COMMENTARY

Open Access Fees: A Barrier to Scholarly Activity Among Neurology Trainees

Keng Lam, MD1; Annette Langer-Gould, MD, PhD2

ABSTRACT
The open access publishing model provides readers of all backgrounds access to articles free of charge. To cover the costs of open access, however, many journals now charge substantial article processing fees. This has inadvertently created yet another barrier for trainees to engage in scholarly activity. Herein, we describe the issue, review the literature, and provide suggestions for addressing this barrier with the focus on the neurology specialty.

Open access is the publishing model in which peer-reviewed research articles are distributed online free of charge regardless of whether the reader is a subscriber to the journal or not. Originally developed in the 1990s to increase access to knowledge for scholars from all backgrounds, it has become increasingly popular since 2000 with an estimated average annual growth of 18% of journals and 30% of all articles.1 There are two main routes for open access: Gold or Green. Gold Open Access allows manuscripts to be made online immediately for all readers and usually requires a fee. Green Open Access archives a version of the article on behalf of the authors (or allows for self-archiving) into a trusted repository, such as PubMed Central, after a specified embargo period (usually 6 to 12 months). During this embargo period the article is available to readers through a subscription or article purchasing fee.

In many ways, this is a positive development for researchers as well as trainees because they can now easily access citations online without paying subscription fees, worrying about whether their institutions are subscribers or having to pay out of pocket to access manuscripts. Rather than covering the cost of publication through subscriptions fee, however, journals are increasingly requiring authors to pay an article processing charge (APC). In 2011, 27% of journals that provided open access required APCs.2 Open access APCs may also inadvertently give rise to predatory journals; these are journals that state misleading information, lack a rigorous peer review process, publish poor quality works, and aim to make a profit rather than elevating the scientific discourse.3 Both unintended consequences of open access have created additional barriers for trainees’ engagement in scholarly activity.

Medical journals charge the highest APCs among academic disciplines. Approximately 50% of medical journals registered on the Directory of Open Access Journals Seal, a mark of certification for open access journals with high publication standards, charge at least $1,500 United States dollars (USD) per manuscript based on the most recent data; these figures have likely increased.4 Medical journals that operate exclusively under the open access model, charged an average of $2,000 USD and neuroscience journals charged over $2,100 USD in 2013.5 Curiously, average open access APCs are higher ($3,000 USD) in hybrid journals, should an author choose this option.5 Options for avoiding APCs include submitting to journals that use a hybrid model, offering the author the option of making their work available only to subscribers and forgoing open access. One can also submit to journals that provide open access but do not require APCs (usually through the Green Open Access). The trade-off for foregoing open access, however, is a lower citation index as articles published open access are more likely to be cited than those available to subscribers only.6,7 Improved citation index may explain the increasing popularity of open access publications, which now account for 40% of major cardiovascular journals and 60% of oncology articles.6,7 Requesting fee waivers or discounts, a potential option for authors from low- or middle-income countries, is usually not an option when there is a co-author from the United States.8 Journals that offer open access and do not require APCs tend to be higher impact journals than the journals in which case reports or reviews written by trainees are unlikely to be accepted. Appropriate target journals for this type of entry level scholarly activity are increasingly operating solely on an open access model.9 A full list of journals from Elsevier or Springer publishing companies with their APCs can be found in references 9 and 10.

The effect of high APCs on trainees is beginning to show. Over 86% of clinical and research fellows from Memorial Sloan Kettering Cancer Center listed APC as a barrier for engagement in scholarly activity. Over 86% of clinical and research fellows from Memorial Sloan Kettering Cancer Center listed APC as a barrier for engagement in scholarly activity.

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Abbreviations: APC = article processing charge; USD = United States dollars
choosing open access journals in a 2020 study, with some quoted in the semi-structured interviews that they could not afford the APC due to lack of funding. In a study of 200 scholars at University of California, San Francisco, 36% of them agree that open access adds administrative burden to the already busy researchers, with some stating publishing can be expensive for those with limited funds. We are concerned that this leaves trainees vulnerable to predatory journals paradoxically with lower APCs. A review of publication fees among 85 predatory neuroscience journals ranged from $521 USD to $637 USD. In an attempt to save money, trainees may accidentally publish in predatory journals. As of matter fact, given that they want to publish quickly and their inexperience with identifying journals with poor integrity, trainees are already vulnerable to predatory journals. Publishing in predatory journals contributes to the process of threatening the science integrity; it hurts the trainees' reputations and puts them at risk of losing their works when the journals disappear.

Precisely how open access APCs affect neurology trainees has not been studied but based on experience, are likely similar. To begin creating a list of potential journals without APCs for our trainees to consider, we conducted a non-comprehensive review of selected neurological journals' websites, emailing editors for clarification when necessary. The results are shown in Table 1. None offered waivers for neurology trainees.

## RECOMMENDATION 1: COMPREHENSIVE LIST OF JOURNALS AND THEIR APCS, IMPACT FACTOR, AND LEGITIMACY

As a first step, we recommend creating and updating a comprehensive list of journals. The list should include their respective operating models, APCs, and waiver policies, and should clearly label legitimate vs predatory journals that residents can easily search and minimize cross-referencing. This type of service could be jointly generated by professional societies, like the American Academy of Neurology for those in the neurology specialty, and librarians from the academic

### Table 1. Non-comprehensive review of selected neurological journals

<table>
<thead>
<tr>
<th>Name of journal</th>
<th>2020 Impact factor</th>
<th>Require publication feea</th>
<th>APC fee*</th>
<th>Open access route</th>
</tr>
</thead>
<tbody>
<tr>
<td>Annals of Clinical and Translational Neurology</td>
<td>4.510</td>
<td>Yes</td>
<td>Varies</td>
<td>Gold with APC</td>
</tr>
<tr>
<td>Annals of Neurology</td>
<td>10.42</td>
<td>No</td>
<td>Varies</td>
<td>Gold with APC, or Green at no charge</td>
</tr>
<tr>
<td>BMC Neurology</td>
<td>2.48</td>
<td>Yes</td>
<td>$2,490</td>
<td>Gold with APC</td>
</tr>
<tr>
<td>Epilepsia</td>
<td>5.86</td>
<td>No</td>
<td></td>
<td>Gold with APC, or Green at no charge</td>
</tr>
<tr>
<td>Frontiers in Neurology</td>
<td>3.55</td>
<td>Yes</td>
<td>Varies</td>
<td>Gold with APC</td>
</tr>
<tr>
<td>Journal of Neurology, Neurosurgery &amp; Psychiatry</td>
<td>8.26</td>
<td>No</td>
<td>$3,328</td>
<td>Gold with APC</td>
</tr>
<tr>
<td>Journal of Neuro-Oncology</td>
<td>3.27</td>
<td>No</td>
<td>$3,860</td>
<td>Gold with APC</td>
</tr>
<tr>
<td>Lancet Neurology</td>
<td>44.18</td>
<td>No</td>
<td>$5,000</td>
<td>Gold with APC; Policy for Green varies.</td>
</tr>
<tr>
<td>Movement Disorders</td>
<td>10.34</td>
<td>No</td>
<td>$3,300</td>
<td>Gold with APC, or Green at no charge</td>
</tr>
<tr>
<td>Multiple Sclerosis Journal</td>
<td>6.31</td>
<td>No</td>
<td>$3,050</td>
<td>Gold with APC, or Green at no charge</td>
</tr>
<tr>
<td>Multiple Sclerosis and Related Disorders</td>
<td>2.89</td>
<td>No</td>
<td></td>
<td>Gold with APC, or Green at no charge</td>
</tr>
<tr>
<td>Neurology</td>
<td>9.90</td>
<td>No</td>
<td>Varies</td>
<td>Gold with APC, or Green at no charge</td>
</tr>
<tr>
<td>Neurology: Clinical Practice</td>
<td>1.61</td>
<td>No</td>
<td>Varies</td>
<td>Gold with APC, or Green at no charge</td>
</tr>
<tr>
<td>Neurology: Genetics</td>
<td>3.49</td>
<td>Yes</td>
<td>Varies</td>
<td>Gold or Green with APC</td>
</tr>
<tr>
<td>Neuro-Oncology</td>
<td>10.25</td>
<td>Yes</td>
<td></td>
<td>Gold with APC</td>
</tr>
<tr>
<td>The Permanente Journal</td>
<td>1.10</td>
<td>No</td>
<td>None</td>
<td>Gold at no charge</td>
</tr>
<tr>
<td>Practical Neurology</td>
<td>1.71</td>
<td>No</td>
<td>$3,189</td>
<td>Gold with APC</td>
</tr>
<tr>
<td>Stroke</td>
<td>7.19</td>
<td>Depends on licensing choice</td>
<td>Varies</td>
<td>Depends on licensing choice</td>
</tr>
<tr>
<td>World Neurosurgery</td>
<td>2.10</td>
<td>No</td>
<td>$2,600</td>
<td>Gold with APC</td>
</tr>
</tbody>
</table>

*a Up to date as of August 14, 2021.
*b May charge for printing color.
APC = article processing charge.
institutions. Our local librarians at Kaiser Permanente Southern California already have resources available to help authors avoid predatory journals, but it would still require individual journal lookup to find out about the APCs. While this does not solve the problem of the increasing popularity of requiring fees for open access, it does help trainees and their mentors avoid predatory journals and select appropriate target journals while preparing manuscripts.

**RECOMMENDATION 2: ESTABLISH TRANSPARENT APC WAIVER AND DISCOUNT POLICIES FOR TRAINEES**

Given the advantages of open access, this mode of publishing is likely to continue to increase in popularity. With that in mind, it would be critical for educators, publishers, institutions, and professional societies to find a mutually agreeable path for alleviating the barrier of APCs for trainees. Setting a maximum charge for trainee publications (eg, $100 USD per research article per trainee, less for case reports and reviews) across journals could be considered. Under certain circumstances, full waivers could be granted and in others a cost-sharing approach, with the journals providing a discount for students, residents, or fellows and the training institutions picking up the remaining (reasonable) fees, should be considered. This is similar to how research conferences offer discounts to trainees for registration, and their respective academic programs often fund the trainees to attend those conferences. By establishing transparent APC policies for trainees, we hope that the journals will follow through and be peer pressured into supporting trainees to publish their works in a more cost-conscious way.

Neurology trainees already face multiple barriers to engaging in scholarly activity, including finding engaged mentors and time. Existing barriers have already led to a shortage of physician-scientists entering academia. For those highly motivated individuals that can complete manuscripts, the steps involved in choosing journals are complicated because, in addition to the journal fit, impact factor, and decision time, they now face the additional barriers of figuring out how to pay for APCs and avoiding predatory journals. With an increasing number of journals moving to open access, we expect to see fewer and fewer journals with no publication fees and an increase in predatory journals. Many rising scholars do not have the financial means to afford over a thousand dollars to publish each article. If affordability becomes a major factor in trainees’ ability to publish, it will likely disproportionally affect those trainees from disadvantaged backgrounds, potentially exacerbating the already troublesome lack of diversity among neurologists in academia.

By starting now, we can work together to find creative solutions before these unintended consequences of open access publishing take hold. We have begun by contacting the American Academy of Neurology to inquire about the concern of publication fees and if funding is available for trainees. Locally, we have reached out to the librarians regarding resources available to help navigate the trainees away from the predatory journals. We will also start the discussion with the graduate medical education office regarding flexibility in funding our residents and fellows to present their scholarly work. Finally, within our department, we have compiled our own list of neurology journals that do not require open access fees. We are hopeful that by starting to take small steps, we can bring changes to the future of publishing.

**Disclosure Statement**

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Keng Lam, MD, wrote the manuscript and prepared and submitted the final version of the article. Annette Langer-Gould, MD, PhD, revised the manuscript and supervised the project.

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