A Century of Modern Cardiology: What’s in the next?

L B Tan
Consultant Cardiologist
Leeds General Infirmary
William Harvey
(1 April 1578 – 3 June 1657)
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"... that the movement of the blood is constantly in a circle, and is brought about by the beat of the heart ... for the sake of nourishment ... "

- William Harvey, DE MOTU CORDIS, 1628
Rev Stephen Hales (1677-1761)
[By courtesy of the Wellcome Trustees.]

Blood Pressure

Non-invasive methods of measuring BP

• Manual:
  – Mercury sphymomanometry (gold standard)
  – Aneroid sphymomanometry

• Automatic:
  – Oscillometric detection
  – Auscultatory detection
Aortic Pressure
Stroke mortality rates vs usual BP ♥


Stroke deaths ↑ with ↑ BP & ↑ Age ♥
Intracerebral Haemorrhage
Ischaemic HD mortality ~ BP
Prospective Studies Collaboration, Lancet 2002; 360:1903-13

IHD deaths ↑ with ↑BP & ↑Age ❤
Severe atherosclerosis ♥
Transverse section of a coronary artery. The plaque cap has a fissure which has allowed blood into the lipid core, allowing the formation of a massive thrombus within the plaque itself.
Benefits of BP Treatment ♥
(Clinical Trials of 2-5 yrs)

- ↓ Stroke 35 – 40%
- ↓ MI 20 – 25%
- ↓ Heart Failure >50%

Evolving treatment targets for hypertensive patients

British Hypertension Society
- Previous BHS Threshold for treatment
- Current GMS target* General Medical Services
- Latest BHS target

* GMS target based on BHS audit standard
BP~Age relationships are different in Westernized & primitive societies.

Geographical distribution of some low BP populations.

South American Indians (Yanomami)

On Evolutionary Diet
i.e. no salt, very little fat, no refined carbohydrate, fruits & vegetables +, but aggressive fit, stress ++

Male adults:
Average BP: 96/61 mmHg ♥
Average Cholesterol: 3.1 mmol/l
No rise in either with age
No vascular disease
Figure 2. Line graphs of SBP & DBP by 10-year age groups in the four populations

BP remains low with ↑age ♥

Salt intake & BP

↑Na intake ➔ ↑BP ♥

**Figure 3.** Graphs of mean systolic and diastolic pressures by mean level of sodium excretion in the four populations.
Sir Austin Bradford Hill, FRS
(8 July 1897 – 18 April 1991)
STREPTOMYCIN TREATMENT OF PULMONARY TUBERCULOSIS
A MEDICAL RESEARCH COUNCIL INVESTIGATION

The following gives the short-term results of a controlled investigation into the effects of streptomycin on one type of pulmonary tuberculosis. The inquiry was planned and directed by the Streptomycin in Tuberculosis Trials Committee, composed of the following members: Dr. Geoffrey Marshall (chairman), Professor J. W. S. Blacklock, Professor C. Cameron, Professor N. B. Capon, Dr. R. Cruickshank, Professor J. H. Gaddum, Dr. F. R. G. Heaf, Professor A. Bradford Hill, Dr. L. E. Houghton, Dr. J. Clifford Hoyle, Professor H. Raistrick, Dr. J. G. Scadding, Professor W. H. Tytler, Professor G. S. Wilson, and Dr. P. D’Arcy Hart (secretary). The centres at which the work was carried out and the specialists in charge of patients and pathological work were as follows:

_Brompton Hospital, London._—Clinician: Dr. J. W. Crofton, Streptomycin Registrar (working under the direction of the honorary staff of Brompton Hospital); Pathologists: Dr. J. W. Clegg, Dr. D. A. Mitchison.

_Colindale Hospital (L.C.C.), London._—Clinicians: Dr. J. V. Hurford, Dr. B. J. Douglas Smith, Dr. W. E. Snell; Pathologists (Central Public Health Laboratory): Dr. G. B. Forbes, Dr. H. D. Holt.

_Harefield Hospital (M.C.C.), Harefield, Middlesex._—Clinicians: Dr. R. H. Brent, Dr. L. E. Houghton; Pathologist: Dr. E. Nassau.

_Bangour Hospital, Bangour, West Lothian._—Clinician: Dr. I. D. Ross; Pathologist: Dr. Isabelle Purdie.

_Killingbeck Hospital and Sanatorium, Leeds._—Clinicians: Dr. W. Santon Gilmour, Dr. A. M. Reevie; Pathologist: Professor J. W. McLeod.

_Northern Hospital (L.C.C.), Winchmore Hill, London._—Clinicians: Dr. F. A. Nash, Dr. R. Shoulman; Pathologists: Dr. J. M. Alston, Dr. A. Mohun.

_Sully Hospital, Sully, Glam._—Clinicians: Dr. D. M. E. Thomas, Dr. L. R. West; Pathologist: Professor W. H. Tytler.
Sir Richard Doll
(28 October 1912 – 24 July 2005)
SMOKING AND CARCINOMA OF THE LUNG
PRELIMINARY REPORT

BY

RICHARD DOLL, M.D., M.R.C.P.
Member of the Statistical Research Unit of the Medical Research Council

AND

A. BRADFORD HILL, Ph.D., D.Sc.
Professor of Medical Statistics, London School of Hygiene and Tropical Medicine; Honorary Director of the Statistical Research Unit of the Medical Research Council

Fig. 2.—Death rate from cancer of the lung and rate of consumption of tobacco and cigarettes.
Smoking kills

Thank you for not smoking
Major advances in 20th Century Cardiology

- Cardiovascular Structure & Function
- RCT & meta-analyses
- Prevention & Rehab: statins, lifestyle, obesity, exercise
- Cardiac surgery, PTCA (Andreas Grundzig), stents
- Cardiac Tx & LVADs
- Devices: PPM, CRT, ICDs, TAVI
Major false avenues in 20th century

- Misleading indicators of cardiac function: e.g. Indices of contractility, LVEF
- Positive inotropes & cardiotoxicity, proarrhythmias of anti-arrhythmic agents
- False ranking of evidences
- Ideological EBM-ism
Future Cardiology

- Prevention of CV Diseases
- Regression of atherosclerosis
- Organ & Cell Replacement Therapies
- Replacement parts from growing cardiac tissues (valves)
- Devices – VADs, TAHs
- Organ functional assessments
- Biomarkers