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Over the past three decades there has been a substantial decline of autopsy rates within community hospitals and academic medical centers. In the years after World War II the autopsy rate approached 50 percent. The current rate is 10 to 15 percent. In teaching hospitals the rates are generally higher (75 percent in 1960, 71 percent in 1970, 38 percent in 1980) than in community hospitals; however, the decline is dramatic for these hospitals as well.

In view of this marked downward trend, coupled with uncertainties surrounding the restructuring of the payment system of medical care, we undertook this study to: (1) assess the current benefits derived from the autopsy; (2) identify those factors responsible for the decline; (3) analyze and project the potential impact of prospective reimbursement on the finance mechanisms for the autopsy; and (4) identify those steps most likely to reverse the current trend. As part of this study we conducted a survey of autopsy rates and reimbursement mechanisms within the hospitals in the Washington, D.C. metropolitan area.

The word “autopsy” comes from Greek, meaning “a seeing for oneself.” The autopsy is a post-mortem medical examination for studying the pathologic changes present and determining the cause of death. The autopsy includes three kinds of examinations: an inspection of the external body; an examination and dissection of the internal organs and vital structures; and a microscopic examination of selected tissues. The extent of the autopsy varies according to the purpose for which it is performed. It may be limited to an external examination (as is done for some forensic cases); it may involve a limited dissection of specified organs; or it can consist of an extensive gross and microscopic evaluation. Incisions are limited to portions of the body which are not displayed during funeral
services. After tissues are removed to prepare microscopic slides and to perform special studies, the incisions are closed. An autopsy requires four to ten hours of a pathologist’s time, as well as three to six hours of effort on the part of autopsy assistants, histologists, and secretaries.

**Current Roles Of The Autopsy**

The autopsy rate is one of the few available methods which estimate roughly the standard of medicine in an institution. An autopsy provides a final and definitive method of quality control. Once mistakes are buried without an autopsy, the clinical diagnosis becomes the “truth” regardless of its basis in fact. An autopsy evaluates the accuracy of diagnoses and validates the interpretation of sophisticated diagnostic procedures. It has been stated that new imaging techniques such as radionuclide scans, computerized axial tomography (CAT) scans, and nuclear magnetic resonance scans (NMR) have made the autopsy obsolete. However, because these procedures reveal gross abnormalities rather than histopathologic diagnoses, their application has brought a shift in the type of errors made. According to Goldman et al., over-reliance on procedures at the expense of clinical acumen and pathologic documentation have “contributed directly to major missed diagnoses.” Their study of a large university teaching hospital reports that in the last three decades there has been an essentially unchanging 20 percent of patients with an unsuspected diagnosis discovered at autopsy, and that 10 percent of patients autopsied had a “major missed diagnosis” that if detected during life could have increased survival. Bauer and Robbins studied 2,734 cancer patients at the Boston City Hospital (1955-1965) and found clinical errors in 40 percent of cases.

In addition to evaluating clinical diagnoses, the autopsy can also reveal errors in management of a case, gross errors in surgical techniques, and adverse consequences of diagnostic procedures. The autopsy is invaluable for documenting efficacy and determining indesireable side effects of various therapeutic regimens. Gotti studied 2,168 autopsies at six hospitals: in 170 cases (8 percent), a drug reaction was estimated to be either the cause of death or to have contributed directly to increased morbidity. H. Barry Jacobs, author of the Spectre of Malpractice, believes that an increase in autopsy rates can lead to an increase in the quality of medical care by stimulating “self-peer review.”

**Education.** The autopsy fills a critical role in the training of pathology residents and a unique position in the continuing medical education of pathologists and clinicians. It provides an opportunity to study the effects of treatment, discover new patterns in old diseases, discover new diseases, and better understand the mechanisms inherent in all diseases. Joint clinical-pathologic conferences, during which gross and microscopic
post-mortem findings are correlated with the clinical course and therapy, are important educational exercises. Clinicians benefit, as their performance is improved by a reality-based foundation for testing diagnostic acumen. Pathologists benefit by acquiring and maintaining skills that aid the living patient by virtue of the pathologist’s roles in surgical pathology and clinical laboratory medicine.

The education of physicians is thought to be a continuum, a never-ending series of questions and answers. The rapid and extensive changes in medical care cannot be adequately encompassed solely by reading medical journals and attending postgraduate courses. The individual application of knowledge through discussion with colleagues gives the physician insight into ever higher standards of medical care. Declining autopsy rates have limited opportunities to train new pathologists. Overall, the number of accredited anatomic and clinical pathology programs has declined 29 percent between 1978-81. Residency training programs must be approved by the Accreditation Council for Graduate Medical Education and the Residency Review Committee (RRC). Even though these accreditation agencies recognize the declining autopsy rate as a national problem, they continue to emphasize the autopsy, recommending that each resident perform approximately 100 cases during training, including an appropriate range from simple to complex, neonatal to geriatric, and medical to forensic. According to Sebring, a shortage of autopsies was a major deficiency of various residency programs from 1976-81. Follow-up data on these statistics, provided by J.R. Weinlader, secretary to the RRC for pathology, indicates that the number of programs cited with a deficient autopsy performance in 1982 and 1983 increased more than during any of the previous years studied.

Research. The autopsy has contributed substantially to both basic and applied research. Autopsy tissues have been used to investigate the effects of drugs, hormones, carcinogens, the environment, aging, atherosclerosis, and other disease processes. The medical autopsy provides invaluable insights into new disease processes, whether stemming from environmental, ideopathic (that is, undertermined), or iatrogenic causes. It also provides opportunities for testing new surgical and imaging technologies. Extracts of cancerous tissues are currently being studied to unlock the mysteries of cancer gene expression and malignant transformation. In order to apply the techniques of cellular biology, immunology, and molecular genetics, “stat” autopsies are performed in select cases to provide researchers with rapid access to tissue with unstable molecular components.

Hormone procurement and transplantation. Declining autopsy rates have had a significant negative impact upon the procurement of pituitary glands. According to Salvatore Raiti, director of the National Hormone and Pituitary Program, University of Maryland School of Medicine, it may be more than a decade before tools of molecular biology can be
successfully employed to meet the clinical need for pituitary hormones. Even when this requirement is met, additional pituitaries will be required for research. Other organs and tissues are used for transplantation; an autopsy helps to ensure that these donated tissues are suitable.

Public health statistics. Mortality statistics are compiled from death certificates to monitor the current health of the populace. These statistics are used to estimate the incidence and prevalence of any diseases, to determine the iatrogenic effects of new therapies, and to monitor potentially dangerous environmental conditions. There is much to be learned about how a society lives by studying how its members die. The results of the mortality statistics help to determine the allocation of monies for research, which diseases will be studied, and what policies will be initiated.\(^\text{15}\)

One of the general goals of the autopsy is to determine the true cause of death. This information has implications not only on an individual perspective, but also for the general public, since the cause of death is reflected in the mortality statistics. The fact that death certificate data is sometimes inaccurately recorded may result from the fact that the death certificate may be viewed by physicians as a legal necessity rather than a public health document.\(^\text{16}\) Inaccuracies in the statistics can result in an inappropriate emphasis on researching specific disease entities, setting possibly irrelevant policies or unjustified priorities.\(^\text{17}\) An autopsy rate sufficient to reflect the general status of the population along with a mechanism for adding autopsy data to death certificates, is likely to improve the quality of our national mortality statistics.\(^\text{18}\)

Family benefits. The autopsy provides information as to the exact cause of death. This information can allay guilt felt by families as they wonder if they could have possibly averted or postponed the loss of a loved one.\(^\text{19}\) Clarifying the cause of death can result in a sense of comfort and understanding.\(^\text{20}\) Families can be made aware of hereditary or contagious diseases which afflicted the deceased. The autopsy can also affect reimbursement of life insurance policies. As autopsies become more difficult to obtain through traditional channels, funeral parlors may include autopsies as part of their services, hiring moonlighting pathologists for families who want an independent verification of the cause of death.\(^\text{21}\) The autopsy, in providing general medical knowledge or a transplantable organ, can also offer families comfort in knowing that another has been offered an improved quality of life.\(^\text{22}\)

Medical-legal benefits. The correlation of autopsy findings with criminal investigations is an invaluable asset for a just society. Forensic autopsy findings frequently implicate the guilty and vindicate the innocent. Forensic autopsies are mandated by law whenever suspicious circumstances surround a death; thus, rates for this type of autopsy have not declined. In those instances where a clinician failed to seek an autopsy to avoid
discovery of potentially damaging malpractice evidence, authorization for exhumation autopsies can be obtained through court order.

As part of this study we conducted a survey of the thirty-four hospitals within the metropolitan Washington, D.C. area. Overall, the autopsy rate for deaths occurring in the hospital was 18 percent. Analysis of the data by hospital type revealed that twenty-three were community hospitals with an average autopsy rate of 12 percent (range 6-24 percent). Four teaching hospitals had an average rate of 31 percent (range 20-51 percent). For the six government-run hospitals in our survey, the average rate was 50 percent (range 31-73 percent). One specialty hospital had a rate of 60 percent. Exhibit 1 summarizes the dramatic decline in autopsy rates throughout the country.

Exhibit 1
Autopsy Rates For Community And Teaching Hospitals

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Factors Responsible For Declining Autopsy Rates

Dropped minimum rate requirement. In 1971, the Board of Commissioners of the Joint Commission on Accreditation of Hospitals (JCAH) dropped its requirement for a minimum 20 percent autopsy rate because it recognized that no single autopsy percentage rate could accommodate the widely divergent needs of community hospitals, teaching hospitals, and academic referral and research centers, and because it was motivated to contain costs. The intent of this action was to emphasize the quality and interpretation of each case rather than the number of autopsies performed. Ideally, each hospital was to have determined its own minimum rate; in reality, few did. This dropped requirement appears to have had an unintended but significant negative impact on autopsy rates. However, a compilation of published rates indicates that the initial decline occurred prior to the 1971 JCAH ruling (see Exhibit 1). In addition, autopsy rates in foreign countries have been on the decline as well, indicating that other elements are contributory.

Clinicians seeking fewer autopsies. There are many factors which affect a clinician’s decision to seek an autopsy. Many recent medical school graduates have not been adequately exposed to autopsy procedures and have not been educated to its value. Some clinicians wrongfully perceive that increasingly sophisticated technologies have dispensed with the need for an autopsy. A clinician’s desire to obtain an autopsy may be met with reluctance on the part of a busy pathologist, and there may be such long delays in the issuance of a final autopsy report that the “burning” clinical questions have lost their relevance. Other clinicians are deterred by the potential threat of malpractice litigation arising from the discovery of errors in clinical judgement; however, there may be many more cases where the autopsy proves that the clinician acted appropriately. Because of their low priority in many pathology departments, autopsies are frequently assigned to a pathology resident or junior staff member whose skills are unequal to those of a seasoned clinical specialist who may be reluctant to seek a consultation from a junior colleague. Finally, in an era when terminal care is more often rendered by a team of medical specialists than by a family physician with a long-standing bond of trust, obtaining consent for an autopsy from a bereaved family may be difficult for both the physician and the family.

Declining enthusiasm of pathologists. In past decades, the less appealing aspects of performing an autopsy were outweighed by the active interest of clinical colleagues. The pathologist’s skill in this area was highly regarded, and pathologists helped to fulfill an important role in the hospital accreditation process. Now, less attention is directed to autopsy findings. Too often, no one comes to observe the pathologist’s meticulous dissections, no one calls to discuss the findings, fewer mortality confer-
ences include the active participation of a pathologist, who in the current litigious atmosphere must possess the skills and tact of a diplomat. The autopsy is rarely performed as a fee-for-service operation, and yet the pathologist is often required to perform this task on an “on-demand” basis, frequently extending into evenings and weekends. Academically oriented pathologists may find that the autopsy is used less for publications and career advancement than other more prestigious areas of pathology. Finally, as residents are performing fewer autopsies per year due the declining rates, anatomic pathologists are less well trained in gross pathology and in autopsy procedures.

Costs And Financing

In 1978, Yesner published a cost analysis of the autopsy. His approach incorporated all expenditures associated with the autopsy, including salaries of faculty, housestaff, histotechnicians, secretaries, morgue assistants, supplies, and indirect costs such as building services. The analysis was performed during fiscal years 1976-78 for both Yale-New Haven Hospital and the Washington University Barnes Hospital, St. Louis, Missouri. Autopsy costs at that time ranged from $900 to $950 per case. He noted that a decrease in the number of autopsies by 10 to 20 percent would probably not decrease overall costs to a significant extent, since most of the costs were incurred whether or not the service had maximum usage. Another study reported the cost at approximately $1,500. In our survey of the D.C. area, one medical center estimated the cost at $2,000 per case. Although autopsy costs at community hospitals are less, inasmuch as fewer professional salaries are supported than in teaching/research hospitals and autopsy examinations are usually less extensive, it is clear that the autopsy is not a profit-generating procedure for pathologists or hospital administrators.

Financing for the autopsy has varied with time as different contracts and standards are negotiated between pathologists, hospital administrators, health insurance policy carriers, and the government. In the 1800s before medicine became so highly specialized, clinicians performed autopsies on their own patients. “In 1820 Sir Issac Cooper paid two men 13 pounds to obtain the body of one of his patients on whom he had ligated the iliac artery 24 years before. The money paid the expenses of two exhumers, guard, watchmen, coach, and carriage, as well as a porter.” Clinicians such as Sir Cooper were motivated to perform autopsies by an intense interest in the anatomic findings which would verify their diagnosis and evaluate the effects of treatment.

This system has changed to one where specially trained physicians (pathologists) conduct the autopsy. Who pays for the examination is to some extent determined by the reason for the autopsy. The objectives
vary with respect to the setting and conditions surrounding the death. Interested parties include: hospital administrators who control the budget, pathologists, clinicians, the next-of-kin who control consent (in nonforensic cases), the JCAH who control accreditation, and the government with its reins on Medicare/Medicaid financing.

In our local-regional area, 82 percent of the pathology departments receive no specific reimbursement for the autopsy. Rather, autopsy services are supported through general operating expenses, and the autopsies are performed by pathologists as part of their professional services contract. In these hospitals, pathologists receive the same compensation for performing 100 autopsies as for none. The remaining 18 percent of hospitals (all community based) charged a nominal fee, either based upon a predetermined amount (average $245, range $100-$342) or at an hourly rate, based upon the Reasonable Compensation Equivalents which were published by the Health Care Financing Administration (HCFA) in the March 2, 1983, provider-based physician regulations implemented by the 1982 Tax Equity and Fiscal Responsibility Act (TEFRA). In one hospital, autopsies were funded by the deceased patient’s family if the attending physician did not specifically request the autopsy be performed.

**Autopsies and diagnosis-related groups.** It is unclear how the autopsy is to be supported under the new prospective payment system. There have been no specific provisions for financing the autopsy under Medicare, Part A (Hospital Insurance Program). Further, autopsy services have always been excluded from Medicare Part B (Supplementary Medical Insurance for Physician Services) reimbursement for pathologists because autopsies are not considered a service related to the diagnosis and treatment of a given patient. Those hospitals which included the autopsy as a general overhead expenditure in calculating Part A of the DRG prospective payment rates will be reimbursed an amount related to the autopsy costs. However, hospital administrators are not obligated to return any part of their DRG reimbursement to the autopsy service. Many physicians are concerned that this form of prospective reimbursement will have a further adverse impact on the already declining autopsy rate. Autopsy services will have to be supported by the shrinking budgets of hospital administrators who will be forced to juggle multiple priorities. Furthermore, projected declines in clinical pathology laboratory revenues (which in the past have been used to subsidize anatomic pathology activities) will mean that fewer dollars are available to support pathology departments as a whole.

The College of American Pathologists (CAP) believes that the autopsy, as the “ultimate medical consultation,” should be considered under Part B of Medicare as a physician service to an individual patient. (Part B services are not currently covered by the DRG prospective rate but are instead paid on the basis of “reasonable charge.”) However, Congress has
directed the Department of Health and Human Services to study and inform Congress as to the “advisability and feasibility” of extending DRGs to physicians’ services for hospitalized patients.) At a minimum, the CAP urges that the direct costs of the autopsy be excluded from Part A prospective payment, and that the costs be allocated as a direct medical education cost which will continue to be reimbursed under a “reasonable cost-based system.” However, according to CAP director A.S. Ercolano, HCFA has not as yet responded to these proposals.

### Saving The Autopsy

The future of the autopsy is imperiled by political and financial forces which threaten it with extinction. In large measure these difficulties have been the unintentioned consequences of policies aimed at cost-containment of the nation’s health care delivery system. Alarmed by the decline, medical students participating in the 1983 annual American Medical Association (AMA) meetings drafted a resolution calling for increased autopsy rates. Subsequently, the AMA House of Delegates passed a resolution in support of the autopsy. However, if the autopsy is to be saved, it will take more than the outcry of concerned physicians. The question must be examined by health care policymakers and regulatory commissions, who are in a position to effect change.

It is commonly recognized that quality control procedures and educational opportunities are not usually self-funding. From a business perspective, the autopsy has never been a lucrative procedure for pathologists. Rather, it has been a service offered by pathologists and subsidized by revenues gained from clinical pathology laboratories, surgical pathology services, and the general hospital overhead. We recommend that the autopsy, as the most challenging and revealing of medical examinations, be recognized as a physician service, billable on a “reasonable charge basis” under Part B of Medicare.

Further, we agree with Caplan’s observation that a shift in the structure and organization of medical practice has contributed substantially to the declining autopsy rate: “As medicine has moved away from the era of the family doctor to an era of impersonal hospital-based medical specialists, it has become less and less likely that physicians and patients will know and, more importantly, trust one another.” These circumstances are not conducive to asking or obtaining consent for the autopsy. A policy of required request as part of the hospital admission procedure and legalization of antemortem consent would help to eliminate this communication gap.

Finally, we recommend reinstitution of a minimum JCAH requirement, with the following modification: instead of imposing a uniform rate for all hospitals, as was done prior to 1971, we suggest that the quality con-
trol or peer review organization within each hospital propose an appropriate minimum rate to the JCAH. Each hospital is in the best position to project its own needs, and pathologists, clinicians, and administrators should all have a voice in setting the rate. Once a specific rate was found acceptable to the commission, enforcement could become part of the normal accreditation process.36

NOTES


13. Ibid.
15. Altman, “Decline in Autopsies Raises Concern.”
27. Yesner et al., “Symposium on the Autopsy.”
36. The Joint Commission on Accreditation of Hospitals (JCAH) advised us that it is important and effective for interested parties with specific recommendations or concerns about the autopsy to write to: Board of Commissioners, JCAH, 875 N. Michigan, Chicago, Illinois. 60611. Changes in policy are made by twenty-one commissioners, representing the American Hospital Association, the American Surgeons Association, the American Physicians Association, and the American Dental Association.