may be misinterpreted. It is perhaps not understood that screen examinations are totally objective and that the radiologist must achieve accurate diagnosis with minimal screening time, any unnecessary prolongation of which increases radiation hazards to both patient and radiologist. It is also perhaps not appreciated that he does not see actual lesions, but a multiplicity of shadows which are dim, superimposed, and constantly mobile. From these he must make his diagnosis, his task being further complicated by innumerable variations of obesity, anatomy, physiology, and post-surgical appearances, and made more difficult if the patient is weak, deaf, or arthritic. A conscientious radiologist focusing his attention on the internal problems of his patient cannot be discursive.

Patient's Welfare

During our review we became increasingly aware of the need to have some member of the departmental staff responsible in a general sense for the patients' welfare. Though relevant to most hospital departments it is of particular importance in a radiology department because x-ray examinations are so far removed from a patient's everyday experience. Secretarial staff are preoccupied with office routine, thinking of the patient mainly in terms of filing data. Radiographers are preoccupied by radiographic techniques, thinking of their patients mainly in these terms. In present circumstances overall personal care

of the patient falls into no man's land. We believe that there is a case for a special receptionist who should correlate patients' and departmental needs, provide a bridge of communication, and also liaison between outpatients and admission services, so that admissions for radiological investigations could be regulated to save the time of the patient and wastage of bed occupancy (Ministry of Health, 1967; Samuel, 1968).

Though restricted to relatively low numbers because of the limited opportunities to extend our survey in a busy department, nevertheless our findings strongly support the observations and recommendations of the Cohen Committee (Ministry of Health, 1963).

Industry can teach us a lot about public relations, which we tend to neglect because we have no profit motive, no obvious immediate medical gain, and limited staff. It is easy but pernicious to accept uncritically practices of the past as standards for the future. There is plenty of room for new thinking.

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Practical Method of Drug Administration in a Peripheral Hospital

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Summary: A system to reduce the dangers of drug-prescribing and administration has been evolved in the County Hospital, Hereford. Prescribing regulations have been designed which aim to reduce the possibility of error, and the prescription sheets virtually never leave the ward when in use. A copy of the prescription sheet, known as the pharmacy card, is sent to the pharmacy when new drugs or further supplies are required. The chief pharmacist has been able under the system to maintain supervision of safety in the use of drugs.

Numerous reports have been published of the dangers of certain practices in hospital drug-prescribing during the past 10 years (Ministry of Health, 1958; Trillwood, 1959; Barker and McConnell, 1962; Crooks *et al.*, 1965; Vere, 1965; Wallace, 1965). Two major attempts have been made to try to combat these dangers and also to provide further information about them, the one in Aberdeen described by Crooks *et al.* (1965, 1966-7) and the other in the London Hospitals by Vere (1965, 1966-7).

Many features of the Aberdeen and London Hospital schemes have been incorporated in the Hereford system, which has made particular use of the Aberdeen analysis of safety (Crooks *et al.*, 1965) and has been designed entirely with a view to safety and convenience.

Crooks *et al.* (1965) point out the advantages of a clinical pharmacist, and it is an attractive proposition, particularly in that it facilitates the passage of information between the medical

and the pharmacy staff. However, there are some possible disadvantages. It is less economic to run, in terms of staffing, than a centralized service, and most hospital pharmacies are already understaffed and working under considerable pressure. Also, the chief pharmacist is the person in his department most closely in touch with information about drugs, their relative efficacy, toxicity, alone and in combination with other drugs, side-effects, and cost, and can be of invaluable assistance to clinicians in these fields. He also forms a vital link between such a body as the hospital infections committee—perhaps outlining, for instance, important recommendations on antibiotic therapy—and his staff. It is felt that, in peripheral hospitals in particular, any loss of contact between the chief pharmacist and his staff is to be avoided where possible, and, furthermore, liaison between the medical staff and the chief pharmacist should be as close as possible.

Hereford System

One of the greatest problems in designing the Hereford system has been to reconcile a central pharmacy, which it is felt cannot at the moment be avoided even if this were desirable, with the principle that the patients' prescription sheets should never leave the ward. The scheme described below has provided a reasonably satisfactory solution. It should also be pointed out that it is the policy in the Hereford Hospitals Group to keep only very limited drug stocks on the wards.

Kardex steel desk units equipped with 38 pockets for 10 by 8 in. (25 by 20 cm.) cards are used to hold the patients' pre-

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scription sheets. Two similarly printed sheets (Fig. 1) are kept in each pocket, the upper being of N.C.R. Conqueror stock CB/81 (hereafter referred to as "prescription sheet") and the underlying being of sturdier N.C.R. CF 173 Tag Board (hereafter referred to as "pharmacy card"). The latter forms a copy of the patient's prescriptions which normally lies under the prescription sheet in the Kardex unit, but goes to the pharmacy when new drugs or further supplies are required. If this card is away from the ward when a fresh prescription is written it will be filled in on its return, but at least the nurse will use only the prescription sheet for drug administration. Medical and nursing staff are asked to comply with the following prescribing regulations.

Date Commenced: Whenever possible the starting date should be the date on which the prescription is signed.

Drugs: All drugs must be prescribed and signed by a doctor. If the pharmacy card is away when the ward prescribing is done, it must be filled in as soon as possible after its return to the ward. Whenever possible the pharmacopoeial name should be used and be always printed in capitals. No alterations will be allowed. Drugs for once only administration are prescribed in the lowest quarter of the sheet beginning opposite 22 on the bottom line. In this area of the card each line represents prescribing for 24 hours only.

Dose: The metric system will be used.

Times of Administration: These will be marked in the appropriate box with an X; thus when a drug in the "once only" area is administered it must be initialised by the nurse. When it is necessary to prescribe a drug "as required" the maximum frequency—e.g., four-hourly or six-hourly—must be inserted in the appropriate box. The "as required" administration checking card is for nursing use only. The date should be entered, the number opposite the drug administered on the prescribing card, then entered in a small square under the appropriate hour, and the fact initialled by the nurse in the larger square.

Method of Administration: The only abbreviations to be used will be: I.V.=intravenous; T.O.P.=topical; I.M.=intramuscular; P.R.=per rectum; S.C.=subcutaneous; I.N.H.A.L.=inhalation; S.L.=sublingual. Oral and other routes of administration should be written in full.

Duration: The number of days over which it is intended to administer the drugs should be entered. If this is not known INDEF should be entered.

Signature: The first signature should be in full, subsequently initials will suffice.

Discontinued: When a drug is discontinued a line should be ruled through it in red ink and the date column completed and initialled.

DRUGS ON DISCHARGE: Prescriptions to be made out as above on reverse side of pharmacy card.

N.B.—Corticosteroid therapy should be recognized by a cross in the top left-hand box and any drugs to which the patient is hypersensitive inserted in the other boxes.

The regulations reveal some of the reasons behind this particular design of prescription sheet, but there are some points which require further explanation.

The prescription sheet is divided horizontally into as few compartments as possible to avoid wastage of lines, and for the same reason is as economic in vertical space as possible. To be a success the sheets must not increase the doctor's work unduly, and with this design only 7% of our patients require a second sheet. When a prescription sheet is filled, the whole of the patient's current therapy has to be entered on a new sheet with its underlying card. The previous card is maintained in the same pocket under the fresh card. It goes to the pharmacy with the new card, because of the information it contains about previous supplies, until it is no longer useful. In a further attempt to prolong the life of the first prescription sheet drugs for "one day only" administration are entered from the bottom of the card upwards so that ordinary prescriptions can be continued down into this section if there is room. The "one day only" section is worth while maintaining for the following reasons. The prescriptions in this section are often for D.D.A. categorized drugs, and frequently have to be given at specific times. Sometimes the time of administration requires slight extra qualification, though additional writing on the sheet is kept to a minimum. Separation of prescriptions for such short usage from those for regular administration has accordingly been found beneficial, and has also helped to condense the prescriptions in current use, which the nurse surveys on her "drug round." Separate sections for oral and parenteral drugs are not considered necessary.

Times of drug administration are arranged to suit the nursing staff. It has been found best to make a large cross to the corners of the square as demonstrated in the prescribing regulations. Otherwise the ruled line crossing out treatment may miss the cross and the drug be administered inadvertently.

Unnecessary accumulation of drugs in the ward is discouraged, and, where possible, the recommended duration of administration is entered in days and INDEF is used as sparingly as possible. However, INDEF is very useful in avoiding repeated prescribing of the same drug with overquick filling of the prescription sheet, and there is an agreement between the pharmacist and the ward sister about the amount of the drug which will be supplied on such a prescription.

The "as required" column has introduced an extra problem in drug administration. There is no information on when the drug was last given, and a nurses' checking sheet is necessary (Fig. 2). Similar checking is thought to be unnecessary for the

CORTICOSTEROID		DRUG HYPERSENSITIVITY												WARD NAME			
		1				2				3							
REGULAR ADMINISTRATION																	
No.	Date Commenced	DRUG (Block Letters)	DOSE	TIMES								METHOD OF ADMIN.	Duration (Days)	AS REQ'D	SIGNATURE	DISCONTINUED	
				A.M. 6	A.M. 9	A.M. 11	P.M. 2	P.M. 5	P.M. 10	M.N. 12	OTHER TIMES					DATE	INITIALS
1																	
2																	
3																	
4																	
21																	
27		ONE DAY ONLY															
26																	
25																	
24																	
23																	
22																	
NAME		AGE		UNIT NUMBER		CONSULTANT											

FIG. 1.—Prescription sheet.

There is general approval of the system by physicians, surgeons, nurses, and pharmacists who have used it, the nurses being particularly enthusiastic. Nursing staff is frequently changing, and it is interesting to note the dismay now which a staff nurse expresses when she moves from a ward using the new system to one which has not yet adopted it. The night sisters have also specifically commended the system, which has made it so much clearer to them which patients are to receive drugs at 10 p.m. and 6 a.m. It is, however, only as good as the amount of care which is taken in its use, but it is time that the dangers and inadequacies of the drug prescribing and administration systems at present in use in a large number of British hospitals were fully appreciated. The major improvements noted in the new system in Hereford have been the adoption of a set of prescribing regulations insisting on legibility, the precise times for prescribing of drug administration,

The Kardex unit is normally kept in the duty room except when it is required in the ward either during drug administration or during a medical or surgical round. The benefit of availability of information about ward therapy in the duty

FIG. 2.—Nurses' administration checking sheet.

FIG. 3.—Prescriptions on discharge sheet.

and the fact that the prescription sheets virtually never leave the ward while they are in use. In arranging these improvements the pharmacist has maintained his supervision of the safety of drug usage. The system has evolved over a period of 18 months, through meetings between medical, nursing, and pharmacy staff, and it has been decided to extend the system to all the wards in the two major hospitals.

All change requires co-operative effort, and it is a pleasure to record our gratitude for help received from all quarters.

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NEW APPLIANCES

Punch for Biopsy Examination of Nerve Endings in Skin

Dr. ALAN RIDLEY, senior registrar, Neurological Unit, University College Hospital, London W.C.1, writes: Examination of cutaneous nerve endings obtained by skin biopsy offers a simple means of investigating peripheral nerve disorders. Punch biopsy of digital glabrous skin can be performed as an outpatient procedure with little distress to the patient and may yield useful information. Dickens, Winkelmann, and Mulder (1963) found the cholinesterase reaction of Meissner corpuscles to be of diagnostic value in peripheral neuropathy, and Ridley (1968) showed that silver staining of cutaneous endings could distinguish neuropathies due to the "dying-back" process (Cavanagh, 1964) from those caused by segmental demyelination. In both studies a 3-mm. skin biopsy specimen was taken from the lateral volar aspect of the terminal phalanx of the finger or toe. This site was chosen because Meissner corpuscles, which are the endings most easily counted, are numerous in this region.

The punch I used was manufactured by Southern Syringe Services Ltd.,* from specifications submitted by Mr. R. J. Horne, curator of instruments at the National Hospital for Nervous Diseases, Queen Square. It consisted of an 8-cm.-long stainless steel cylinder of 4 mm. external diameter and 3 mm. internal diameter, with a cutting edge at one end. The cutting edge was bevelled externally to prevent buckling against the hard outer layer of the skin. When not in use the cutting edge was protected by a brass stylet (Fig. 1). Biopsy specimens were taken in the following manner. After cleansing, the site was infiltrated with local anaesthetic, and the punch, held between the operator's thumb and index finger, was placed on the

skin with the cutting edge perpendicular to the surface. Firm pressure was applied and the punch was given a quick twist through

FIG. 2.—Wound immediately after taking biopsy specimen.

FIG. 3.—Healed scar three months after biopsy. The site is indicated by arrows.

360 degrees, thereby freeing a cone-shaped biopsy specimen the apex of which consisted of dermal tissue. The specimen was snipped free with fine scissors and a dry dressing applied. A suture was not needed and heal-

ing occurred in 7 to 10 days, leaving a barely perceptible scar (Figs. 2 and 3).

Biopsy specimens obtained in this way were usually satisfactory, but their small size and conical shape meant that very little dermis, which contains a rich plexus of somatic and autonomic nerves, was available for examination. It was subsequently found that by sharpening the other end of the needle with an internal bevel (Fig. 4), larger, less

FIG. 4.—Diagram of internally bevelled cutting edge.

conical specimens containing more dermis could be obtained, and healing still occurred satisfactorily without suturing. The internally bevelled cutting edge is protected by the screw cap of the stylet. The modified punch can be used in two ways: when only Meissner corpuscles are required the cutting edge with the external bevel is used; if dermal nerves are also to be studied the other end of the punch is used.

It is hoped that the punch described will prove useful to workers interested in exploring the field of cutaneous nerve biopsy.

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FIG. 1.—Bottom: Dermal punch with serrated barrel for gripping. Top: The stylet.

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