our program by the utilization of modern machine methods for information storage and retrieval. The paper in this symposium of Dr. Donald G. Levitt of FDA describes our accomplishments in this area, and the paper by Dr. Joseph F. Sadusk, Jr., our Medical Director, discusses the direction this program will take in the years ahead. These papers affirm our intention to develop this program in full cooperation with industry and the scientific community at large.

To meet the challenge to our society presented by developments in the field of new drugs requires the highest degree of individual, as well as collective effort, plus the cooperation and free communication on the part of all concerned with these problems—researcher, manufacturer, clinician, and government. This effort is demanded if we are to meet and conquer the new drug problems of today so that we can look forward to the even greater challenge of tomorrow, that of providing still other new drugs in the conquest of more and more of the serious diseases with which mankind is afflicted.

Drug Information Handling by the American Medical Association*

JOHN R. LEWIS
AMA Department of Drugs, American Medical Association, Chicago, Illinois 60610

Received August 17, 1965

The continuing education of the physician is one of the major programs by which the American Medical Association fulfills it prime mission, the promotion of the art and science of medicine and the betterment of the public health. That part of the educational program related to drugs, which is the responsibility of the Department of Drugs, is dedicated to providing the medical profession with timely, authoritative information on drugs and drug therapy. This mission is accomplished primarily by the publication in the *Journal of the American Medical Association* of statements on drugs, including their evaluation, adverse reactions, and nomenclature, and by the publication of the annual volume, "New and Nonofficial Drugs" (NND), which has now been replaced by a new book, "New Drugs."

Providing this service to the medical profession involves the handling of a considerable volume and variety of data on drugs. As the volume of these data has increased and as new needs have evolved, various procedures, including the use of mechanized systems, have been developed to facilitate the handling of this information. Inasmuch as the evolution and development of these procedures are continuing, this presentation should be considered as a progress report.

The procedures I shall discuss are the result of the efforts of several members of the Department of Drugs and I should like to give credit to those responsible for this work, namely, Dr. Joseph Jerome, Director of the Nomenclature Section, Dr. Norman De Nosaquo and Dr. Betty Jo Tricou, Director and Assistant Director, respectively, of the Adverse Reactions Section, and Dr. Philip Seitner, Assistant Director of the Literature Documentation Section. I also wish to acknowledge the assistance of Dr. Eugene Conrad and Mrs. Helene Weston in the preparation of this material.

The drug information accumulated in the files of the Department of Drugs is obtained from several sources. These consist primarily of (1) manufacturers, who submit data on new drugs, most of which are unpublished and thus are confidential and must be handled as such; (2) physicians or hospitals, who submit individual case reports of adverse reactions to drugs; and (3) the published literature. Some of the information originates within our Department, including the previously mentioned drug evaluations and nonproprietary names selected under the drug nomenclature program.

DRUG NOMENCLATURE PROGRAM

It is of the utmost importance that a potential drug not become known by an inappropriate name, or, even worse, by several names, since this makes it extremely difficult to correlate information from various sources and may create an almost hopeless problem of recognition for the practicing physician. To help solve this drug nomenclature problem, the AMA Council on Drugs has, for many years, operated a program in which it negotiated with manufacturers in the selection and adoption of appropriate nonproprietary (generic) names for new drugs.

This work is now carried on by the USAN Council, an organization composed of representatives of the AMA, USP, and NF, and staffed by the AMA. The USAN Council also collaborates with other national and international nomenclature agencies (*e.g.*, the World Health

* Presented before the Divisions of Chemical Literature and Medicinal Chemistry, Symposium on Drug Information, 148th National Meeting of the American Chemical Society, Chicago, Ill., Sept. 1, 1964.

Organization, British Pharmacopoeia, French Codex, Nordica Pharmacopoeia) in an attempt to adopt names acceptable to all. The objective of this Council is to select suitable nonproprietary designations, known as United States Adopted Names (USAN), for chemical compounds or other identifiable substances of potential therapeutic usefulness at an early date, and to encourage the subsequent use of these names in all scientific literature.

As an aid in the selection of appropriate names, the USAN Council has devised and published a set of "Guiding Principles," and those working with a new compound are urged to refer to and use these "Guiding Principles" in coining a nonproprietary name for the compound. If such a coined name is based on these principles, the approval of the proposed name by the USAN Council probably will be greatly facilitated.

Another program of the Nomenclature Section that is related to the selection of new names and perhaps is more pertinent to the interests of this symposium is the documentation of drug names. Since the development of a dictionary of drug names is basic to all other documentation activities of the Department of Drugs, such a dictionary has been prepared. Although no attempt has been made to provide a complete international dictionary of drug names, it currently does contain listings of over 4,000 drugs and about 10,000 names. Standard coding techniques have been used to facilitate the entry of data into an IBM computer, which is used to prepare suitable printouts of lists.

An example of the coding for the drug dictionary is shown on the Drug Name Work Sheet (Figure 1). A six-digit number, which is entered in columns 1–6, is assigned to each drug as it is added to our list. A new serial number is assigned to each separate compound, including those that exist in the form of a base and derived salt(s).

Columns 7–64 are used for drug names. The first name entered on the work sheet is either the preferred name or the only name known for the substance. The preferred name is always one that has been selected through a formal procedure by one of the national agencies in the United States formerly or presently concerned with the selection of nonproprietary names for drugs. These agencies are (1) the United States Pharmacopeia, (2) the National Formulary, (3) the USAN Council or Council on Drugs, and (4) the Secretary of Health, Education, and Welfare.

Synonyms, which may be another nonproprietary name, trademark, or code number, are entered in columns 7–64 of the other available sections of the work sheet. Each active ingredient of a mixture is identified by name (preferred name when this is available) as a separate entry in the sections of the work sheet following the trademark (usually given as the "only" name) for the mixture.

Column 66 is used for the code number of the category of the name. For example, 1 means it is the preferred name; 2 designates a nonproprietary name not formally approved; 3, a chemical name; 4, the trademark; 5, a code number or designation; and 6, other nonproprietary name formally approved by a foreign agency.

Numbers assigned in numerical order to indicate the serial number of a specific name among other names in its category are placed in columns 67 and 68.

Columns 70–72 are used to record either the agency approving the name or the manufacturer. In order to give as complete a list of international agencies which have

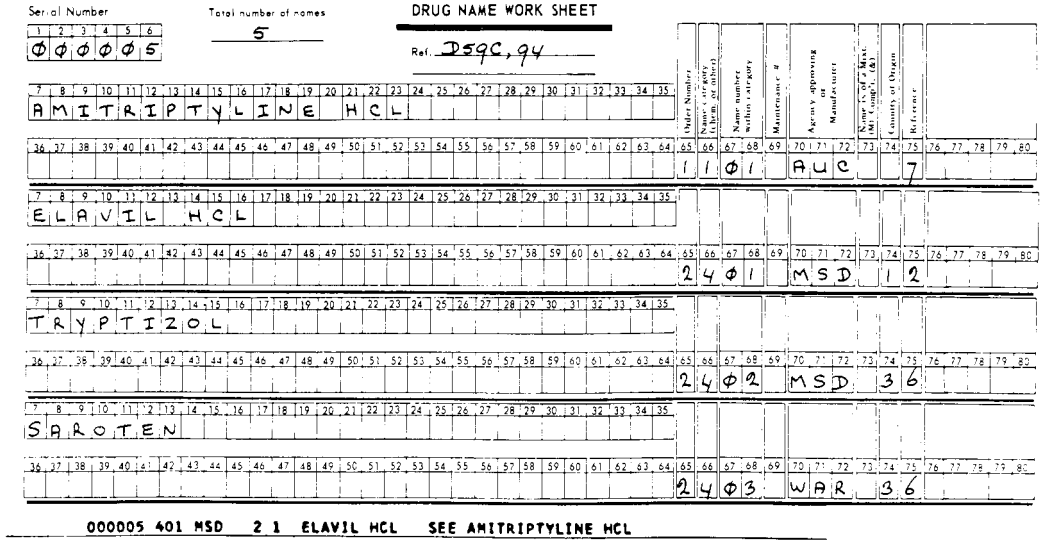


Figure 1. Drug Name Work Sheet and sample printout.

formally approved a given name, code numbers have been adopted for these agencies and the numbers are entered in ascending order in these columns. A preferred name coded as 101 in columns 66–68 will be linked to the authority most recently recognizing the designation. In the example given, the code designation is AUC (USAN Council). When a trademark is entered on the work sheet, the code designation for the manufacturer is entered in columns 70–72.

If the entry in columns 7–64 represents a mixture of active components, usually entered as a tradename, the symbol M is inserted in column 73. The ampersand sign (&) is entered here if the name is a component of a mixture.

Column 74 is used to record the code number of the country in which a trademark is in use.

Since adequate reference is available for preferred names in columns 70–72, supplemented by the "Ref." space at the top of the work sheet, column 75 is intended to record, in code, the published authority for all other names.

Columns 65, Order Number, and 69, Maintenance Number, serve as an aid in programming the information for the computer.

A sample of a portion of the drug name list printout is illustrated on the lower portion of Figure 1. This sample contains the preliminary run of an alphabetical listing. Other lists may be arranged somewhat differently and special lists, for example, a list of all trademarks for each manufacturer or a list of preferred names with all synonyms following each name, can be prepared from the coded information.

The first name in the example shown is Elavil HCl. Appearing first is the basic number assigned to it, the six-digit number corresponding to that on the work sheet. Separated by a space is a supplementary number, the first digit of which is a 4; this designates it as being a synonym, which, of course, is a trademark. After another space, the abbreviation of the manufacturer, MSD, is indicated. Following that is a code symbol for the cross reference to the name, as well as a symbol for the country of origin. The final entry, which appears after the trademark, is the cross reference to the preferred name.

It is expected that this drug dictionary will have many uses both within the Department and by other interested agencies, and special types of printouts will be made when needed.

ADVERSE REACTIONS PROGRAM

As mentioned previously, reports of adverse reactions to drugs that are sent in by physicians and hospitals represent one of the sources and types of data accumulated by the Department of Drugs.

The AMA Registry on Adverse Reactions has been a natural outgrowth of the Registry on Blood Dyscrasias, which was established by a subcommittee of the Council on Drugs in 1952. The Subcommittee on Blood Dyscrasias collected information on blood dyscrasias associated with the administration of a drug and alerted physicians to the potential hematopoietic toxicity of drugs.

Encouraged by the interest of the medical profession and scientific community in this program, the Council on Drugs decided that future programs should not be limited to reports on blood dyscrasias, but should be expanded to include all serious adverse reactions to drugs, pesticides, and other hazardous chemicals. Thus, a Registry of Adverse Reactions was established under the aegis of the Adverse Reactions Committee of the Council on Drugs. With the Subcommittee on Blood Dyscrasias serving as a prototype, advisory panels were formed in the following areas: allergy, dermatology, gastroenterology, hematology, nephrology, neurology and psychiatry, pediatrics, and household and economic chemicals.

One of the first tasks of these panels was to design an initial report form—one that would require a minimum of time and effort on the part of the physician to complete, but which would provide the maximal amount of information. An important consideration in designing the form was to develop one that could be used by both the AMA and other interested agencies such as the FDA to facilitate the exchange of information and to reduce the number of forms that would confront the physician. It might be pointed out that there has been close cooperation between the AMA and FDA staffs in planning the procedures of operation so that an exchange of information in coded form would be feasible. Moreover, discussions with representatives of the PMA, as well as with some individual companies, have indicated their willingness to participate in this program.

The present report form, illustrated in Figure 2, is designed as a self-mailer and provides an original report for the Registry and a duplicate copy which may be retained by the physician. The physician is assured of complete confidentiality regarding his name and address, as well as those of the patient. Thus, it will be noted that, for identification purposes, only the patient's initials, rather than his name, and his date of birth and sex are requested.

In planning our coding system, it was realized that the problem of duplication of reports in the Registry may become very serious when any significant volume of information is exchanged with other agencies and groups. For example, a physician could report a case to us, to the manufacturer of the drug, to the Food and Drug Administration, and to some other group, such as his specialty society. A possible solution to this problem would be for all cooperating agencies and medical publications to use a standardized code identification system. Existing codes for identification of individuals, such as social security or internal revenue numbers, are not entirely useful since they are not all inclusive. Ideally, such a system should be based on simple, easily obtainable information and provide anonymity of the patient if a report of the case were published.

A system which seems to meet these criteria has been developed and will be used by the AMA Registry on Adverse Reactions in the coding of the reports received. The identifying code indicates month, day, and last two digits of year of birth; the patient's first and last (not middle) initials; and 0 or 1 for female or male, respectively. The chance of duplication would be small with the use of such a code. Obviously this is not an absolute identification but should serve as an aid in determining whether reports received are duplicates. If duplicate patient numbers are found when reports are tabulated, a review of the additional data in these reports would determine whether they were actually duplicates.

For AMA use only

03329
2767-69

REGISTRY ON ADVERSE REACTIONS—COUNCIL ON DRUGS — **ORIGINAL**

AMERICAN MEDICAL ASSOCIATION, 535 North Dearborn Street, Chicago, Illinois 60610

Please see reverse side of duplicate form for special instructions and glossary to aid you in completing this form. If you wish to add any material to this report, please use a separate sheet and enclose it.

1. Patient's Initials S M Sex M Weight 140
Address or Hospital
Date of Birth 3/4/34 Occupation Accountant
Mo./Day/Yr.
1. ☑ Cauc. 2. ☐ Negro 3. ☐ Oriental 4. ☐ Amer. Indian 5. ☐ Other

2. Dr. —
Stre —
City —

3. Adverse Reaction(s): Fever, exfoliative dermatitis, lymphadenopathy, jaundice, hemolytic anemia
Date of Onset April 1, 1964 Date of Diagnosis April 14, 1964 Was onset of reaction {1. ☐ acute explosive 2. ☑ slowly developing

4. Clinical Description of Adverse Reaction(s):
fever, chills, followed by rash, then severe jaundice, cervical nodes were enlarged. Later developed hemolytic anemia.

5. Result of Relevant Diagnostic Studies (Clinical Laboratory, Endoscopy, Biopsy, Autopsy, X-Ray, etc.):
4/14/64 Direct Bilirubin 14.5
4/16/64 " " 26.4
Liver Biopsy – cholangiolitic hepatitis
5/20/64 RBC 2.99 million/cu.mm.
hemoglobin 5.8 gm/100ml

6. List all drugs patient has received in the 6 months prior to onset of adverse reaction. Include biologicals, diagnostic agents, and transfusions. Give manufacturer's name and lot or code number, if available. Indicate date of first and last dose of drug for each course of therapy, and indicate route of administration.

NAME OF DRUG (Trade Name) (suspected drug)	TOTAL DAILY DOSE	ROUTE (p.o., im, iv, etc.)	DURATION OF THERAPY (Days)	DATES OF ADMINISTRATION	DISORDER OR REASON FOR USE OF DRUG
Para-amino salicylic acid	18.75 GM	p.o.	45	3/1/64 – 4/14/64	Tuberculosis
Sulfadimethoxine	1 GM	P.O.	14	2/3/64 – 2/17/64	urinary infection
Renografin	30 cc.	I.V.	1	1/30/64	I.V.P.

7. List all potentially toxic agents to which patient has been exposed, and describe circumstances of exposure. Give any information available on dose or exposure. (Include radiation, household products, industrial and agricultural chemicals, cosmetics, etc.)

Name and Type of Agent	Type & Description of Exposure	Amount, Dosage and Duration

8. Has patient been exposed to suspected drug or agent before? ☐ Yes ☑ No
Was suspect drug or agent used according to directions? ☑ Yes ☐ No Explain —

9. Other Disorders Which Existed Prior to Onset of Adverse Reaction or Are Now Present:
Asthma

10. Factors Contributing to Reaction (check all applicable boxes):
1 ☐ self medication by patient
2 ☐ accidental exposure
3 ☐ occupational exposure
Comments:
1 ☐ drug mislabeled
2 ☐ decomposition of drug
3 ☐ contamination of drug
4 ☐ drug outdated
5 ☐ interaction of two or more drugs

11. Outcome of Case
1 ☑ Recovered
2 ☐ Alive with sequelae
Explain —
3 ☐ Still under Treatment
4 ☐ Died —
(date and cause of death)
5 ☐ Autopsy (Describe in item 5)

12. Sources of Suspected Drug:
1 ☐ from physician
2 ☐ physician's sample
3 ☐ hospital
4 ☐ pharmacy
5 ☐ other retail source
6 ☐ mail order
7 ☐ door-to-door salesman

13. Has this case been reported to any other group or agency? No
☐ FDA ☐ Mfr. ☐ Poison Control Center ☐ Other (specify)
Has or will this case appear in the literature?
☐ Yes ☑ No. Journal Ref. —

AR7-64

Figure 2. Registry on adverse reactions.

There is no question that a universal coding system is desirable and necessary in view of the increasing sophistication of data collection and the increasing recognition of the necessity for exchange of information in medical fields. Representatives of all interested groups, societies, and agencies should consider this problem further in order to avoid duplication in the exchange of information and to make such exchange more comprehensive, more accurate, and more uniform.

Items 3, 4, and 5 of the report form provide as much information as possible concerning the reported adverse reactions. Items 6 and 7 give information on the drugs or other chemicals to which the patient has been exposed, which may be considered important in the production of the reaction. The information in the other items of the form are self-explanatory and are included to assist in the interpretation or handling of the data.

Early in the planning of the Registry it was realized that the data received from such a reporting system could be handled most efficiently by using electronic data processing equipment. Therefore, suitable codes have been worked out to record the information obtained from the report forms. The coding of this information is illustrated in the portion of the Adverse Reactions Code Sheet shown in Figure 3. The figure illustrates only the first two of the four cards that are actually used for coding this information. On card number 1, the first six columns represent the document number and its source (an A in column 1 indicates an AMA report and an F indicates a FDA report); the number in columns 2–6 is assigned to the report when it is received. Columns 7–15 contain the patient's identification code number, previously described. The occupation code number established by the Department of Labor is given in columns 19–21.

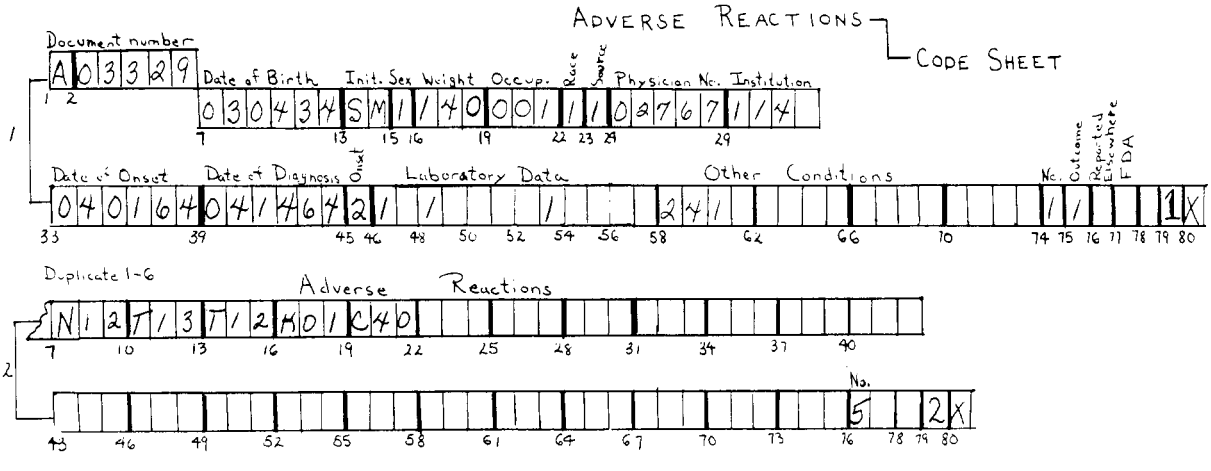
The source of the report (*i.e.*, whether it is a direct report from a physician, a hospital, an abstract from the literature, a report from the manufacturer, the poison control clearing house, or other source) is entered as a code number in column 23.

An arbitrary code number signifying the physician is given in columns 24–28, and information on the reporting institution (type of hospital and its geographic location) is entered in columns 29–31. The dates of onset and of diagnosis of the reaction are entered in the next sets of columns. Whether the onset of reaction is acute, explosive, or slowly developing is recorded in column 45. Information concerning laboratory data is given by placing a "1" in the appropriate place in columns 46–57; for example, 46 indicates blood counts, 47 urine analysis, and 48 blood chemistry.

Other disorders which existed prior to onset of adverse reactions and the number of other conditions are indicated in columns 58–74. These are classified according to the codes of the International Classification of Diseases, Adapted. The outcome of the case is entered in column 75 and information concerning the reporting of the case to another group is given in column 76, and, if also reported to the FDA, this is noted in column 77.

Columns 78–80 are used to indicate the card format number and whether or not there are trailer cards.

Card number 2 is devoted entirely to the coding of the reported adverse reactions. Using the International Classification of Diseases as a basis, the advisory panels have developed a dictionary of terms used in reporting adverse



CARD 1

COLUMN	CODE	
19-21	001	accountant
29-31	114	general hospital, Illinois
58-60	241	asthma

CARD 2

7-9	N12	exfoliative dermatitis
10-12	T13	lymphadenopathy
13-15	T12	fever
16-18	K01	hepatitis
19-21	C40	hemolytic anemia

Figure 3. Adverse Reactions Code Sheet.

reactions. Code numbers developed by the AMA and FDA have been assigned to these terms and are used to record the data in the appropriate columns. This dictionary will be available to any group needing such a code. A few examples of the codes and terms used on cards 1 and 2 are given in Figure 3.

Cards number 3 and 4, although not illustrated, are used to record information on the drugs received by the patient, as reported principally in section 6 of the report form.

One use for information thus accumulated will be to print tabulations of reports of adverse reactions. An example of such a tabulation is shown in Table I. This is a portion of the cumulative tabulation of reports of blood dyscrasias associated with the administration of certain drugs. The number of reports received for each drug is given in the column for the reported type of dyscrasia. Information regarding the concomitant administration of other drugs and whether or not they might also have been suspected of causing the reaction is also included in the tabulation. This particular table was prepared from our older, manually operated system. Future tabulations will be printed out by machine but probably will have a format similar to the one illustrated. Such tabulations will enable us to determine any potential hazards from the use of drugs which should be called to the attention of the medical profession.

In relation to this, the use of the computerized data will, of course, permit retrieval of specific drug data and allow certain correlative studies of the reports to be made; this, in turn, will assist us in the preparation of appropriate material for publication.

LITERATURE DOCUMENTATION PROGRAM

Although the drug information collected from the literature by our Literature Documentation Section is not handled mechanically at the present time, I will review briefly the manual system in use, which is a uniterm system. Copies of the index card and the uniterm documentation cards are shown in Figure 4.

This system is not designed to index detailed data from the literature, but rather to provide a mechanism for the ready retrieval of pertinent literature references on specific drugs. The index card gives a limited amount of detailed information, which, although not indexed, can serve as a guide to the person seeking references as to whether he would want to consult the original article.

The Literature Documentation Section reviews about 500 journals per month and indexes all pertinent articles relating to drugs, drug therapy, and the adverse reactions or toxicology of household and economic poisons, including pesticides. Each article indexed is given an accession number by which it is identified in the indexing and filing system. The name of the drug reported in the article is entered in the appropriate space on the index card, and the article is indexed on the uniterm card of the preferred name or "only" name in accordance with the listing in our dictionary of drug names previously mentioned. Following

Table I. Major Blood Dycrasias—Selected Drugs

CATEGORIES	APLASTIC ANEMIA with PANCYTOPENIA	THROMBOCYTOPENIA	LEUKOPENIA, AGRANULOCYTOSIS	ERYTHROID HYPOPLASIA without PANCYTOPENIA	HEMOLYTIC ANEMIA
Registry cases, prior to Jan. 1, 1963	509	211	522	66	54
Foreign literature, prior to Jan. 1, 1963	88	82	221	8	52
Registry cases, Jan. 1-June 30, 1963	32	20	26	9	5
Foreign literature, Jan. 1-June 30, 1963	9	3	5	0	6
TOTALS	638 (31.4%)	316 (15.5%)	774 (38.1%)	83 (4.1%)	117 (5.8%)

GENERIC & PROPRIETARY NAMES	APLASTIC ANEMIA with PANCYTOPENIA				THROMBOCYTOPENIA				LEUKOPENIA, AGRANULOCYTOSIS				ERYTHROID HYPOPLASIA without PANCYTOPENIA				HEMOLYTIC ANEMIA			
	Drug Alone	With Other Drugs			Drug Alone	With Other Drugs			Drug Alone	With Other Drugs			Drug Alone	With other Drugs			Drug Alone	With other Drugs		
		Innoc	Undet	Toxic		Innoc	Undet	Toxic		Innoc	Undet	Toxic		Innoc	Undet	Toxic		Innoc	Undet	Toxic
ACETAZOLAMIDE, Diamox	1	1	4	3	* * * 7	* * *	* * * 2	* * * 2			2	1				1				
AMINOPYRINE, Pyramidon	1		2	3	2	2		3	14	7	18	23								1
ASPIRIN	2		22	55	3	1	13	16	3		15	42			2	3	1	1	3	11
BENZENE	* * * 8	* * *	* * *	* * * 2	* * *	* * *	* * * 1	* * *	* * * 1	* * *	* * *	* * *	* * * 1	* * *	* * * 1	* * *				
CHLORAMPHENICOL, Chloromycetin	* * * 128	* * * 24	* * * 105	* * * 34	* * * 7	* * * 2	* * * 4	* * * 9	* * * 16	* * * 4	* * * 12	* * * 23	* * * 18	* * * 2	* * * 11	* * * 4	2	1	1	
CHLORDIAZEPOXIDE, Librium	1			2			1		1		1	6						1		
CHLOROTHIAZIDE, Diuril	1		6	5	* * * 6	* * * 2	* * * 5	* * * 7	* * *	* * * 1	* * * 4	* * * 6			1					
CHLORPROMAZINE, Thorazine	3		8	7	1		3	1	* * * 73	* * * 7	* * * 38	* * * 56			2		1		1	
CHLORPROPAMIDE, Diabinese	* * * 2	* * *	* * * 1	* * * 1	* * * 8	* * *	* * * 1	* * * 4	* * *	* * *	* * *	* * * 2	* * *	* * *	* * *	* * *				
DIPHENYLHYDANTOIN SODIUM, Dilantin+		3	5	12	3	2		1	3	2	3	17	* * *	* * *	* * * 2	* * * 2		1	1	
DIPYRONE, Pydirone, Pyralgin, etc.			2	1		1	1		* * * 17	* * * 6	* * * 6	* * * 12								
GAMMA BENZENE HEXACHLORIDE	* * * 7	* * *	* * * 3	* * * 3	* * *	* * *	* * *	* * *	* * * 2	* * *	* * * 1	* * *	* * *	* * *	* * * 1	* * * 1			1	
GOLD (include Aurothioglucose)	* * * 6	* * * 2	* * *	* * * 2	* * * 2	* * * 1	* * * 1	* * *	* * * 1	* * *	* * *	* * * 2	* * * 1	*	* * *	* * *			1	
MEPAZINE, Pacatal	* * * 4	* * *	* * *	* * * 1					* * * 12	* * * 1	* * * 7	* * * 12			1					
MEPHENYTOIN, Mesantoin	* * * 7	* * * 2	* * * 10	* * * 3	* * *	* * *	* * * 1	* * *	* * * 2	* * *	* * * 2	* * *	* * * 2	* * *	* * *	* * * 1				
MEPROBAMATE, Equanil, Miltown	* * *	* * *	* * * 7	* * * 5	* * * 5	* * *	* * * 5	* * * 4	* * * 1	* * * 1	* * * 7	* * * 7	* * *	* * *	* * * 1	* * *				

*Drug or chemical in indicated row has been implicated by direct or circumstantial evidence in the dyscrasia named at the top of the indicated column.
+Also appears on Table II.

AMERICAN MEDICAL ASSOCIATION DEPARTMENT OF DRUGS

GENERIC NAME HALOTHANE NEW ☐ ACC. 18770

TRADE NAME OTHER NAMES

TITLE Halothane Hepatotoxicity

AUTHOR(S) Kerbel, N C and Hilliard, I M TYPE OF ARTICLE Case Reports

REFERENCE Can Med Ass. J Nov. 2, 1963 V. 89#18 PAGES 944-6

USE: CONDITION TREATED Pain, Surgery

UNDESIR. EFFECTS, POS. AND NEG. INF. Fever; severe rigor for one hour; Jaundice; Nausea; Chills; Slight Dysuria. Liver Biopsies showed evidence of focal necrosis; High SGOT titres and variable evidence of transcient cholestasis. (Justification in withholding Halothane in cases which have previously been exposed to it within a short time or in those with evidence of liver or biliary tract disease.)

DESIR. EFFECTS, POS. AND NEG. INF.

SUPP. DRUGS, TREAT. Nitrous oxide; oxygen

AGE adult SEX F ROUTE NO. CASES 2 DOSAGE ☒ LAB TESTS ☒

ANIMAL ☐ HUMAN ☒ IN VITRO ☐ NORMAL ☐ PREGNANT ☐

IND. M[1] DATE 11/27/63 CK BW EV(1) (2) A-R SECTION ☒

HALOTHANE

0	1	2	3	4	5	6	7	8	9
I-1200	15441	14782	16153	16214	16095	14976	17707	16418	14959
15980	16561	23172	16113	18274	16785	16736	18187	17778	15549
16340	15131	23732F	17923	18754	18335	17616	20447	17958	16259
16270	18761	24512	20843	19304	18675	18286	20817	18218	16389
17130	19561	24592	21643	19754	21145	19226	21967	18558	16419
18770	21481		21833	20484	21505	21266	22887	18828	16779
19840	22801		22063	20904	21755	21276	23557	20038	16889
20750	22421		22953	20864	22245	I-1476		20428	16969
18880	23661		23643F	21534	22625	21466		20908	18429
23660F	23731F		24383	22004	23445	21506		22548	18529
I-1820				23084	23245	22746		23658F	19709

JAUNDICE

0	1	2	3	4	5	6	7	8	9
17330	15271	17592	14783	17434	14785	18386	16697	15958	14909
18770	17121	33342	17053	17504	16095	21576	16957	16348	15689
18830	17881	23172	17413	19304	16955	22096	20357	16168	16029
20000	18761	23752	17693	22534	18425	22136	22217	18078	17899
19890	18821	22092	17923		21755	23596		18678	18279
20870	21061		21643		23495	23896		20438	19079
20790	21431				I 1875	24066		17938	20559
23270	21751					I 1886		21758	21479
22920	22801							23408	22749
23930	23251							22998	23959
24350	I 1871							23888	
24730									

Figure 4. Index worksheet and uniterm cards.

the journal reference of the article, information concerning the use for which the drug was administered is entered on the card. This is followed by the notation on the undesirable effects reported; in addition, any desirable effects reported by the author are noted. Other drugs and treatment, as well as supplemental information, are also entered. However, an entry on the appropriate uniterm card, in addition to the drug name itself, is made only for those items that are underscored.

Samples of uniterm cards are shown on the lower portion of Figure 4. It will be noted that the last digit of each serial accession number corresponds to the number of the column in which it is posted. In the example given, the accession number of the article, 18770, appears on both the Halothane card and on the Jaundice card. An underlined number indicates that the article contains an adverse reaction report. Other notations further identify the article, *e.g.*, an F indicates a foreign language report.

In order to retrieve this information, the uniterm cards for the keywords for which one is searching are examined for matching accession numbers, which indicate that an article has been indexed with these keywords. Using these matched numbers as a guide, either the index card can be reviewed or the original article can be obtained.

MANUFACTURER'S DATA

The largest volume of data in the files of the Department of Drugs is received from the manufacturer. This material, along with supplementary data obtained from the other sources in the Department which I have discussed, are used in the preparation of monographs on drugs evaluated by the Council on Drugs. For this purpose, each drug is considered individually, the data for each are handled as a unit, and conventional filing systems are used. However, the increasing volume of this information and the need to coordinate it with other data will necessitate the development of other methods for handling it in the future. Furthermore, because an increasing number of pharmaceutical companies are now putting their data into mechanized systems, they can submit this type of information to us in a different form than in the past. As a matter of fact, we are presently considering a pilot study of some clinical data which have been submitted by a pharmaceutical firm in code form on IBM punched cards. Inasmuch as the trend is toward the exchange and handling of drug data on data processing cards, tape, or on microfilm, our procedures will be adapted to accommodate these.

AUTHOR INDEX FOR VOLUMES 1–5