



Assumptions

IMPACT Program Curriculum

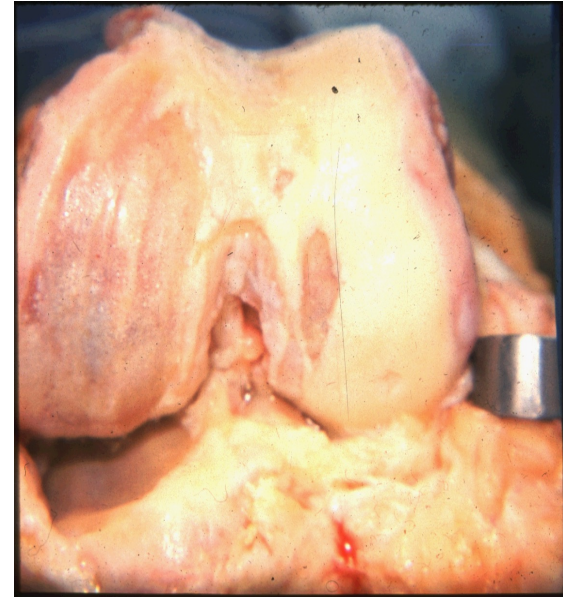
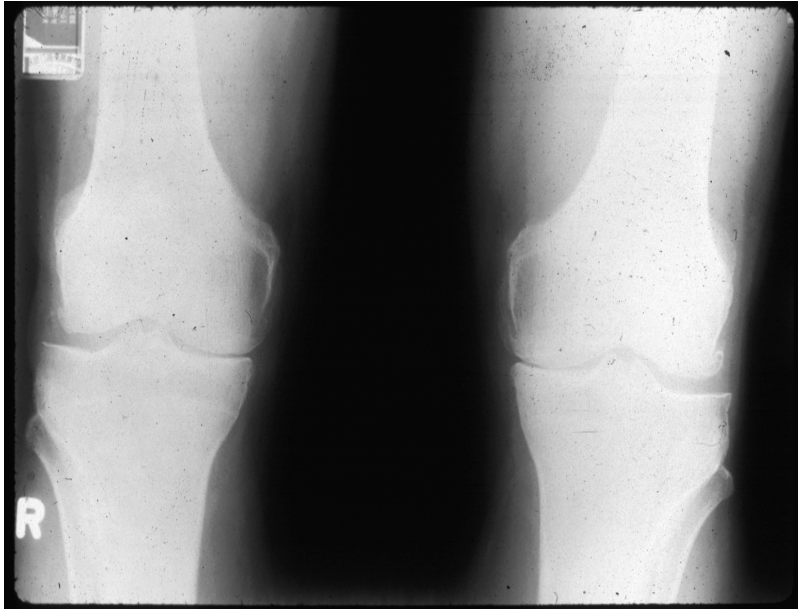


Assumptions

Assumptions are inherent in research; some assumptions are obvious, and others are more subtle. Here we discuss how assumptions can impact research.



Assumptions in Research: Arthritis as Case Study



For many years, arthritis was diagnosed by how close the bones appeared to be on a knee radiograph; this led to the assumption that arthritis is a progressive “wear and tear” disease with irreversible loss of cartilage tissue



How we “see” arthritis...

And how this biases our assumptions in research

- Problem is “wear and tear” (versus biological)
 - Biases problem definition
- Participants in clinical trials must be those likely to lose cartilage quickly (to see the effect of the drug on slowing down cartilage loss) => trials utilize late disease. (Potentially the reason for the numerous negative results of clinical trials of new drugs)
 - Biases study design
- FDA considers cartilage loss the outcome metric for drug trials
 - Biases regulatory design



How we “see” arthritis...

And how this biases our assumptions in research

- When MRI became available (which could see cartilage tissue directly), major resources went to development of methods to measure cartilage thickness as a better measure of cartilage loss
 - Biases experimental design
- Patients will need to take drug for life and therefore will not be willing to take drug with any toxicity
 - Biased assumption of solution and of end-user preference
- Etc....

Even “scientific” studies and “facts” have inherent assumptions and bias; try to identify those.



Identify assumptions in your work:

- Reexamine “facts” that have been around for years
- Try to identify bias in viewing of problem
- Consider positive (supporting your hypothesis) and negative (unexpected or not supporting your hypothesis) as potentially important findings
- Consider your assumptions about those who might want to use the results of your research
- Consider the realistic (and practical) impact of the results; how will it really be used (by whomever)

These assumptions may take very different forms depending on the particulars of the projects.