

# How To Read a Research Article

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There are several reasons why a respiratory therapist should read a research article. This article will review a few to highlight the importance of reading and understanding research articles.

The first, and likely the best, reason to read is the professional obligation to maintain competence. Respiratory care is a profession and one of the aspects of being a professional is the capability to self-teach, self-learn and evolve your practice. Respiratory therapists are accused of practicing the same way they were taught in respiratory school. If you ever wonder why our practice varies, it's likely because of the influence of research articles. To maintain relevance, we must review scientific articles.

The second reason to read research is to review an article in preparation for an upcoming meeting or discussion. Our practice should be reviewed as part of a comprehensive quality-improvement process. This is healthy, and we should always look to improve our practice and associated outcomes.

The third reason is for the joy of it. Now, I know you are starting to laugh, but I really do enjoy exploring research articles. It's not the reading or mental exercise I enjoy, it's the practice change that improves the care we provide that warms my heart.

Now that you have picked a research article to read from the reasons above or others, I have a few suggestions in how to tackle a research article.

## Be skeptical or suspicious

Read critically. I often skip the abstract and go right to the introduction. Within the introduction the authors are tasked with introducing the problem or topic and convincing you there is a problem and that they believe a new way is needed. Often, if you first read the abstract and stop there, you miss the full message. The abstract is the *hard sell*, is word limited and often very dense. If the introduction doesn't pull you in, then you should move on to another article that does. If the authors' introduction pulls you in, then continue on, but don't assume the authors are right — critically critique their assumptions, logic, and reasoning.

## Identify the question

Summarize the introduction in a few sentences. I often highlight three or four sentences and rewrite the question to fully synthesize the problem and question. The research question should be toward the end of the introduction. Rewriting the question helps you identify possible conclusions. I even list some possible conclusions.

A newer section most journals are offering now is a quick look or brief summary section that helps you identify within a few sentences the current practice and what this paper contributes to our understanding.

## Identify the method to their madness

The methods section often intimidates the reader. This section is responsible for the perception you are either a researcher or a genius to be able to understand a research article; this is simply not true. The methods section is typically action packed and may take some work to understand, but it can be done. Certain procedures or methods may be understood by the authors and even reviewers. However, this can translate within the authors' mind that everyone understands the methods when the reader does not. This leads to the occasional miscommunication, but don't let that stop you. To truly understand, you may have to look up referenced methods if they aren't explained completely. Diagramming each experiment and the order of events can help. I am a visual thinker and this often helps me more fully understand the results.

## Read creatively

Based on your experience and expertise, start to take a guess at the results or conclusions. It's easy to find fault, but there comes a time in the article to get excited about the opportunity and switch to a more creative or positive evaluation. What are some of the opportunities? Could you implement changes in your practice? Could this help your patients?



### Drumroll please

The results are often sentences of facts and very dry to read. Because our mind can out process (output) our reading speed (input) this becomes a source of confusion. Since your mind is already creating a dialog and developing conclusions before you completely read the results, you must try not to jump to conclusions. Focus on words like "significant" or "non-significant." Check out the graphs and tables — they are often the best way to fully understand the data. Statistical analysis is standardized by study design and data type. Don't be afraid to look up these methods, as they have strengths and weaknesses that should be understood. Look for p-values < 0.05. P-values less than a given significance level (0.05) suggest that the observed data is inconsistent with the null hypothesis. Some researchers refer to p-values of 0.05–0.1 as a trend. If it didn't reach statistical significance but was coming close, this may be something to watch or to consider studying in the future.

### Explore the gab section

The discussion section is a very valuable section of the authors' thoughts and limitations. This section is a synthesis of the introduction, methods, and results that won't be in the conclusion. The discussion section is a place to find some of your unanswered questions. Authors will elaborate on design strengths or weaknesses, unexpected results, and possible future directions.

### Read the conclusion last

I know this is likely contrary to what others have taught, but reading the conclusion *first* often leads to improper conclusions. The conclusion can only be read in the context of the entire study. If you are provided proof, it's time to turn your healthy skepticism to acceptance and get to work allowing the research to positively influence your practice.

### Compare results

If possible, look up the references or similar research. Learn what others think of the research. Is this similar or different to

what others have found? If the research paper is a little older, is it cited in review articles? Editorials are a wonderful source to see experts in the profession debate relevance and impact. Not all research articles will have an accompanying editorial, but if they do, it's worth the extra read.

Research manuscripts are the most common way scientific information is distributed because reading is the most common and universal way we learn. In this information age, new knowledge is being published every day, and it can be overwhelming. Reading a research article takes work, but there are a few tricks that can help improve your efficiency.

- **Develop a method of reading that works for you.** Set aside time each week to read or work on your method to improve yourself professionally. This is one of the healthiest habits you can develop.
- **Skim titles in journals.** RESPIRATORY CARE is a wonderful resource and is our profession's science journal. Skim the titles and read every month. The editors and reviewers have your best interest in mind. Each month they prepare state-of-the-art articles for your

viewing pleasure. If you only had time to read one journal, RESPIRATORY CARE would be my choice.

- **Use technology.** Technology can help identify and sort information. Most major medical search engines allow you to set up an account with notifications. When articles are published that meet your search criteria, you will receive a notification. Most journals have Facebook or Twitter accounts that you can follow to get the latest updates. I also use apps like UpToDate and Docphin to help organize topics and review hot topics more efficiently.

While technology is positively impacting our research productivity and acquisition of knowledge, there is no replacement for critical and creative reading of research articles. There are no fancy shortcuts and, unfortunately, knowing the literature alone will not improve your practice. The best achievable result is being able to apply your newly found knowledge from reading a research article to your daily practice. ■



### ABOUT THE AUTHOR

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