Module 1

Ethical Considerations in Research

Animals

History

- **Ancient Greece**
  - Anatomical (dead) studies – *Aristotle* + *Alcmaeon* + *Hippocratic collection*
  - Vivisection and physiology experiments – *Aristotle* + *Erasistratus* + *Herophilus*
- **Ancient Rome –** live studies: *Galen*
- **15th-16th Century –** continued live studies: *Vesalius*
- **Evolving Notions**
  - Animals exist to be used by humans
  - Mutual dependence
  - Animal welfare limits use
  - Animal rights prohibits use
- **Use –** 100-200 million used in research each year: *Sandoe et al. (2008)*

Issues

- Based on anthropocentric arguments
  - Greek Mythology and Judeo-Christian Theology
  - Ideas
    - Purpose is to serve humans
    - No soul – *Thomas of Aquinas*
    - Are organic machines that don't feel pain and good science is based on neutral and dispassionate observation – *Descartes*
- Doubted and debated due to the suffering observed – questioned morality
- Issues
  - What species
  - Who owns the animal
  - Who benefits
  - How invasive is it

Humans

History

- Began in Ancient Greece
- **18th Century –** generalizable outcomes
- **19th Century –** Industrial Revolution and expansion of hospitals led to large-scale research
- **20th Century**
  - An awareness of infectious disease + vaccines + pharmacotherapy led to expansion
  - Driven by militarism and emerging biotechnology

Issues

- Constant change – changes in technology and ethical values + emerging issues
- Global inequalities
- Money
- Power

Guidelines on the Ethics of Biomedical Research

Berlin Code	**1900**	Informed consent + the exclusion of minors + documentation + authorisation
Nuremberg Code	**1947**	• **10** standards for permissible medical experiments • Example ❖ **Voluntary** informed consent ❖ Freedom to withdraw
Declaration of Helsinki	**1964 + Updates**	• World Medical Association • Based on the Nuremberg Code • **12** basic principles for clinical and non-clinical research • Example ❖ Judged by an independent committee ❖ Placebo ❖ Post-trial
NC3R's	**Animals**	• NC3R's – National Centre for the Replacement, Refinement and Reduction of Animals in Research • 3 R's ❖ Replacement – models ❖ Reduction – minimum number for reliable results ❖ Refinement – analgesia ➔ monitoring ➔ humane endpoint
ARRIVE Guidelines	**Animals**	• ARRIVE = Animal Research: Reporting of In Vivo Experiments • Report research involving animals to prevent unnecessary research

Practical: Evidence-Based Practice

Steps

1. **Ask –** **P**atient / Population / Problem + **I**ntervention / Exposure + **C**omparison + **O**utcome
2. **Acquire –** best evidence
3. **Appraise –** validity (chance / bias), importance (size) and applicability
4. **Apply –** evidence to clinical decision making
5. **Audit –** evaluation

Hierarchy of Evidence

- Meta-analysis (quantitative) ➔ systemic reviews (qualitative)
- Experimental – randomised control trials: answers diagnosis and treatment
- Observational
  - ❖ Cohort – pre-existing groups
  - ❖ Case control – diseased vs not diseased
  - ❖ Cross sectional – survey
  - ❖ Case series ➔ single case
- Expert opinions
- Laboratory studies – comparative animal research ➔ in-vitro "test tube" research