

It will be seen that not only does the cherry syrup yield a more pleasantly tasting dose, but it is clear, while the syrup of wild cherry is turbid from precipitation of codeine tannate.

Another comparison of interest is yielded by the following two prescriptions.

	R	Iron and Ammonium Citrate.....	5.0 Gm.
		Syrup of Wild Cherry, to make.....	60.0 cc.
and			
	R	Iron and Ammonium Citrate.....	5.0 Gm.
		Syrup of Cherry, to make.....	60.0 cc.

The former is ink, the latter is merely dark, and not unpalatable; though we believe the Syrup of Cinnamon (new formula) furnishes the better vehicle.

CONCLUSIONS.

1. We advocate a change in the preparation of the syrup of raspberry consisting in the introduction of 0.1 per cent of benzoic acid in the fruit juice undergoing depectinization.

2. We respectfully submit formulas for syrup of strawberry and syrup of cherry to consideration for admission by either the United States Pharmacopœia or the National Formulary.

3. In the preparation of these other fruit syrups we also find that the presence of 0.1 per cent benzoic acid is of value in the removal of pectin while preventing vinegar formation and other fermentations.

4. The syrup of cherry becomes much more highly flavored when it is made from the cherry juice that has been permitted to stand in contact with crushed cherry stones for several days, than if made without the maceration of the kernels.

5. Syrup of raspberry seems to form a particularly useful vehicle for anti-pyrine in small dosage; syrup of strawberry for sodium citrate and syrup of cherry for diluted hydrochloric acid.

HOSPITAL PHARMACY PRACTICE: AN INNOVATION.*

BY J. SOLON MORDELL.¹

In the latter part of 1925 a group of forty-five physicians and one pharmacist, members of the staff of the University Hospital and of the affiliated teaching hospitals of the College of Medicine, Syracuse University, embarked upon a program of rationalization of hospital drug therapy. This committee, representative of every branch of medical practice, and under the chairmanship of the Director of the Department of Pharmacology at the College of Medicine, was asked to investigate and to offer some organized plan to correct the existent drug situation.

Time, effort and finances were, and still are deservedly expended in improving diagnostic methods. Yet little interest has been shown in having drug treatment keep abreast of diagnostic progress. It was just such a problem which confronted this group in 1925. The condition was by no means a local one nor was it any

* Section on Practical Pharmacy and Dispensing, A. Ph. A., Washington, D. C., meeting, 1934.

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more serious than in other institutions. In many respects the movement was pioneer in nature and had little assistance in the way of precedent.

The efforts of this committee were consummated by the publication of the *Interns Handbook*.¹ This book, which includes a description of emergency medical and surgical procedures, presents as one of its important achievements a drug list which exhibits drugs of proved therapeutic value and those which are felt to be the most efficient of their respective groups. The list is unencumbered by drugs which duplicate one another's action. Selections were made from the *United States Pharmacopœia*, the *National Formulary*, *New and Nonofficial Remedies* and *Useful Drugs*. Each item gained its place after it had been considered meticulously from every standpoint. Whim and custom were brushed aside and replaced by a scientific, common-sense attitude. The list is outstanding because of the scarcity of so-called "specialties." Preparations of official drugs under fanciful names are absent, as are items whose formulas are secret. Digitalis, ergot, cresol solution, liquid petrolatum and a host of others are deemed efficient *per se*. No sympathy is extended to embellishments of these items and the exorbitant price premiums entailed. In the rare instances where specialties were approved for admission, it was for the reason that they possess unique value not available in other preparations. In no case were specialties considered unless accepted by the Council on Pharmacy and Chemistry of the American Medical Association; this, among other considerations, implies that formulas and standards are not secret. Similarly, wherever several manufacturers are bidding for the same item, preference is given to the product approved by the aforementioned Council.

The drugs are not grouped and classified according to therapeutic use, but listed alphabetically, by Latin title. The object was to induce a feeling of independence on the part of the prescriber in so far as application of the various drugs is concerned. It was felt that to suggest therapeutic uses would put prescribing on a cataloging basis and would discourage individual initiative in this respect.

The list of approved drugs included as a part of the material presented in the *Interns Handbook*, once officially adopted, laid the foundation for a reorganization of the entire system pertaining to the issuing of medicaments. It was not until 1929—four years after the establishment of the committee—that the *Handbook* was published and sold throughout the world. This wide distribution was possible because the material presented was not individualized to the group here but was made applicable for most hospitals. At this writing, the book is in process of revision.

During the four years of work on the original project, and for three years thereafter, the ground was being carefully prepared for reconstruction in the Pharmacy and throughout the hospital. After having secured the coöperation and sympathy of the heads of the various services, the work had to be done cautiously. A radical transplanting would have been disastrous to the whole plan. Each step had to be studied most carefully before it was put into operation. It should be noted that the guiding hand in all this work was that of a specialist in pharmacology, whose knowledge of drug markets as well as drugs is such as to make him constantly aware of the fads in medicine and to prompt him to assume a very critical attitude in all matters pertaining to the uses of drugs. Coöperation between a

¹ J. B. Lippincott Company, Philadelphia, Pa.

physician of this type, experienced in therapeutic problems, and a pharmacist possessing the necessary training and professional ideals, is prerequisite to the success of an undertaking of this nature.

Finally, in the summer of 1932 the situation was ripe enough to permit a general housecleaning in the Pharmacy and in the drug cabinets throughout the hospital. This work involved not only the discarding of all undesirable drugs and drug preparations, but a careful revision of buying methods. By October 1932, the eight hundred drugs previously inventoried in the Pharmacy were reduced in number by over five hundred, leaving an inventory of approved items of less than three hundred. Comparing this with the inventory of one hospital which, in reply to a questionnaire by the chairman of the committee, reported seven hundred, while other large modern hospitals reported as high as seven thousand, and eight thousand,¹ one gets a picture of the inroads which the drug situation, if uncontrolled, may make in the hospital budget. There is an analogous condition in retail pharmacies. We can find sections of shelf space in most retail establishments, which have four or five, or even more items identical in composition. The pharmacist, unfortunately, does not entirely control the situation. He must maintain a stock which will prepare him to meet all demands.

The picture in the hospital here is different. Under proper guidance, useless waste is eliminated. The following is a list of regulations formulated to cover pharmacy service in this institution:

"(1) The Pharmacy is placed under the supervision and direction of the Department of Pharmacology, in so far as the supply and standardization of drugs for use on ward cases is concerned.

"(2) This implies that the Director, together with the Pharmacy Committee and the Pharmacist, possesses or is able to secure special information concerning drugs, not easily accessible to others of the hospital organization, and will undertake to supply such information as occasion arises. Decisions of the Director, in conjunction with the Pharmacy Committee and the Director of the Service involved, on such matters as quality and integrity of drugs, are to be on the same basis as those of the Heads of other clinical laboratories, and are to be overridden only in emergency.

"(3) Additions and deletions of drug stock, and changes in forms of drugs, shall be effected only after conferring with the Directors of the Services involved, who may also recommend changes including the addition of new remedies. Advice and counsel may be obtained by them from the Department of Pharmacology whenever questions of the relative merits of these new remedies shall arise. However, when these newer preparations are used as a part of a controlled clinical investigation, the Directors of Medicine and Surgery shall be responsible for such investigation and shall determine whether they shall be used, the Director of the Pharmacy merely acting in an advisory capacity."

The above regulations are directly applicable in hospitals affiliated with a college of medicine, but the details may be adjusted to suit conditions in hospitals which do not have this connection.

Only those drugs which appear on the approved list may be prescribed for ward patients. The hospital ruling with regard to private patients is that drugs not regularly stocked are purchased especially, in the least possible quantity. The patient is charged with this quantity, even though it may materially exceed the

¹ "The Doctor and the Hospital Pharmacy," M. S. Dooley, M.D., director of Pharmacy and chairman of Pharmacy Committee, University Hospital, and *Interns Handbook* Committee; *Bull. Am. Hosp. Assoc.*, January 1931.

amount actually needed. In many such cases visiting physicians have inquired as to the corresponding item regularly stocked and approved, and have ordered it. This has usually served to reduce the patient's bill considerably with no sacrifice of therapeutic efficiency.

Advice and information are available at the Pharmacy. Here, by virtue of contact with so many physicians, the hospital pharmacist has a splendid opportunity to demonstrate to them the proper uses of vehicles and flavors; to help them construct an efficient and palatable prescription. Of course, all questions out of the pharmacist's scope are submitted to the pharmacologist.

The following procedure is used in issuing drugs: Each division (fourteen in number) sends a partitioned wire basket to the Pharmacy in the morning. Empty stock containers are included in these baskets for refilling according to an order book which, after having been checked by the nurse in charge of the division, is counterchecked and signed by a supervisor of nursing. Special orders originating during the night, for prescriptions or items not regularly stocked, are also listed in this order book. Orders presented during the day are made out on separate requisition blanks, also signed by the nurse in charge and countersigned by a supervisor of nursing. These orders have, in addition to the desired item or items, a notation of the dosage to be given, which dosage is checked by the pharmacist. In instances where patients are leaving the hospital, a notation to that effect is made. The pharmacist, in such cases, places only the directions on the label, instead of the ingredients, as is ordinarily done with containers issued in the hospital.

As part of the reorganization activities, a radical change was made in the equipment for handling the various medicaments. Uniform screw-capped, green-glass vials are used for tablets, capsules and pills, instead of pasteboard boxes. Liquids are supplied in bottles of the ebony screw-cap type. All vials and bottles bear typewritten labels coated with a suitable label varnish. These containers are used for items which constitute the regular stock supply on each division. Since special orders are used only during the stay of the patient using them, they are issued in pill boxes or in corked bottles.

The official English title of the Pharmacopœia or National Formulary is used on all labels. If in neither text, an approved title is designated by the Pharmacy committee. This eliminates misunderstandings which arise when all sorts of common names and synonyms are used. The English, rather than the Latin title, is used for the reason that the nurses receive no special instruction in the Latin of pharmacy. Prominence is given throughout to the metric system.

Another step in the reorganization consisted in equipping all divisions uniformly. Since the hospital includes a school of nursing which rotates student nurses throughout the various hospital divisions, it contributes greatly to efficiency if the nurse does not have to be confronted with a different drug arrangement with each change she makes. The same applies to private duty nurses, since a change of patient may mean a change in location in the hospital. In addition to uniform arrangement and lay-out, a stock list is posted on each division. This list is valuable in several ways. *First*, it is a guide whereby each division may intelligently replenish its stock of drug supplies; *second*, it guides the new student nurse who is acquainting herself with the equipment of the particular ward concerned; *third*,

it controls any overloading of drug supplies throughout the hospital; and *fourth*—a matter of extreme importance—it serves as a control for the pharmacist, obviating waste in supplying the hospital, and enabling him to prepare his own stock intelligently.

The most recent improvement effected has been the establishment of a central supply room in conjunction with the Pharmacy. This coördination does not usually exist in other hospitals. Under the new arrangement, the preparation and sterilization of solutions for parenteral use (such as Physiological Sodium Chloride and Ringer's), as well as the sterile dressings and various sterile trays (hypodermoclysis, intravenous, thoracentesis, paracentesis, etc.), are all carried out in this specially equipped room. Previously these operations had been performed in another division of the hospital, which division combines several different activities. The principal advantages sought by the change were, *first*, that of having the solutions prepared and sterilized under the supervision of the pharmacist, and *second*, that the unit would be specialized for the above-mentioned functions instead of being part of a conglomerate department. To effect this change, it was necessary to break through one wall of the Pharmacy into a room formerly used for excess stock of another department. As a result, the pharmacist is able to have constant surveillance of operations. The actual work is handled by a capable graduate nurse who has had special instruction and experience in this branch, while the pharmacist checks all operations and acts in a consulting capacity.

No little advantage has accrued to the hospital's financial situation as a result of the work done in the pharmaceutical end. Without sacrificing quality and efficiency, the replacement of costly specialties by their corresponding official drugs wherever possible, and the elimination of questionable patent medicines and nostrums has meant savings which, during the first year of operation of the new set-up, ran into four figures. It is quite certain that the second year's operations will reveal a considerably greater saving. It is important to note that the original primary aim was solely to rationalize drug therapy. The marked financial advantages which attend such a plan are, therefore, significant and satisfying.

Through the efforts of the AMERICAN PHARMACEUTICAL ASSOCIATION, the Council on Medical Education and Hospitals of the American Medical Association has initiated a move in the right direction with regard to hospital pharmacies.

As described in the April 1934, JOURNAL A. PH. A., this Council has included in its "Essentials of a Registered Hospital" the one requiring that "the handling of drugs should be adequately supervised and should comply with state laws." The next step might well be that of establishing minimum standards in hospital pharmacies with regard to the nature of drugs handled. Much has been accomplished by the various medical groups concerned, with regard to standards for the operating room, the X-ray division, Physiotherapy, etc. In coördination with the AMERICAN PHARMACEUTICAL ASSOCIATION, the American Medical Association can do much to raise hospital pharmacies to the standards it has so admirably reached in the other departments of the hospital.
