**DESCRIPTION**

HeartRhythm, the official Journal of the Heart Rhythm Society and the Cardiac Electrophysiology Society, is a unique journal for fundamental discovery and clinical applicability.

HeartRhythm integrates the entire cardiac electrophysiology (EP) community from basic and clinical academic researchers, private practitioners, engineers, allied professionals, industry, and trainees, all of whom are vital and interdependent members of our EP community.

The Heart Rhythm Society is the international leader in science, education, and advocacy for cardiac arrhythmia professionals and patients, and the primary information resource on heart rhythm disorders. Its mission is to improve the care of patients by promoting research, education, and optimal health care policies and standards. The Heart Rhythm Society is the preeminent professional group representing more than 5,100 specialists in cardiac pacing and electrophysiology from more than 70 countries. The Society is accredited by the Accreditation Council for Continuing Medical Education (ACCME) to sponsor continuing medical education for physicians. For more information on the Heart Rhythm Society, please visit www.HRSonline.org

**IMPACT FACTOR**

2017: 4.743 © Clarivate Analytics Journal Citation Reports 2018

**ABSTRACTING AND INDEXING**

Science Citation Index Expanded
Current Contents/Clinical Medicine
EMBASE/Excerpta Medica
MEDLINE®

**EDITORIAL BOARD**

**Editor-in-Chief**
Peng-Sheng Chen, MD, FHRS, Indiana University School of Medicine, Indianapolis, IN, USA
Executive Managing Editor
Lori Monteleone

Associate Editors
Charles Antzelevitch, PhD, FHRs, Wynnewood, PA, USA
Alfred E. Buxton, MD, Boston, MA, USA
David L. Hayes, MD, FHRs, Rochester, MN, USA
Andrew D. Krahn, MD, FHRs, Vancouver, BC, Canada
Fred Morady, MD, Ann Arbor, MI, USA
Arthur A.M. Wilde, MD, PhD, Amsterdam, Netherlands

Online Editor
Daniel P. Morin, MD, MPH, FHRs, New Orleans, LA, USA

Section Editors
Charles I. Berul, MD, FHRs, CEPS-P, CCDS, Washington, DC, USA
Penelope A. Boyden, PhD, New York, NY, USA
T. Jared Bunch, MD, Murray, UT, USA
Kenneth A. Ellenbogen, MD, FHRs, Richmond, VA, USA
N. A. Mark Estes, III, MD, FHRs, CCDS, Boston, MA, USA
Michael R. Gold, MD, PhD, FHRs, Charleston, SC, USA
Sunny S. Po, MD, PhD, Oklahoma City, OK, USA
Kalyanam Shivkumar, MD, PhD, FHRs, Los Angeles, CA, USA
Natalia A. Trayanova, PhD, FHRs, Baltimore, MD, USA
David R. van Wagoner, PhD, FHRs, Cleveland, OH, USA
Richard L. Verrier, PhD, FHRs, Boston, MA, USA
Hein J. Wellens, MD, PhD, Maastricht, Netherlands
Erica S. Zado, PAC, FHRs, Philadelphia, PA, USA

Statistical Editors
Changyu Shen, PhD, Boston, MA, USA
Ziyue Liu, PhD, Indianapolis, IN, USA
Zhangsheng Yu, PhD, Indianapolis, IN, USA
Huiping Xu, PhD, Indianapolis, IN, USA

Founding Editor
Douglas P. Zipes, MD, FHRs with M. Joan Zipes

Editorial Board
Michael J. Ackerman, MD, PhD, Rochester, MN, USA
Arnon Adler, MD, Toronto, ON
Yoshifusa Aizawa, MD, PhD, Niigata, Japan
Joseph G. Akar, MD, PhD, New Haven, CT, USA
Christine M. Albert, MD, MPH, Boston, MA, USA
Sana M. Al-Khatib, MD, FHRs, CCDS, Durham, NC, USA
Kazutaka Aonuma, MD, Tsukuba, Japan
Samuel J. Asirvatham, MD, FHRs, Rochester, MN, USA
Boaz Avital, MD, PhD, FHRs, Chicago, IL, USA
Jeroen J. Bax, MD, Leiden, Netherlands
Elijah R. Behr, MA, MBBS, MD, London, UK
Bernard Belhassen, MD, Tel-Aviv, Israel
Omer Benenfeld, PhD, FHRs, Ann Arbor, MI, USA
Ronald D. Berger, MD, PhD, FHRs, Baltimore, MD, USA
Donald M. Bers, PhD, Davis, CA, USA
Deepak Bhakta, MD, FHRs, CCDS, Indianapolis, IN, USA
Lucas V. Boersma, MD, PhD, Nieuwegein, Netherlands
Frank M. Bogun, MD, Ann Arbor, MI, USA
Jeffrey A. Brinker, MD, Baltimore, MD, USA
Eric F. Buch, MD, FHRs, Los Angeles, CA, USA
Alexander Burashnikov, PhD, FHRs, Wynnewood, PA, USA
Hugh Calkins, MD, FHRs, CCDS, Baltimore, MD, USA
David J. Callans, MD, FHRs, CCDS, Philadelphia, PA, USA
Shih-Ann Chen, MD, Taipei, Taiwan
Nipavan Chiamvimonvat, MD, Davis, CA, USA
Aman Chugh, MD, FHRs, Ann Arbor, MI, USA
Sumeet S. Chugh, MD, FHRs, Los Angeles, CA, USA
Ruben Corronel, MD, PhD, Amsterdam, Netherlands
GUIDE FOR AUTHORS

HeartRhythm provides rapid online electronic (3-5 business days) and print publication of the most important current scientific developments in the field of cardiac arrhythmias and electrophysiology. The Journal publishes both clinical and basic original, peer-reviewed articles devoted to the diagnosis and treatment of heart rhythm disorders, as well as the electrophysiology of the heart and blood vessels, including ion channels and biophysics, pharmacology, genetics, modeling, cellular and in vivo electrophysiology, outcomes, health systems and health delivery research. In general, review articles are invited, but unsolicited submissions will be considered. All articles are peer-reviewed. Articles from the Editor's institution are processed by a guest editor.

Manuscripts must be submitted online at http://ees.elsevier.com/jhrm

BEFORE YOU BEGIN

Ethics in publishing
Please see our information pages on Ethics in publishing and Ethical guidelines for journal publication.

Conflict of interest
All authors must disclose any financial and personal relationships with other people or organizations that could inappropriately influence (bias) their work. Examples of potential conflicts of interest include employment, consultancies, stock ownership, honoraria, paid expert testimony, patent applications/registrations, and grants or other funding. If there are no conflicts of interest then please state this: 'Conflicts of interest: none'. See also http://www.elsevier.com/conflictsinterest. Further information can be found at: http://service.elsevier.com/app/answers/detail/a_id/286/supporthub/publishing.

The corresponding author must upload a signed HeartRhythm conflict of interest form: http://www.elsevier.com/__data/promis_misc/hr_coi.pdf.

Submission declaration and verification
Submission of an article implies that the work described has not been published previously (except in the form of an abstract, a published lecture or academic thesis, see 'Multiple, redundant or concurrent publication' for more information), that it is not under consideration for publication elsewhere, that its publication is approved by all authors and tacitly or explicitly by the responsible authorities where the work was carried out, and that, if accepted, it will not be published elsewhere in the same form, in English or in any other language, including electronically without the written consent of the copyright-holder. To verify originality, your article may be checked by the originality detection service Crossref Similarity Check.

Please confirm in the cover letter with your submission that the manuscript is original and that all authors are responsible for the contents and have read and approved the manuscript for submission to Heart Rhythm.

Authorship
All authors should have made substantial contributions to all of the following: (1) the conception and design of the study, or acquisition of data, or analysis and interpretation of data, (2) drafting the article or revising it critically for important intellectual content, (3) final approval of the version to be submitted.

More than 12 authors must be justified. Please include a statement in the cover letter justifying the inclusion of more than 12 authors.

Changes to authorship
This policy concerns the addition, deletion, or rearrangement of author names:
Before an article is accepted for publication: If an author is removed or the author order has changed during any revision stage, the corresponding author must upload with the resubmission a letter explaining (a) the reason the person is being removed or the author names rearranged and (b) written confirmation (e-mail, fax, letter) from all authors that they agree with the removal or rearrangement. In the case of removal of authors, this includes confirmation from the author being removed. All documentation should be collated into a single file (preferably PDF) and uploaded via the submission site as an "Author Change Documentation" submission item.
After acceptance, but before the accepted manuscript is published in an online issue: Requests to add or remove an author, or to rearrange the author names, must be sent to the Managing Editor from the corresponding author and include the same information as above. Requests that are not sent by the corresponding author will be forwarded by the Managing Editor to the corresponding author. Note that: (1) Managing Editors will inform the Journal Editors of any such requests and (2) publication of the accepted manuscript in an online issue is suspended until authorship has been agreed.

After the accepted manuscript is published in an online issue: Any requests to add, delete, or rearrange author names in an article published in an online issue must be sent to the Journal Manager and follow the same policies as noted above; changes will result in a corrigendum.

Clinical trial results
In line with the position of the International Committee of Medical Journal Editors, the journal will not consider results posted in the same clinical trials registry in which primary registration resides to be prior publication if the results posted are presented in the form of a brief structured (less than 500 words) abstract or table. However, divulging results in other circumstances (e.g., investors’ meetings) is discouraged and may jeopardise consideration of the manuscript. Authors should fully disclose all posting in registries of results of the same or closely related work.

Registration of clinical trials
Registration in a public trials registry is a condition for publication of clinical trials in this journal in accordance with International Committee of Medical Journal Editors (ICMJE, http://www.icmje.org) recommendations. Trials must register at or before the onset of patient enrolment. The clinical trial registration number should be included at the end of the abstract of the article. A clinical trial is defined as any research study that prospectively assigns human participants or groups of humans to one or more health-related interventions to evaluate the effects of health outcomes. Health-related interventions include any intervention used to modify a biomedical or health-related outcome (for example drugs, surgical procedures, devices, behavioral treatments, dietary interventions, and process-of-care changes). Health outcomes include any biomedical or health-related measures obtained in patients or participants, including pharmacokinetic measures and adverse events. Purely observational studies (those in which the assignment of the medical intervention is not at the discretion of the investigator) will not require registration.

Note that registering drug and biologics trials that are phase II – IV controlled investigations of a product subject to FDA regulation, and device trials including controlled trials of health outcomes of devices subject to FDA regulation, has become mandatory for trials started later than 12/26/07, or 21 days after the first patient is enrolled. Exceptions are for trials ongoing as of 9/27/07 that do NOT involve serious or life threatening conditions; they may be submitted by 9/27/08. For example, all cardiology studies will be considered “serious conditions”. Trials involving serious conditions and initiated before 9/27/07 but completed prior to 12/26/07 are NOT subject to the new requirements. For any questions, consult: http://prsinfo.clinicaltrials.gov; http://grants.nih.gov/grants/guide/notice-files/NOT-OD-08-014.html

Article transfer service
This journal is part of our Article Transfer Service. This means that if the Editor feels your article is more suitable in one of our other participating journals, then you may be asked to consider transferring the article to one of those. If you agree, your article will be transferred automatically on your behalf with no need to reformat. Please note that your article will be reviewed again by the new journal. More information.

Copyright
Upon acceptance of an article, authors will be asked to complete a 'Journal Publishing Agreement' (see more information on this). An e-mail will be sent to the corresponding author confirming receipt of the manuscript together with a 'Journal Publishing Agreement' form or a link to the online version of this agreement.

Subscribers may reproduce tables of contents or prepare lists of articles including abstracts for internal circulation within their institutions. **Permission** of the Publisher is required for resale or distribution outside the institution and for all other derivative works, including compilations and translations. If excerpts from other copyrighted works are included, the author(s) must obtain written permission from the copyright owners and credit the source(s) in the article. Elsevier has preprinted forms for use by authors in these cases.
For gold open access articles: Upon acceptance of an article, authors will be asked to complete an 'Exclusive License Agreement' (more information). Permitted third party reuse of gold open access articles is determined by the author's choice of user license.

**Author rights**

As an author you (or your employer or institution) have certain rights to reuse your work. More information.

*Elsevier supports responsible sharing*

Find out how you can share your research published in Elsevier journals.

**Role of the funding source**

You are requested to identify who provided financial support for the conduct of the research and/or preparation of the article and to briefly describe the role of the sponsor(s), if any, in study design; in the collection, analysis and interpretation of data; in the writing of the report; and in the decision to submit the article for publication. If the funding source(s) had no such involvement then this should be stated.

**Funding body agreements and policies**

Elsevier has established a number of agreements with funding bodies which allow authors to comply with their funder's open access policies. Some funding bodies will reimburse the author for the gold open access publication fee. Details of existing agreements are available online.

**Open access**

This journal does not ordinarily have publication charges; however, authors can now opt to make their articles available to all (including non-subscribers) via the ScienceDirect platform, for which a fee of US $3500 applies (for further information on open access see [http://www.elsevier.com/about/open-access/open-access-options](http://www.elsevier.com/about/open-access/open-access-options)). Please note that you can only make this choice after receiving notification that your article has been accepted for publication, to avoid any perception of conflict of interest. The fee excludes taxes. In some cases, institutions and funding bodies have entered into agreement with Elsevier to meet these fees on behalf of their authors. Details of these agreements are available at [http://www.elsevier.com/fundingbodies](http://www.elsevier.com/fundingbodies). Authors of accepted articles, who wish to take advantage of this option, should complete and submit the order form (available at [http://www.elsevier.com/locate/openaccessform.pdf](http://www.elsevier.com/locate/openaccessform.pdf)). Whatever access option you choose, you retain many rights as an author, including the right to post a revised personal version of your article on your own website. More information can be found here: [http://www.elsevier.com/authorsrights](http://www.elsevier.com/authorsrights).

Your publication choice will have no effect on the peer review process or acceptance of submitted articles.

The gold open access publication fee for this journal is **USD 3500**, excluding taxes. Learn more about Elsevier's pricing policy: [https://www.elsevier.com/openaccesspricing](https://www.elsevier.com/openaccesspricing).

**Green open access**

Authors can share their research in a variety of different ways and Elsevier has a number of green open access options available. We recommend authors see our green open access page for further information. Authors can also self-archive their manuscripts immediately and enable public access from their institution's repository after an embargo period. This is the version that has been accepted for publication and which typically includes author-incorporated changes suggested during submission, peer review and in editor-author communications. Embargo period: For subscription articles, an appropriate amount of time is needed for journals to deliver value to subscribing customers before an article becomes freely available to the public. This is the embargo period and it begins from the date the article is formally published online in its final and fully citable form. Find out more.

This journal has an embargo period of 12 months.

**Language (usage and editing services)**

Please write your text in good English (American or British usage is accepted, but not a mixture of these). Authors who feel their English language manuscript may require editing to eliminate possible grammatical or spelling errors and to conform to correct scientific English may wish to use the [English Language Editing service](https://www.elsevier.com/authorship/author-support-services/quality-assurance/alpha/edits) available from Elsevier's WebShop.
Informed consent and patient details
Studies on patients or volunteers require Institutional Review Board (IRB) approval, which must be documented in the Methods section of the paper. Appropriate consents, permissions and releases must be obtained where an author wishes to include case details or other personal information or images of patients and any other individuals in an Elsevier publication. Written consents must be retained by the author and copies of the consents or evidence that such consents have been obtained must be provided to Elsevier on request. For more information, please review the Elsevier Policy on the Use of Images or Personal Information of Patients or other Individuals, http://www.elsevier.com/patient-consent-policy. Unless you have written permission from the patient (or, where applicable, the next of kin), the personal details of any patient included in any part of the article and in any supplementary materials (including all illustrations and videos) must be removed before submission.

Animal studies
Animal Studies must conform to the Guide for the Care and Use of Laboratory Animals. Authors must include a statement in the Methods section confirming that the study conforms to these guidelines and was approved by the Institutional Animal Care and Use Committee (IACUC) at the authors’ institution.

Submission
Our online submission system guides you stepwise through the process of entering your article details and uploading your files. The system converts your article files to a single PDF file used in the peer-review process. Editable files (e.g., Word) are required to typeset your article for final publication. All correspondence, including notification of the Editor’s decision and requests for revision, is sent by e-mail.

Submit your article
Please submit your article via http://ees.elsevier.com/jhrm.

Revision policy
Revised manuscripts must be received within 6 months of notification of a decision. After this timeframe, any revised paper must be submitted to the journal as a new submission.

Manuscript categories
Original Clinical or Original Experimental
Original research articles must not exceed 5000 words. The word count includes all text in the submission, i.e., title page, keywords, abstract, main text, references, acknowledgments, funding, tables, and figure legends; articles are limited to a combined total of 8 figures and/or tables and 35 references. The abstract (250 words or fewer) is required and should be divided into the following 5 subsections: Background, Objective, Methods, Results, and Conclusion.

Case Reports
Submissions are limited to 6 authors and 2500 words, including text, references (≤15), figure legends, and ≤3 figures. No abstract should be included. All case reports will be considered. Selection priority will be based upon the reporting of new therapies, new complications of therapies, or new mechanisms of diseases.

Contemporary Reviews (Solicited and Unsolicited)
Review articles should include a brief abstract and <6000 total words, including references, and tables; the combined figure/table limit is 8.

Creative Concepts
Submissions to this section are for articles that contain untested or unproven new ideas with little supporting evidence but must have compelling rationale. The idea should be one that is difficult or impossible to test definitively, or would take a long time or significant resources to do so. Articles must be <4000 total words, including references and tables, and a combined total of 8 figures and/or tables. No abstract should be included.

Unknown of the Month
Manuscripts are limited to 1500 words, ≤3 illustrations, ≤4 authors, and ≤5 references. The intracardiac electrograms or electrocardiogram should be presented as an unknown. The figures must contain enough information for the reader to make the correct diagnosis. The figure legends should not reveal the correct diagnosis. The cases will be judged based on degree of difficulty, novelty, and teaching value. No abstract should be included.
Pacemaker/ICD Problems
Manuscripts are limited to 1500 words, ≤3 illustrations and ≤4 authors. The article will be judged based on novelty and educational value as a teaching case. No abstract should be included.

Images
Submissions to "Electrophysiology Images and Movies" are limited to a total of 450 words (including title page, keywords, main text, references, etc.), 4 authors, ≤5 references, and 1 figure with no more than 2 panels (i.e., Figure 1A and 1B). Figure legends should not be included. Images are judged according to their aesthetic quality, the novelty, importance, and effectiveness of their scientific or clinical message, or their utility as a teaching tool. Unlike case reports, the focus should be on the image, not the narrative.
Authors can also include a single electronic movie (e.g. QuickTime or MPEG1 formats) file or computer animation (e.g. as Power Point file) that expands or enhances the message of the printed images. Animations or movies must provide novel or especially useful means of conveying known principles (e.g. Animations or movies that effectively teach/portray an electrophysiological mechanism or process). If an electronic movie or animation is submitted, the authors must also provide 1 or 2 frames of images (which may appear in print) that convey the essence of the movie's content. A movie legend must be submitted as supplemental material.

Published images, movies, and animations will be made available in high resolution format via a web site to subscribers to HeartRhythm.

Letters to the Editor
Letters should be double-spaced, and should not exceed 400 words. Letters may refer to papers published on the journal website within 3 months. Letters regarding articles posted outside this time frame will not be eligible for consideration. Letters will be reviewed and are subject to editing. They should not contain original data or figures. If accepted for publication, a copy of the letter will be sent to the author(s) of the original article, if applicable. The author(s) will have an opportunity to respond with new material that will be considered for publication with the letter. Letters, with rare exception, will be e-published only.

Humanism in Medicine: Treat Each Patient As Your First and Each Day As Your Last
Articles should briefly describe a unique personal experience in medicine. Articles are limited to no more than one (1) page, 500 words or fewer, and cannot include references or figures.

In Memoriam
This section is used to highlight the outstanding contributions to the field of Heart Rhythm by a deceased individual. Submissions should be prepared as a Letter to Editor, but may include a small figure. In Memoriam articles, with rare exception, will be e-published only.

Hands On
All articles by invitation only.

Point/Counterpoint
All articles by invitation only.

Josephson and Wellens ECG lessons
All articles by invitation only.

Editorial Commentary
All articles by invitation only. Limited to 1500 words or fewer, including references.

Historical Vignette
All articles by invitation only.

PREPARATION
New: When formatting your article, please add continuous line numbers to the document, as well as page numbers.
**Peer review**

This journal operates a single blind review process. All contributions will be initially assessed by the editor for suitability for the journal. Papers deemed suitable are then typically sent to a minimum of one independent expert reviewer to assess the scientific quality of the paper. The Editor is responsible for the final decision regarding acceptance or rejection of articles. The Editor's decision is final. More information on types of peer review.

**Use of word processing software**

It is important that the file be saved in the native format of the word processor used. The text should be in single-column format. Keep the layout of the text as simple as possible. Most formatting codes will be removed and replaced on processing the article. In particular, do not use the word processor's options to justify text or to hyphenate words. However, do use bold face, italics, subscripts, superscripts etc. When preparing tables, if you are using a table grid, use only one grid for each individual table and not a grid for each row. If no grid is used, use tabs, not spaces, to align columns. The electronic text should be prepared in a way very similar to that of conventional manuscripts (see also the Guide to Publishing with Elsevier). Note that source files of figures, tables and text graphics will be required whether or not you embed your figures in the text. See also the section on Electronic artwork.

To avoid unnecessary errors you are strongly advised to use the 'spell-check' and 'grammar-check' functions of your word processor.

**Article structure**

Original Clinical and Experimental articles should be divided into the following sections: *Introduction, Methods, Results, Discussion, and Conclusions*, with appropriate subheadings to make the sections easily understood. A section on Clinical Implications for Experimental articles may be worthwhile.

**Introduction**

State the objectives of the work and provide an adequate background, avoiding a detailed literature survey or a summary of the results.

**Methods**

Provide sufficient detail to allow the work to be reproduced. Methods already published should be indicated by a reference: only relevant modifications should be described. If the article is an original study describing human or animal studies, a statement regarding local ethics committee or IRB approval must be included in the Methods section.

**Results**

Results should be clear and concise.

**Discussion**

This should explore the significance of the results of the work, not repeat them. Avoid extensive citations and discussion of published literature.

**Conclusions**

The main conclusions of the study should be presented in a short Conclusion.

**Appendices**

If there is more than one appendix, they should be identified as A, B, etc. Formulae and equations in appendices should be given separate numbering: Eq. (A.1), Eq. (A.2), etc.; in a subsequent appendix, Eq. (B.1) and so on. Similarly for tables and figures: Table A.1; Fig. A.1, etc.

**Essential title page information**

- **Title.** Concise and informative. Titles are often used in information-retrieval systems. Avoid abbreviations and formulae where possible. Do not include trade names in titles.
- **Short title.** Include a short title of 50 or fewer characters.
- **Author names, academic degrees, and affiliations.** Please include academic degrees after each author’s name. Fellows of the Heart Rhythm Society (FHRS) should be identified by including FHRS after the degree. Where the family name may be ambiguous (e.g., a double name), please indicate this clearly. Present the authors’ affiliation addresses (where the actual work was done) below the names. Indicate all affiliations with a lower-case superscript letter immediately after the author’s name and in front of the appropriate address. Provide the full postal address of each affiliation, including the country name and, if available, the e-mail address of each author.
• **Corresponding author.** Clearly indicate who will handle correspondence at all stages of refereeing and publication, also post-publication. **Ensure that phone numbers (with country and area code) are provided in addition to the e-mail address and the complete postal address. Contact details must be kept up to date by the corresponding author.**

• **Present/permanent address.** If an author has moved since the work described in the article was done, or was visiting at the time, a 'Present address' (or 'Permanent address') may be indicated as a footnote to that author's name. The address at which the author actually did the work must be retained as the main, affiliation address. Superscript Arabic numerals are used for such footnotes.

• **Word count.** The total word count should be included on the title page. The word count includes all text in the submission, i.e., title page, keywords, abstract, main text, references, acknowledgments, funding, tables, and figure legends.

### Abstract
Clinical and Experimental articles should include a structured abstract (without references) of fewer than 250 words. Divide the abstract into sections: Background, Objective, Methods, Results, and Conclusion that state the importance and potential implications of the observations. Review articles should have an unstructured abstract. All other article types should not include an abstract.

### Graphical abstract
Authors are encouraged to submit a graphical abstract, as it draws more attention to the online article. Graphical abstracts are optional and should not be identical to any figures from the article or supplemental data. The graphical abstract should summarize the contents of the article in a concise, pictorial form designed to capture the attention of a wide readership. Graphical abstracts should be submitted as a separate file in the online submission system. Image size: Please provide an image with a minimum of 531 × 1328 pixels (h × w) or proportionally more. The image should be readable at a size of 5 × 13 cm using a regular screen resolution of 96 dpi. Preferred file types: TIFF, EPS, PDF or MS Office files. See [http://www.elsevier.com/graphicalabstracts](http://www.elsevier.com/graphicalabstracts) for examples.

Authors can make use of Elsevier's Illustration and Enhancement service to ensure the best presentation of their images and in accordance with all technical requirements: [Illustration Service](http://www.elsevier.com/graphicalabstracts).

### Keywords
Immediately after the abstract, provide 5-10 keywords, using American spelling and avoiding general and plural terms and multiple concepts (avoid, for example, 'and', 'of'). Be sparing with abbreviations: only abbreviations firmly established in the field may be eligible. These keywords will be used for indexing purposes.

### Abbreviations
Avoid ALL abbreviations other than standard units of measurement and common abbreviations, such as RV, LV, etc. Such abbreviations that are unavoidable should be spelled out at first mention in both the abstract and the text. Ensure consistency of abbreviations throughout the article.

### Acknowledgements
Collate acknowledgements in a separate section at the end of the article before the references and do not, therefore, include them on the title page, as a footnote to the title or otherwise. List here those individuals who provided help during the research (e.g., providing language help, writing assistance or proof reading the article, etc.).

### Formatting of funding sources
List funding sources in this standard way to facilitate compliance to funder's requirements:

Funding: This work was supported by the National Institutes of Health [grant numbers xxxx, yyyy]; the Bill & Melinda Gates Foundation, Seattle, WA [grant number zzzz]; and the United States Institutes of Peace [grant number aaaa].

It is not necessary to include detailed descriptions on the program or type of grants and awards. When funding is from a block grant or other resources available to a university, college, or other research institution, submit the name of the institute or organization that provided the funding.

If no funding has been provided for the research, please include the following sentence:

This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.
Units
Follow internationally accepted rules and conventions: use the international system of units (SI). If other units are mentioned, please give their equivalent in SI.

Math formulae
Please submit math equations as editable text and not as images. Present simple formulae in line with normal text where possible and use the solidus (/) instead of a horizontal line for small fractional terms, e.g., X/Y. In principle, variables are to be presented in italics. Powers of e are often more conveniently denoted by exp. Number consecutively any equations that have to be displayed separately from the text (if referred to explicitly in the text).

Footnotes
Footnotes should be used sparingly. Number them consecutively throughout the article. Many wordprocessors build footnotes into the text, and this feature may be used. Should this not be the case, indicate the position of footnotes in the text and present the footnotes themselves separately at the end of the article. Do not include footnotes in the Reference list.

Artwork
New: For the ease of reviewers, please include figures and legends at the end of the main manuscript MS Word file. Each legend should appear on the same page as the figure it describes. For revised submissions, please also upload each figure as a separate, high resolution figure file. Acceptable file formats are noted below.

Electronic artwork
General points
- Make sure you use uniform lettering and sizing of your original artwork.
- Embed the fonts used if the application provides that option.
- Aim to use the following fonts in your illustrations: Arial, Courier, Times New Roman, Symbol, or use fonts that look similar.
- Number the illustrations according to their sequence in the text.
- Use a logical naming convention for your artwork files.
- Size the illustrations close to the desired dimensions of the published version.
- Submit each illustration as a separate file.
A detailed guide on electronic artwork is available on our website: http://www.elsevier.com/artworkinstructions.

You are urged to visit this site; some excerpts from the detailed information are given here.

Formats
If your electronic artwork is created in a Microsoft Office application (Word, PowerPoint, Excel) then please supply 'as is' in the native document format. Regardless of the application used other than Microsoft Office, when your electronic artwork is finalized, please 'Save as' or convert the images to one of the following formats (note the resolution requirements for line drawings, halftones, and line/halftone combinations given below):

EPS (or PDF): Vector drawings, embed all used fonts.
TIFF (or JPEG): Color or grayscale photographs (halftones), keep to a minimum of 300 dpi.
TIFF (or JPEG): Bitmapped (pure black and white pixels) line drawings, keep to a minimum of 1000 dpi.
TIFF (or JPEG): Combinations bitmapped line/half-tone (color or grayscale), keep to a minimum of 500 dpi.

Please do not:
- Supply files that are optimized for screen use (e.g., GIF, BMP, PICT, WPG); these typically have a low number of pixels and limited set of colors;
- Supply files that are too low in resolution;
- Submit graphics that are disproportionately large for the content.

Color artwork
Please make sure that artwork files are in an acceptable format (TIFF (or JPEG), EPS (or PDF), or MS Office files) and with the correct resolution. HeartRhythm will no longer charge authors for color figures in print. For further information on the preparation of electronic artwork, please see http://www.elsevier.com/artworkinstructions.
Figure captions
Ensure that each illustration has a caption. A caption should comprise a brief title and a description of the illustration. Keep text in the illustrations themselves to a minimum but explain all symbols and abbreviations used. Figure captions must be included in the manuscript file; the text of the caption should be editable.

Tables
Number tables consecutively in accordance with their appearance in the text. Each table should be included on a separate page and designed for economy of space and readability. Notes designated in the tables and all abbreviations should be defined in a footnote. Abbreviations should be identified in alphabetical order. Footnotes should be used in the following order: †, ‡, §, ¶, #. Avoid vertical rules. Be sparing in the use of tables and ensure that the data presented in tables do not duplicate results described elsewhere in the article.

References
Citation in text
Please ensure that every reference cited in text is also present in the reference list (and vice versa). Unpublished results and personal communications are not recommended in the reference list, but may be mentioned in the text in parentheses. Citation of a reference as 'in press' implies that the item has been accepted for publication.

Reference links
Increased discoverability of research and high quality peer review are ensured by online links to the sources cited. In order to allow us to create links to abstracting and indexing services, such as Scopus, CrossRef and PubMed, please ensure that data provided in the references are correct. Please note that incorrect surnames, journal/book titles, publication year and pagination may prevent link creation. When copying references, please be careful as they may already contain errors. Use of the DOI is encouraged.

A DOI can be used to cite and link to electronic articles where an article is in-press and full citation details are not yet known, but the article is available online. A DOI is guaranteed never to change, so you can use it as a permanent link to any electronic article. An example of a citation using DOI for an article not yet in an issue is: VanDecar J.C., Russo R.M., James D.E., Ambeh W.B., Franke M. (2003). Aseismic continuation of the Lesser Antilles slab beneath northeastern Venezuela. Journal of Geophysical Research, https://doi.org/10.1029/2001JB000884. Please note the format of such citations should be in the same style as all other references in the paper.

Web references
As a minimum, the full URL should be given and the date when the reference was last accessed. Any further information, if known (DOI, author names, dates, reference to a source publication, etc.), should also be given. Web references can be listed separately (e.g., after the reference list) under a different heading if desired, or can be included in the reference list.

Data references
This journal encourages you to cite underlying or relevant datasets in your manuscript by citing them in your text and including a data reference in your Reference List. Data references should include the following elements: author name(s), dataset title, data repository, version (where available), year, and global persistent identifier. Add [dataset] immediately before the reference so we can properly identify it as a data reference. The [dataset] identifier will not appear in your published article.

References in a special issue
Please ensure that the words 'this issue' are added to any references in the list (and any citations in the text) to other articles in the same Special Issue.

Reference management software
Most Elsevier journals have their reference template available in many of the most popular reference management software products. These include all products that support Citation Style Language styles, such as Mendeley and Zotero, as well as EndNote. Using the word processor plug-ins from these products, authors only need to select the appropriate journal template when preparing their article, after which citations and bibliographies will be automatically formatted in the journal's style. If no template is yet available for this journal, please follow the format of the sample references and citations as shown in this Guide. If you use reference management software, please ensure that you remove all field codes before submitting the electronic manuscript. More information on how to remove field codes.
Users of Mendeley Desktop can easily install the reference style for this journal by clicking the following link:
http://open.mendeley.com/use-citation-style/heart-rhythm

When preparing your manuscript, you will then be able to select this style using the Mendeley plug-ins for Microsoft Word or LibreOffice.

Reference style

Text: Indicate references by (consecutive) superscript Arabic numerals in the order in which they appear in the text. The numerals are to be used outside periods and commas, inside colons and semicolons.

List: Number the references in the list in the order in which they appear in the text. Please list the first 12 authors in each reference. If there are more than 12 authors, list the first 3 followed by et al. The references should be double spaced and use the same font size as the remainder of the manuscript.

Examples:

Reference to a journal publication:

Reference to a book:

Reference to a chapter in an edited book:

Abbreviations for periodicals cited in the references should follow the style of Index Medicus and can also be accessed at http://www.nlm.nih.gov.

AudioSlides

The journal encourages authors to create an AudioSlides presentation with their published article. AudioSlides are brief, webinar-style presentations that are shown next to the online article on ScienceDirect. This gives authors the opportunity to summarize their research in their own words and to help readers understand what the paper is about. More information and examples are available. Authors of this journal will automatically receive an invitation e-mail to create an AudioSlides presentation after acceptance of their paper.

Data visualization

Include interactive data visualizations in your publication and let your readers interact and engage more closely with your research. Follow the instructions here to find out about available data visualization options and how to include them with your article.

Supplementary material

Elsevier accepts electronic supplementary material to support and enhance your scientific research. Supplementary files offer the author additional possibilities to publish supporting applications, high-resolution images, background datasets, sound clips and more. Supplementary files supplied will be published online alongside the electronic version of your article in Elsevier Web products, including ScienceDirect: http://www.sciencedirect.com. In order to ensure that your submitted material is directly usable, please provide the data in one of our recommended file formats. Authors should submit the material in electronic format together with the article and supply a concise and descriptive caption for each file. Supplemental material should be referred to in the main text in sequential order. For more detailed instructions please visit our artwork instruction pages at http://www.elsevier.com/artworkinstructions.

Supplementary material is scientific evidence and assumed to be original. If published previously, the source must be cited with permission exactly as required for previously published material and should not include logos, symbolic landmarks, or any other identification of the origin.
Research data
This journal encourages and enables you to share data that supports your research publication
where appropriate, and enables you to interlink the data with your published articles. Research data
refers to the results of observations or experimentation that validate research findings. To facilitate
reproducibility and data reuse, this journal also encourages you to share your software, code, models,
algorithms, protocols, methods and other useful materials related to the project.

Below are a number of ways in which you can associate data with your article or make a statement
about the availability of your data when submitting your manuscript. If you are sharing data in one of
these ways, you are encouraged to cite the data in your manuscript and reference list. Please refer to
the "References" section for more information about data citation. For more information on depositing,
sharing and using research data and other relevant research materials, visit the research data page.

Data linking
If you have made your research data available in a data repository, you can link your article directly to
the dataset. Elsevier collaborates with a number of repositories to link articles on ScienceDirect with
relevant repositories, giving readers access to underlying data that gives them a better understanding
of the research described.

There are different ways to link your datasets to your article. When available, you can directly link
your dataset to your article by providing the relevant information in the submission system. For more
information, visit the database linking page.

For supported data repositories a repository banner will automatically appear next to your published
article on ScienceDirect.

In addition, you can link to relevant data or entities through identifiers within the text of your
manuscript, using the following format: Database: xxxx (e.g., TAIR: AT1G01020; CCDC: 734053;
PDB: 1XFN).

Mendeley Data
This journal supports Mendeley Data, enabling you to deposit any research data (including raw and
processed data, video, code, software, algorithms, protocols, and methods) associated with your
manuscript in a free-to-use, open access repository. Before submitting your article, you can deposit
the relevant datasets to Mendeley Data. Please include the DOI of the deposited dataset(s) in your
main manuscript file. The datasets will be listed and directly accessible to readers next to your
published article online.

For more information, visit the Mendeley Data for journals page.

Data statement
To foster transparency, we encourage you to state the availability of your data in your submission.
This may be a requirement of your funding body or institution. If your data is unavailable to access
or unsuitable to post, you will have the opportunity to indicate why during the submission process,
for example by stating that the research data is confidential. The statement will appear with your
published article on ScienceDirect. For more information, visit the Data Statement page.

Submission checklist
The following list will be useful during the final checking of an article prior to sending it to the journal
for review. Please consult this Guide for Authors for further details of any item.

Ensure that the following items are present:
Cover letter confirming:
• The article is original, with no portion under simultaneous consideration for publication elsewhere
  or previously published, except for an abstract of fewer than 400 words.
• All authors have read and approve the submission
• One author has been designated as the corresponding author with contact details:
  • E-mail address
  • Full postal address
  • Phone numbers
All necessary files have been uploaded, and contain:
• Total word count on the title page
• Keywords
• Each figure caption is included on the same page as the figure it describes
• All tables (including title, description, footnotes)
Further considerations
• Manuscript has been ‘spell-checked’ and ‘grammar-checked’
• Manuscript includes continuous line numbering;
• Manuscript is double-spaced, single columned, and pages are numbered.
• References are in the correct format for this journal
• All references mentioned in the Reference list are cited in the text, and vice versa
• Permission has been obtained for use of copyrighted material from other sources (including the Web)
For any further information please visit our customer support site at http://support.elsevier.com.

AFTER ACCEPTANCE

Proofs
One set of page proofs (as PDF files) will be sent by e-mail to the corresponding author (if we do not have an e-mail address then paper proofs will be sent by post) or, a link will be provided in the e-mail so that authors can download the files themselves. Elsevier now provides authors with PDF proofs which can be annotated; for this you will need to download the free Adobe Reader, version 9 (or higher). Instructions on how to annotate PDF files will accompany the proofs (also given online). The exact system requirements are given at the Adobe site.
If you do not wish to use the PDF annotations function, you may list the corrections (including replies to the Query Form) and return them to Elsevier in an e-mail. Please list your corrections quoting line number. If, for any reason, this is not possible, then mark the corrections and any other comments (including replies to the Query Form) on a printout of your proof and scan the pages and return via e-mail. Please use this proof only for checking the typesetting, editing, completeness and correctness of the text, tables and figures. Significant changes to the article as accepted for publication will only be considered at this stage with permission from the Editor. We will do everything possible to get your article published quickly and accurately. It is important to ensure that all corrections are sent back to us in one communication: please check carefully before replying, as inclusion of any subsequent corrections cannot be guaranteed. Proofreading is solely your responsibility.

Offprints
The corresponding author, at no cost, will be provided with a PDF file of the article via e-mail (the PDF file is a watermarked version of the published article and includes a cover sheet with the journal cover image and a disclaimer outlining the terms and conditions of use). For an extra charge, paper offprints can be ordered via the offprint order form which is sent once the article is accepted for publication. Both corresponding and co-authors may order offprints at any time via Elsevier’s WebShop. Authors requiring printed copies of multiple articles may use Elsevier WebShop’s ‘Create Your Own Book’ service to collate multiple articles within a single cover.
Journal does not give free offprints.

AUTHOR INQUIRIES
Visit the Elsevier Support Center to find the answers you need. Here you will find everything from Frequently Asked Questions to ways to get in touch.
You can also check the status of your submitted article or find out when your accepted article will be published.

© Copyright 2018 Elsevier | https://www.elsevier.com