Preprints: What, Why and How

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Disclosure

PCORI Board; United HealthCare and Aetna Advisory Committees; Grant from JNJ to distribute clinical trial data; grant from Medtronic, in collaboration with FDA, to improve device surveillance; contracts with CMS to develop performance measures; contract with Blue Cross for technology assessment; AHRQ and NIH grants; Founder, Hugo personal health information platform.
The Rush to Publication
An Editorial and Scientific Mistake

Howard Bauchner, MD

The world moves at a far faster pace than even a decade ago. instantaneous access to electronic communication via email and social media is available 24 hours a day, virtually anywhere in the world, on the ground and in the air, with video and audio on demand. Thus, no one ever needs to be—or ever is—disconnected from the world.

The speed of communication has clearly affected clinical and laboratory research. There appears to be an increasing rush to publish, or at least to make the results of studies immediately publicly available. It is unclear if flawed science is more common than in the past, but the number of accounts of serious problems with scientific reports appears to be increasing, with more high-profile publication, and their own internal motivations, often request rapid review and publication by journals. Many journals acquiesce to these requests, in turn, placing more pressure on peer reviewers, most of whom are investigators, to complete review in a matter of days, and more pressure on journal staff and resources to expedite article preparation and distribution.

New interest in preprint servers in clinical medicine increases the likelihood of premature dissemination and public consumption of clinical research findings prior to rigorous evaluation and peer review. At JAMA and throughout the JAMA Network journals, the conclusions and interpretations of many research articles change substantially between the initially submission and the final publication.
Progress in human health is measured in years, not days, weeks, or months. Major breakthroughs in clinical medicine are rare, with very few research findings likely to be implemented immediately. No drug or device, regardless of how effective, is likely to improve health outcomes more than many common and important clinical practices such as measuring blood pressure and treating hypertension with well-known drugs that have been proven to be safe and effective.

It usually takes years for interventions that improve patient outcomes to become part of routine practice and few novel interventions are likely to be more important than those already known to be effective. Improving the health of the world’s population has little to do with the speed of publication (except in the case of major public health emergencies), but rather with effective interventions that have been properly tested, appropriate implementation of known or new interventions, and sustainable improvements in health systems.
For most articles, public consumption of research findings prior to peer review will have little influence on health, but for some articles, the effect could be devastating for some patients if the results made public prior to peer review are wrong or incorrectly interpreted.
Sacrificing adequate and thoughtful peer review and editorial assessment is a mistake for research in medicine. Timely assessment and dissemination of medical research findings is certainly important, but for most articles, rushing to publication in days or weeks will not improve health outcomes.
Dual Nature of Medical Journals
PEER REVIEW MATTERS
Please try to keep an open mind
What problem are we trying to solve?

How do we easily and rapidly archive and share information with other scientists to accelerate research, enhance collaboration, reduce waste, increase transparency?
BUT... IS THERE A BETTER WAY?

IN 1991:

PAUL GINSPARG
PHYSICIST

arXiv: ~ 100,000 papers EACH YEAR!

arXiv.org
A PREPRINT SERVER

RAPID COMMUNICATION

https://www.youtube.com/watch?v=2zMgY8Dx9co
Preprint Servers

Complementary to, and not a replacement for, peer review journals.
Science for Scientists
DOI (Digital Object Identifier)

- DOI is a unique alphanumeric string assigned by registration agency (International DOI Foundation) to identify content and provide a persistent link to its location on the Internet.
Pre-peer review results already released...

- Major journals already allow pre-peer review release of information.
For example...

- Medical meetings
- Clinicaltrials.gov
- Press releases
But...

- Information often incomplete
- May not be citable
- May not be searchable
And...

- No opportunity for community comments/dialogue
IMPROVE-IT Trial

Study Results Reported

Results First Announced: August 28, 2014

Trial First Presented: November 17, 2014

Paper published: June 3, 2015
Lack options for less publishable products...

- Protocols/Technical reports
- Quality innovations
- White papers
Many trials are never reported – or are delayed by years.
We will work towards a timeframe of 12 months from primary study completion (the last visit of the last subject for collection of data on the primary outcome) as the global norm for summary results disclosure.
Jeremy Farrar, Director Wellcome Trust

“Not only will this help ensure that these research findings are more discoverable, but it will also reduce reporting biases, which currently favor publication of trials which have a positive outcome.”
"It's a 21st-century best practice – and an essential part of the social contract that underlies medical research – that clinical trial data should be made publicly available less than one year after a clinical trial's completion."
In general, results information must be submitted no later than one year after the completion date of the applicable drug clinical trial.
Only 29% of completed clinical trials conducted by the faculty at major academic centers were published within two years of completion and only 13% reported results on ClinicalTrials.gov.
And then there is speed...
Concern: Fake News

- There is already too much fake information out there.

http://www.intellectualtakeout.org/blog/5-reasons-why-fake-news-here-stay
Concern: There is already too much information.

https://www.flickr.com/photos/intersectionconsulting/7537238368
About volume...

“It’s not information overload. It’s filter failure.”

CLAY SHIRKEY

https://hcsmonitor.com/2015/10/29/information-overload/
Concern:
Public may act prematurely.
Harm may accrue.
Concern: May undermine ClinicalTrials.gov
Risk Mitigation

- High-level screen
- IRB-approved or exempted
- Require posting on clinicaltrials.gov
- Corresponding author: ORCHID
- Labeling and watermarks
Concern: Publication

Will this jeopardize peer-review publication?
Many journals allow preprints, including BMJ, Science, Nature and others.
## Journal Policies

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<th>Journal</th>
<th>Publisher</th>
<th>Policy type</th>
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<tr>
<td>The BMJ (formerly British Medical Journal)</td>
<td>BMJ Publishing Group Ltd</td>
<td>Compatible</td>
<td>Preprint (&quot;Original manuscript submitted to BMJ.&quot;) can be posted.</td>
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## Journal Policies

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<td>The policy states &quot;Neither conference presentations nor posting on recognized preprint servers constitute prior publication,&quot; and an editorial explains: &quot;Nature never wishes to stand in the way of communication between researchers. [...] Communication between researchers includes not only conferences but also preprint servers. The ArXiv preprint server is the medium of choice for (mainly) physicists and astronomers who wish to share drafts of their papers with their colleagues, and with anyone else with sufficient time and knowledge to navigate it. [...] If scientists wish to display drafts of their research papers on an established preprint server before or during submission to Nature or any Nature journal, that's fine by us.&quot;</td>
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PREPRINTS: IMMEDIATE ACCESS!

ACCELERATE SCIENTIFIC PROGRESS!

OPEN ACCESS!

DOWNLOAD

MORE FEEDBACK

PRIORITY OF WORK!

RECENT ACCOMPLISHMENTS!

JOBS

https://www.youtube.com/watch?v=2zMgY8Dx9co
NIH encourages the use of preprints

Preprints and other interim research products “can be the first place researchers share their ideas,” says NIH.
Cancer Research UK encourages the use of preprints
Growing use in biology: bioRxiv

http://asapbio.org/preprint-info/biology-preprints-over-time
Yale Data Open Access (YODA) Project

The real voyage of discovery consists not in seeking new landscapes, but in having new eyes.

Marcel Proust

OUR MISSION
The Yale University Open Data Access (YODA) Project’s mission is to facilitate the responsible sharing of multidisciplinary data, open science, and scientific transparency. The Project is committed to supporting research focused on improving the health of patients and informing science and public health. The YODA Project can only improve with your feedback. Please share your comments and ideas.

CONTACT US

REQUEST DATA
Are you ready to innovate? To share? Have data that need to be shared? Explore available data. The YODA Project partners with data holders to identify and address.

GET STARTED

SHARE FINDINGS
The YODA Project facilitates discovery, aims to promote science, and supports the generation of knowledge in the interest of society. Participants and data holders must believe the public good in sharing data over data access to the YODA Project.

LEARN MORE
When is the right time?

The scientific community [is] arguably the most powerful collective enterprise in human history.

Atul Gawande

Yoda.yale.edu
When is the right time?
Medical Preprint Server

- Community resource
- Stewards not owners
- Iterative learning
Goal

- Not to establish a server
- But to improve and accelerate science, promote collaboration, enhance transparency, reduce waste
- Improve over time
Ask...

- Journals should allow co-existence of pre-print servers and not penalize scientists who use them.
- Is there really a difference from presenting at a meeting?
Tell us what you think…

medarxiv@yale.edu