

Autopsies as a Quality Assurance Tool



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Roots of the autopsy



The roots of the 'autopsy' can be traced to food preparation and religious practices in ancient Greece, Egypt and Babylon.

Galen in 2nd century was the first to correlate patients' signs and symptoms to examination of the affected organ.

Antonio Benivieni (1443 – 1502)



Antonio Benivieni (1443 – 1502) wrote first manuscript on autopsy, based on a thorough study of disease progression.

***De abditis nonnullis ac mirandis morborum et sanationum causis* (“About the hidden and incredible causes of diseases and cures”).**

Theophilus Bonet (1620-1689)



**Theophilus Bonet (1620 – 1689)
Published Sepulchretum in
1679.**

**Second edition (1700) compiled
over 3000 autopsy descriptions
by 450 authors, from Galen to
contemporary physicians.**

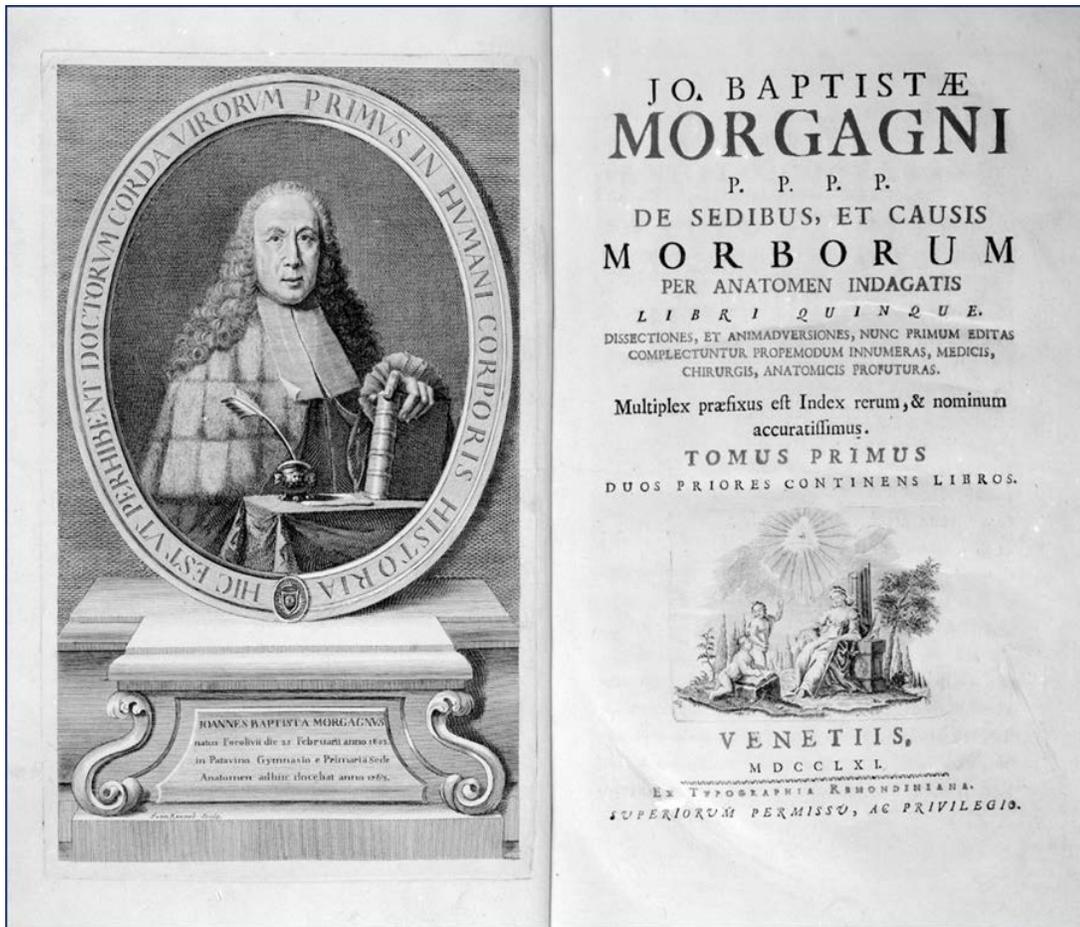
Hermann Boerhaave (1668 – 1738)



Hermann Boerhaave (1668 – 1738) published 2 “libelli” (monographs) in which autopsies played an important role.

Boerhaave emphasized the importance of the clinical history in understanding the cause of disease.

Giovanni Morgagni (1682 – 1772)



Giovanni Morgagni (1682 – 1772) published *De sedibus et causis morborum per anatomen indagatis* (About the seats and causes of diseases investigated by anatomical investigations).

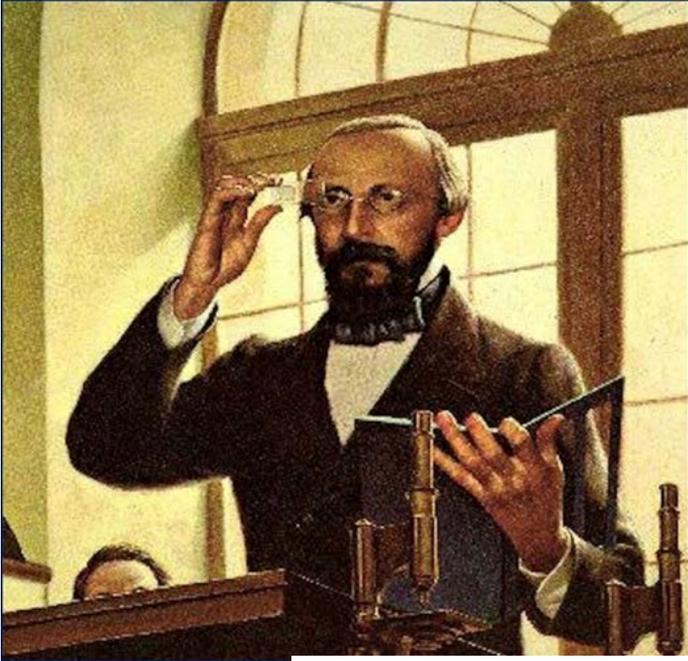
Morgagni described 640 autopsies, correlating symptoms with autopsy findings, a breakthrough in understanding that diseases have anatomical correlates.

Carl von Rokitansky (1804 - 1878)

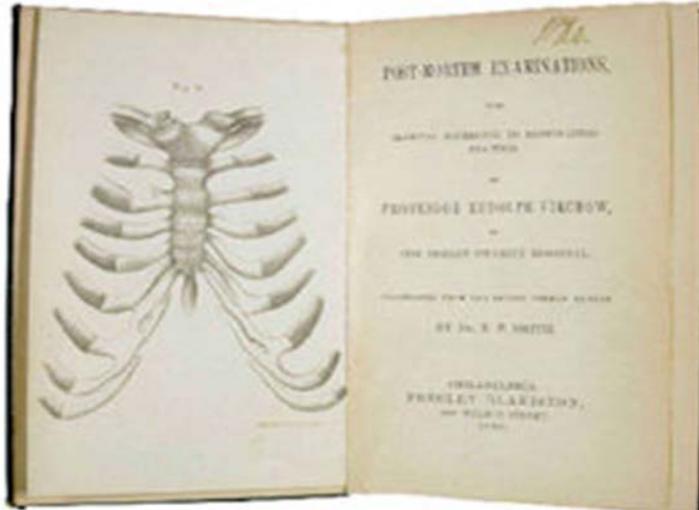


Carl von Rokitansky (1804 - 1878) has been called “the father of the autopsy.” Rokitansky reportedly performed 30,000 autopsies, and was the first to systematically look at pathological changes in human organs. Regarded as the premier gross pathologist in history, Rokitansky carefully correlated morphology with clinical symptoms in developing the concept of pathogenesis.

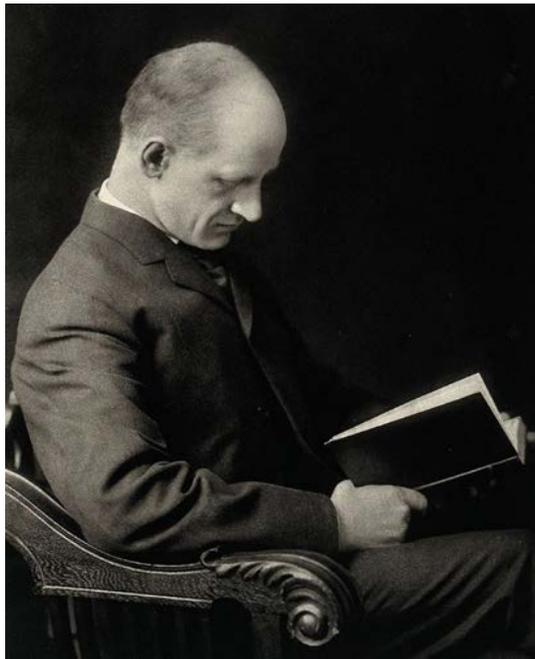
Rudolph Virchow (1821 - 1902)



Rudolph Virchow (1821 - 1902) focused on standardization of procedures and techniques, and integrated use of the microscope into standard autopsy practice. In 1876, Virchow published a widely used autopsy manual.

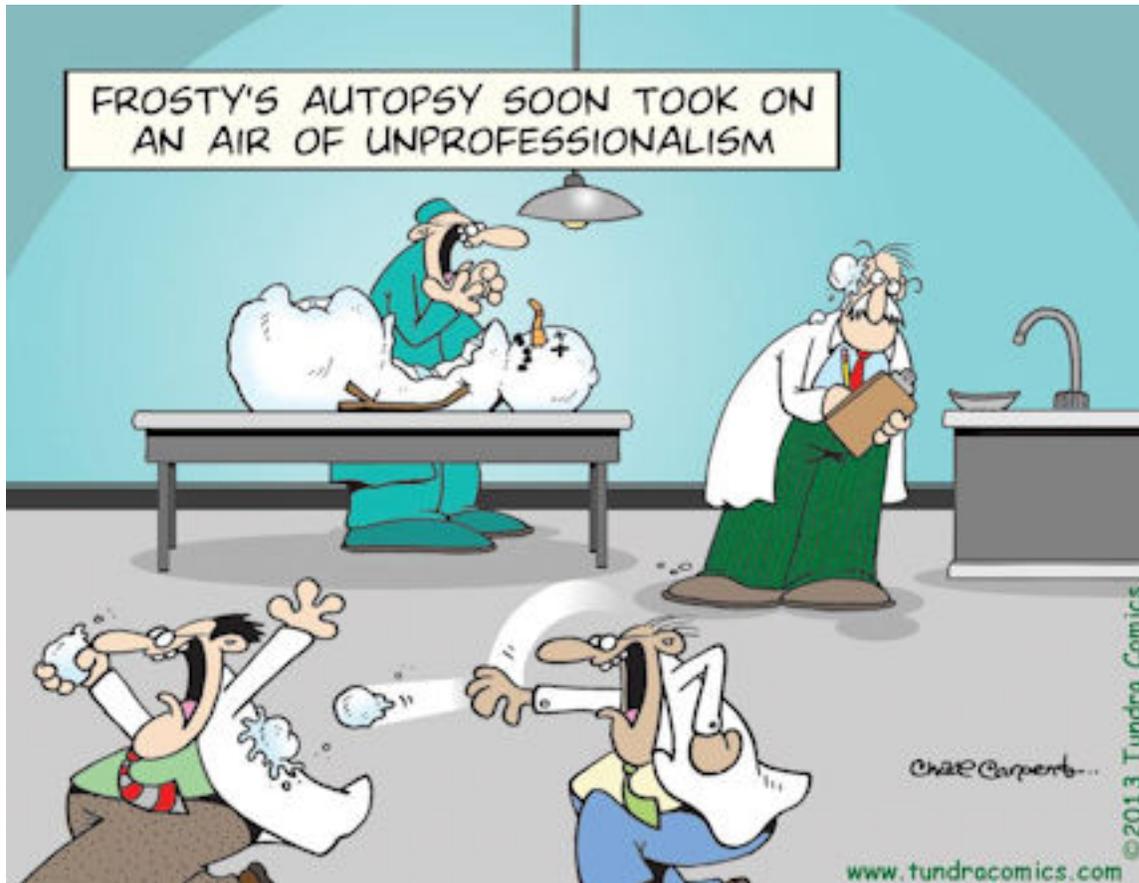


Autopsy in the 20th century



- **Influence of William Osler (Johns Hopkins) and Richard Clarke Cabot (Massachusetts General Hospital) made autopsies central to medical practice and education**
 - Cabot found 40% incorrect clinical diagnoses at MGH
- **By World War II autopsy rates ~ 50%**
- **Around 1970 rates began to decline**
 - 50% of hospital deaths in 1960 to less than 10% today

What is an autopsy?



- Detailed external examination
- Full dissection and investigation of cranial, thoracic, abdominal, pelvic cavities

Autopsy as quality tool

- Initially a critical means of understanding pathogenesis of disease and detecting new disease entities
- The role of autopsy as a quality assurance tool is now emphasized
 - focuses on difference between antemortem (clinical) and postmortem diagnoses

Goldman criteria

- Class I error
 - major missed diagnosis with potentially adverse impact on survival that would have changed management
- Class II error
 - major missed diagnosis without potential impact on survival that would not have changed management
- Class III and IV errors are missed minor diagnoses not related to the cause of the main diseases

Frequency of misdiagnosis

- Major error rates estimated to be approximately 10%.
 - appears to vary by setting
 - antemortem tissue diagnosis most difficult for heart and brain
- In a widely cited study, Shojania et al. examined data from 53 autopsy series over a period of 40 years
 - decreases in major discrepancies and class I errors were 19.4% and 33.4% per decade
- Based on autopsy rates of 100% to 5% authors estimated U.S. institutions could experience a major error rate of 8.4 to 24.4% and a class I error rate of 4.1% to 6.7% (JAMA 2003;289:2849 - 2856)

Supportive data

- There are no objective data that support the use of autopsies as a quality assurance procedure to improve patient care
 - There are no studies that demonstrate a direct benefit of autopsies to patients
 - No data that demonstrate that performing autopsies improves the quality of patient care
 - No studies been performed to determine error rates in autopsy diagnosis itself.
- **Thus, any theoretically positive effects of autopsy on the quality of care are unproven.**

Autopsies on the decline

- Expert opinion and anecdotal evidence encourage the use of the autopsy as quality assurance tool.
- Precipitous decline in autopsy rates over the past 50 years
 - medical schools fragment pathology teaching
 - treating physicians skeptical about autopsy value
 - concern about malpractice risk
 - pathologist dislike or preference for other activities
 - informed consent problems
 - limited reimbursement (no professional payment)
 - lack of family desire to pursue autopsies
 - elimination of accreditation requirement of autopsies in minimum percentage of hospital deaths

Anatomic Pathology

Postmortem Examination

Procedures 88000 through 88099 represent physician services only. Use modifier 90 for outside laboratory services.

- 88000** Necropsy (autopsy), gross examination only; without CNS
 → CPT Assistant Aug 05:9
- 88005** with brain
- 88007** with brain and spinal cord
- 88012** infant with brain
- 88014** stillborn or newborn with brain
- 88016** macerated stillborn
- 88020** Necropsy (autopsy), gross and microscopic; without CNS
- 88025** with brain
- 88027** with brain and spinal cord
- 88028** infant with brain
- 88029** stillborn or newborn with brain
- 88036** Necropsy (autopsy), limited, gross and/or microscopic; regional
- 88037** single organ
- 88040** Necropsy (autopsy); forensic examination
- 88045** coroner's call
- 88099** Unlisted necropsy (autopsy) procedure

Cytopathology

- 88104** Cytopathology, fluids, washings or brushings, except

(Do not report 88112 with 88108)

- 88120** Cytopathology, in situ hybridization (eg, FISH), urinary tract specimen with morphometric analysis, 3-5 molecular probes, each specimen; manual

→ CPT Changes: An Insider's View 2011

→ CPT Assistant Oct 10:9, Dec 10:9

- 88121** using computer-assisted technology

→ CPT Changes: An Insider's View 2011

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(For morphometric in situ hybridization on cytologic specimens other than urinary tract, see 88367, 88368)

(For more than 5 probes, use 88399)

- 88125** Cytopathology, forensic (eg, sperm)

- 88130** Sex chromatin identification; Barr bodies

- 88140** peripheral blood smear, polymorphonuclear drumsticks

→ CPT Assistant Nov 98:27-28, Mar 06:6

(For Guard stain, use 88313)

Codes 88141-88155, 88164-88167, 88174-88175 are used to report cervical or vaginal screening by various methods and to report physician interpretation services. Use codes 88150-88154 to report conventional Pap smears that are examined using non-Bethesda reporting. Use codes 88164-88167 to report conventional Pap smears that are examined using the Bethesda System of reporting. Use codes 88142-88143 to report liquid-based specimens processed as thin-layer preparations that are examined using any system of reporting (Bethesda or non-Bethesda). Use codes 88174-88175 to report automated screening of liquid-based specimens that are examined using any system of reporting (Bethesda or non-Bethesda). Within each of these three code families choose the one code that describes the screening method(s) used. Codes 88141 and 88155 should be

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Search Results [0 Record(s)]

Selected Criteria:
 Year: HCPSC:
 Type of Info.: Modifier:
 HCPSC:
 Criteria:
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Single HCPSC Code	
Code	Description
88000	Autopsy (necropsy) gross

For your convenience, search results can be printed, downloaded or emailed.

The current Physician Fee Schedule does not price the requested HCPSC Code(s).

The current Physician Fee Schedule does not price the requested HCPSC Codes

IOM conclusions

- Postmortem examinations play a critical role in understanding the epidemiology of diagnostic errors
- Increasing the number of postmortem examinations is warranted
- Tracking number of deaths, those eligible and selected for postmortem exams, and refusal rate among family members would enable development of better national estimates of diagnostic error incidence
- More efficient to have a limited number of systems that are highly qualified in conducting postmortem exams to produce research quality information about the incidence and nature of diagnostic errors among a representative sample of patient deaths.

IOM Recommendation

- [T]he committee recommends that the Department of Health and Human Services (HHS) should provide funding for a designated subset of health care systems to conduct routine postmortem examinations on a representative sample of patient deaths.

IOM Recommendation

- Health systems should reflect a broad array of different settings of care
- A competitive grant process *could* be used
- Systems *can* characterize frequency with which the request for a postmortem examination is refused
 - better describe the risk of response bias in results
- Participating health care systems *could* be required to produce annual reports on:
 - the epidemiology of diagnostic errors found
 - the value of postmortem examinations as a tool for identifying and reducing errors, and
 - if relevant, the role and value of postmortem examinations in quality improvement efforts.
- Health care systems *could* investigate how minimally invasive postmortem approaches compare with traditional full body postmortem examinations.

Potential type of study

- Ongoing, systematic study of autopsies coupled with an automated review of deceased's electronic health records
 - using natural language processing and machine learning
- Study would allow for creation of algorithms to assess EHR for all deaths and automatically produce a draft death certificate for attending physician's consideration and editing
- Study could also look at whether (if/when) limited, directed post-mortem examination using less invasive techniques such as needle biopsies, evaluation of body fluids, radiographic techniques, etc. can provide sensitive and specific information
- Understanding gained linked to patient outcomes
- **All of this starts with a systematic study of deaths using post-mortem examination**

Potential outcomes from study

- Ways to reduce diagnostic errors
- Guidelines for autopsy utilization
- National autopsy database
- Determine need for updating reimbursement paradigm

Previous proposed CLIAC recommendation

- HHS should support IOM recommendations for increasing the use of autopsies with 3 accompanying items below to ensure success of this recommendation:
 - Guidance on when use of autopsy is required or highly recommended for error discovery;
 - Procedures to ensure quality control
 - Steps to account for RVU allocation to incentivize the use of autopsies

Other reasons to perform autopsies

- Epidemiology and public health
- Detection of new patterns in old diseases (e.g., tuberculosis and syphilis)
- Providing information on disease course and cause of death to next of kin of deceased patients
- Facilitating investigation of environmental, occupational, and lifestyle-related diseases
- Providing tissue for research
- Teaching medical students and residents in specialty training

Proposed CLIAC recommendation

- “The CLIAC supports the IOM recommendation that Department of Health and Human Services (HHS) provide funding for a designated subset of health care systems to conduct routine postmortem examinations on a representative sample of patient deaths.” However, these funds should be directly linked to proposals for data acquisition, including standardization of procedure and reporting, with the express goal of understanding the value of autopsies on reducing diagnostic error and improving patient health outcomes.”

Issues for discussion

- Should the number of autopsies be increased?
- Do we agree with IOM's plan for increasing the number of autopsies?
- Other ways to influence the number of autopsies:
 - influencing medical school curricula
 - educating treating physicians
 - increased professional status via creation of an autopsy subspecialty
 - direct funding for autopsies, including professional payments
 - educating families about autopsies
 - reinstating regulatory requirement to perform specified percentage of autopsies
- Are there other areas in need of investigation and/or improvement, e.g. informed consent process?
- Should funding for autopsies be more closely linked to data gathering directed toward understanding the impact of autopsies on patient outcomes?

The End