Saving my mailwoman's back: Scientific publishing in the age of millennials

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I like my mailwoman. So when she complained that her back was hurting, I listened. She told me that e-billing, online advertising, and PDFs had made her soft. She had gained weight. No more being on her feet for hours to sort mail in the morning. No more back bending bag to carry all day. Just a nice unencumbered stroll from door to door. That is until she gets mail like mine. I asked her to show me. She handed me the *Journal of Nuclear Cardiology* (JNC). Volume 24. Issue Number 2. March/April 2017. She walked away shaking her head and holding her back.

I like my mailwoman. So I went inside to see why she was so upset by my mail. JNC looked fairly typical for scientific journals. I weighed it. A cinder block-like 4 pounds 8 ounces. I could use it in place of a barbell. I flipped through the contents. On the inside front and both sides of the back covers there were company advertisements: no doubt vetted and approved by their Compliance Department. Boring. Not like the old days with page after page of colorful advertising with interesting pictures and great graphics. Interesting and fun. Advertising dollars helped cover journal overhead. That dried up years ago. Now, just 3 measly pages.

What else? Announcements for an industry supported non-CME American Society of Nuclear Cardiology (ASNC) program in April; the ASNC annual meeting in September; information on the ASNC ImageGuide Registry; promotion for ASNC CME/CE educational online programs; and announcement of the Intersocietal Accreditation Commission QuickFill Reaccreditation program. Hadn't I already received

these notices in the daily barrage of emails I receive from ASNC? I'm afraid to block them just so I don't miss the important notices ASNC sends on very rare occasion. So I suffer the continuing onslaught of emails.

Anything else? Page after page of dense, sleep inducing text. I could probably use it as an eye-test chart. Bar graphs with 15 bars. Six quadrant line graphs. Tables with 25 rows and 10 columns. Poorly reproduced still color and grayscale images. And column after column of numbered references. Four hundred and twenty-one (421!!) pages of content and 18 pages of filler. Hardly inviting. Russian novels aren't this long. But no one ever said medicine was going to be easy. This is the price we must pay to be informed, up-to-date academic clinicians. Hard work will make us stronger. My need for penance because of my Catholic upbringing is not helping my mailwoman.

At work I tell a colleague about the plight of my mailwoman. He is not sympathetic. "We need a weekly infusion of in-depth, detailed rigorous data to keep up with all the clinical and scientific advances," he says. He takes me into his office (See Figure 1). He explains his method developed over 30 years of academic hospital work and why he needs the weekly infusion of brick like journals: "You gotta pile'em up. See. Let them age. Need to know if stuff holds up. Cut out the important ones. Keep them in sight at all times so you don't forget things." "How do you find things?" I ask. "Easy. Just keep them all in eye sight and within reach" he says. "Tell your mailwoman to join a health club." he says.

I walk away toward my uncluttered office, shaking my head still not knowing how I can help my mailwoman. I almost get knocked over by one of the busiest clinicians in the hospital. He comes around the corner at a sprinters pace. "Hey dude why so forlorn? What's wrong?" he asks. I tell him I'm concerned about my

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Figure 1. Three views of a colleague's office. Order from chaos?.

mailwoman's back problems and explain. "Easy. One page" he says. "One page?" I ask. "No article should be longer than 1 page. Use only 24 font text and include lots of lists, bullets and cartoons. Two references. Max. Who has the time to read all that long stuff anyway? One page and I can give it to my advanced practice practitioner who sees my patients first and it is important for her to understand this stuff while I take care of the important business." Clearly a busy clinician has different needs than my academic colleague.

How did we get to this point in scientific publishing? How did it all start and evolve?

The first recognized scientific publication was the Philosophical Transactions of the Royal Society of London for Improving Natural Knowledge published in 1665.¹ Henry Oldenburg was appointed as secretary in charge of managing the correspondence between the Society and the scientific world. In this role he searched out material for the monthly periodical from his extensive correspondence with scholars around Europe; his participation in the weekly meetings of the Royal Society and recently published treatises and pamphlets. He was a very active editor, soliciting contributions and extracting, excerpting, and translating from his other sources. Sounds a lot like the work ethic of our own Dr.

Iskandrian. Early on he wrote all the published material. Latin was the preferred language but English, French, and German were all used. Not to be read by all under these conditions.

Early scientific publications were usually observations and reports of natural events with few experimental observations. Individual Editors selected and published the results. Gradually Editorial Committees were established to avoid single editor bias.² Individual investigators began submitting their work for consideration and referees were established to review submissions. It was only in 1967 that peer review, a review of the competence and value of the material by those in the same occupation, was formally instilled as a review process. During the early years of scientific publication, the format for how material was presented was at the discretion of individual editors or the authors submitting their work. There was a gradual evolution in publication formats. It was only after World War II, that the IMRAD (Introduction, Methods, Results, and Discussion) format was highly recommended for scientific publications and it was only in 1978 that the group that eventually became the International Committee of Medical Journal Editors (ICMJE) mandated this format for all publications. All these measures optimized the

quality, reproducibility, and objectivity of scientific publications. Only a hard copy publishing was available. This format and method of transmitting information was successful and the amount of scientific information grew at a tremendous rate. The number of hard copy journals kept increasing.³

Word processors, statistical software, computer-assisted design, and reference managers have made the mechanical process of writing a paper easier. No longer do administrative assistants have to retype a manuscript on a typewriter when we change a reference. Typewriter? Many of our younger colleagues have never seen a typewriter and the concept of manually re-typing 20 pages to make 1 addition sounds like brutal punishment.

This is how I was introduced to medical publishing and I accepted the method. The question is do we need to continue publishing scientific information the same way or are there opportunities to make it more efficient and effective? An Editor at a leading medical journal has stated” “I have learned that most people read the conclusion of the abstract first, and only then do they determine whether the study is worthy of their time—which generally consists of skimming the discussion.”⁴ This “skimming” approach is in use for all types of publications, not just scientific articles. You need a hook to get a reader's attention, but even that is not a guarantee that more will be read.

Given the need for scientific rigor and the continued reliance by those in my generation on hard copy, is there a way to transition to a new method of scientific publishing? How would I know? I have been living with hardcopy forever. For that reason I sought input from those who have not been dependent on hard copy—2 of my daughters who are part of the millennial generation. They don't know hard copy when they see it. They grew up online. One of them even works for an online news service. Maybe they can help me help my mailwoman. Their advice is to keep it simple, easily accessible, have additive value, and be retrievable. At all cost avoid all things associated with Figure 1!

The internet and e-publishing provide new opportunities to maintain the integrity of scientific publications while making the information available in a format that allows flexibility for the preferences of individual readers. It is difficult but not impossible for my academic and clinical colleagues to have their needs met by the same publication. By its very nature, nuclear cardiology is a visual-dependent technique that has not always been well served by hard copy. The ability to recreate the workstation environment in online publications gives tremendous opportunity to convey information in a more relevant way: the way it is used in day-to-day clinical work. We need to take advantage of these options and incorporate them into the way we

publish. If we just listen to our children, residents, and fellows, and be humble enough to ask for their help, they can show us tremendous opportunities to evolve. We can come up with new ways to teach the sometimes intangible aspects of nuclear cardiology image interpretation that we have acquired over many years of clinical practice.

SATISFYING ACADEMIC AND SCIENTIFIC RIGOR

For readers demanding in-depth information from publications, there are unique opportunities provided by online access. These allow inclusion of detailed methodological data and supplemental information that may not be demanded by all readers, but can be made available for those that want it.

Consider the following:

- (1) Provide easy access to the material. An email with live links that go directly to the material without additional need to log in or enter secondary online sites is optimal.
- (2) In place of, or in addition to publishing every 2 months, consider more frequent online publications with email notices so that readers are not overwhelmed by a massive jolt of information every 2 months, but get consistent and steady information. Much less overwhelming.
- (3) Incorporate features in the online access that allow academic techniques that facilitate retention and retrieval of the published information. Include administrative features for writing and publishing.

Table 1. Desirable tools for online scientific publication access

1	Print
2	Save as PDF
3	Download citation
4	Export references to reference manager
5	Power Point slide set
6	Export all images to power point
7	Supplementary material
8	Email
9	Share/bookmark
10	Request permission
11	Find similar or related articles
12	Find articles citing this reference

Some of these desirable features are listed in Table 1. In addition it is very useful to provide an outline of the publication that allows easy moving from section to section. This can be provided as tabbed headings or a flow outline where individual sections can be activated by clicking on the desired portion. Note that Print is at the top of the list so that diehards for hardcopy can get their fix upfront.

- (4) Encourage inclusion of more detailed video files and cases to illustrate findings in new imaging techniques: sarcoid and amyloid; description of new methods of analysis; new software programs; and description of artifacts or technical issues.
- (5) Consider ways for adding a central illustration without burdening the authors.

MAKING IT EASY TO UNDERSTAND THE RELEVANCE OF THE DATA

All Scientific Medical society guidelines now include an executive summary which is very often the first and only thing that gets read. For original article publications, the abstract, condensed abstract, and new knowledge gained sections are an attempt to address the need for clarity and simplicity. Unfortunately they do not always go far enough to make evident the clinical implementation of the findings. Clearly original research cannot always be reduced to sound bites and there are many qualifiers that must be kept in mind when considering applying the results to clinical practice. Within these limitations, authors and reviewers should summarize their findings and considerations for clinical

use. No easy fixes here. Simplify as much as the data allow, but do not over reach when the data are not there. Our clinical colleagues will just have to spend more time educating their advance practice practitioners on the new data.

This is all well and good but what can I tell my suffering mailwoman? Next time I see her I say “When those big, heavy loads of journals arrive, no sense being superwoman. Give up the bag. Use a mail cart. For now. The publishers and editors are elderly. They’ll never change their ways. Good thing is you’re young and they will retire soon. You’ll outlast them. They have term limits. I know their replacements will be doing everything online.” I don’t see a smile materialize on her face. Instead she frowns and asks, “Will I still have a job?”

Disclosure

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