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THE AUTOPSY

ARMED FORCES INSTITUTE OF PATHOLOGY

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Washington, D. C.
1951

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INTRODUCTION

The technique of the autopsy and the special bacteriological, chemical, and other methods that should be used to supplement morphological studies as described in the guide prepared by a Conference Group on Pathology of the National Research Council in 1942, and published in the Journal of Technical Methods and Bulletin No. XXIII of the International Association of Medical Museums, is hereby revised to meet the present requirements and regulations of the Armed Forces and the Veterans Administration.

Authority to revise and republish the original work was given to The Director, Armed Forces Institute of Pathology, by a letter, dated 7 February 1950, signed by the Secretary-Treasurer of the International Association of Medical Museums.

"All members of the Council of the International Association of Medical Museums approve the release of the copyright on Volume XXIII, Bulletin of the I. A. M. M., entitled 'Autopsy Technique' for use by the Armed Forces Institute of Pathology in the preparation of a new edition of a brochure of similar title."

New information, instructions, and quotations from regulations have been included under authority granted by The Surgeon General, Department of the Army, J. W. Kernohan, M. D., Mayo Clinic, and the Chief Medical Director, Veterans Administration, as appropriate and applicable.



ELBERT DeCOURSEY
Brigadier General, MC, USA
The Director
Armed Forces Institute of
Pathology

I. OBJECT AND SCOPE

The autopsy is a scientific inquiry, and should be regarded as constituting a post mortem examination of the body to determine the pathologic processes present in their relation to clinical phenomena and history; to determine the causes of the pathological processes; and to acquire information regarding the processes and nature of disease. The more effectively these ends are accomplished, the greater will be the contribution of the autopsy to the sum of knowledge concerning the disease from which the patient died, and thereby to clinical medicine, to public health, and to the interest of the family of the deceased. In the modern sense it includes a complete examination of the thorax, abdomen, head, spinal cord, bone marrow, and such other regions as are necessary or desirable. It should cover not only those structures which are the seat of obvious alteration, but all the organs of the body, because the normality of certain viscera is often quite as significant as the disease of others, and because organs that appear normal macroscopically are frequently abnormal microscopically. The gross examination should be amplified by microscopic studies, bacteriological and toxicological examinations, and such other investigations as may be indicated.

II. PERMISSION

In the United States the legal right to grant consent for the performance of an autopsy is based on common law, statutory laws of each of the 48 States, court decisions, and opinions of the legal counsels for the States, counties, and municipalities. The pathologist should familiarize himself with the laws governing autopsies in his State. The unauthorized performance of an autopsy is ground for a civil suit for damages, and in some States is a violation of the criminal code.

Property Rights in the Dead Human Body and Permission for Autopsy in Civilian Practice

The dead human body is property, but not in the usual legal sense in that it may not be bargained for, bartered, or sold. Property disposal is provided for in many States by law. The right of custody and the duty of legal disposal are concomitant. The right of custody of the body is generally in the surviving spouse, or, if there is not surviving spouse, in the next of kin in the order of their relationship to the decedent.

II. PERMISSION

Many state statutes permit autopsies under specified circumstances without the consent of the person entitled to custody of the body. Where the applicable statute would not so permit under the facts of the case, consent to an autopsy should be obtained from the surviving spouse or the next of kin.

The consent, usually in writing, need not be in any special form, but should include the following points: Date, name of grantor, relation of grantor to deceased, name of deceased, name of grantee, list of examinations allowed (trunk, neck, head, extremities, spinal cord), signature and address of grantor, signature of a witness (usually the physician who secured the consent), signature of the administrator of the hospital (indicating his approval), name of the funeral director to whom the body is to be released, and the hour when the funeral director has been told that the body will be available. Many pathologists prefer to add a sentence concerning the retention of organs. If this is desired on either civilian or military permits, the Conference Group recommends the following:

The pathologist is authorized to retain such organs or parts of organs as may be necessary for medicolegal investigations, further study, or the educational and research purposes of the laboratories.

Anatomical Acts

If the deceased has no known relatives or friends, common law places the responsibility for custody and burial on the owner or tenant of the building, or on the master or owner of the ship or on the administrator or superintendent of the hospital in which death occurred. In most States common law has been superseded by statutory laws for the Disposal of Dead Human Bodies at Public Expense or by Anatomical Acts.

These Anatomical Acts generally require that all dead human bodies unclaimed by relatives or friends shall come into the custody of an Anatomical Board. The following excerpts from the law in Missouri will serve to illustrate the basic principles. (From an Act Approved by the Legislature on June 14, 1939, Laws of Missouri, 1939; Pages 510-514; Revised Statutes of Missouri, 1939, Article 3, Chapter 59, Sections 9998 to 10004, inclusive.)

Section 4. Superintendents or wardens of penitentiaries,

II. PERMISSION

houses of correction and bridewells, hospitals, insane asylums and poor houses, and coroners, sheriffs, jailers, city and county undertakers, and all other State, county, town or city officers having the custody of the body of any deceased person required to be buried at public expense, shall be and hereby are required immediately to notify the secretary of the Board or the person duly designated by the Anatomical Board or by its secretary to receive such notice whenever any such body or bodies come into his or their custody, charge or control, and shall, without fee or reward, deliver, within a period not to exceed thirty-six (36) hours after death, except in cases within the jurisdiction of a coroner where retention for a longer time may be necessary, such body or bodies into the custody of the Board and permit the Board or its agent or agents to take and remove all such bodies, or otherwise dispose of them:....

Section 5. The secretary of the Board shall cause to be distributed the bodies aforesaid, to any of the educational institutions mentioned in section 2 hereof, upon the acceptance and compliance by said educational institution with the provisions of this article, in proportion to the number of students in attendance at said educational institutions where the subject of human anatomy is studied or investigated. The Board may employ a carrier or carriers for the conveyance of such bodies, which bodies shall be well enclosed within a suitable encasement, and carefully deposited free from public observation. Said carrier shall obtain a receipt from the officer or other person having custody of any dead body subject to the provisions of this act for each body received by said carrier, and said receipt shall set forth the name of the deceased, if known, and all other data that will aid in identifying such body, and shall deposit this receipt with the secretary of the Board.

Section 6. Bodies required to be buried at public expense shall be under the exclusive custody and control of the Board. It is hereby declared unlawful for any person or persons to hold any autopsy on any dead human body subject to the provisions of this article without first having obtained the consent of the secretary of the Board or his accredited agent. The consent of any person for an autopsy on his or her body shall not in any way prevent or affect the application of this article.

II. PERMISSION

The Coroner or Medical Examiner and the Dead Human Body

In many States there are laws which provide that certain types of death shall be the subject first of an investigation to determine the causes and circumstances thereof and second of a magisterial inquiry or inquest to determine what steps shall be taken in the interests of law enforcement. These duties devolve on the county coroner or on the medical examiner. The following statute in New Jersey will serve to illustrate the type of death that should come to the attention of law enforcement agencies:

When, in the county, any person shall die as a result of violence or by casualty or suicide, or suddenly when in apparent health, or when unattended by a physician, or within 24 hours after admission to a hospital or institution, or in prison, or in a suspicious or unusual manner, the superintendent or medical director of the institution in which he died, or the physician called in attendance, shall immediately notify the office of the chief medical examiner of the known facts concerning the time, place, manner, and circumstances of the death. Immediately upon receipt of such notification the chief medical examiner or an assistant medical examiner shall fully investigate the essential facts. If necessary, he shall go to the dead body and take charge thereof.

In most jurisdictions the authority to order the performance of an autopsy incident to the conduct of an official medicolegal inquiry rests with the coroner, with the prosecuting attorney, or with a coroner's jury.

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Regulations, statutes, and rendered opinions pertaining to autopsies are quoted for information and guidance.

'An Army aviation cadet and a civilian pilot instructor were killed in an airplane accident at a civilian air training school not owned by nor subject to the exclusive jurisdiction of the United States. The local authorities asked the Army to conduct an investigation in the nature of a coroner's inquest. Held: The request may not be granted. While the Army may

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investigate the deaths of military personnel, wherever they may occur, for purposes of military administration, an Army investigation in the nature of a coroner's inquest may only be conducted when death occurs on a military reservation subject to the exclusive jurisdiction of the United States. (A. W. 113.) SPJGA 013.35 (1942/3809), Aug. 21, 1942., Bull. JAG 166).'

'In cases involving sudden or violent death of military personnel occurring at places over which the United States does not have exclusive jurisdiction, it is customary for the military authorities to make such investigation as appear to be warranted by the particular needs of the military service. The military authorities have no power to hold inquests required in those cases by applicable state statutes, but may make only such investigations as are expressly or impliedly authorized or required by Federal laws or regulations. The coroner of the county in which the dead body of a member of the Military Establishment is found is not presently prohibited by Federal law or regulations from exercising his jurisdiction to conduct the inquest required by state law. However, in the interest of comity and the obvious need of safeguarding military information vital to the national defense, such inquests should be made in such a manner as will not interfere with the official duties of the military personnel in the conduct of their investigations and the safeguarding, removal or other disposition by them of any military equipment or material that may be involved. SPJGA 1943/4937, April 13, 1943. ✓

Note: The statement in JAG 013.2, Aug. 28, 1918 (Dig. Op. JAG 1912-1940, sec. 471), 'that a county coroner should not take jurisdiction of the case and hold an inquest where the death of a person in military service occurs in the performance of a military duty, such as flying an aeroplane,' is to be considered in the light of the whole situation generally, and not as a limitation on the coroner's jurisdiction. II Bull. JAG 192, 193.'

The act of 4 June 1920 (41 Stat. 810), as amended (10 U.S.C. 1585; see pp. 453-454, MCM, 1941) provides:

"When at any post, fort, camp or other place garrisoned by the military forces of the United States and under the exclusive jurisdiction of the United States, any person shall have been found dead under circumstances which appear to

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require investigation, the commanding officer will designate and direct a summary court-martial to investigate the circumstances attending the death; and for this purpose, such summary court-martial shall have powers to summon witnesses and examine them upon oath or affirmation. He shall promptly transmit to the post or other commander a report of his investigation and of his findings as to the cause of death."

The term "any person" includes persons other than those subject to military law. The installation commander may order an autopsy when necessary to the satisfactory completion of the inquest. It is to be noted that under the mentioned act an inquest is not required in the case of every death but only those which occur "under circumstances which appear to require investigation." Further, even in those instances where an inquest is deemed necessary by the installation commander, an autopsy need not be ordered unless necessary to the satisfactory completion of the inquest. When such autopsy is deemed necessary by the installation commander, present Department of the Army policy requires the prior consent of the next of kin (Par. 11d (2), AR 40-610, 1 Dec. 1950). Such consent should be secured whenever possible. But in the last analysis when the installation commander has ordered an inquest under the mentioned act and in his sound discretion an autopsy is necessary to the satisfactory completion of the inquest, the installation commander may order the autopsy performed without the consent of the next of kin.

Although it may not be necessary legally, it is probably good policy to notify the coroner or police and obtain consent before proceeding with an autopsy in the case of a civilian death occurring on a military post under unusual circumstances. Further, consent should be obtained from the proper civilian authority before performing an autopsy on military personnel brought to a military hospital following death in unusual circumstances not on a military post.

Department of the Army, Circular No. 49, under date of 15 June 1951, announces Standard Form No. 523, "Authorization for Post-Mortem Examination".

AR 30-1820, 15 Nov. 1943, C 4, 18 June 1946 - Paragraph 8

Inspection of remains. - In order to verify that the contractor for the burial service fully complies with all provisions of his contract and to assure that when the remains arrive at their burial destination they are in an acceptable state of preservation, the purchasing and contracting officer or his representative with the surgeon

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or his representative together will inspect the remains both after they are embalmed and while they are nude, and after they are clothed and in the casket. Both the purchasing and contracting officer or his representative and the surgeon or his representative will, after completing the inspection, accomplish a certificate as prescribed on Preparation Room Report (WD AGO Form 10-15) and in TM 10-285 as to -

a. Whether the remains have been embalmed properly or, if embalming is impossible due to the condition of the remains, that adequate preservative measures have been taken to insure that the remains will be in good condition upon arrival at destination.

b. That the remains have been washed and shaved, unless this is impossible due to their condition.

c. That the casket and other supplies and materials furnished by the contractor are strictly in accordance with specifications.

d. That the remains are clothed in underwear and a proper uniform in a clean and serviceable condition. If the condition of the remains precludes this, the remains will be wrapped in a sheet or blanket and the uniform placed on top thereof in the casket.

e. That a flag in good condition has been furnished.

AR 40-610, 1 Dec. 1950 - Paragraph 11

c. (2) Inspection and record. - In cases of burials at Government expense, the commanding officer or his commissioned representative will inspect each body immediately after death, and again in the nude after embalming process to insure that embalming has been correctly and thoroughly accomplished. (See AR 30-1820.) The commanding officer or his representative will file in the medical treatment facility a signed record of the fact of compliance with the above requirement.

d. Autopsies.

(1) Deceased military personnel. - An autopsy will be performed upon the body of any person dying in the military service when the commanding officer or the surgeon of a station or command deems such procedure necessary in

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order to determine the true cause of death, and to secure information for the completion of military records.

- (2) Deceased civilians. - In the case of a civilian dying in a medical treatment facility or on a military installation inside the continental United States, when an autopsy is deemed necessary, written permission from the next of kin will be obtained before the autopsy is performed. If permission is unobtainable, and an autopsy is required to complete records of death in compliance with local, State or Federal law, report will be made to civil authorities for necessary action.
- (3) Prompt performance. - The performance of an autopsy will occasion minimum delay in delivering the remains to the mortician. Where possible, the autopsy surgeon will be available on call at all times to expedite performance of the examination. Autopsies will normally be completed without delay and the body made immediately available to the mortician. Technique employed will insure minimum interference with the embalming function, particularly disturbance of the circulatory system. Embalming may be performed prior to autopsy provided the autopsy surgeon is agreeable.
- (4) Records. - Complete records of autopsies performed will be filed in the medical treatment facility. Copies of autopsy protocols will be furnished in accordance with AR 30-1820, SR 40-410-10, and AR 600-550.

Manual of the Medical Department, USN, Par. 2918

In all cases of death occurring in the Navy under unnatural or suspicious circumstances, or where the cause of death is obscure or not apparent and a decision affecting pension or gratuity is involved, the medical officer shall recommend to the commanding officer such postmortem examination or autopsy as may be required in determining the exact cause of death. In all cases the autopsy must be performed in a manner requiring no more disfigurement of the body than is necessary to obtain the evidence necessary (Art. 1841 (5), N.R.). The results of all autopsies shall be fully recorded in the reports of death and health records.

CLINICAL RECORD

AUTOPSY PROTOCOL

DATE AND HOUR DIED		DATE AND HOUR AUTOPSY PERFORMED		CHECK ONE		
A. M.	P. M.	A. M.	P. M.	FULL AUTOPSY	HEAD ONLY	TRUNK ONLY
SECTOR		ASSISTANT				

CLINICAL DIAGNOSIS (Including operations)

PATHOLOGICAL DIAGNOSES

APPROVED—SIGNATURE

AUTOPSY NO.

PATIENT'S LAST NAME—FIRST NAME—MIDDLE NAME

REGISTER NO.

WARD NO.

(NAME OF HOSPITAL OR OTHER MEDICAL FACILITY)

AUTOPSY PROTOCOL
 Standard Form 508

XIV. TOXICOLOGICAL AND CHEMICAL EXAMINATIONS

Each specimen should be placed in a separate, clean, glass vessel. The total quantity of fluid should be measured, and each of the viscera weighed before taking the specimen, in order that the determinations may be quantitative. Label each glass vessel with all information required to identify the specimen fully and completely. When all of the specimens are taken, wrap each in heavy paper, tie with cord, and seal the top, bottom, free edge, and knot with sealing wax. Mark the wax with some distinctive device in such a manner that tampering would be immediately evident. Keep all specimens so prepared in your immediate possession, or safely locked up, until they are shipped or otherwise delivered to the toxicologist.

If the body has been embalmed, or if the tissues have come in contact with any chemical preservative, a separate sample of this solution should be sent to the toxicologist. If a preservative must be used, 95 percent ethyl alcohol is to be preferred. No preservative should be employed when one of the poisons in question is ethyl alcohol or any other alcohol.

When specimens must be shipped to a distant laboratory, refrigeration is by far the best method of preservation, and may be accomplished by the use of either ice or dry ice. Place the solid dry ice in paper bags on top of the specimen and seal the package with strips of gummed paper. This is adequate for 72 hours. If ordinary ice is used it should be shipped by express, and arrangements made to have it re-iced en route.

Specimens Best Suited for Particular Poisons

Unless the pathologist possesses reliable information regarding the identity of the poison the following samples should be submitted for toxicological examination: brain--500 gm.; liver--500 gm.; blood--500 gm.; urine--all available; 1 kidney; 1 lung; 10 gm. of hair; and the contents of the alimentary canal. Each specimen should be placed in a separate container.

- a. Gastric and intestinal contents: for any poison taken by mouth when death has occurred within a few hours.
- b. Brain: for alcohols, chloroform, ether, alkaloids, barbiturate group, benzene.
- c. Liver: metals, barbiturate group, fluorides, oxalates.
- d. Kidney: metals, especially mercury.
- e. Blood: all gaseous poisons, drowning (see below).

XIV. TOXICOLOGICAL AND CHEMICAL EXAMINATIONS

- f. Bone: lead, arsenic, radium (especially chronic poisonings).
- g. Lung: for inhaled poisons and to prove whether poison entered by inhalation.
- h. Urine: barbiturate group, sulfonal, metals.

If the deceased lived for several days following the ingestion of certain poison, such as chloroform, ethers, alcohol, and the barbiturates, it is not likely to be detectable in materials taken at the autopsy.

Specimens From Cases of Suspected Drowning

If drowning is suspected, take samples of blood, not less than 10 cc. from the right and left sides of the heart, using pipettes with relatively large openings, and being careful not to perforate the septum. Label the bottles "left heart" and "right heart". In addition, secure a specimen of water from which the body was recovered. By determination of the amount of chloride and magnesium in each of the 3 specimens, it is frequently possible to prove that death resulted from drowning.

Shipment of Specimens

All specimens for toxicological analysis should be shipped in a container sealed with wax. A full and complete history and the complete protocol should accompany the specimens.

XV. SPECIAL EVIDENTIARY OBJECTIVES OF THE MEDICOLEGAL AUTOPSY

ALAN R. MORITZ, M.D., Boston, and HERBERT LUND, M.D., Cleveland

An autopsy performed primarily for medicolegal purposes differs from an ordinary autopsy in objectives rather than in technique. A medicolegal autopsy should invariably be witnessed by one or more persons in addition to the autopsy surgeon and the names of witnesses should be included in the report. A written record should be made of the examination at the time of its performance.