

Neumología y Cirugía de Tórax

www.revistanct.org.mx

Founded in 1939 as Revista Mexicana de
Tuberculosis y Enfermedades del Aparato Respiratorio
(Mexican Journal of Tuberculosis and Respiratory Diseases).

Revista oficial de:

Sociedad Mexicana de Neumología y Cirugía de Tórax
Instituto Nacional de Enfermedades Respiratorias Ismael Cosío Villegas

Editor-in-chief

Juan Carlos Vázquez García
*Directorate of Education, National
Institute of Respiratory Diseases Ismael
Cosío Villegas/Mexican Society of
Pneumology and Chest Surgery*

Associated publishers

Pulmonary Medicine:

Renata Báez Saldaña
*Directorate of Education, National Institute
of Respiratory Diseases Ismael Cosío Villegas*

Pediatric Pulmonary Medicine:

María del Carmen Cano Salas
*Subdirector of Education,
National Institute of Respiratory
Diseases Ismael Cosío Villegas*

Thoracic Surgery:

Francina Valezka Bolaños Morales
*Subdirector of Surgery,
National Institute of Respiratory
Diseases Ismael Cosío Villegas*

Editorial Board

José Rogelio Pérez Padilla
*Research in Smoking and COPD,
National Institute of Respiratory
Diseases Ismael Cosío Villegas*

Patricio Santillán Doherty
*National Bioethics Commission,
Ministry of Health, Mexico*

Andrés Palomar Lever
ABC Medical Center, Mexico City

Mayra Edith Mejía Ávila
*Clinic of Interstitial Lung Diseases,
Ismael Cosío Villegas National Institute
of Respiratory Diseases, Mexico*

Mario Vargas Becerra
*Research in Bronchial Hyperactivity,
National Institute of Respiratory
Diseases Ismael Cosío Villegas*

Assistant editors

Irene Sánchez Cuahutitla
V. Beatriz Ayala Robles
*Library and Publishing Office,
National Institute of Respiratory
Diseases Ismael Cosío Villegas*

Cover art and design

Diana Beatriz Campos Puebla
*Department of Technical
Support in Teaching
National Institute of Respiratory
Diseases Ismael Cosío Villegas*

Emma Samantha González Benítez
*Audiovisual Office, National
Institute of Respiratory Diseases
Ismael Cosío Villegas*

Editorial Board

Luis Felipe Alva López
*Radiology and Molecular Imaging,
Hospital Médica Sur,
Mexico City, Mexico*

Luis M. Argote Greene
*Regional Director Thoracic and
Esophageal Surgery Cleveland
Clinic Florida Cleveland, USA*

Ivette Buendía Roldán
*Research Laboratory on Aging and
Fibrous Diseases, National Institute
of Respiratory Diseases Ismael
Cosío Villegas, Mexico City*

Guillermo Careaga Reyna
*High Specialty Medical Unit, General
Hospital "Dr. Gaudencio Garza"
CMN La Raza, IMSS. Mexico City*

José Luis Carrillo Alduenda
*Sleep Clinic, National Institute
of Respiratory Diseases Ismael
Cosío Villegas, Mexico City*

Armando Castorena Maldonado
*Medical Subdirector, National
Institute of Respiratory Diseases
Ismael Cosío Villegas, Mexico City*

Miguel Gaxiola Gaxiola
*Morphology Laboratory, National
Institute of Respiratory Diseases
Ismael Cosío Villegas, Mexico City*

Laura Graciela Gochicoa Rangel
*Department of Physiology, National
Institute of Respiratory Diseases
Ismael Cosío Villegas, Mexico City*

Alejandro Gómez y Gómez
*Autonomous University of San Luis
Potosí, Center for Respiratory Diseases
(CERSLP), San Luis Potosí, Mexico*

Julio Edgardo González Aguirre
*University Hospital, Autonomous
University of Nuevo León,
Nuevo León, Mexico*

Rogelio Jasso Victoria
*Department of Research in
Experimental Surgery, National
Institute of Respiratory Diseases
Ismael Cosío Villegas, Mexico City*

Rafael Laniado-Laborín
*Tuberculosis Clinic and Laboratory
Tijuana General Hospital, Tijuana, Mexico*

José Antonio Loaiza Martínez
*Fundación de los Niños de las
Californias, Children's Hospital of
Las Californias, Tijuana, Mexico*

Fernando Alfredo Mata Ávalos
*José E. González University Hospital,
Autonomous University of Nuevo
León, Nuevo León, Mexico*

Raúl Olmos Zúñiga
*Experimental Lung Transplant Unit,
National Institute of Respiratory
Diseases Ismael Cosío Villegas,
Mexico City*

Luis Adrián Rendón Pérez
*Pneumology Service, CIPTIR.
Autonomous University of Nuevo
León, Nuevo León, Mexico*

Mauricio Salcedo Vargas
*Research Unit in Biomedicine and
Genomic Oncology, Hospital de
Gineco-Pediatría 3-A, OOAD Norte,
Mexican Institute of Social
Security, Mexico City*

Christian Sánchez Castrillo
*Vivian Pellas Hospital,
Managua, Nicaragua*

Julio Sandoval Zárate
*ABC Medical Center,
Mexico City*

Saraí del Carmen Toral Freyre
*Technical Training School, National
Institute of Respiratory Diseases
Ismael Cosío Villegas, Mexico City*

Claudia Vargas Domínguez
*PPD- Thermo Fisher, Medical
Associate Director, Madrid, Spain*

Joaquín A. Zúñiga Ramos
*Directorate of Research, National
Institute of Respiratory Diseases
Ismael Cosío Villegas, Mexico City*



**Sociedad Mexicana de Neumología
y Cirugía de Tórax, A.C.**

José Luis Sandoval Gutiérrez
President

Catalina Casillas Suárez
Vice-President

Jesús Javier Vázquez Cortés
Past President

Uriel Rumbo Nava
Secretary

Luis Albrecht Septién Stute
Treasurer



**Instituto Nacional de Enfermedades
Respiratorias Ismael Cosío Villegas**

Carmen Margarita Hernández Cárdenas
General Directorate Head

Renata Báez Saldaña
Head of the Education Directorate

Joaquín A. Zúñiga Ramos
Head of the Research Directorate

Armando Roberto Castorena Maldonado
Head of the Medical Directorate

Pneumology and Thoracic Surgery

Address correspondence to: Dr. Juan Carlos Vázquez García, Editor-in-Chief of the journal *Neumología y Cirugía de Tórax*, Office of Library and Editorial, National Institute of Respiratory Diseases Ismael Cosío Villegas: Calzada de Tlalpan 4502, district Section XVI, Mexico City, 14080. Telephone 55-5487-1700, ext., 5145. Email address: neumolcirtorax@gmail.com

On the internet indexed and compiled in:

www.revistanct.org.mx,
www.medigraphic.com/neumologia,
www.smnyct.org.mx,
www.iner.salud.gob.mx,
www.socune.sld.cu,
www.neumoparaguay.org,
www.soboneumo.com,
www.neumofedeca.org

Cover image: photomontage of two images; the upper image is part of the mural *Por el derecho de respirar* (for the right to breathe) by Antonio Esparza Castillo, cultural heritage, INER.

Por el derecho de respirar (for the right to breathe) by Antonio Esparza Castillo, cultural heritage, INER; the second portrays the swabbing process for the detection of COVID-19 in INER personnel during the pandemic. Both images belong to the photographic collection of the Audiovisual Office, INER.

The journal **Neumología y Cirugía de Tórax** is the official organ of the Sociedad Mexicana de Neumología y Cirugía de Tórax, the Instituto Nacional de Enfermedades Respiratorias Ismael Cosío Villegas, Sociedad Cubana de Neumología, Sociedad Paraguaya de Neumología, Sociedad Boliviana de Neumología, Asociación Sudamericana de Endoscopia Respiratoria, Asociación Internacional de Ventilación Mecánica No Invasiva and the Federación Centroamericana y del Caribe de Neumología y Cirugía de Tórax; it is published quarterly. The rights of reproduction of the contents and graphic features of this edition (including by electronic means) are reserved in accordance with the law in the signatory countries of the Pan-American and International Copyright Conventions. Copyright No. 04-2009-10081130303100-102. All Rights Reserved© 1985. Periodical Publication Registration No. 010196 authorized by SEPOMEX. The intellectual responsibility of the signed articles and photographs reverts to their authors. Certificates of legality of title and content Nos. 6331 and 5011, respectively. Art, design, typesetting, prepress, printing and distribution by Graphimedic, S.A. de C.V. Tels: 55 8589-8527 to 31. E-mail: emyc@medigraphic.com

Electronic libraries and indexes in which the journal of *Neumología y Cirugía de Tórax* has been registered

Medigraphic, biomedical literature
<http://www.medigraphic.org.mx>

Free Medical Journals
<http://www.freemedicaljournals.com/f.php?f=es>

Regensburg University Library, Germany
<https://ezb.uni-regensburg.de/>

Biomedical Research Institute Library, UNAM
<http://www.revbiomedicas.unam.mx/>

LATINDEX. Regional Online Information System for Scientific Journals in Latin America, the Caribbean, Spain and Portugal.
<https://www.latindex.org/>

Virtual Health Library (VHL, Brazil)
<http://portal.revistas.bvs.br>

Library of the Biotechnology Institute, UNAM.
<http://www.biblioteca.ibt.unam.mx/revistas.php>

Geneva Foundation for Medical Training and Research, Switzerland
https://www.gfmer.ch/Medical_journals/Revistas_medicas_acceso_libre.htm

PERIODICA (Index of Latin American Journals in Science) UNAM
<https://periodica.dgb.unam.mx>

Google Academic
<https://scholar.google.es>

Wissenschaftszentrum Berlin für Sozialforschung, Berlin WZB
<https://www.wzb.eu/de/literatur-daten/bereiche/bibliothek>

Virtuelle Bibliothek Universität des Saarlandes, German
<https://ezb.ur.de/ezeit/search.phtml?bibid=SULB&colors=7&lang=de>

Electronic Library of the University of Heidelberg, Germany
<https://ezb.ur.de/ezeit/search.phtml?bibid=UBHE&colors=3&lang=de>

Bielefeld University Library, Germany
<https://ub-bielefeld.digibib.net/eres>

University of Washington Libraries
<http://guides.lib.washington.edu/ejournals>

Journals for free
<http://www.journals4free.com/>

Research Institute of Molecular Pathology (IMP)/ Institute of Molecular Biotechnology (IMBA) Electronic Journals Library, Viena, Austria
<https://ezb.uni-regensburg.de/ezeit/index.phtml?bibid=IMP&colors=7&lang=en>

Scielo Mexico
http://www.scielo.org.mx/scielo.php?script=sci_serial&pid=0028-3746&lng=es&nrm=iso

Library of the University of Applied Sciences and Arts, Hochschule Hannover (HSH), Germany
<https://www.hs-hannover.de/ueber-uns/organisation/bibliothek/literatursuche/elektronische-zeitschriften/?libconnect%5Bsubject%5D=23>

Max Planck Institute for Comparative Public Law and International Law
<https://ezb.uni-regensburg.de/ezeit/index.phtml?bibid=MPIV&colors=7&lang=en>

Library of the Carinthia University of Applied Sciences (Austria)
<https://ezb.ur.de/ezeit/fl.phtml?bibid=FHTK&colors=7&lang=en>

Biblat (Latin American Bibliography in Scientific and Social Research Journals) UNAM
<https://biblat.unam.mx>

University of Barcelona. MIAR (Matrix of Information for the Analysis of Journals)
<https://miar.ub.edu/issn/0028-3746>

Scilit (scientific literature) database of academic papers
https://www.scilit.net/wcg/container_group/48539

CROSSREF
https://search.crossref.org/?q=0028-3746&from_ui=yes