

# Critique a Research Article

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# Reading literature

- \* **One of the most valuable skills to develop is an ability to critically evaluate literature & critique a study**
- **Understand the study**
  - \* **Main research question**
  - \* **Study population**
  - \* **Study design**
  - \* **Sample selection**
  - \* **The independent and dependent variables**
    - \* **What are they? How were they measured?**
  - \* **Study results**
  - \* **Authors' interpretations and stated strength/limitations**

# The Body of a Research Article

- **Abstract**
- **Introduction**
- **Methods**
- **Results**
- **Discussion**



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# Critiquing an Article

- \* The title
  - \* Clear, readily understood, related to content
- \* Abstract
  - \* States problem; methodology described; results summarized; conclusions stated
- \* Problem
  - \* Problem statement is clear; hypothesis stated; can identify limitations and assumptions; significance of the problem discussed and research is justified

# Abstract

- **A well-written abstract should provide key highlights from each of the article sections**
  - ★ **Main research question**
  - ★ **Study population and design**
  - ★ **Sample selection**
  - ★ **Primary exposure/treatment and outcomes**
  - ★ **Results**
  - ★ **Authors' interpretations**

# Introduction

- **Introduction often follow a general format**
  - We know...*
  - We don't know....*
  - We aim to find out...*
- **Delineates study objectives (and hypotheses)**
  - *e.g. Test whether vitamin D deficiency is associated with progression of disease in multiple sclerosis*

# Review of the Literature

- \* Literature review is pertinent to the problem
- \* Cited literature provides rationale for the research
- \* Relationship of problem to previous research is clear
- \* Conceptual framework/ rationale is clear
- \* Review concludes with brief summary of literature and implications to research problem

# Methods

- **Provides details on how study was actually conducted**
  - ★ **Underlying population from which participants were drawn and how selected**
  - ★ **Study design**
  - ★ **Sample size**
  - ★ **Exposures/Treatments (definitions, how measured)**
  - ★ **Outcomes (definitions, how measured)**
  - ★ **Analysis type used in the study**



# Methodology

- \* Subjects described
- \* Sampling method is described and justified
- \* Sample size sufficient to reduce type II error
- \* Protection of subjects discussed
- \* Data collection
  - \* Reliability and validity of instruments stated
  - \* Data collection methods appropriate
- \* Design
  - \* Appropriate to study hypothesis
  - \* Confounding variables identified
  - \* Design description explicit to permit replication

# Results

- **Results with descriptive details of the sample**
  - ★ Sample characteristics?
  - ★ Response rate (Who enrolled?)
  - ★ How many people were exposed overall? Had or developed outcome of interest?
- **Main association of interest described in detail**
  - ★ Associations (Odds Ratio, Risk Ratio)
  - ★ Subgroup analyses
  - ★ Adjusted associations
  - ★ Graphs and tables

# Analysis

- \* Information presented sufficient to answer research questions
- \* Statistical tests used are identified and obtained values are reported
- \* Reported stats are appropriate for hypothesis
- \* Tables and figures are easy to understand



# Discussion

- **Most important findings are typically outlined in first paragraphs, with scientific or public health implications**
  - ★ **Placed in context of other studies (Consistent? Contradictory? Altogether new?)**
  - ★ **Potential biological and social processes underlying the observed associations are considered**
- **Limitations of study are outlined and weighed**
- **Unanswered questions identified**

# Discussion

- \* Conclusions stated clearly
- \* Conclusions substantiated by evidence
- \* Methodological problems identified and discussed
- \* Findings related to theory
- \* Implications of findings discussed
- \* Results generalized only to population on which study is based
- \* Recommendations are made for further research

# Form and Style

- \* Report is clearly written
- \* Report is logically organized
- \* Tone of report displays an unbiased, impartial, scientific attitude
- \* Strengths of study
- \* Limitations of study





# Think on your own...

- **A LONGITUDINAL STUDY OF ABNORMALITIES ON MRI AND DISABILITY FROM MULTIPLE SCLEROSIS**
- New England Journal of Medicine 2002; 346:158-64.
  - ★ Main research question
  - ★ Study population and design
  - ★ Sample selection processes
  - ★ Primary exposures and outcomes
    - ★ What are they?
    - ★ How were they measured?
  - ★ Result, precision?
  - ★ Author's interpretations