A COMBINED ANESTHESIA RECORD AND STATISTICAL CARD

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At present two methods are in use for sorting of anesthesia data, (1) the Nosworthy card (1) and (2) the Hollerith punch card system. Neither is entirely satisfactory for universal use. The Nosworthy card is easily understood and the anesthetist who is untrained in the use of more complicated methods will find it easy to use. The disadvantage of the Nosworthy card is the limitation in the scope and amount of detail that can be prepared for sorting.

The Hollerith punch card system, when use is made of the code prepared by the Committee on Records and Statistics of The American Society of Anesthetists, Inc.† (2), is definitely the most complete and most satisfactory system available at present. The disadvantage of this system is that expensive and complicated machines are necessary for punching and sorting the statistical cards. These machines are not available to all anesthesiologists, especially those in military service. Since the machines must be operated by trained technicians, sorting of the cards is expensive and inconvenient. Sorting of the data cannot be individually regulated by the anesthesiologist unless he has had technical training in use of the machine.

The anesthesia record card and system of sorting to be presented here includes some of the features of both of the other two methods. The card on which the anesthesia data are recorded measures 5 by 8 inches and along the edges are perforations to be used for sorting.‡ Only one card is used for both recording and sorting. On the obverse (fig. 1) is space for recording the data to be collected before and after the operation. On the reverse (fig. 2) is space for recording the data collected in the operating room, concerning the anesthesia and the course of the operation.

After the patient has been discharged, or all possibility of complications is past, the card is prepared for filing and future sorting. The same code is used with this card as is used with the Hollerith punch card system, except that numbers have been substituted for the few places in the code where letters of the alphabet were used. Copies of the revised 1945 anesthesia code, and interpretations of the anesthesia code, can be purchased from The American Society of Anesthesiologists, room 1503, 745 Fifth Avenue, New York, New York. The anes-

* Present Address, Rochester, Minn.
† The name of the society has now been changed to "Anesthesiologists."
‡ Cards and sorting equipment were obtained from McBee Keysort Co., 1015 Twelfth St. N. W., Washington 5, D. C.
Anesthesia data in code numbers for statistical study are marked on the card by connecting the appropriate perforations with the edge of the card (fig. 1). The openings into the perforations can most rapidly and easily be made with an inexpensive punch.* If a perforation is incorrectly opened it can be closed with specially perforated gummed paper.

In the simulated case (fig. 1) the operation was performed in September, the code number of which is nine; therefore, perforations seven and two (total nine) in the “month of operation” bracket are opened. Four is the code number for 30 to 39 years of age of the patient and perforation four in the “age group” bracket is opened.

![Fig. 1. Obverse of the combined anesthesia record and statistical card.](image)

The code number for premedication composed of a combination of a barbiturate, morphine and atropine is sixty-six; therefore, in the “premedication” bracket, four and two (total six) are opened in the tens group and four and two are opened in the units group. When a zero is present in the number to be punched, no perforation is opened in the indicated group. For example, in coding 350, which is the code number for appendectomy without drainage, two and one are opened in the hundreds group of the “operation” bracket, four and one in the tens group and no opening is made in the units group.

In any one case, only two anesthetic agents and their methods of administration can be coded for sorting but the use of more agents than two can be indicated by opening the perforation “3 and plus” in the

* Provided by the McBee Keysort Company.
"number of agents used" bracket. It is a distinct disadvantage, with the 5 by 8 inch card, to be able to code only one complication in each subdivision of the "complications" bracket, the subdivisions of which are marked respectively "preoperative," "operative," and "postoperative." The size of the presented card was limited for economical reasons but use of a larger card would allow the coding of more of the data which can be coded on the Hollerith punch card.

The perforation marked "female" is opened when indicated. When the patient is a male, no opening is made. If the patient dies, the perforation "Dth" is opened. The cause of death can be coded in the "complications" bracket. The complication is indicated as being

![Fig. 2. Reverse of the combined anesthesia record and statistical card.](image)

the cause of death by opening the appropriate perforation in the bottom row of perforations in the "complication—cause of death" bracket. When a complication occurs which is not the cause of death, the code number is indicated in the "complications" bracket and the indicated perforation is opened in the top row of the "complications—cause of death" bracket. As an example, suppose a patient had an acute infection of the upper part of the respiratory tract before operation and, after operation, bronchopneumonia developed and the patient died. In that case, 700 would be coded in the "preoperative complication" bracket and 720 would be coded in the "postoperative complication" bracket. In the "complication—cause of death" bracket, the "pre" perforation would be opened in the top row and the "post" perforation would be opened in the bottom row.
Two brackets have been left for the anesthesiologist to use for coding according to his needs and interest. In my personal use, the unmarked bracket with two perforations was used to code whether the anesthetist was an anesthesiologist, surgeon or technician. The unmarked bracket with four perforations, which allows coding up to ten, was used to code the first letter of the patient's surname.

The sorting of cards is accomplished by aligning the group of cards on a table top or in a right angle rack so that each perforation is exactly superimposed over the corresponding perforation on the card underneath. The right-hand upper corner has been trimmed to facilitate shuffling a large number of cards; thus, all the cards can be quickly turned with obverse toward the operator. An instrument similar to a knitting needle now can be passed through any corresponding perforations in all the cards.

When the needle is lifted, all the cards on which that perforation has been opened will fall off the needle, while those cards on which that certain perforation has not been opened will remain on the needle (fig. 3). Sorting is at first awkward and slow but, with a little practice, the technic is easily learned. The equipment is inexpensive and is so simple that the anesthesiologist, if he so desires, can sort his cards at home by his fireside. Sorting is simplified by starting at perforation "one" and sorting each perforation to the left in sequence, each time putting the cards which fall off the needle at the back of the group of cards that is being sorted. When all perforations in that group have

![Diagram](http://anesthesiology.pubs.asahq.org/pdfaccess.ashx?url=/data/journals/jasa/931730/)

**Fig. 3. Simple method of sorting the anesthesia cards. (Reproduced by permission from Army Regulations Pamphlet No. 615-25.)**
been sorted, the cards will be in numerical order according to code number.

Many improvements on this type of card could be made. It is presented so that a satisfactory anesthesia record and data card for general use may evolve. It is hoped that some day a similar card may be standardized and adopted by the Committee on Records and Statistics of The American Society of Anesthesiologists, Inc., as an alternate for the Hollerith punch card system. The Hollerith punch card undoubtedly will continue to be used by departments of anesthesia which handle tens of thousands of cases and which are located in large centers where the machines for punching and sorting such cards are readily available. There still remain many private anesthesiologists and small departments of anesthesia for whom the Hollerith card system is impractical for one reason or another but who desire more statistical data about their work than they now have. Use of the anesthesia code is slow and tedious at first, especially for those who have not had some instruction in its use. With a little study and perseverance, however, it is surprising how rapidly one becomes able to code the cards on routine cases without having to refer to the code for numbers. For the beginner, the necessity of referring to the code is the greatest disadvantage of this card. If my experience proves the rule, however, this seeming disadvantage will prove to be the card’s greatest asset. The beginner in anesthesiology will learn more of lasting value to him from using the code and developing the habit of being definite and precise than he will learn from the statistical data that he will derive. Use of the code is particularly valuable in the training of residents or assistants. Nothing good is obtained without a price. The benefit derived from use of this card will be in direct proportion to the effort which the anesthesiologist puts into it.

**Summary**

A card which combines some of the characteristics of both the Nosworthy and the Hollerith cards provides a simple and inexpensive method for recording and sorting data on anesthesia.

**REFERENCES**