

# Finding the Needle in a Haystack: The Dominance of the Systematic Review

Nicholas Arrotta

Whenever I mention the term 'research' to my family, friends, and colleagues, their gaze drifts skyward as they envision a serene laboratory full of flasks spewing colorful gaseous elements. Of course, in this elusive laboratory, all the paraphernalia is minded by Pinky and the Brain, and organized in an array of endless computers and test tubes illuminated by neon lights. Yes, there are basic medical science laboratories - the term basic refers to a fundamental type of research that seeks to improve understanding of phenomena, not rudimentary or unimportant work - that aren't too far removed from this fantastical notion. And yes, these labs provide a vital and everlasting contribution to the medical community. Without reservation, it is an understatement to say that without basic science laboratories, the vast majority of medical advancements we take for granted would cease to exist. I do not think anyone disputes this.

The immense amount of data generated from basic medical science laboratories increases every year. What most individuals -- both those involved and not involved in the medical community -- fail to consider is how all this information is amalgamated in to a story. Alas, a type of research endeavor that works to synthesize all available information from all over the world, in all languages, from all dates, in to a collective conclusion, doesn't have the shimmer and glory of the fantasy medical laboratory.

But to me, this type of scientific work sounds perfect: it's called a Systematic Review.

It's logical to think that, based on what basic medical laboratory labs must be like, these

systematic review labs must be at a quantum stage of complexity; but, in reality, they most likely harbor your average computer in your average office. It's not the hardware or fancy laboratory instruments that make systematic reviews dominate the scientific community, but rather the scientific team behind the process.

In short, a systematic review uses a systematic approach to search nearly all available scientific literature to answer a question. Simple, straightforward, and immensely effective. You begin with defining a query. You then set your target population, the intervention of interest, and comparison to another intervention or control. Finally, you establish the outcomes of your study. In a world with exponential growth of medical information, the systematic review seeks to find the needle in the haystack of what type of data you're exactly looking for. It combines the conclusions from nearly every study of a topic of choice, ideally, using an unbiased methodology.

Basic science literature can produce breathtaking images, complex graphs, and unique figures. Of course, this draws the attention of any reader.

However, when data is compiled, compared, and a conclusion is drawn in a systematic review, it really isn't much for the eye to behold -- maybe a table riddled with numbers, or charts here and there. To the new reader, it may look like every other systematic review is the same since most share similar types of tables and figures to keep their data presentation consistent.

However, the ability to sift through so much data in a comprehensive and rigorous way, and present it in a neat, tidy, consistent, and logical

format, is a powerful tool. The effort and time invested in a single basic science study to derive one conclusion can take years of dedication.

A systematic review both acknowledges and compiles the effort of those involved in all these studies and tells a story. This an amazing feat. The seemingly mundane numbers and tables may not make the front cover of the leading scientific journal since, well, they're just plain numbers -- they're not that pretty. But, what they represent significantly affects decision making and ultimately how medicine is practiced and how we live our lives.

The next time your eyes are half shut in the early hours of the morning, scrambling through every database to hunt down a manuscript to include in your own research paper, do not discount the paper that is titled 'systematic review'. Although it may not have the appeal and allure of an original research article and drain the color ink cartridge of your printer, the power and utility of its data is astronomical. It truly assimilates the work of the medical science community in to a message that can alter how we live our daily lives.