As a general surgical journal, covering all specialties, the International Journal of Surgery Open is dedicated to publishing original research, review articles, and more—all offering significant contributions to knowledge in clinical surgery, experimental surgery, surgical education and history. The Journal is a fully open-access online-only journal and authors are required to pay a fee for publication.

Upon publication all articles will be freely available for all to read on ScienceDirect. All articles will be published under a creative commons license with authors retaining ownership of the copyright.

Indexed and Abstracted in:

• SCOPUS
• EMBASE
• SciVal
• ScienceDirect
• ClinicalKey
• Google Scholar
• The British Library
• ProQuest
• EBSCO
• Directory of Open Access Journals (DOAJ)
• Emerging Sources Citation Index

Disclaimer

The information and opinions presented in the Journal reflect the views of the authors and not of the Journal or its Editorial Board or the Publisher. Publication does not constitute endorsement by the journal. Neither IJS Open nor its publishers nor anyone else involved in creating, producing or delivering IJS Open or the materials contained therein, assumes any liability or responsibility for the accuracy, completeness, or usefulness of any information provided in IJS Open, nor shall they be liable for any direct, indirect, incidental, special, consequential or punitive damages arising out of the use of IJS Open. IJS Open, nor its publishers, nor any other party involved in the preparation of material contained in IJS Open represents or warrants that the information contained herein is in every respect accurate or complete, and they are not responsible for any errors or omissions or for the
results obtained from the use of such material. Readers are encouraged to confirm the information contained herein with other sources.

**ABSTRACTING AND INDEXING**

Emerging Sources Citation Index (ESCI)
Directory of Open Access Journals (DOAJ)
Scopus
Embase
ScienceDirect
ClinicalKey
Google Scholar
The British Library
ProQuest
EBSCOhost

**EDITORIAL BOARD**

*Editor-in-Chief*
D. Rosin, University of the West Indies at Cave Hill, Bridgetown, Barbados

*Managing and Executive Editor*
R Agha, Guy's and Saint Thomas' NHS Foundation Trust, London, United Kingdom

*Senior Editors*
R.Y. Afifi, Cairo University General Surgery Department, Cairo, Egypt
H. Alam, University of Michigan Health System, Ann Arbor, United States
J. P. Barret, Autonomous University of Barcelona, Barcelona, Spain
B. Challacombe, Guy's and Saint Thomas' NHS Foundation Trust, London, United Kingdom
X-P. Chen, Huazhong University of Science and Technology, Wuhan, China
R.L. De Wilde, Carl von Ossietzky University of Oldenburg, Oldenburg, Germany
B. Ekser, Indiana University Purdue University at Indianapolis, Indianapolis, United States
H.B. Hechtman, Harvard Medical School, Boston, United States
J. W. Y. Lau, Chinese University of Hong Kong Faculty of Medicine, Shatin, Hong Kong
O. Muensterer, Johannes Gutenberg University, Mainz, Germany
S. Rogers, University of Chicago, Chicago, United States
J. Talati, Aga Khan University, Karachi, Pakistan
M. Thorat, Queen Mary University of London, London, United Kingdom
F.C. Wei, Chang Gung Memorial Hospital, Taoyuan, Taiwan

*Associate Editors*
R. Coppola, Campus Bio-Medico University, Roma, Italy
V. Kasivisvanathan, University College London, London, United Kingdom
R Keijzer, Winnipeg Regional Health Authority, Winnipeg, Canada
B Kirshtein, Soroka Medical Center, Be'er Sheva, Israel
J.A. McCaul, Bradford Teaching Hospitals NHS Foundation Trust, Bradford, United Kingdom
E.R. McGlone, Imperial College London, London, United Kingdom
D. Muzumdar, Seth GS Medical College and KEM Hospital Department of Neurosurgery, Mumbai, India
A Petroianu, Federal University of Minas Gerais, Belo Horizonte, Brazil
S.G. Raja, Harefield Hospital Heart Surgery, London, United Kingdom
K Raveendran, Hospital Fatimah, Ipoh, Malaysia
D. Yeh, Massachusetts General Hospital Division of Trauma Emergency Surgery & Surgical Critical Care, Boston, United States

*Assistant Editors*
R. Al-mahfouhd, University of Oxford, Oxford, United Kingdom
H. M. Atta, Boston Children’s Hospital, Boston, Massachusetts, United States
M. Bashashati, Texas Tech University Health Sciences Center El Paso, El Paso, Texas, United States
S. Basu, All India Institute of Medical Sciences - Rishikesh, Rishikesh, India
A. Beamish, University of Gothenburg, Goteborg, Sweden
A. G. Charles, University of North Carolina at Chapel Hill Program in the Humanities, Chapel Hill, North Carolina, United States
N. J. Curtis, Imperial College London, London, United Kingdom
A. Das, Indian Institute of Chemical Technology, Hyderabad, India
S. A. Esquivel Gaón, LatinoClinica, Oral and Maxillofacial Surgery, Mexico
C. Gambardella, University of Campania Luigi Vanvitelli, Napoli, Italy
J. Gómez Rivas, La Paz University Hospital Urology Service, Madrid, Spain
H. Kaafarani, Massachusetts General Hospital, Dept. of Surgery, Boston, Massachusetts, United States
Y. D. Kamat, KMC Hospital, Mangaluru, India
O. Khan, Saint George's Hospital, London, United Kingdom
L. Lorenzon, University Hospital Agostino Gemelli, Rome, Italy
T. Manning, Austin Health, Heidelberg, Victoria, Australia
A. Meyer, Sao Paulo University Faculty of Medicine Department of Gastroenterology, São Paulo, Brazil
I. Mukherjee, AdventHealth Tampa The Gastroenterology Center, Tampa, Florida, United States
E Ofo, University of London St George’s, London, United Kingdom
P. Pai, Tata Memorial Centre, Mumbai, India
F. Sheng, Eastern Hepatobiliary Surgery Hospital, Shanghai, China
A. Smailys, Lithuanian University of Health Sciences, Kaunas, Lithuania
P. Suman, NorthShore University HealthSystem, Evanston, Illinois, United States
D.G. Weber, Royal Perth Hospital, Perth, Australia
H. Zhu, Shanghai Jiao Tong University, Shanghai, China

Statistical Editors
N. Donaldson, Colombia, South America
M.W. Gray, American University, Washington, United States

Society Representatives
X-P. Chen, Huazhong University of Science and Technology
G.F. Coppa, President of the New York Surgical Society
A. Williams, President, Association of Surgeons in Training

Executive Committee
G. Catto
D.K.C Cooper, Pittsburgh, United States
A. Darzi, London, United Kingdom
H. Ellis, London, United Kingdom
B. Jackson
C.-H. Leong, Pokfulam, Hong Kong
A.K-C. Li, Hong Kong, Hong Kong
I. McColl, London, United Kingdom
J. Norcini, Philadelphia, United States
S. Standring
N. Williams
R. Winston
M. Yacoub, London, United Kingdom

Editorial Board
R. A. Badwe, Tata Memorial Hospital, Mumbai, India
M. Boscoe, Harefield Hospital, Uxbridge, United Kingdom
R. Bueno, Harvard Medical School, Boston, Massachusetts, United States
K. Chatamra, Bumrungrad International Hospital, Bangkok, Thailand
P. Coulthard, The University of Manchester, Manchester, United Kingdom
A. d’Cruz, Tata Memorial Hospital, Mumbai, India
M. Desai, Mulijibhai Patel Urological Hospital, Nadiad, India
W. Green, King's College Hospital, London, United Kingdom
I. Harirchi, Tehran University of Medical Sciences, Tehran, Iran, Islamic Republic of
D. Henne-Bruns, University Hospital Ulm, Ulm, Germany
D. Kahn, University of Cape Town, Rondebosch, South Africa
X. Lin, Shanghai Jiao Tong University - Fahua Campus, Shanghai, China
A. Mahapatra, All India Institute of Medical Sciences Bhubaneswar, Bhubaneswar, India
I. Mittra, Tata Memorial Centre, Mumbai, India
V. Naraynsingh, The University of the West Indies at Saint Augustine Department of Clinical Surgical Sciences, Saint Augustine, Trinidad and Tobago
F. Nicoli, Guy's and Saint Thomas' NHS Foundation Trust, London, United Kingdom
A. Nuñez De Pierro, Acute Care General Hospital Juan A Fernández, Buenos Aires, Argentina
R. Orda, Tel Aviv University, Tel Aviv, Israel
V. Semiglazov, FSBI National Medical Research Center of Oncology named after N N Petrov, Sankt Peterburg, Russian Federation
T. Singh, Christian Medical College and Hospital Ludhiana, Ludhiana, India
B.L. Smith, MASSACHUSETTS GENERAL HOSPITAL, Charlestown, Massachusetts, United States
T.E. Udwadia, PD Hinduja National Hospital and Medical Research Centre, Mumbai, India
M. C. Warlé, Radboudumc, Nijmegen, Netherlands
J. Wee, Brigham and Women's Hospital, Boston, Massachusetts, United States
M. Weiser, Memorial Sloan Kettering Cancer Center, New York, New York, United States
Z.F. Xia, Shanghai Jiao Tong University School of Medicine, Shanghai, China
Y. Zhang, Shanghai Jiao Tong University School of Medicine, Shanghai, China
J Zhong, Shanghai Jiao Tong University School of Medicine, Shanghai, China
INTRODUCTION

**IJS Open** is an online open access journal and is published as a sister title to the *International Journal of Surgery*. The publication fee for this journal is $1,700, excluding taxes for original research articles, reviews and perspectives.

Contact details

Corresponding authors from HINARI countries ([http://www.who.int/hinari/eligibility/en/](http://www.who.int/hinari/eligibility/en/)) can apply for a discount or fee-waiver by highlighting their country of origin when submitting their article or by contacting the editorial office at IJSO@elsevier.com.

If you have any problem submitting your paper online please contact the Editorial Office at IJSO@elsevier.com

**Reporting Standards**

The International Journal of Surgery Open has a policy of mandatory enforcement of all relevant reporting guidelines (see below). Please ensure your work follows the appropriate guidelines and the relevant completed checklist and flow diagram are submitted with your work. Please ensure you cite the relevant guideline in the methods section of your manuscript.

**Randomised Controlled Trials**

All randomised controlled trials submitted for publication in International Journal of Surgery must include a completed Consolidated Standards of Reporting Trials (CONSORT) flow chart and ensure that all elements in the CONSORT checklist are covered. A copy of the CONSORT checklist must be uploaded as supplemental material. Please refer to the CONSORT statement website at [http://www.consort-statement.org](http://www.consort-statement.org) for more information.

**Systematic Reviews**

Systematic reviews must be reported in accordance PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) Guidelines ([http://www.prisma-statement.org/](http://www.prisma-statement.org/)) and must include the flow diagram as a figure and the checklist as supplemental material ([http://www.prisma-statement.org/2.1.2%20-%20PRISMA%202009%20Checklist.pdf](http://www.prisma-statement.org/2.1.2%20-%20PRISMA%202009%20Checklist.pdf)). Please download a PRISMA Flowchart and a PRISMA Checklist from the link above. Please also upload a completed AMSTAR 2 checklist to aid the methodological quality of your article: [https://amstar.ca/Amstar_Checklist.php](https://amstar.ca/Amstar_Checklist.php) or [https://amstar.ca/docs/AMSTAR-2.pdf](https://amstar.ca/docs/AMSTAR-2.pdf).

**Cohort, Case-control and Cross-sectional studies**

Cohort, Case-control and Cross-sectional studies must all be compliant with the STROBE criteria (Strengthening the reporting of observational studies in epidemiology). Please see [http://www.strobe-statement.org/index.php?id=available-checklists](http://www.strobe-statement.org/index.php?id=available-checklists) - each study type has its own checklist which must be uploaded as a supplemental file.

**Diagnostic, Quality Improvement and Qualitative studies**

Diagnostic Studies must be reported in accordance with the STARD statement criteria ([http://www.stard-statement.org/](http://www.stard-statement.org/)). Quality Improvement studies must comply with the Standards for Quality Improvement Reporting Excellence (SQUIRE) criteria: [http://squire-statement.org](http://squire-statement.org). Qualitative studies require the Consolidated criteria for Reporting Qualitative Research (COREQ) checklist, please see : [http://intqhc.oxfordjournals.org/content/19/6/349.long](http://intqhc.oxfordjournals.org/content/19/6/349.long)

**Health Economic Evaluation**

Health Economic Evaluation studies must conform to the CHEERS statement: [http://www.bmj.com/content/346/bmj.f1049.pdf%2Bhtml](http://www.bmj.com/content/346/bmj.f1049.pdf%2Bhtml)

**Tumour Marker Prognostic Study**

Tumor Marker Prognostic studies must be reported in accordance with the REMARK criteria, please see [http://www.equator-network.org/resource-centre/library-of-health-research-reporting/reporting-guidelines/remark](http://www.equator-network.org/resource-centre/library-of-health-research-reporting/reporting-guidelines/remark)
Before and After Studies
Before and After studies measuring particular characteristics of a population or group of individuals at the end of an event or intervention, compares them with those characteristics before the event or intervention: then gauges the effects of the event or intervention. These studies must conform to the STROBE statement. http://www.strobe-statement.org/index.php?id=available-checklists

Surgical Case Reports
Please ensure your case report is compliant with the SCARE Guidelines and submit a completed SCARE checklist.

Please also ensure you state that the work has been reported in line with the SCARE criteria and cite the following paper:

Surgical Case Series
Please ensure your case series is compliant with the PROCESS Guidelines and submit a completed PROCESS checklist.

Please also ensure you state that the work has been reported in line with the PROCESS criteria and cite the following paper:

Submission checklist
You can use this list to carry out a final check of your submission before you send it to the journal for review. Please check the relevant section in this Guide for Authors for more details.

Ensure that the following items are present:

One author has been designated as the corresponding author with contact details:
• E-mail address
• Full postal address

All necessary files have been uploaded:
Manuscript:
• Include keywords
• All figures (include relevant captions)
• All tables (including titles, description, footnotes)
• Ensure all figure and table citations in the text match the files provided
• Indicate clearly if color should be used for any figures in print
Graphical Abstracts / Highlights files (where applicable)
Supplemental files (where applicable)

Further considerations
• Manuscript has been 'spell checked' and 'grammar checked'
• 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 Internet)
• A competing interests statement is provided, even if the authors have no competing interests to declare
• Journal policies detailed in this guide have been reviewed
• Referee suggestions and contact details provided, based on journal requirements

For further information, visit our Support Center.

BEFORE YOU BEGIN
Ethics in publishing
Please see our information pages on Ethics in publishing and Ethical guidelines for journal publication.
**Studies in humans and animals**

If the work involves the use of human subjects, the author should ensure that the work described has been carried out in accordance with The Code of Ethics of the World Medical Association (Declaration of Helsinki) for experiments involving humans. The manuscript should be in line with the Recommendations for the Conduct, Reporting, Editing and Publication of Scholarly Work in Medical Journals and aim for the inclusion of representative human populations (sex, age and ethnicity) as per those recommendations. The terms sex and gender should be used correctly.

Authors should include a statement in the manuscript that informed consent was obtained for experimentation with human subjects. The privacy rights of human subjects must always be observed.

All animal experiments should comply with the ARRIVE guidelines and should be carried out in accordance with the U.K. Animals (Scientific Procedures) Act, 1986 and associated guidelines, EU Directive 2010/63/EU for animal experiments, or the National Institutes of Health guide for the care and use of Laboratory animals (NIH Publications No. 8023, revised 1978) and the authors should clearly indicate in the manuscript that such guidelines have been followed. The sex of animals must be indicated, and where appropriate, the influence (or association) of sex on the results of the study.

**Declaration 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 competing interests include employment, consultancies, stock ownership, honoraria, paid expert testimony, patent applications/registrations, and grants or other funding. Authors must disclose any interests in two places: 1. A summary declaration of interest statement in the title page file (if double-blind) or the manuscript file (if single-blind). If there are no interests to declare then please state this: 'Declarations of interest: none'. This summary statement will be ultimately published if the article is accepted. 2. Detailed disclosures as part of a separate Declaration of Interest form, which forms part of the journal's official records. It is important for potential interests to be declared in both places and that the information matches. More information.

**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.

**Use of inclusive language**

Inclusive language acknowledges diversity, conveys respect to all people, is sensitive to differences, and promotes equal opportunities. Articles should make no assumptions about the beliefs or commitments of any reader, should contain nothing which might imply that one individual is superior to another on the grounds of race, sex, culture or any other characteristic, and should use inclusive language throughout. Authors should ensure that writing is free from bias, for instance by using 'he or she', 'his/her' instead of 'he' or 'his', and by making use of job titles that are free of stereotyping (e.g. 'chairperson' instead of 'chairman' and 'flight attendant' instead of 'stewardess').

**Contributorship**

The IJS lists contributors in two ways. Firstly, we publish a list of authors' names at the beginning of the paper and, secondly, we list contributors (some of whom may not be included as authors) at the end of the paper, giving details of who did what in planning, conducting, and reporting the work. One or more of these contributors are listed as guarantors of the paper. The guarantor accepts full responsibility for the work and/or the conduct of the study, had access to the data, and controlled the decision to publish.

**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.
When submitting a paper authors must complete the Authorship form, which can be downloaded [here](#). This form confirms that all authors agree to publication if the paper is accepted and allows authors to declare any conflicts of interest, sources of funding and ethical approval (if required). Please download the form and submit it with your paper. Submissions that do not include a completed form will be returned without review.

**Changes to authorship**

Authors are expected to consider carefully the list and order of authors **before** submitting their manuscript and provide the definitive list of authors at the time of the original submission. Any addition, deletion or rearrangement of author names in the authorship list should be made only **before** the manuscript has been accepted and only if approved by the journal Editor. To request such a change, the Editor must receive the following from the **corresponding author**: (a) the reason for the change in author list and (b) written confirmation (e-mail, letter) from all authors that they agree with the addition, removal or rearrangement. In the case of addition or removal of authors, this includes confirmation from the author being added or removed.

Only in exceptional circumstances will the Editor consider the addition, deletion or rearrangement of authors **after** the manuscript has been accepted. While the Editor considers the request, publication of the manuscript will be suspended. If the manuscript has already been published in an online issue, any requests approved by the Editor will result in a corrigendum.

**Reporting clinical trials**

Randomized controlled trials should be presented according to the CONSORT guidelines. At manuscript submission, authors must provide the CONSORT checklist accompanied by a flow diagram that illustrates the progress of patients through the trial, including recruitment, enrollment, randomization, withdrawal and completion, and a detailed description of the randomization procedure. The CONSORT checklist and template flow diagram are available online.

**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](#) 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, behavioural 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.

**Copyright**

Upon acceptance of an article, authors will be asked to complete an 'Exclusive License Agreement' ([see more information](#) on this). Permitted third party reuse of 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.
After acceptance, open access papers will be published under a noncommercial license. For authors requiring a commercial CC BY license, you can apply after your manuscript is accepted for publication.

**Open access**
This is an open access journal: all articles will be immediately and permanently free for everyone to read and download. To provide open access, this journal has an open access fee (also known as an article publishing charge APC) which needs to be paid by the authors or on their behalf e.g. by their research funder or institution. Permitted third party (re)use is defined by the following Creative Commons user licenses:

*Creative Commons Attribution (CC BY)*
Lets others distribute and copy the article, create extracts, abstracts, and other revised versions, adaptations or derivative works of or from an article (such as a translation), include in a collective work (such as an anthology), text or data mine the article, even for commercial purposes, as long as they credit the author(s), do not represent the author as endorsing their adaptation of the article, and do not modify the article in such a way as to damage the author's honor or reputation.

The open access publication fee for this journal is **USD 1700**, excluding taxes. Learn more about Elsevier's pricing policy: https://www.elsevier.com/openaccesspricing.

*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 available from Elsevier's Author Services.

*Informed consent and patient details*
Studies on patients or volunteers require ethics committee approval and informed consent, which should be documented in 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 but copies should not be provided to the journal. Only if specifically requested by the journal in exceptional circumstances (for example if a legal issue arises) the author must provide copies of the consents or evidence that such consents have been obtained. For more information, please review the Elsevier Policy on the Use of Images or Personal Information of Patients or other Individuals. 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.

*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, LaTeX) 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 https://www.evise.com/profile/api/navigate/IJSO.

*Referees*
Authors must suggest three non-conflicted peer reviewers with expertise as much for content as for methodology of their submission, with contact details including email address. This will significantly help facilitate timely peer review.

**PREPARATION**

*Peer review*
This journal operates a double 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 two independent expert reviewers 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.
**Double-blind review**
This journal uses double-blind review, which means the identities of the authors are concealed from the reviewers, and vice versa. More information is available on our website. To facilitate this, please include the following separately:

*Title page (with author details):* This should include the title, authors' names, affiliations, acknowledgements and any Declaration of Interest statement, and a complete address for the corresponding author including an e-mail address.

*Blinded manuscript (no author details):* The main body of the paper (including the references, figures, tables and any acknowledgements) should not include any identifying information, such as the authors' names or affiliations.

**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**

**Word Limits**
Papers should not exceed 3000 words for an original research article, review article, Cohort, Case control, Cross Sectional, diagnostic, Quality Improvement, Qualitative studies, experimental research or editorial (excluding references). Correspondence, book and media reviews should not exceed 1000 words.

**Subdivision - numbered sections**
Divide your article into clearly defined and numbered sections. Subsections should be numbered 1.1 (then 1.1.1, 1.1.2, etc.), 1.2, etc. (the abstract is not included in section numbering). Use this numbering also for internal cross-referencing: do not just refer to 'the text'. Any subsection may be given a brief heading. Each heading should appear on its own separate line.

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

**Material and methods**
Provide sufficient details to allow the work to be reproduced by an independent researcher. Methods that are already published should be summarized, and indicated by a reference. If quoting directly from a previously published method, use quotation marks and also cite the source. Any modifications to existing methods should also be described.

**Theory/calculation**
A Theory section should extend, not repeat, the background to the article already dealt with in the Introduction and lay the foundation for further work. In contrast, a Calculation section represents a practical development from a theoretical basis.

**Results**
Results should be clear and concise.

**Discussion**
This should explore the significance of the results of the work, not repeat them. A combined Results and Discussion section is often appropriate. Avoid extensive citations and discussion of published literature.

**Conclusions**
The main conclusions of the study may be presented in a short Conclusions section, which may stand alone or form a subsection of a Discussion or Results and Discussion section.
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.
- **Author names and affiliations.** Please clearly indicate the given name(s) and family name(s) of each author and check that all names are accurately spelled. You can add your name between parentheses in your own script behind the English transliteration. 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. This responsibility includes answering any future queries about Methodology and Materials. **Ensure that the e-mail address is given and that contact details are 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.

**Covering Letter**
Manuscripts must be accompanied by a covering letter stating that the current "Instructions to Authors" have been read by all authors, thereby indicating compliance with those instructions and acceptance of the conditions posed. The letter should state that the authors have seen and agreed to the submitted version of the paper, that all who have been acknowledged as contributors or as providers of personal communications have agreed to their inclusion, that the material is original and that it has been neither published elsewhere not submitted for publication simultaneously. In addition the letter should state that if accepted, the paper will not be published elsewhere in the same form, in English or in any other language, without written consent of the copyright holder. Please also note that Authors should provide a list of 3 potential reviewers (e-mail and affiliation) who are knowledgeable in the subject matter, have no conflict of interest, and are likely to agree to review the manuscript. Please ensure that 2 of the potential reviewers are from a different country to the Authors.

**Highlights**
Highlights are mandatory for this journal as they help increase the discoverability of your article via search engines. They consist of a short collection of bullet points that capture the novel results of your research as well as new methods that were used during the study (if any). Please have a look at the examples here: example Highlights.

Highlights should be submitted in a separate editable file in the online submission system. Please use 'Highlights' in the file name and include 3 to 5 bullet points (maximum 85 characters, including spaces, per bullet point).

**Abstract**
A concise and factual abstract is required. The abstract should state briefly the purpose of the research, the principal results and major conclusions. An abstract is often presented separately from the article, so it must be able to stand alone. For this reason, References should be avoided, but if essential, then cite the author(s) and year(s). Also, non-standard or uncommon abbreviations should be avoided, but if essential they must be defined at their first mention in the abstract itself.

The abstract should be a maximum of 250 words. For all original research articles, the abstract should be structured with the following headings: Introduction; Methods; Results; Conclusion.

**Keywords**
Immediately after the abstract, provide a maximum of 6 keywords, using British 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.
Units and Abbreviations
Systme Internationale (SI) units should be used, with the traditional equivalent in parentheses where appropriate. Conventions for abbreviations should be those detailed in: Baron DN, ed. Units, Symbols, and Abbreviations: A Guide for Biological and Medical Editors and Authors. 5th edition. London: Royal Society of Medicine Services, 1994. Systme Internationale (SI) units should be used, with the traditional equivalent in parentheses where appropriate. Conventions for abbreviations should be those detailed in: Baron DN, ed. Units, Symbols, and Abbreviations: A Guide for Biological and Medical Editors and Authors. 5th edition. London: Royal Society of Medicine Services, 1994.

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 word processors can build footnotes into the text, and this feature may be used. Otherwise, please indicate the position of footnotes in the text and list the footnotes themselves separately at the end of the article. Do not include footnotes in the Reference list.

Artwork
Electronic artwork
General points
- Make sure you use uniform lettering and sizing of your original artwork.
- Embed the used fonts 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.
- Provide captions to illustrations separately.
- Size the illustrations close to the desired dimensions of the published version.
- Submit each illustration as a separate file.
- Ensure that color images are accessible to all, including those with impaired color vision.
A detailed guide on electronic artwork is available.

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 & 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.

**Illustration services**

**Elsevier's Author Services** offers Illustration Services to authors preparing to submit a manuscript but concerned about the quality of the images accompanying their article. Elsevier's expert illustrators can produce scientific, technical and medical-style images, as well as a full range of charts, tables and graphs. Image 'polishing' is also available, where our illustrators take your image(s) and improve them to a professional standard. Please visit the website to find out more.

**Figure captions**

Ensure that each illustration has a caption. Supply captions separately, not attached to the figure. A caption should comprise a brief title (**not** on the figure itself) and a description of the illustration. Keep text in the illustrations themselves to a minimum but explain all symbols and abbreviations used.

**Tables**

Please submit tables as editable text and not as images. Tables can be placed either next to the relevant text in the article, or on separate page(s) at the end. Number tables consecutively in accordance with their appearance in the text and place any table notes below the table body. Be sparing in the use of tables and ensure that the data presented in them do not duplicate results described elsewhere in the article. Please avoid using vertical rules and shading in table cells.

**References**

**Citation in text**

Please ensure that every reference cited in the text is also present in the reference list (and vice versa). Any references cited in the abstract must be given in full. Unpublished results and personal communications are not recommended in the reference list, but may be mentioned in the text. If these references are included in the reference list they should follow the standard reference style of the journal and should include a substitution of the publication date with either 'Unpublished results' or 'Personal communication'. 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 highly encouraged.

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.

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. Using citation 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 from different reference management software.

Reference style

Text: Indicate references by number(s) in square brackets in line with the text. The actual authors can be referred to, but the reference number(s) must always be given.

List: Number the references (numbers in square brackets) in the list in the order in which they appear in the text.

Examples:
Reference to a journal publication:
Reference to a journal publication with an article number:
Reference to a book:
Reference to a chapter in an edited book:
Reference to a website:
Reference to a dataset:
Note shortened form for last page number. e.g., 51–9, and that for more than 6 authors the first 6 should be listed followed by 'et al.' For further details you are referred to 'Uniform Requirements for Manuscripts submitted to Biomedical Journals' (J Am Med Assoc 1997;277:927–34) (see also Samples of Formatted References).

Journal abbreviations source
Journal names should be abbreviated according to the List of Title Word Abbreviations.

Video
Elsevier accepts video material and animation sequences to support and enhance your scientific research. Authors who have video or animation files that they wish to submit with their article are strongly encouraged to include links to these within the body of the article. This can be done in the same way as a figure or table by referring to the video or animation content and noting in the body text where it should be placed. All submitted files should be properly labeled so that they directly relate to the video file's content. In order to ensure that your video or animation material is directly
usable, please provide the file in one of our recommended file formats with a preferred maximum size of 150 MB per file, 1 GB in total. Video and animation files supplied will be published online in the electronic version of your article in Elsevier Web products, including ScienceDirect. Please supply 'stills' with your files: you can choose any frame from the video or animation or make a separate image. These will be used instead of standard icons and will personalize the link to your video data. For more detailed instructions please visit our video instruction pages. Note: since video and animation cannot be embedded in the print version of the journal, please provide text for both the electronic and the print version for the portions of the article that refer to this content.

Supplementary material
Supplementary material such as applications, images and sound clips, can be published with your article to enhance it. Submitted supplementary items are published exactly as they are received (Excel or PowerPoint files will appear as such online). Please submit your material together with the article and supply a concise, descriptive caption for each supplementary file. If you wish to make changes to supplementary material during any stage of the process, please make sure to provide an updated file. Do not annotate any corrections on a previous version. Please switch off the 'Track Changes' option in Microsoft Office files as these will appear in the published version.

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. During the submission process, after uploading your manuscript, you will have the opportunity to upload your relevant datasets directly to Mendeley Data. 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.
AFTER ACCEPTANCE

Online proof correction
Corresponding authors will receive an e-mail with a link to our online proofing system, allowing annotation and correction of proofs online. The environment is similar to MS Word: in addition to editing text, you can also comment on figures/tables and answer questions from the Copy Editor. Web-based proofing provides a faster and less error-prone process by allowing you to directly type your corrections, eliminating the potential introduction of errors.
If preferred, you can still choose to annotate and upload your edits on the PDF version. All instructions for proofing will be given in the e-mail we send to authors, including alternative methods to the online version and PDF.
We will do everything possible to get your article published quickly and accurately. 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. 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 will be notified and receive a link to the published version of the open access article on ScienceDirect. This link is in the form of an article DOI link which can be shared via email and social networks. 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 Author Services.

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