A STUDY OF THE DEATHS ASSOCIATED WITH ANESTHESIA AND SURGERY

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A Study of the Deaths

Associated with

Anesthesia and Surgery

Based on a study of 599,548 anesthesias in 10 institutions, 1948-1952, inclusive

By

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FOREWORD

ANESTHESIA is an adjunct to the care of the patient; hardly ever is it an end in itself, except where it is the principal physical tool used in the study and treatment of mental illness or where, for another example, nerve blocks are used in the treatment of paresthesias or circulatory disorders. In such limited cases, anesthesia is perhaps an end in itself. This study, however, is concerned with anesthesia as a part of the total surgical care of the patient. Anesthesia in this rôle is not of itself the therapeutic act which makes possible the correction of deformity, the restoration to health, or the staying of death. It merely makes possible the acts which can accomplish these things. We set down these truisms here, for it is our belief that one of the principal accomplishments of this survey is to show, within the precise framework to be described, the extent of the responsibility which must be borne by anesthesia for failure in the total care of the surgical patient.

The inseparability of anesthesia from the total care of the surgical patient is to us the compelling reason why surgeon and anesthetist, engaged as they are in a common task, cannot with profit pursue separate goals. The two great goals are facilitation of therapy (the surgical procedure in this case) and the patient's safety. Notwithstanding the frequent attempts to emphasize one of these aspects over the other, it is clear that in reality they merge into the single goal: a successful therapeutic procedure. Important, but far less so than facilitation and safety of the procedure is comfort of the patient. It is true that in certain abnormal patients, for example in extremely neurotic individuals or, for another example, in patients with se-

vere mitral stenosis where mental agitation leads to pulmonary edema, that comfort is required to ensure safety; not often is this the case.

Inevitably and rightly the mounting data of this study have been widely discussed. Informed discussion has been encouraged during the accumulation of the data as a protection against oversight. From a methodological point of view it would of course have been better to have completed the study without any intermediate report to the participants. The data sample obtained each year was of such magnitude that it seemed desirable and necessary from a humanitarian point of view to pass along to the participants each year's findings, so they could act on the observations if it seemed desirable to them to do so. From a practical point of view it is not certain that all of the participating institutions would have continued with the study, which they did, without the annual report to maintain their interest. There is no evidence that such annual reporting influenced procedures in the local institutions, and there is evidence in the constancy of the anesthesia death rate over the course of the study that such annual reporting was without influence.

We have no wish to exaggerate the accuracy of this study. It best fits into the category of a survey. No important conclusions in controversial areas have been arrived at where even a 100 per cent change in the data against the conclusion, would alter the view. This is in recognition of the possibilities for error inherent in a study of this kind.

We hope that our conclusions give an accurate picture of the anesthesia situation within university hospitals of the United States at this period, where well-established departments of anesthesia exist. (Reasons for choosing a group of university hospitals for study will be presented below.) The fact that this carefully arrived at picture is, in

several instances, not in accord with some current impressions has led, reasonably enough, to examination of the validity of the conclusions arrived at. We have welcomed such criticism.

A moment ago we spoke of the wide discussion evoked by this study. Possibly time will show that this interest and the self-examination stimulated by it will be the study's most valuable result. In any case, it may not be inappropriate to comment upon one or two directions such discussion has taken. Very often during such consideration, data at variance with those given here are presented. We make no claim to infallibility; but we have had an extraordinary opportunity to amass data within the limited framework of the university hospital. The data are as sound as we could make them. Whatever their shortcomings, we do not believe that casual clinical impression, unaided by painstakingly complete record keeping can properly be used as an argument against these data. Nor do we believe that conflicting reports based upon the occasional voluntary and intermittent reporting of anesthesia deaths can be set against this study where *all* deaths from whatever cause were examined at the time they occurred and reported by those, both surgeons and anesthetists, who were on the spot when they occurred.

Again and again we have encountered confusion as to the fact that when we speak of a death associated with anesthesia and assigned to it, we mean just that, not a death attributed primarily to the patient's disease or to surgical error, or to other cause. One enthusiastic gentleman collected all deaths from all causes in a large area and tried to show that we had grossly understated the death rate owing to anesthesia. Such misunderstandings have driven us to what may seem to be a tiresome explicitness.

A recurrent misunderstanding has come out of the fail-

ure to realize that our objective here was to describe how things are, not how they could be or even how they should be, but *how they are*. Our hope was, that if we could establish how things are, progress could then be made in the direction of how they should be. Participants have written in to say, "Most of our obvious anesthesia deaths resulted from mistakes of men in training, if our senior staff had administered all anesthesia, the data would be very different, etc., etc." Comments of this kind certainly miss the point of what we are trying to do.

Twenty-one physicians* and 11 secretaries worked on this report continuously for five years, thus there are involved 105 man-years of professional effort in which the material was painstakingly observed, recorded, gathered and checked. Each of the institutions invited to participate did so and remained with the study until the end of it. We accepted the conclusions arrived at in the given institution; certainly we had no right to change diagnoses or to alter conclusions arrived at by the participants.**

In preparing this material for publication we have distinguished plainly between observed fact and our opinions. The participants in the study have gathered the tabular material. We take the responsibility for the opinions expressed. The two of us who have prepared the text are solely responsible for any errors it may prove to contain.

The study was made possible by the Medical Research and Development Board of the Army, first under the Chairmanship of Colonel William S. Stone and then under

* These numbers represent positions. While there was good constancy in the group, there was some shift of manpower, shown in the list of participants.

** The data of Table XXVII contained an error of cataloging by one or two of the participants. Even so, the data are shown both as sent in and as corrected.

Colonel John R. Wood. Their insight into the need for this work from a military as well as civilian point of view and their loyal furtherance of it has constituted a fine example of how military support can be and is of substantial aid to civil medicine.

We wish to express our appreciation to Prof. Frederick Mosteller for the discerning help he gave us from time to time on problems that arose during the course of this study.

We would be remiss if we failed to express our warm thanks to all of those who have patiently worked with us over the years of this study, tiresome and exasperating and rewarding as it has been. Through it we can see some of the shortcomings of anesthesia as well as its strong points. The prospect for sound growth lies in such appraisal.

H. K. B., D. P. T.

CONTENTS

A STUDY OF THE DEATHS ASSOCIATED WITH ANESTHESIA AND SURGERY

A STUDY OF THE DEATHS ASSOCIATED WITH ANESTHESIA AND SURGERY*

BASIS FOR THE STUDY

Purpose

THE PURPOSE of this study was to determine as accurately as possible the death rate (and why deaths occurred) attributable to anesthesia, whether due to agent or technic or to their misapplications, and thus to assess the responsibility of the anesthetist in the total care of the surgical patient when failure occurred. To accomplish this, *all deaths* from 1 January 1948 through 31 December 1952 occurring on the surgical services of ten participating university hospitals were appraised. We have therefore of necessity accumulated information concerning deaths associated with surgery as well as anesthesia.

The desirability of this study is based upon: (a) the belief that anesthesia has an unnecessarily high death rate; (b) our inadequate knowledge of where the dangers lie in making choices in the field of anesthesia, and (c) the belief that the study itself, by directing attention to these matters, would lead to sharper criticism of existing practices with improvement in them.† Moreover, we had hoped that the data obtained should make clear which agents and tech-

* This material is reprinted through the courtesy of the proprietors of the *Annals of Surgery*.

† Several of the participating institutions have stated that they have found the benefits of this work such that they plan to continue to examine their clinical performance in this way.