The Autopsy:The Ultimate Tool for Surveillance and Quality Assurance.

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The views and opinions expressed in this presentation are those of the author and do not reflect the official policy or position of the Department of Defense, or the United States Government.

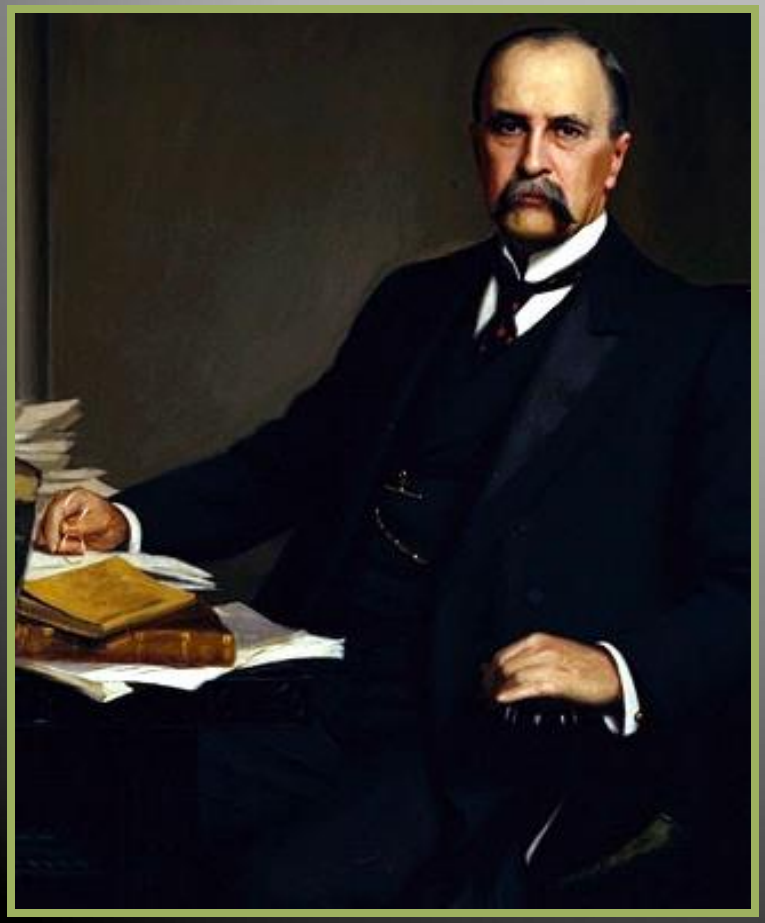
"To investigate the causes of death…

..to examine carefully the condition of organs, after such changes have gone on in them to render existence impossible

and

..to apply such knowledge to the prevention and treatment of disease, is one of the highest objectives of the Physician…

Graduation Thesis McGill University, 1872



Sir William Osler

Health resources cannot be allocated without evidence-based information

"*It is difficult to deliver effective and high quality care to patients without knowing their diagnosis….Christopher Murray, Measuring the Global Burden of Disease, NEJM 2013*

Who dies and why?

- In the majority of African countries people are born and die without any statistical traces
- Most people die outside of medical care therefore most data are biased towards those few with access to health facilities
- Autopsies remain the gold standard of determining the cause of death in patients and populations

4 Main Types of Autopsies

- l) Perinatal autopsies
- 2) Child + adult consented clinical autopsies
- 3) Child + adult medico-legal (coronial) autopsies
- 4) Suspected homicide (forensic) autopsies

- Verbal Autopsy
  - Not an anatomic pathology procedure
  - Useful tool for population-based death statistics
  - Low sensitivity and specificity for many conditions

Roles and benefits of autopsy

- Cause of death
- Understanding sequence of events
- Local audit of mortality
- Natural cause-of-death statistics
- Identify adverse outcomes of medical care
- Identifying new and emerging diseases
- Identifying epidemics
- Teaching undergraduate and post-graduate physicians
- Information for next of kin
- Tissue material for research

Autopsy Causes of Death in HIV-positive Individuals in Sub-Saharan Africa.

Cox JA, Lukande RL, Lucas S, Nelson A et al. AIDS Rev 2010

- Review of the literature: 20 HIV autopsy studies in SSA 1993-2008
- Tuberculosis has remained the most common cause of death in HIV positive adults (32-45%)
  - TB under and over-diagnosed (sensitivity 43-80%)
    - Only sometimes due to late presentation and early death
- Other important causes of respiratory disease were bacterial pneumonia, CMV, cryptococcosis, and KS

An Autopsy Study Describing Cause of Death and Comparing Clinicopathological Findings Among Hospitalized Patients in Kampala, Uganda.

Cox JA, Lukande RL, Nelson AM et al. Plos One 2012

- TB present in 49% of cases
  - Disseminated TB cause of death in 37%
  - 12 % had TB but died of an other cause
- CN was the second leading cause of death at 20%
- KS = 9%.
- Pts on ART died of similar causes (50% TB, 20% CN, 10% KS)
  - RX short duration or inadequate
- Only 12% of diagnosis had been clinically confirmed. Another 33% suspected
- Overall, 45% of dx had not been considered

Many cases from these and other autopsieswere used for a successful CPC at Mulago with 100+ attendees

Causes of Death At Korle Bu, Accra Ghana
autopsy data from 14034 deaths (2001-2003)

- **Mortality data** important in evaluating the health of a nation in order to introduce interventions that can promote health and prolong life
- Autopsy
  - A useful epidemiologic tool for the study of the pattern and causes of mortality
  - Also useful in evaluating some health programes, and intervention
    - Expanded Program on Immunization (EPI)
    - Prevention of Maternal Mortality
    - School Health Programs

Table showing the shifting pattern of disease of the top causes of death for chosen age groups

Data from a mix of medical and forensic autopsies

	0--4yr	5--14yr	15--24yr	25--64yr	65+yr
Malaria	23.4	15.6			
Pneumonia	20	9.7	9.4	12	14.1
Typhoid	7.2	9.2	4.7		
Gastroenteritis	7.1	2.5	1.8	1.9	
Anaemia	4.7	2.2		1.6	1.8
Congenital	3.9	1.7			
Malnutrition	2.4	0			
Meningitis	2.4	4.6	3.5	1.7	
Drowning	2.3	5.1	4.8		
RTA	2.2	5.1	7.4	4.9	2
Tuberculosis	1.4	1.4	4.4	9.2	2.8
Sickle cell	1.4	5.9	7.6		
Abortion			2.9		
HIV/AIDS			2.6	6.4	
Glomerular/renal			1.7		
Cirrhosis				3.5	
Pyelonephritis					1.6
Atherosclerosis					1.9
Diabetes mellitus					2.6
Ischaemic heart disease					3.5
Pulmonary embolism				1.9	4.6
Cerebrovascular				2.4	4.9
Hypertension				14	21.8

Public Health Policy

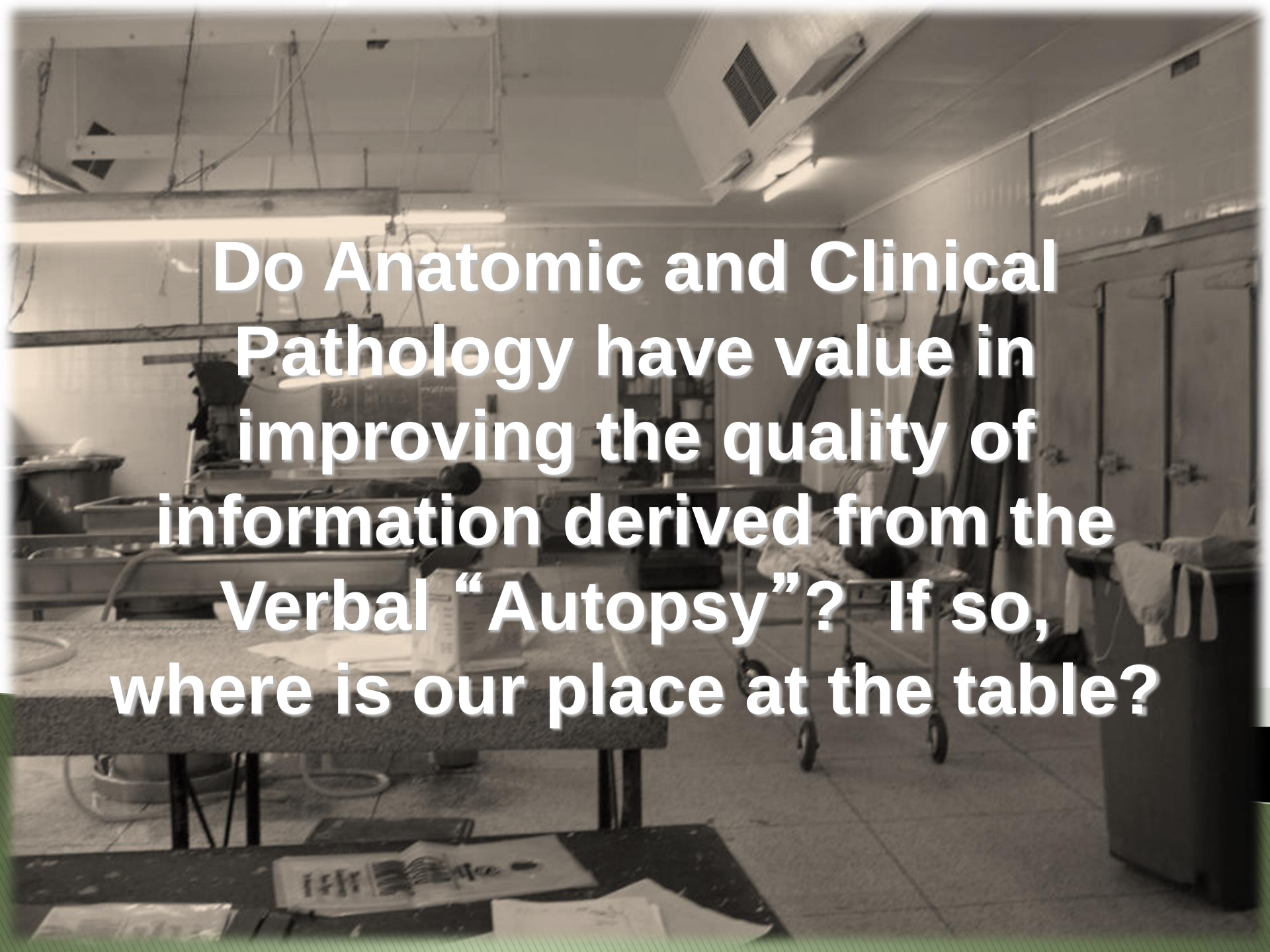
Example of South Africa – Routine Autopsies in Miners (Jill Murry, RSA)

- Inform next of kin, determine compensation
- Since 1975, the rate of silicosis has not deceased
- Describes what is happening to TB increasing rate of TB pre and Post HIV
  - Rate of missed diagnosis of TB – 60%
  - Able to devise an intervention for TB
  - People on anti-TB Rx die of something other than TB
- Also demonstrate other missed diagnoses

Verbal Autopsy

- Need to strengthen the vital registration system which should capture the following information:
  - All deaths in different places
  - Age and sex
  - Death based on the opinion of medical qualified personnel (cause-specific, if possible)

- WHO released a VA instrument to gather population based information on causes of death (2007, rev 2012)
  - Method of obtaining as much information as possible about a deceased person
    - asking questions of family and others who can describe the mode of death and circumstances preceding death
    - used especially in developing countries and in settings and situations in which postmortem pathologic examination is not feasible


Do Anatomic and Clinical Pathology have value in improving the quality of information derived from the Verbal “Autopsy”? If so, where is our place at the table?

Post-Mortems to Reduce Uncertainty Regarding Causes of Death in Developing Countries

Comment in the Lancet, 2013

- Complete PMs infrequent in SSA
  - Deaths outside medical setting
  - Lack of resources
  - Cultural reluctance
- Verbal autopsy has issues with accuracy
  - Quality of data is uneven
  - Lack of any medical evaluation prior to death
  - Non-specific signs and symptoms are problematic
    - Perinatal deaths
    - Infectious diseases
- What other method available?
  - Minimally invasive, imaging guided needle autopsy is in development by international consortium

Tuberculosis and Tuberculosis/HIV/AIDS-associated Mortality in Africa: The Urgent Need to Expand and Invest in Routine and Research Autopsies. Mudenda V, Lucas S, Shibmeba A et al. JID Supplement March 2012

- "Accurate cause-specific mortality data are essential for prioritization of governmental and donor investments into health services to reduce mortality and morbidity from deadly infectious diseases such as tuberculosis and HIV/AIDS"

How Do We Increase Autopsies?

- Link autopsies to other programs that are being heavily funded
- Broaden autopsies for what is happening in university teaching hospitals
- Bring research into the countries where material is collected
- Create structured protocols
  - Standardized across countries
  - Enables publication of comparable results


Thank You!