Improving manuscript quality via structured reviews, enhanced scientific category taxonomy, and outreach

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Improving the quality of manuscripts is crucial to improving journal impact.

With this in mind, Medical Physics:

➢ Has implemented a structured template review form
➢ Has implemented a comprehensive scientific category taxonomy to identify reviewers who are best suited to an article
➢ Fostering outreach in important areas that are currently underrepresented in Medical Physics

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WHY INSTITUTE A TEMPLATE FOR REVIEWS?

➢ Reviewer inexperience
➢ Even experienced reviewers miss important points
➢ Standardization of review elements

BACKGROUND: WHAT QUALITIES DISTINGUIGH GOOD REVIEWS?

<u>Journal of International Business Studies</u>: Best reviews offer specific and constructive feedback to address problems, have a collegial tone (no harsh criticism).

<u>Annals of Behavioral Medicine</u>: Advocates that good reviews should be "respectful" and "offer corrective feedback" if the manuscript is eventually publishable.

<u>Molecular Biology of the Cell</u>: Be critical, but also provide constructive feedback. Be judicious about requiring extra work that is tangential to the manuscript's objective.

<u>The Academy of Management Journal</u>: Bad reviews are characterized by reviewers focusing on uncovering flaws and aggressively highlighting them (very little positive or constructive feedback).

<u>AJR</u>: Looked at reviewer quality scores based on level of sophistication, quality of feedback for improvement, amount of detail, and punctuality. Younger reviewers from academic institutions scored highest.

BACKGROUND: WHAT QUALITIES DISTINGUIGH GOOD REVIEWS?

<u>In general:</u>

➤ Collegial reviews that do not aggressively highlight flaws

➤ Positive and constructive feedback for improvement

➤ Judicious requirement of additional work

➤ Attention to detail

BACKGROUND: HOW TO ACCOUNT FOR REVIEWER PERCEIVED IMPORTANCE/IMPACT OF THE MANUSCRIPT?

<u>Dilemma:</u>

➤ Incremental work: technically sound and hence may not be rejected by reviewers/associate editor.

➤ Promising but premature work: rejected from a technical perspective, but potentially high impact if given feedback for improvement.

Several journals use an importance scale with some acceptance threshold.

MEDICAL PHYSICS REVIEWER TEMPLATE

➤ Designed by WG1.

➤ Entered limiting testing approximately a year back. Rolled out last month.

➤ Divided into 2 major sections:

1. Overall assessment (mandatory): free form review, suggestions for improving manuscript, importance scale.

2. Section-specific feedback (optional): alerts reviewer to key elements in each section of the manuscript.

MEDICAL PHYSICS REVIEWER TEMPLATE

➤ Show html review file

NEW TAXONOMY

➤ A more refined taxonomy for identifying appropriate AEs and reviewers.

➤ Rationale:

- Reviewers assigned to broad categories may not have specific subtopic experience under these broad categories.
- Identifying better AEs/reviewers -> better final article.

➤ Designed by WG1 .

➤ AE survey completed with new taxonomy.

Slide 1

NEW TAXONOMY

Example of new taxonomy category →

1. IM: CT
   1. General (Most aspects)
   2. Theory
   3. CAD
   4. Dual Energy and Spectral
   5. Quantitative CT
   6. Detector development & evaluation
   7. Digital phantoms
   8. Physical phantoms
   9. Development (New technology and techniques)
   10. Display Technology & Evaluation
   11. Radiation dosimetry & risk
   12. Drug uptake imaging
   13. 4DCT
   14. Image quality and analysis
   15. Image analysis, Image Processing, registration, segmentation
   16. Image Reconstruction
   17. Machine learning, computer vision
   18. Micro (including small animal imaging)
   19. Monte Carlo, modeling
   20. Motion management
   21. Nanoparticle imaging
   22. Perfusion imaging
   23. Quality control
   24. Radiation dose and risk
   25. Virtual tools and phantom
   26. Perfusion, CTA

Slide 2

Associate Editor Topics for Medical Physics Journal – New Taxonomy

Please check off appropriate subcategories of expertise under Imaging Medical Physics:
- IM: X-ray
- IM: CT
- IM: Breast x-ray imaging
- IM: Particle (e.g., proton) CT
- IM: Cone Beam CT
- IM: MRI
- IM: PET
- IM: SPECT
- IM: Nuclear Medicine General
- IM: Ultrasound
- IM: Other (General)
- IM: Multi-modality imaging systems
- IM: Dataset analysis/biomathematics
- IM: Optical
- IM: Other imaging modalities
- IM: Radiation dose and risk

Slide 3

Associate Editor Topics for Medical Physics Journal – New Taxonomy

Please check off appropriate subcategories under Therapy Medical Physics:
- TH: Brachytherapy
- TH: Radiation dose measurement devices
- TH: External beam: electrons
- TH: Dataset analysis/biomathematics
- TH: RT Interfraction motion management
- TH: External beam: photons
- TH: External Beam: Particle therapy
- TH: Radiobiology(RBio)/Biology(Bio)
- TH: Response Assessment
- TH: Small Animal RT
- TH: Non-ionizing radiation therapies

OUTREACH TO RELATED COMMUNITIES

➤ WG4: Publicize journal to research communities (of interest to Medical Physics) who are not aware of the journal, with the intent of attracting either individual submissions or group conference submissions.

OUTREACH TO RELATED COMMUNITIES

➤ Special issue: submissions from "Third International Conference on Image Formation in X-ray Computed Tomography" (June 22-24, 2014, Salt Lake City, UT). Published May 2015.

➤ Future special issue: submissions from "4th International Conference on Image Formation in X-ray Computed Tomography" (July 18 – 22, 2016, Bamberg, Germany). To appear online May 2017.

➤ Future special issue: "Current Challenges and Prospects in Particle Therapy", edited by Jonathon Farr and Katia Parodi, due to appear in January, 2017.

THANK YOU!