DESCRIPTION

Cardiovascular Revascularization Medicine (CRM) is an international and multidisciplinary journal that publishes original laboratory and clinical investigations related to revascularization therapies in cardiovascular medicine.

Cardiovascular Revascularization Medicine publishes articles related to preclinical work and molecular interventions, including angiogenesis, cell therapy, pharmacological interventions, restenosis management; and prevention, including experiments conducted in human subjects, in laboratory animals, and in vitro. Specific areas of interest include percutaneous angioplasty in coronary and peripheral arteries, intervention in structural heart disease, cardiovascular surgery, congenital heart disease, coronary heart disease, epidemiology, genetics, health services and outcomes research, invasive imaging, molecular cardiology, preventive cardiology, and vascular medicine.

Cardiovascular Revascularization Medicine will consider all articles describing clinical trials and translational research (ie, those that unite the clinic with the laboratory). The Journal publishes original articles, rapid communications, reviews, technical notes, teaching editorials, and special features. Original articles that address any aspect of cardiovascular revascularization medicine are invited. Letters to the Editor and interesting images are encouraged.

ABSTRACTING AND INDEXING

Scopus
Embase
PubMed/Medline

EDITORIAL BOARD

Editor-in-Chief
Ron Waksman, Washington Cancer Institute, 110 Irving Street, NW, Washington, District of Columbia, 20010, United States

Editor-at-Large
Gary Mintz, Cardiovascular Research Foundation, New York, New York, , United States
**Associate Editors**

Itsik Ben-Dor, MedStar Washington Hospital Center, Washington, District of Columbia, United States  
Danny Dvir, University of Washington Medical Center, Seattle, Washington, United States  
Michael A. Gaglia Jr., Cardiovascular Institute of the South Lafayette General Southwest, Lafayette, Louisiana, United States  
Michael Mahmoudi, University Hospital Southampton NHS Foundation Trust, Southampton, United Kingdom  
Toby Rogers, MedStar Washington Hospital Center, Washington, District of Columbia, United States  
Lowell F. Satler, MedStar Washington Hospital Center, Washington, District of Columbia, United States  
Christian Shults  
Daniel H. Steinberg, Medical University of South Carolina, Charleston, South Carolina, United States

**Section Editors**

Gary L. Schaer, Rush University Medical Center, Chicago, Illinois, United States  
ACS/AMI Editor  
George Vetrovec, Virginia Commonwealth University, Richmond, Virginia, United States  
Cardiogenic Shock and Hemodynamic Support Editor  
Michael Slack, University of Maryland Medical Center, Baltimore, Maryland, United States  
Congenital Heart Disease Editor  
Richard Heuser, St. Luke's Behavioral Health Center, Phoenix, Arizona, United States  
CTO Editor  
Aravinda Nanjundappa, West Virginia University, Morgantown, West Virginia, United States  
Endovascular Editor  
Hector M. Garcia-Garcia, MedStar Washington Hospital Center, Washington, District of Columbia, United States  
Imaging/Physiology Editor  
Morton Kern, University of California Irvine, Irvine, California, United States  
Imaging/Physiology Editor  
Rebecca Torguson, MedStar Cardiovascular Research Network, Hyattsville, Maryland, United States  
Regulatory and Health Policy Editor  
Michael Lipinski, Cardiovascular Associates Of Charlottesville, Charlottesville, Virginia, United States  
Science/Molecular Interventions/Atherosclerosis Editor  
Israel Barbash, Sheba Medical Center, Leviev Heart Center, Shoham, Israel  
Technology/Innovation Editor  
Steven L. Goldberg, Community Hospital of the Monterey Peninsula, Monterey, California, United States  
Valve & Structural Heart Editor

**Editorial Board Members**

ACS AMI  
Herbert Aronow, Brown University Warren Alpert Medical School, Providence, Rhode Island, United States  
Marc Cohen, Newark Beth Israel Medical Center, Newark, New Jersey, United States  
Khagendra Dahal, LOUISIANA STATE UNIVERSITY HEALTH SCIENCES CENTER, New Orleans, Louisiana, United States  
George Dangas, Mount Sinai School of Medicine, Division of Cardiology, New York City, New York, United States  
Robert Dieter, Loyola University Chicago Stritch School of Medicine, Maywood, Illinois, United States  
Tariq Enezaet, MU Health Care, Columbia, Missouri, United States  
El Sayed Farag, Zagazig University, Faculty of Medicine, Cardiology Department, El Zaqaq, Egypt  
Christine M. Gasperetti, PENN MEDICINE (UNIVERSITY OF PENNSYLVANIA HEALTH SYSTEM), Philadelphia, Pennsylvania, United States  
Jon C. George, Albert Einstein Medical Center, Philadelphia, Pennsylvania, United States  
C. Michael Gibson, BETH ISRAEL DEACONESS MEDICAL CENTER, Boston, Massachusetts, United States  
James A. Goldstein, Beaumont Hospital - Troy, Troy, Michigan, United States  
Michael Guiry, St Luke's University Health Network, Bethlehem, Pennsylvania, United States  
Ravi Hira, University of Washington, Seattle, Washington, United States  
Wah Wah Htun, Mount Sinai Beth Israel Hospital, New York, New York, United States  
Alfonso Ielasi, Saint Ambrose Cardio Thoracic Center, Milano, Italy  
Ashequl Islam, Baystate Medical Center, Springfield, Massachusetts, United States  
Sanjit S. Jolly, Population Health Research Institute, Hamilton, Canada  
Daniel A. Jones, Barts Heart Centre, London, England, United Kingdom  
Adnan Kastrati, Technical University of Munich, Munich, Germany  
Neal S. Kleiman, Houston Methodist DeBakey Heart & Vascular Center, Houston, Texas, United States  
Vijay Kunadian, Newcastle University, Newcastle Upon Tyne, United Kingdom  
Alexandra Lansky, Yale University School of Medicine, New Haven, Connecticut, United States  
Massoud Leesar, The University of Alabama at Birmingham, Birmingham, Alabama, United States  
Sagar Mallikethi-Reddy, Hurley Medical Center, Flint, Michigan, United States  
Roxana Mehran, Icahn School of Medicine at Mount Sinai, New York, New York, United States  
Perwaiz Meraj, Northwell Health, Great Neck, New York, United States
Michael R. Mooney, Minneapolis Heart Institute at Abbott Northwestern Hospital, Minneapolis, Minnesota, United States

Smita Negi, Cardiovascular Institute of the South Lafayette General Southwest, Lafayette, Louisiana, United States

Keith Oldroyd, Golden Jubilee National Hospital, Clydebank, United Kingdom

Kyriaki Pournouridis, Northwell Health, Great Neck, New York, United States

Mohammad Sarraf, UAB Medicine, Birmingham, Alabama, United States

Dawn C. Scantlebury, Queen Elizabeth Hospital, Saint Michael, Barbados

Scott W. Shurmur, Texas Tech University Health Sciences Center, Lubbock, Texas, United States

Poonam Velagapudi, UNIVERSITY OF NEBRASKA MEDICAL CENTER, Omaha, Nebraska, United States

Marco Zimarino, Cath Lab and Institute of Cardiology, Chieti, Italy

Cardiogenic Shock and Hemodynamic Support

Mir Babar Basir, Henry Ford Hospital, Detroit, Michigan, United States

Cara Hendry, Manchester University NHS Foundation Trust, Manchester, United Kingdom

Hani Jneid, Baylor College of Medicine, Houston, Texas, United States

Navin Kapur, Tufts University, Medford, Massachusetts, United States

Salvatore F. Mannino, WellStar Health System, United States

Atul Pathak, Pasteur Clinic, Toulouse, France

Alexander G. Truesdell, Inova Heart and Vascular Institute, Falls Church, Virginia, United States

Complex Coronary

Rasha Al-Lamee, Imperial College London, London, United Kingdom

Mrvat Alasnag, King Fahd Armed Forces Hospital, Jeddah, Saudi Arabia

Dominick J. Angiolillo, University of Florida College of Medicine - Jacksonville, Jacksonville, Florida, United States

Usman Baber, Mount Sinai Medical Center, Miami Beach, Florida, United States

Marta Bande, Sant’Ambrogio Clinic, Milano, Italy

Subhash Banerjee, VA North Texas Health Care System, Dallas, Texas, United States

Oliver F. Bertrand, Quebec Heart and Lung Institute, Québécois, Quebec, Canada

Balram Bhargava, Indian Council of Medical Research, New Delhi, India

James Blankenship, Geisinger Medical Center, Danville, Pennsylvania, United States

Paul T. Campbell, Sanger Heart and Vascular Institute, Charlotte, North Carolina, United States

Jeffrey W. Chambers, Metropolitan Heart and Vascular Institute, Coon Rapids, Minnesota, United States

Shao-Liang Chen, Jiangsu Province Hospital and Nanjing Medical University First Affiliated Hospital, Nanjing, China

Bimmer Claessen, New York, New York, United States

Antonio Colombo, University Life-Health Saint Raphael, Milano, Italy

Ramesh Daggubati, NYU Winthrop Hospital, Mineola, New York, United States

Joseph De Gregorio, Englewood Hospital and Medical Center, Englewood, New Jersey, United States

Gheorghe Doros, Baime Institute for Clinical Research, Boston, Massachusetts, United States

John Douglas, Jr., Emory University School of Medicine, Atlanta, Georgia, United States

Robert M. van Geuns, Erasmus Medical Center, Rotterdam, Netherlands

Bill D. Gogas, Nanjing Medical University, Nanjing, China

Luis Gruberg, Stony Brook University, Stony Brook, New York, United States

Paul Gurbel, Inova Heart and Vascular Institute, Falls Church, Virginia, United States

Tarek Helmy, Saint Louis University, Saint Louis, Missouri, United States

Elizabeth M. Holper, Baylor Scott & White The Heart Hospital Plano, Plano, Texas, United States

Aaron Horne, HeartPlace North Hills, North Richland Hills, Texas, United States

Akrum W. Ibrahim, Southeastern Cardiology Associates, Columbus, Georgia, United States

Qurat-ul-Ain Jelani, Yale University School of Medicine, New Haven, Connecticut, United States

Allen Jeremias, Saint Francis Hospital The Heart Center, Roslyn, New York, United States

Ion S. Jovin, Virginia Commonwealth University, Richmond, Virginia, United States

Maddury Jyotsna, Nizam's Institute of Medical Sciences, Hyderabad, India

Sasko Kedev, University Clinic of Cardiology, Skopje, Macedonia, the former Yugoslav Republic of

Michael C. Kim, Lenox Hill Hospital, New York, New York, United States

Spencer B. King, Emory University, Atlanta, Georgia, United States

Jacques Koolen, Catharina Hospital, Eindhoven, Netherlands

Kusum Lata, Sutter Health, Sacramento, California, United States

Faisal Latif, Oklahoma University Medical Center, Oklahoma City, Oklahoma, United States

Joshua Loh, National University Heart Centre, Singapore, Singapore

Ayman K. Magd, Al-Azhar University, Cairo, Egypt

Ehtisham Mahmud, University of California San Diego Division of Cardiovascular Medicine, La Jolla, California, United States

Eugene P. McFadden, Cork University Hospital
Shiu Chiu Wong, Weill Cornell Medicine, New York, New York, United States
Thomas Zeller, University Heart Center Freiburg Bad Krozingen, Bad Krozingen, Germany

**Imaging/Physiology**

Hiram G. Bezerra, UH Cleveland Medical Center, Cleveland, Ohio, United States
Justin E. Davies, Imperial College London, London, United Kingdom
Mohamed Effat, University of Cincinnati, Cincinnati, Ohio, United States
Santiago Garcia, MINNEAPOLIS HEART INSTITUTE, Minneapolis, Minnesota, United States
Junko Honye, Kikuna Memorial Hospital, Yokohama-shi, Japan
Michael Joner, German Heart Centre Munich, München, Germany
Sandeep Kumar Krishnan, Ascension St John Hospital, Detroit, Michigan, United States
Ryan D. Maddrer, Spectrum Health, Grand Rapids, Michigan, United States
Akiko Maehara, Columbia University Irving Medical Center, New York, New York, United States
Marc Aurelio Magalhaes, Saint Marcelline Hospital, SAO PAULO, Brazil
Sarang Mangalmurti, Main Line Health System Bryn Mawr Hospital, Philadelphia, Pennsylvania, United States
Fadi A. Matar, University of South Florida, Tampa, United States
Lorenz Räber, Inselspital University Hospital Bern, Bern, Switzerland
Robert Schwartz, MINNEAPOLIS HEART INSTITUTE, Minneapolis, Minnesota, United States
Rahul Sharma, CEDARS-SIANI MEDICAL CENTER, Los Angeles, California, United States
Jose de la Torre Hernandez, Marquis of Valdecilla University Hospital, Santander, Spain
Dee Dee Wang, Henry Ford Hospital, Detroit, Michigan, United States
Mark H. Wholey, University of Texas at San Antonio, San Antonio, Texas, United States

**Regulatory and Health Policy**

Wayne Batchelor, Inova Heart and Vascular Institute, Falls Church, Virginia, United States
Anthony DeMaria, University of California San Diego Health System, Pittsburgh, Pennsylvania, United States
Fumiaki Ikeno, Stanford University, Stanford, California, United States
David J. Slotwiner, New York Presbyterian Queens Weill Cornell Medical College School of Health Policy and Research Division of Cardiology, New York, New York, United States
Jason Wasfy, MASSACHUSETTS GENERAL HOSPITAL, Boston, Massachusetts, United States

**Science/Molecular Interventions/Atherosclerosis**

John Abraham, University of St. Thomas, School of Engineering, Saint Paul, Minnesota, United States
Michael Davidson, University of Chicago, Chicago, Illinois, United States
Alok V. Finn, CVPath Institute Inc, Gaithersburg, Maryland, United States
Timothy D. Henry, The Christ Hospital, Cincinnati, Ohio, United States
Ik-Kyung Jang, Harvard Medical School, Massachusetts General Hospital, Boston, United States
David Kallend, The Medicines Company, Parsippany, New Jersey, United States
Safi U. Khan, West Virginia University, Morgantown, West Virginia, United States
Dror Luger, MedStar Washington Hospital Center, Washington, District of Columbia, United States
Steven E. Nissen, Cleveland Clinic, Cleveland, Ohio, United States
Samin K. Sharma, Mount Sinai Hospital NY, Inst. of Cardiovascular, Levy Place, New York, United States
Renu Virmani, CVPath Institute Inc, Gaithersburg, Maryland, United States

**Technology/Innovation**

Amit Amin, Washington University in St Louis School of Medicine, Saint Louis, Missouri, United States
Steven R. Bailey, University of Texas Health Science Center at San Antonio, San Antonio, Texas, United States
Sripal Bangalore, NEW YORK UNIVERSITY SCHOOL OF MEDICINE, New York, New York, United States
Stefan Bertog, Cardiovascular Center Frankfurt, Frankfurt, Germany
Emmanouil S. Brilakis, Minneapolis Heart Institute Foundation, Minneapolis, Minnesota, United States
Robert A. Byrne, Technical University of Munich, München, Germany
Daniel Chamié, Dante Pazzanese Cardiological Institute, SAO PAULO, Brazil
Bernardo Cortese, San Carlo Clinic Milano, Department of Cardiology, Milano, Italy
Donald E. Cutlip, BETH ISRAEL DEACONESS MEDICAL CENTER, Boston, Massachusetts, United States
Tim A. Fischell, Ascension Borgess Hospital, Borgess Heart Institute, Kalamazoo, Michigan, United States
Stefano Galli, Monzino Cardiology Centre, Milano, Italy
Michael Haude, Rheinland Klinikum Neuss GmbH, Neuss, Germany
Richard J. Jabbour, Imperial College Healthcare NHS Trust, London, United Kingdom
Eedo Kaluski, Rutgers Biomedical and Health Sciences, Newark, New Jersey, United States
Dean Kereiakes, Christ Hospital, Cincinnati, Ohio, United States
Ran Kornowski, Ha’me’rka’z ha’re’fui Rabin, Petah Tikva, Israel
Chaim Lotan, Hebrew University Hadassah Medical School, Jerusalem, Israel
Felix Mahfoud, Saarland University Hospital Internal Medicine III Cardiology Angiology and Intensive Care Medicine, Homburg, Germany
John Patrick Reilly, Stony Brook University Hospital, Stony Brook, New York, United States
Mark Reisman, University of Washington Medical Center, Seattle, Washington, United States
Mark J. Ricciardi, Bluhm Cardiovascular Institute at Northwestern Memorial Hospital, Chicago, Illinois, United States
Bruno Scheller, University Hospital of Saarland, Homburg, Germany
Michael A. Weber, SUNY Downstate Medical Center College of Medicine, Brooklyn, New York, United States

Valve & Structural

Jinnette D. Abbott, Brown University Warren Alpert Medical School, Providence, Rhode Island, United States
Karim Al-Azizi, Baylor Scott & White The Heart Hospital Plano, Plano, Texas, United States
Mohamad Alkhouli, West Virginia University, Morgantown, West Virginia, United States
R. David Anderson, University of Florida, Gainesville, Florida, United States
Mohammad M. Ansari, Texas Tech University Health Sciences Center, Lubbock, Texas, United States
Prakash Balan, The University of Texas Health Science Center at Houston John P and Katherine G McGovern Medical School, Houston, Texas, United States
Anthony Bavry, University of Florida, Gainesville, Florida, United States
Konstantinos Dean Boudoulas, The Ohio State University, Columbus, Ohio, United States
João L. Cavalcante, MINNEAPOLIS HEART INSTITUTE, Minneapolis, Minnesota, United States
Mehmet Cilingiroglu, Arkansas Heart Hospital, Little Rock, Arkansas, United States
Jeffrey E. Cohen, MedStar Health, United States
Haim Danenberg, Hadassah Medical Center, Jerusalem, Israel
Charles Davidson, Northwestern University, Evanston, Illinois, United States
Marvin Eng, Henry Ford Hospital, Detroit, Michigan, United States
Peter S. Fail, Cardiovascular Institute of the South Lafayette General Southwest, Lafayette, Louisiana, United States
Hans R. Figulla, Friedrich Schiller University Jena, Jena, Germany
Ariel Finkelstein, Meir Medical Center Cardiology Department, Kfar Sava, Israel
Kashish Goel, Vanderbilt University, Nashville, Tennessee, United States
Andrew M. Goldsweig, UNIVERSITY OF NEBRASKA MEDICAL CENTER, Omaha, Nebraska, United States
Robert T. Gooley, Monash Heart, Clayton, Australia
Mayra Guerrero, Mayo Clinic Hospital, Phoenix, Arizona, United States
Uzoma N. Ibebuogu, The University of Tennessee Health Science Center, Memphis, Tennessee, United States
Vijay Iyer, University at Buffalo, Buffalo, New York, United States
Richard A. Krasuski, Duke University School of Medicine, Durham, North Carolina, United States
Rony Lahoud, University of Vermont, Burlington, Vermont, United States
Azem Latib, University Life-Health Saint Raphael, Milano, Italy
Scott Lilly, OHIO STATE UNIVERSITY WEXNER MEDICAL CENTER, Columbus, Ohio, United States
Paul D. Mahoney, Sentara Healthcare Inc, Norfolk, Virginia, United States
Francesco Maisano, University of Zurich, Zurich, Switzerland
Thierry G. Mesana, University of Ottawa Heart Institute, Ottawa, Ontario, Canada
Igor F. Palacios, Harvard Medical School, Massachusetts General Hospital, Boston, United States
Andres M. Pineda, University of Florida College of Medicine - Jacksonville, Jacksonville, Florida, United States
Ramón Quesada, Miami Cardiac & Vascular Institute, Miami, Florida, United States
Ehud Raanani, Chaim Sheba Medical Center, Tel Aviv, Israel
Michael J. Reardon, Houston Methodist DeBakey Heart & Vascular Center, Houston, Texas, United States
Grant W. Reed, Cleveland Clinic, Cleveland, Ohio, United States
Michael J. Rinaldi, Sanger Heart and Vascular Institute, Charlotte, North Carolina, United States
Carlos E. Ruiz, Hackensack University Medical Center, Hackensack, New Jersey, United States
Saurabh Sanon, Palm Beach Gardens Medical Center - Tenet Health, Palm Beach Gardens, Florida, United States
Alok Sharma, VA MEDICAL CENTER, Minneapolis, Minnesota, United States
Jeffrey Southard, University of California Davis Medical Center, Davis, California, United States
Pieter R. Stella
Lars G. Svensson, Cleveland Clinic, Cleveland, Ohio, United States
Corrado Tamburino, University of Catania, CAST Policlinico Hospital, Catania, Italy
Anwar Tandar, The University of Utah School of Medicine, Salt Lake City, Utah, United States
Vinod H. Thourani, Cardiovascular Research Institute, Washington, DC, District of Columbia, United States
Moritz C. Wyler von Ballmoos, Houston Methodist DeBakey Heart & Vascular Center, Houston, Texas, United States
Pradeep Yadav, PENN STATE MILTON S HERSHEY MEDICAL CENTER, Hershey, Pennsylvania, United States
Steven J. Yakubov, OhioHealth, United States

Young Leaders Editorial Board

ACS AMI

Basem Elbarouni, St Boniface General Hospital, Winnipeg, Manitoba, Canada
Abdul Hakeem, Rutgers Robert Wood Johnson Medical School, Piscataway, New Jersey, United States
Pranav Kansara, Lehigh Valley Heart Institute, Allentown, Pennsylvania, United States
Subrata Kar, Texas Tech University Health Sciences Center El Paso, El Paso, Texas, United States
Waleed Kayani, Baylor College of Medicine, Houston, Texas, United States
Valeria Paradies, San Paolo Hospital  
Nicola Ryan, Aberdeen Royal Infirmary, Aberdeen, United Kingdom  
Rachit Shah, Heart Health Center, Florence, Alabama, United States  
Jolanta M. Siller-Matula, Medical University of Vienna Division of Cardiology, Vienna, Austria  
Nadia R. Sutton, University of Michigan, Ann Arbor, Michigan, United States  
Giampiero Vizzari, University of Messina, Giovanni Paolo II Hospital, Messina, Italy  
Junjie Zhang, Jiangsu Province Hospital and Nanjing Medical University First Affiliated Hospital, Nanjing, China  

Complex Coronary  
Damiano Regazzoli, Humanitas Research Hospital, Rozzano, Italy  

Congenital Heart Disease  
Michele Pighi, University of Verona, Verona, Italy  

CTO  
Ignacio J. Amat-Santos, Valladolid University Hospital, Valladolid, Spain  
Yader Sandoval, Mayo Clinic Rochester, Rochester, Minnesota, United States  
Luiz F. Ybarra, McGill University, Montreal, Quebec, Canada  

Endovascular  
Mitchell Weinberg, Northwell Health, Great Neck, New York, United States  

Imaging/Physiology  
John Blair, University of Chicago, Chicago, Illinois, United States  

Science/Molecular/Atherosclerosis  
Deborah Kalkman, Academic Medical Center, Amsterdam, Netherlands  

Technology/Innovation  
Carlos E. Sanchez, Riverside Methodist Hospital, Columbus, Ohio, United States  

Valve & Structural  
Zaher Fanari, Wesley Medical Center Heartland Cardiology, Wichita, Kansas, United States  
Sachin Goel, Prairie Heart Institute at Saint John’s Hospital, Springfield, Illinois, United States  
Ryan K. Kaple, Yale University School of Medicine, New Haven, Connecticut, United States  
Tobias Rheude, German Heart Centre Munich, München, Germany  

Managing Editor  
Lindsey J. Donofrio, MedStar Washington Hospital Center, Washington, District of Columbia, United States  
Fax: 202-877-0243
GUIDE FOR AUTHORS

EDITOR-IN-CHIEF Ron Waksman, MD

To Contact the Editorial Office: Jason Wermers, Managing Editor, Cardiovascular Revascularization Medicine, Washington Hospital Center 110 Irving Street, NW, Suite 4B-1 Washington, DC 20010 Tel: 202-877-2988 E-mail: jason.p.wermers@medstar.net

Cardiovascular Revascularization Medicine (CRM) is an international and multidisciplinary journal that publishes articles related to preclinical work and molecular interventions including angiogenesis, cell therapy, pharmacological interventions, restenosis management and prevention, including experiments conducted in human subjects, laboratory animals, and in vitro. Specific content areas of interest include percutaneous angioplasty in coronary and peripheral arteries, intervention in structural heart disease, cardiovascular surgery, congenital heart disease, coronary heart disease, epidemiology, genetics, health services and outcomes research, invasive imaging, molecular cardiology, preventive cardiology, and vascular medicine.

It is a condition of publication that manuscripts submitted to CRM have not been published and will not be simultaneously submitted or published elsewhere. CRM uses the "Uniform Requirements for Manuscripts Submitted to Biomedical Journals," 5th ed (N Engl J Med 1997;336:309-315) as well as the American Medical Association Manual of Style, 9th ed.

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.
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.

Preprints
Please note that preprints can be shared anywhere at any time, in line with Elsevier's sharing policy. Sharing your preprints e.g. on a preprint server will not count as prior publication (see 'Multiple, redundant or concurrent publication' for more information).

Use of inclusive language
Inclusive language acknowledges diversity, conveys respect to all people, is sensitive to differences, and promotes equal opportunities. Content should make no assumptions about the beliefs or commitments of any reader; contain nothing which might imply that one individual is superior to another on the grounds of age, gender, race, ethnicity, culture, sexual orientation, disability or health condition; and use inclusive language throughout. Authors should ensure that writing is free from bias, stereotypes, slang, reference to dominant culture and/or cultural assumptions. We advise to seek gender neutrality by using plural nouns ("clinicians, patients/clients") as default/wherever possible to avoid using "he, she," or "he/she." We recommend avoiding the use of descriptors that refer to personal attributes such as age, gender, race, ethnicity, culture, sexual orientation, disability or health condition unless they are relevant and valid. These guidelines are meant as a point of reference to help identify appropriate language but are by no means exhaustive or definitive.

Author contributions
For transparency, we encourage authors to submit an author statement file outlining their individual contributions to the paper using the relevant CRediT roles: Conceptualization; Data curation; Formal analysis; Funding acquisition; Investigation; Methodology; Project administration; Resources; Software; Supervision; Validation; Visualization; Roles/Writing - original draft; Writing - review & editing. Authorship statements should be formatted with the names of authors first and CRediT role(s) following. More details and an example

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.

**Open access**
Please visit our Open Access page for more information.

*Elsevier Researcher Academy*
Researcher Academy is a free e-learning platform designed to support early and mid-career researchers throughout their research journey. The "Learn" environment at Researcher Academy offers several interactive modules, webinars, downloadable guides and resources to guide you through the process of writing for research and going through peer review. Feel free to use these free resources to improve your submission and navigate the publication process with ease.

**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.

**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://ees.elsevier.com/crm/.

**Abstracts and Keywords:** Limit the abstract to 250 words. Use the following subheadings: Background/Purpose, Methods/Materials, Results, and Conclusions. Mini-Review and Review articles do not require an abstract. Instead please add a summary less than 100 words. List 2-4 keywords at the end of the abstract/summary. Please also provide a 2-to-3-sentence summary for the annotated table of contents.

**Mini-Reviews:** The mini-review should include a summary (as opposed to a structured abstract), a review of the published data, a table of appropriate trials, it should be maximum 3000 words, have less than 50 references, and include case(s).

**Review Articles:** Highly encouraged. **Trial Designs.** Efficient but thorough descriptions of study protocols, including the conceptual issues underlying the hypotheses, the methodology, and planned analysis of a trial. An important part of the evaluation of trial design papers pertains to the likely ability of the investigators to complete the trial as planned. Papers should include target sample size information along with a timeline for enrollment and follow-up. If the trial has already begun enrollment, provide number of patients enrolled as of the date of manuscript submission.

**PREPARATION**
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 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.

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
Subdivision - unnumbered sections
Divide your article into clearly defined sections. Each subsection is given a brief heading. Each heading should appear on its own separate line. Subsections should be used as much as possible when cross-referencing text: refer to the subsection by heading as opposed to simply 'the text'.

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.

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.

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 lowercase 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.

**Highlights**
Highlights are optional yet highly encouraged for this journal, as they 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).

**Abbreviations**
Define abbreviations that are not standard in this field in a footnote to be placed on the first page of the article. Such abbreviations that are unavoidable in the abstract must be defined at their first mention there, as well as in the footnote. 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.

**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.

**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. If, together with your accepted article, you submit usable color figures then Elsevier will ensure, at no additional charge, that these figures will appear in color online (e.g., ScienceDirect and other sites) regardless of whether or not these illustrations are reproduced in color in the printed version. **For color reproduction in print, you will receive information regarding the costs from Elsevier after receipt of your accepted article.** Please indicate your preference for color: in print or online only. Further information on the preparation of electronic artwork.

**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.

**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. 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.

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/cardiovascular-revascularization-medicine

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 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.

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
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
To ensure a fast publication process of the article, we kindly ask authors to provide us with their proof corrections within two days. 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.

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