolved very many new sulphonamides, all possessing the basically similar chemical linkage. Each tends to be particularly effective against a certain group of bacteria, but this is largely due to the fact that they dissolve to varying extents in the body fluids. Thus sulphathiazole, given by mouth, dissolves, and is absorbed so readily thus it is active against staphylococci anywhere in the body that the blood-stream carries it. On the other hand, sulphasuxidine is practically insoluble, and, because it reaches the large bowel unabsorbed, it is particularly useful in cleansing the colon and making operations in the region safer.

Blood Level must be maintained :

The drugs are used to deal either with a generalised septicaemia or pyaemia, or a local inflammation like osteomyelitis or pneumonia. It is nearly always necessary to achieve systematic diffusion throughout the blood-stream, through administration by mouth or by injection; in a few cases this is supplemented by local applications, and in still fewer cases the local use of the agent suffices. The efficiency of the drug at any site, whether bone, lung or other organ, depends, therefore, on how much is dissolved in the blood reaching the part, i. e., there is a certain concentration, or blood level, which must be reached if we are to tackle the infection properly. Now each time we give a couple of tablets by mouth, or a gramme by injection, the dose is fairly rapidly absorbed, and boosts

up the blood level. But it is also rapidly lost in the urine, and, in order to produce a blood level which is always high enough, frequent administration is needed, usually at four-hourly intervals. On beginning treatment, we aim at building up the right level quickly by giving, say, two grammes and repeating this after two hours, and then continuing at the standard rate of one gramme four-hourly. Why is it so important not to allow the blood level to fall? Not only does too small a dose lessen the antibacterial effect, but it may enable the organisms to get used to the drug and survive with an acquired resistance to it. When they have become "Sulphonamide fast" in this way, they have become unsusceptible to normal dosage and much more difficult to deal with, and they may spread from patient to patient and retain this immunity. It is as if our burglar had managed to wriggle free and had become too wily to be caught again. This is why we have to be so careful to give every dose regularly. The 2 a. m. dose must not be omitted because a very ill patient has at last fallen asleep, for this is a mistaken kindness. And it is important to see that the tablets are retained, and not rejected because of their unpleasant taste. Not only do children spit them out and need persuading with firmness—or jam—many adults conceal them if given the chance. Nausea and vomiting may lead to the loss of a considerable proportion of the dosage, and this must always be reported, for it may make injection treatment advisable.

Nursing of Complications :

Other nursing points are connected with the dangerous complications sometimes seen. The major risk is of renal failure. This is due to precipitation of crystals of the drug in the kidney tubules when the fluid intake is so inadequate as to make the urinary output too small to keep the whole quantity dissolved. The precipitate irritates and damages the kidney, still further limits urine formation, and may lead to complete anuria and death in uræmia. The risk is much greater, therefore, with the less soluble drugs like sulphapyridine than the easily-dissolved sulphadiazine and sulphamezathine. A dram of bicarbonate with each dose increases the solubility.

The necessary precautions are (i) See that the patient has enough fluid. A safe rule is six pints in the 24 hours, and no patient on this regime will have urinary difficulties, unless he has an additional fluid loss from, say a burned surface or an enterostomy, which is not being compensated. A glass of water with each dose, and another between doses, is the amount required in normal cases. (ii) Keep an accurate chart of fluid intake and urinary output. If the intake is steady, a falling output is one of the first signs of trouble. (iii) Look out for blood, or bloodstained crystalline deposit, in the urine specimen. It is important also to realise how rapidly a raw surface can absorb sulphonamides when applied locally. It may easily happen that an over-liberal powdering of an extensive burned area leads to an excessive blood level, and to renal failure, and this is particularly so in children, for these have a larger surface area in relation to their body weight than adults. Local applications must always be made sparingly, and with due regard to the dosage, if any, that is being given by mouth. The other danger is agranulocytosis, an often fatal disappearance of the granular leucocytes of the blood, and the first signs of this may be apparent to nursing observation—increasing weakness, severe sore throat, or skin hæmorrhage.

Patients often have irritant skin rashes which need soothing applications. Occasionally there is gross mental disturbance, with mania or delirium. It is very common for the individual on a course of the drug to become depressed and sleepless, with loss of appetite. He needs tactful, firm handling and cheering-up and sedatives should not be spared at night.