RegenMed

ARTICLE

REDISCOVERING AND RE-IMAGINING MEDICAL RESEARCH

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THE WAY IT USED TO BE

Long before high speed computers, CRISPR, and artificial intelligence, clinicians and medical scientists achieved major breakthroughs in healthcare through bold thinking and simple tools. They asked the right questions, challenged scientific orthodoxy, looked for answers in the real-world, and let the data lead.

John Snow and germ theory, Marie Curie and radiation for neoplasms, Alexander Fleming and penicillin, William Osler and evidence-based medicine – these are among the men and women whose tenacity, scientific method, and commitment yielded discoveries which remain the bedrock of much of modern medicine.

It is worth reflecting on their methods. They did not spend months preparing grant proposals. They rarely had access to expensive laboratory equipment, research assistants, budgets, or mentors. They were often ridiculed or even ostracized.

But, they had the courage of their convictions – convictions borne of the facts often "hiding in plain sight". They sought out first principles. They doubted. They replied, "yes, but what if. . . ?"

WHAT IT HAS BECOME

Return On The Research Dollar

Hundreds of billions of dollars are spent annually on medical research in the U.S. alone. [1] Many ask whether the hoped-for results are being achieved. [2] By some measures of success – articles published, patents granted, dollars raised, grants allocated -- one can argue that those billions have been well invested.

But high on the list of "key performance indicators" for medical research should be better overall healthcare metrics for broad population groups. Here, the report card is more disappointing. [3]

The Shrinking Pool Of Innovators

Medical students must decide early on whether to practice or "do research". Some may be fortunate enough to be accepted into research fellowships. Others, employed at academic medical centers, may benefit from limited participation in a research project.

The large majority however simply do not have the time or resources for medical research. This is greatly to the detriment of true advancement in healthcare.

It is precisely the busy doctors who, each day, must make treatment decisions based on informed observation of real patients. It

is they who must wrestle with "standards of care" poorly fitting their patient panels.

It is thus the practitioners who are in the best position to collect the most clinically relevant and statistically significant data. It is they who, if only they had the time to analyze those data, could suggest insights of lasting value to medical science.

The "Siloization" of Medical Research

Today's medical researchers are funneled into ever-narrower areas of study. (This is ironic as the systemic nature of disease becomes more evident.) As a result, there is no shortage of studies, articles, and conference presentations on any topic. Indeed, there is too much information. [4] Unfortunately, much is unhelpful and/or of poor quality. [5]

Moreover, even within the same department of an academic medical center, the clinical and research sides rarely interact. Their budgets, motivations, and resources are not only unaligned, they are often at cross purposes. Genuine clinical translation is stifled.

PhDs and clinicians should be working arm-in-arm with each other. Both groups should be collaborating with their counterparts in other institutions, and in other fields. Unfortunately, they do so all too infrequently.

For Whose Benefit?

Medical research in the 21st century is an amalgam of businesses. [6] Clinical research organizations, fund-raising organizations, middle-level managers and consultants, for-profit IRBs, laboratory charges, software systems, and other overhead items all take substantial percentages of the research dollar. Consequently, the remainder which goes into actual research is far less than it could be.

Moreover, a large share of research today is funded by well-capitalized medical product manufacturers. Their research objectives and study protocols are understandably focused on marketing approvals for specific products. Achieving statistical significance usually means tightly defined inclusionary/exclusionary criteria in the study sample. This greatly narrows the applicability of the resulting research.

Why Re-Imagine Medical Research?

The mission statements of all medical research entities are similar – prevention, curing, making a difference for patients, a longer life, a higher quality life, more accessible healthcare.

Those laudable goals are, of course, shared by every healthcare professional. They are at the heart of medicine. If these are the right goals, why then does our current approach to medical research deserve careful re-examination? Simply put, because we can do much better.

Medical research can be less costly, and more efficient. Involving more healthcare professionals in research, especially those with busy clinical practices, can make a

real difference in medical relevance. The advances can have greater impact sooner, and on broader patient populations. There can be greater transparency, and more meaningful collaboration among clinicians, scientists, and industry.

WHAT IT COULD BE AGAIN

The Role of Government

Government policies, legislation, and regulations increasingly recognize the importance of more efficient, and more broadly applicable, research. Examples include the 21st Century Cures Act, state and federal "right to try" laws, Expanded Access Programs, NIHs RECOVER (long-Covid) initiative to name a few.

Recent FDA guidance also recognizes the important role in regulatory decision-making of real-world evidence. [7]

Democratizing Medical Research

In the past, ground-breaking medical research was undertaken by clinicians with limited resources, armed only with the intelligence to ask the right questions, and the perseverance to develop causally correlated datasets.

This "democratization" of medical research is even more important today. Value-based care, health-equity, and social determinants of health are all pressing healthcare objectives which, by definition, rely on active involvement of as many practitioners as possible.

Similarly, they rely on sustained collaboration by those clinicians with medical scientists across institutional and specialty borders.

The modern world is highly networked and collaborative. Leading companies in non-healthcare industries regularly develop and analyze large amounts of information in an efficient manner. They equally efficiently convert those data into useful products and processes.

Conversely, medicine often utilizes old approaches, with impactful clinical translation delayed because of self-imposed constraints. It need not be so.

The Role of The Busy Clinician

The goal of medical research is clinical usefulness – more accurate diagnoses, superior and more predictable outcomes from a particular intervention, better healthcare for broader patient populations, higher levels of evidence for standards of care.

Therefore, clinicians and their patients should not be distant, potential beneficiaries of medical research. Rather, they should be active participants.

Clinicians will often establish the most promising hypotheses; they have access to

the richest and most validated datasets; they are the first to observe correlated outcomes; they are the most impartial.

The Role of The Medical Scientist

Today's medical scientist has access to enormous amounts of literature, laboratory resources, analytical tools, and other resources often unavailable to the busy physician. She is at her best when she uses these assets not to study something "small", but rather something with a large impact.

This she does by questioning the literature, by looking for first principles, by reviewing the work of thought leaders in adjacent fields – even outside of medicine.

Equally important for meaningful medical research, she seeks out and works closely with co-investigators, including practicing physicians.

The Role of Industry

Industry has always played a major role in medical research. That research will largely be dedicated to receiving product marketing approval. But approved products also require ongoing post-market surveillance and support for new indications. This do calls for efficient approaches to statistically and clinically significant research.

Medical research programs are important not only for large, well-capitalized companies. They are also a strategic imperative for OTC products, compounded pharmaceuticals, nutraceuticals and other "health and wellness" offerings. These research programs go well beyond regulatory requirements; they are essential to competitive differentiation.

Leading product manufacturers have long recognized the value of working closely and ethically with external practitioners and scientists. Investigator-initiated studies and similar programs often represent the foundation of INDs, IDE's 510-Ks, ongoing product improvement and intellectual property development. [8]

REAL-WORLD USE CASES

The democratization of quality medical research is well underway. Following are some use cases.

Medical Study Formats

Randomized clinical trials ("RCT's") remain the gold standard for evidence-based standards of care. However, due to their cost and duration, the vast majority of such RCT's are designed and paid for by product manufacturers. The purpose and design of such trials reduces their applicability to most real-world patient populations. Consequently, many if not most "standards of care" in modern medicine are not supported by RCTs or

other quality evidence.

This has led to a proliferation of "registries" [9] and study design types -- pragmatic, quality improvement, observational, and other – which if properly designed and executed can represent clinically and statistically significant datasets. [10]

Independent Provider Groups

ASCs, physician owned hospitals, and other independent medical practice groups are well positioned for impactful medical research.

They represent large case volumes, diverse patient populations, centralized systems, existing collaboration processes, and, often, a research director.

Moreover, as hematology analyzers, cell counters, imaging devices and other laboratory equipment become more accessible, independent practice groups can perform sophisticated scientific assays which were previously out of reach for them.

As a result, many independent provider groups are capitalizing on the scientific, clinical, and financial value of "real-world evidence" research programs.

Academic Medical Centers

In principle, teaching hospitals should be "hotbeds" of impactful medical research. That impact is often thwarted however by complex internal processes, unclear IP attribution rights, weak collaboration between the "clinical" and "science" departments, high study costs, and misaligned budgetary incentives.

Small pilot projects -- focusing on value-based care within a single department for example -- can provide the template for larger initiatives.

Also, a multi-center study not only allows investigators to participate with colleagues across institutional and national borders, it often streamlines the IRB process.

Medical Societies

Medical societies can represent the vanguard of medical research in their respective fields. Indeed, many have played this role historically.

There are challenges, however: part time and short-term participation of society board members, a focus on annual conferences, and the lack of a research culture delivering demonstrable clinical value to society members.

Those societies paying attention to the clinical decision-making challenges of their members will thrive. Such societies also effectively intermediate industry research support and the involvement of thought-leader members in the design and execution of impactful study protocols.

Product Manufacturers

For manufacturers, research and clinical studies are at the heart of product development, regulatory approvals, and HCP communications. They are also increasingly important for patient

education and compliance.

By exploiting the full potential of investigator-initiated trial programs, product registries, and post-market surveillance, manufacturers can realize several strategic benefits. These include deeper relationships with key opinion leaders, sustained engagement with clinical customers, more and faster product development insights, and more efficient regulatory submission processes.

CONTACT US

To find out more, please contact us.

ENDNOTES

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[10] See Pragmatic Trials, NEJM, Ford and Norrie, Quality Improvement Projects and Clinical Research Studies, Faiman, and Quality Improvement In Practice, Backman.