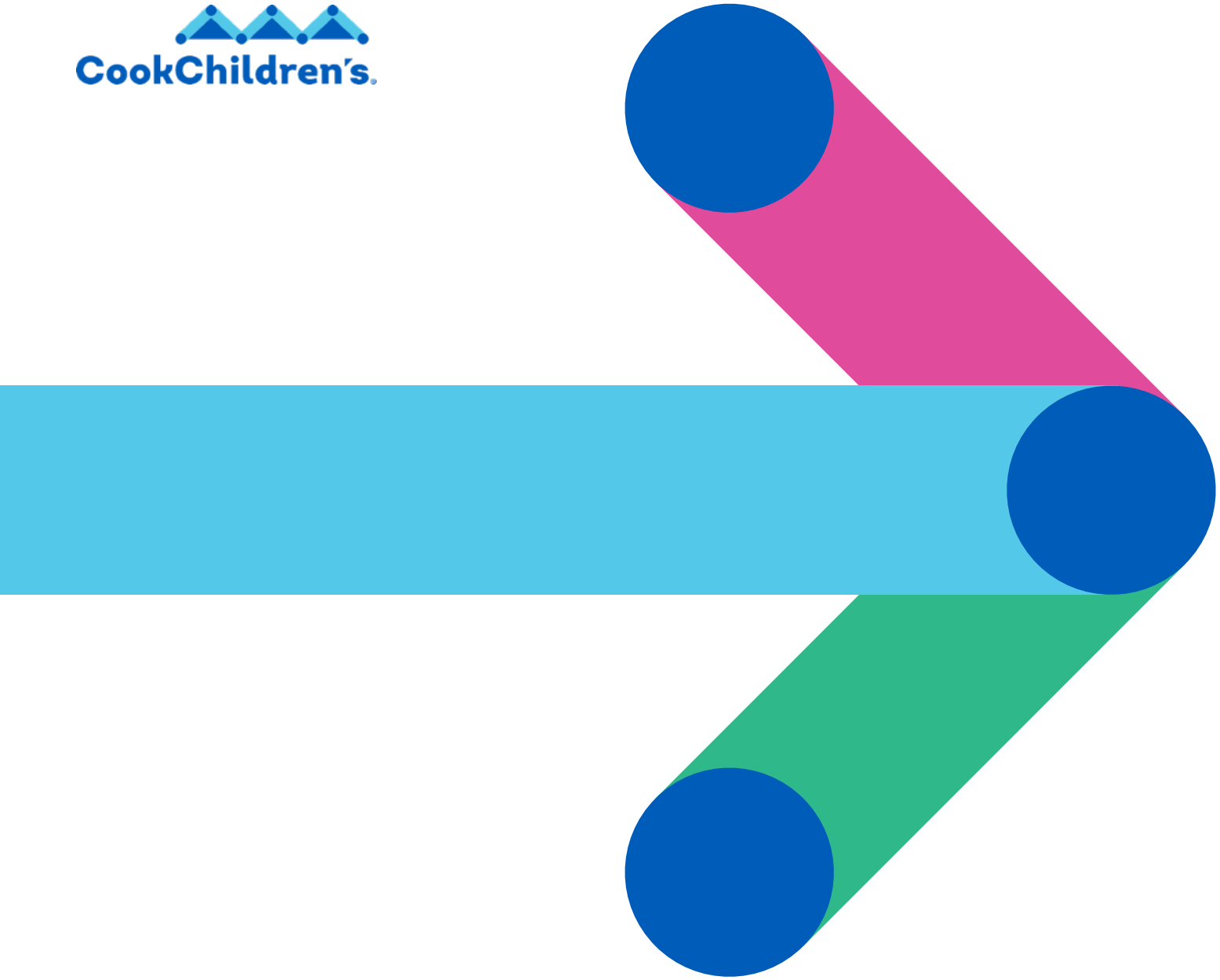


How to Read a Research Article

Deborah Rafferty, MSc.

Congenital Hyperinsulinism Family Conference
6/1/24

Tips for Reading Research Articles

- Skim the article during the first read-through.
- Always read the abstract first.
- Identify the structure of the article. What kind of research article is it?
- Highlight vocabulary and look up any words you do not understand.
- Write down your questions. They may be answered later in the article.
- References can help identify other articles that may be related to your topic of interest.
- Read the article multiple times to help understanding.
- If statistics and results are overwhelming, skip the text and focus on the tables and figures.

Types of Research Articles

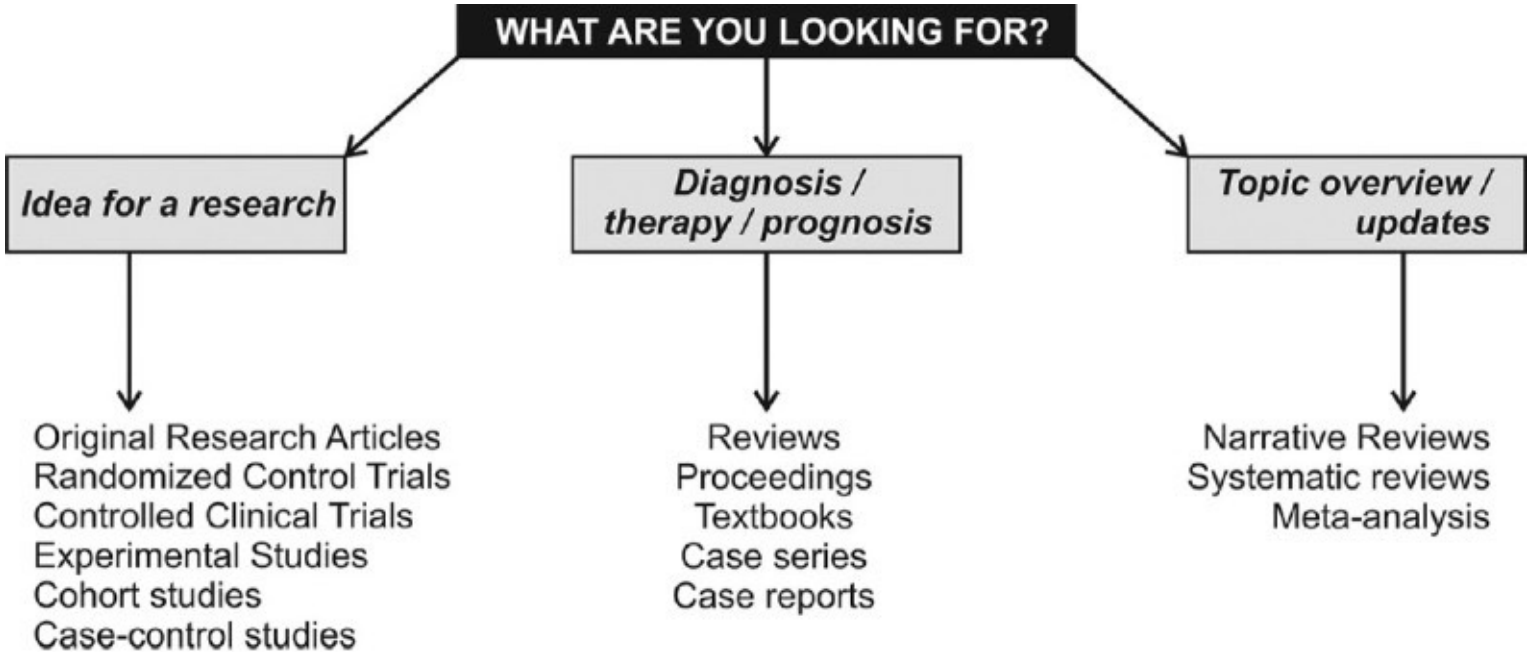
Primary Literature

- **Original data from one source**
  - Original Research Articles
  - Surveys
  - Case report/Case Series
  - Conference Proceedings and Abstracts
  - Editorial
  - Correspondence/Letter to the Editor

Secondary Literature

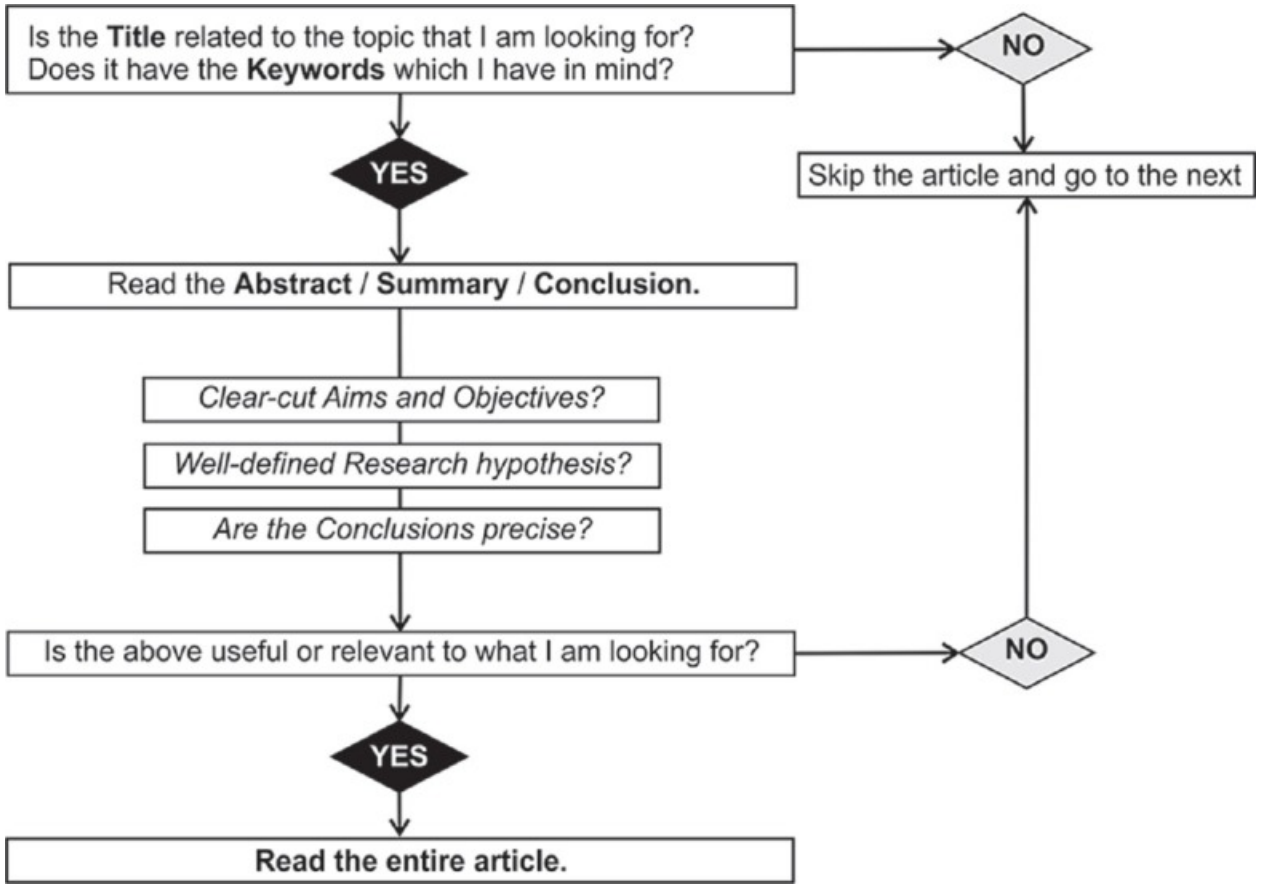
- **Overview or commentary of multiple sources**
  - Narrative Reviews
  - Systematic Reviews
  - Meta-analysis
  - Book Reviews
  - Guidelines
  - Commentary

Choosing the Right Article



Subramanyam (2013)

Choosing the Right Article

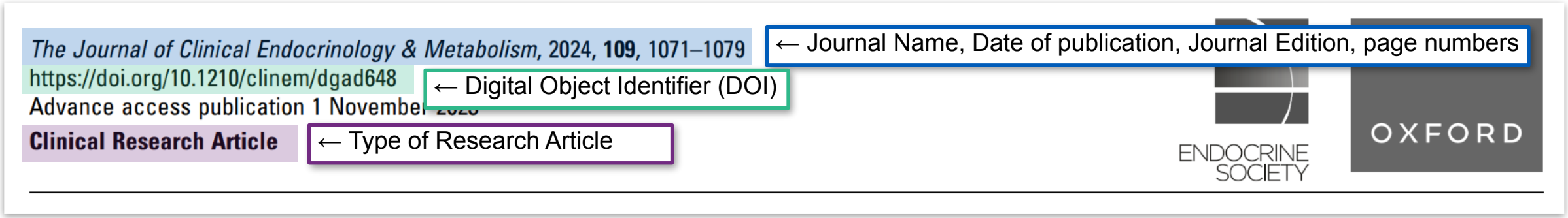


Subramanyam (2013)

Original Research Article Format

- **Title:** Provides information about the topic, authors and journal
- **Abstract:** Brief overview of the article
- **Introduction:** Background information and statement of research hypothesis
  - Why is this research important? What has previous research found?
- **Method:** Details about how the study was conducted, who participated (inclusion/exclusion criteri
  the authors measured
- **Results:** Statistical data, figures and tables
- **Discussion:** Interpretation and implications of the study
  - What do the results mean? How does this study impact interventions and future research?
- **References:** Citations and sources used in the article

Journal Information



Journal Name: Can help identify if the research article is related to right topic for your interests

DOI: a standardized unique number that identifies an article, helpful in finding specific articles

Type of Research Article: useful in identifying what type of research

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Title and Authors

Dasiglucagon for the Treatment of Congenital Hyperinsulinism: A Randomized Phase 3 Trial in Infants and Children

← Article Title

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← Corresponding Author: Who to contact if you have questions about the article

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Abstract

- Abstracts are a brief summary of the article and can help determine if you should read the full article.
  - Is this article is relevant to your questions or topic of interest?
- Abstracts have a similar structure to research article.
  - Background/Introduction, Method, Results, Discussion
- Good for answering fundamental questions about research article.
  - What is the study about? Why is it important?
  - How was the study conducted?
  - What did researchers find?

Example Abstract

Abstract

Context: Congenital hyperinsulinism (CHI) is characterized by dysregulated insulin secretion causing hypoglycemia and consequent brain damage. Dasiglucagon is a glucagon analogue under investigation to treat CHI.

Objective: To evaluate the efficacy and safety of dasiglucagon delivered via continuous subcutaneous infusion to children with CHI and persistent hypoglycemia as add-on to standard of care (SoC).

Methods: In this open-label trial, patients were randomized 1:1 to SoC or SoC + dasiglucagon (10-70 µg/h) for 4 weeks. In the following 4 weeks, all patients received dasiglucagon + SoC. Hypoglycemia was assessed by self-monitored plasma glucose (SMPG) and blinded continuous glucose monitoring (CGM). Primary endpoint was average number of SMPG-detected hypoglycemia episodes/week (SMPG <3.9 mmol/L) during Weeks 2 to 4.

Results: Thirty-two patients (0.6-10.9 years) were randomly assigned to dasiglucagon + SoC (n = 16) or SoC (n = 16). The rate of SMPG-detected hypoglycemia decreased from baseline in both groups, but with no statistically significant difference during Weeks 2 to 4 (event rate ratio: 0.85 [0.54; 1.36], $P = .5028$). However, dasiglucagon administration resulted in a 43% reduction in CGM-detected hypoglycemia (<3.9 mmol/L) vs SoC alone during Weeks 2 to 4 (post hoc analysis; event rate ratio: 0.57 [0.39; 0.83], $P = .0029$). Dasiglucagon enabled reductions (of 37% to 61%) in all other measures of hypoglycemia assessed by CGM vs SoC alone including extent and percent time in hypoglycemia (post hoc analyses). Dasiglucagon appeared safe and well tolerated. Skin and gastrointestinal events were more frequent with dasiglucagon + SoC than SoC only.

Conclusion: Clinically meaningful reductions in all CGM-recorded measures of hypoglycemia support using dasiglucagon as a potential treatment for CHI.

Key Words: congenital hyperinsulinism, hypoglycemia, treatment, dasiglucagon

Abbreviations: ADA, anti-drug antibody; AE, adverse event; ANCOVA, analysis of covariance; CGM, continuous glucose monitoring; CHI, congenital hyperinsulinism; IV, intravenous; NG, nasogastric; SC, subcutaneous; SMPG, self-monitored plasma glucose; SoC, standard of care.

Introduction

- Provides a background for and an overview of previous research related to the topic of interest and de important concepts
- Should answer the question: Why is this research important?
- Tips for reading the introduction:
  - The first paragraph(s) is the most important to read as it should tell you specifically what is being re
  - The last paragraph(s) outline the research question, hypothesis, and study aims.
  - Use a medical/scientific dictionary for words/ideas/concepts you do not understand.
  - Pay attention to abbreviations!

Method

- **Participants:** Who took part in the research study?
  - Demographics, Recruitment/Sampling, Inclusion/Exclusion Criteria
- **Study Design:** What was the research design?
  - Clinical Trial, Randomized Control Trial, Retrospective Chart Review
- **Procedures:** How was the research conducted?
  - The process and equipment used during the study
- **Outcomes:** What is being measured? How is success determined? What is the study endp
- **Statistical Analyses:** How did they analyze the data?

Results

- Statistical analyses and outcomes are reported. Typically, there is no interpretation of res
  this section.

- Tables and figures are a good visualization of results and can highlight the most importar

- **P-value:** a statistical measure used to determine the likelihood that an observed outcom
  result of chance.
  - Statistical significance typically has a threshold of .05. Some studies reduce the threshold to .01

Types of Statistics

- **Descriptive Statistics:** summarizes aggregate data

Statistic	Statistic	Description of calculation	Intent
Measures of central tendency	Mean	Total of values divided by the number of values.	Describe all responses with the average value.
	Median	Arrange all values in order and determine the halfway point.	Determine the middle value among all values, which is important when dealing with extreme outliers.
	Mode	Examine all values and determine which one appears most frequently.	Describe the most common value.
Measures of variability	Variance	Calculate the difference of each value from the mean, square this difference score, sum all of the squared difference scores and divide by the number of values minus 1.	Provide an indicator of spread.
	Standard deviation	Square root of variance.	Give an indicator of spread by reporting on average how much values differ from the mean.
	Range	The difference between the maximum and minimum value.	Give a very general indicator of spread.
	Frequencies	Count the number of occurrences of each value.	Provide a distribution of how many times each value occurs.

Guetterman (2019)

Types of Statistics

- **Inferential Statistics:** used in hypothesis testing to examine group differences and associations between variables

Statistic	Intent
t tests	Compare groups to examine whether means between two groups are statistically significant.
Analysis of variance	Compare groups to examine whether means among two or more groups are statistically significant.
Correlation	Examine whether there is a relationship or association between two or more variables.
Regression	Examine how one or more variables predict another variable.

Guetterman (2019)

Discussion and Conclusion

Discussion: Research questions are answered and results are interpreted in this section. The authors should address:

- Meaning of results and analyses
- New theories and hypotheses
- Connection to prior research and discussion of similarities and differences
- Strengths and limitations of the study
- Suggestions for future research

Conclusion: summary of article and results.

Resources

- Harvard Health Medical Dictionary
- SciSpace: Allows you to ask AI questions and it will provide a summary of relevant research and links to research articles. Basic accounts are free to use.
- Art of reading a journal article: Subramanyam (2013)
- Basics of statistics for primary care research: Guetterman (2019)
- The *P* Value and Statistical Significance: Andrade (2019)

Thank You

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