



# BJORL

## BRAZILIAN JOURNAL OF OTORHINOLARYNGOLOGY

Official Publication of the “Associação Brasileira de Otorrinolaringologia e Cirurgia Cérvico-Facial”  
(Brazilian Association of Otorhinolaryngology and Cervicofacial Surgery)

### Brazilian Association of Otorhinolaryngology and Cervicofacial Surgery

Av. Indianópolis, 1287 - Planalto Paulista  
São Paulo - SP - Brazil  
CEP: 04063-002  
Phone: +55-11-50537500

### BRAZILIAN JOURNAL OF OTORHINOLARYNGOLOGY

**Editor-in-Chief:** Carlos Takahiro Chone  
E-mail: revista@aborlccf.org.br  
Site: www.bjorl.org

*Brazilian Journal of Otorhinolaryngology* is an official publication of the Associação Brasileira de Otorrinolaringologia e Cirurgia Cérvico-Facial (ABORL-CCF) in partnership with Elsevier Ltda. and is dedicated to the medical community.

Guide for authors can be found at the following site:  
<http://www.bjorl.org.br/en/guia-autores/>

The electronic version of *Brazilian Journal of Otorhinolaryngology* is published in English and Portuguese.

*Brazilian Journal of Otorhinolaryngology* is listed in MEDLINE/PubMed, Scopus, Web of Science/SCIE, DOAJ, Lilacs, SciELO.  
Impact Factor 2020: 1.811

The papers cannot be transcribed in total or in part. There will be six regular issues per year, in February, April, June, August, October and December.

Freely distributed to ABORL-CCF members.

For subscription, please contact the ABORL-CCF.

The journal is not liable for the truthfulness of the data presented by the authors.

© 2022 Associação Brasileira de Otorrinolaringologia e Cirurgia Cérvico-Facial. Published by Elsevier Editora Ltda. All rights reserved.

All rights reserved and protected by law 9.610 - 19/02/98. No part of this publication may be reproduced or transmitted in any form or by any means, electronic or mechanical, including photocopying, recording or any information storage and retrieval system, without permission in writing from BJORL and the Publisher.



ELSEVIER

RJ: Phone: + 55-21-39709300  
SP: Phone: + 55-11-51058555  
Site: www.elsevier.com

No responsibility is assumed by Elsevier for any injury and/or damage to persons or property as a matter of products liability, negligence or otherwise, or from any use or operation of any methods, products, instructions, or ideas contained in the material herein. Because of rapid advances in the medical sciences, in particular, independent verification of diagnoses and drug dosages should be made.

Although all advertising material is expected to conform to ethical (medical) standards, inclusion in this publication does not constitute a guarantee or endorsement of the quality.

### ABORL-CCF Executive Board

**PRESIDENT**  
Renato Roithmann  
**1<sup>st</sup> VICE-PRESIDENT**  
José Roberto Parisi Jurado  
**2<sup>nd</sup> VICE-PRESIDENT**  
Fabrizio Ricci Romano  
**EXECUTIVE DIRECTOR - GENERAL SECRETARY**  
Edwin Tamashiro  
**EXECUTIVE DIRECTOR - ADJUNCT SECRETARY**  
Fabio Lorenzetti  
**EXECUTIVE DIRECTOR - GENERAL TREASURER**  
Eduardo Macoto Kosugi  
**EXECUTIVE DIRECTOR - ADJUNCT TREASURER**  
Reinaldo Ragazzo

### Advisors

Cláudia Schweiger  
Joel Lavinsky  
Luciana Miwa Nita Watanabe  
Miguel Soares Tepedino  
Ricardo Landini Lutaif Dolci  
Roberto Dihl Angeli

### Standing Committees

**PROGRAMS AND EVENTS**  
President: Arthur Menino Castilho  
**COMMUNICATIONS**  
President: Alexandre Beraldo Ordones  
**CONTINUING MEDICAL EDUCATION**  
President: Andreia Ardevino de Oliveira  
**ETHICS AND DISCIPLINE**  
President: Ricardo Ferreira Bento  
**MEDICAL RESIDENCY AND TRAINING**  
President: Fernando Kaoru Yonamine  
**TITLE OF SPECIALIST**  
President: Ana Cristina Kfourri Camargo  
**MEDICAL MALPRACTICE DEFENSE**  
President: Virgílio Batista do Prado  
**STRATEGIC PLANNING**  
President: Jose Eduardo Lutaif Dolci

### International Board

Antonio Moffa (Italy)  
Charles Ford (USA)  
Claus Frenz Claussen (Germany)  
Fernando Vaz Garcia (Portugal)  
Guillermo Campos (Colombia)  
Hamlet Suarez (Uruguay)  
Hiroyuki Fukuda (Japan)  
James Palmer (USA)  
José Carlos Rosmaninho Seabra (Portugal)  
Mamoru Suzuki (Japan)  
Mans Magnusson (Sweden)  
Mark S. Courey (USA)  
Markus Hess (Germany)  
Masao Kume (Mexico)  
Michael Strupp (Germany)  
Nicolas Maragos (USA)  
Noam Cohen (USA)  
Pranav Dinesh Mathur (USA)  
Richard Rosenfeld (USA)  
Robert K. Jackler (USA)  
Rodney Schlosser (USA)  
Olivier Deguine (France)  
Thomas Lenarz (Germany)  
Vincent Darrouzet (France)



# BJORL

## BRAZILIAN JOURNAL OF OTORHINOLARYNGOLOGY

### Editor-in-Chief

Carlos Takahiro Chone

### Co-Editors

Eulalia Sakano  
Mariana de Carvalho Leal Gouveia

### Associate Editors

#### Head and Neck Surgery

Jose Vicente Tagliarini  
Onivaldo Cervantes

#### Pediatric Otolaryngology

Fabiana Cardoso Pereira Valera

#### Otology and Skull Base Surgery

Eduardo Tanaka Massuda  
Fayez Bahmad Jr.

#### Neurotology

Osmar Mesquita Neto

#### Laryngology and Voice

Luciano Rodrigues Neves

#### Facial Plastic and Reconstructive Surgery

José Eduardo Lutaif Dolci

#### Rhinology and Skull Base Surgery

Edwin Tamashiro

Otavio Bejzman Piltcher

#### Bucopharyngology and Sleep Medicine

Edilson Zancanella

### Editorial Board

Adalberto Novaes Silva - MT, Brazil  
Adriana Lima Gurtler - SP, Brazil  
Adriano Braga - SP, Brazil  
Adriana Sondermann - SP, Brazil  
Agnaldo J. Graciano - SC, Brazil  
Alessandra Ramos Venosa - DF, Brazil  
Aloysio Augusto Tahan de Campos Netto - SP, Brazil  
Anderson Castelo Branco de Castro - BA, Brazil  
André Bandiera de Oliveira Santos - SP, Brazil  
André de Campos Duprat - SP, Brazil  
André Del Negro - SP, Brazil  
André Sasse - SP, Brazil  
André Vicente Guimarães - SP, Brazil  
Andrea Arantes Braga Biagiotti - SP, Brazil  
Arthur Guilherme L. de Bettencourt S. Augusto - SP, Brazil  
Arthur Menino Castilho - SP, Brazil  
Atilio Maximino Fernandes - SP, Brazil  
Beatriz Godói Cavalheiro - SP, Brazil  
Berenice Dias Ramos - RS, Brazil  
Bianca Hocevar de Moura - RS, Brazil  
Bruno Bernardo Duarte - SP, Brazil  
Bruno Teixeira de Moraes - PE, Brazil  
Camila de Giacomo Carneiro Barros - SP, Brazil  
Carlos Alberto Caropreso - SP, Brazil  
Carlos Augusto Costa Pires de Oliveira - DF, Brazil  
Carlos Neutzling Lehn - SP, Brazil  
Carolina Ferraz de Paula - PR, Brazil  
Carolina Miura - SP, Brazil  
Celso Dall'Ígna - RS, Brazil  
Celso Gonçalves Becker - MG, Brazil  
Cícero Matsuyama - SP, Brazil  
Cintia Felício Adriano Adriano Rosa - PR, Brazil  
Claudia Alessandra Eckley - SP, Brazil  
Cláudia Schweiger - RS, Brazil  
Claudiney Candido Costa - GO, Brazil  
Claudio Roberto Cernea - SP, Brazil  
Danielle Gonçalves Seabra Peixoto Ramos - PE, Brazil  
Danilo Sguillar - SP, Brazil  
Davi Sandes Sobral - BA, Brazil  
Dayse Manrique - SP, Brazil  
Edilson Zancanella - SP, Brazil  
Edson Ibrahim Mitre - SP, Brazil  
Eduardo Landini Lutaif Dolci - SP, Brazil  
Eduardo Macoto Macoto Kosugi - SP, Brazil  
Ektor Tsuneo Onishi - SP, Brazil  
Érica Ortiz - SP, Brazil  
Erich Christiano Madruga de Melo - PB, Brazil  
Eriavelto Volpi - SP, Brazil  
Eulália Sakano - SP, Brazil  
Fabiana C. P. Valera - SP, Brazil  
Fabio Akira Suzuki - SP, Brazil  
Fabio Augusto Winckler Rabelo - SP, Brazil  
Fabio de Azevedo Caparroz - SP, Brazil  
Fabio Pinna - SP, Brazil  
Fabio Tadeu Moura Lorenzetti - SP, Brazil  
Fabrizio Ricci Romano - SP, Brazil  
Fayez Bahmad Jr. - DF, Brazil  
Felippe Felix - RJ, Brazil  
Fernanda Viviane Mariano - SP, Brazil  
Fernando de Andrade Quintanilha Ribeiro - SP, Brazil  
Fernando Freitas Ganança - SP, Brazil  
Fernando Veiga Angelico - SP, Brazil  
Fernando Walder - SP, Brazil  
Flávio Hojaiji - SP, Brazil  
Francini Grecco de Melo Pádua - SP, Brazil

Francisco Verissimo Mello Filho - SP, Brazil  
Geraldo Pereira Jotz - RS, Brazil  
Gisele Vieira Hennemann - PA, Brazil  
Giuliano Molina Melo - SP, Brazil  
Graziela de Souza Queiroz Martins - SP, Brazil  
Guilherme Pietrucci Buzatto - SP, Brazil  
Gustavo Jacob Lorenzo - SP, Brazil  
Gustavo Polacow Korn - SP, Brazil  
Gustavo Subtil Magalhães - DF, Brazil  
Helena Maria Gonçalves Becker - MG, Brazil  
Heloisa Juliana Zabeu Rossi Costa - SP, Brazil  
Henrique Furtan Pauna - SP, Brazil  
Hugo Valter Lisboa Ramos - GO, Brazil  
Ivo Bussoloti Filho - SP, Brazil  
Jair Cortez Montovani - SP, Brazil  
João Aragão Ximenes Filho - CE, Brazil  
João Ferreira Mello Júnior - SP, Brazil  
João Paulo Mangussi Costa Gomes - Sidney, Australia  
Joel Lavinsky - RS, Brazil  
José A. Patrocínio - MG, Brazil  
José B.C. Carvalheira - SP, Brazil  
José Faibes Lubianca Neto - RS, Brazil  
José Fernando Polanski - PR, Brazil  
José Higino Steck - SP, Brazil  
Jose Jarjura Jorge Jr. - SP, Brazil  
Jose Ricardo Gurgel Testa - SP, Brazil  
Jose Vicente Tagliarini - SP, Brazil  
Karen Lopes - SP, Brazil  
Leandro Luongo de Mattos - SP, Brazil  
Leonardo da Silva - SP, Brazil  
Leonardo Haddad - SP, Brazil  
Leticia Paiva Franco - MG, Brazil  
Leticia Petersen Schmidt Rosito - RS, Brazil  
Lucas Gomes Patrocínio - MG, Brazil  
Lucas Neves de Andrade Lemes - RJ, Brazil  
Lucia Figueiredo Mourão - SP, Brazil  
Luciano Lobato Gregorio - SP, Brazil  
Luiz Henrique Fonseca Barbosa - BA, Brazil  
Luiz Carlos de Melo Barboza Junior - SP, Brazil  
Luiz Lavinsky - RS, Brazil  
Luiz Paulo Kowalski - SP, Brazil  
Luiz Ubirajara Sennes - SP, Brazil  
Luiza Robalinho Faria - AL, Brazil  
Manoel de Nobrega - SP, Brazil  
Marcel Menon Miyake - SP, Brazil  
Marcelo H. Sampaio - SP, Brazil  
Marcelo Miguel Hueb - MG, Brazil  
Marcilio Ferreira Marques Filho - BA, Brazil  
Márcio Abrahão - SP, Brazil  
Marcio Nakanishi - DF, Brazil  
Marco Antonio A. Corvo - SP, Brazil  
Marco Aurélio Fornazieri - PR, Brazil  
Marco Aurelio Vamondes Kulcsar - SP, Brazil  
Marcos Luiz Antunes - SP, Brazil  
Marcos Marques Rodrigues - SP, Brazil  
Marcos Mocellin - PR, Brazil  
Marcos Rabelo de Freitas - SP, Brazil  
Marcus Miranda Lessa - BA, Brazil  
Maria Beatriz Nogueira Pascal - SP, Brazil  
Maria Beatriz Rotta Pereira - RS, Brazil  
Maria Dantas Costa Lima Godoy - SP, Brazil  
Maria Stella Arantes do Amaral - SP, Brazil  
Mariana Aumond - SP, Brazil  
Mariana Lopes Fávoro - SP, Brazil  
Mário Greters - SP, Brazil

Matheus de Souza Campos - DF, Brazil  
Maurício Kurc - SP, Brazil  
Melissa A. G. Avelino - GO, Brazil  
Melissa Ferreira Vianna - SP, Brazil  
Michel Burihan Cahali - SP, Brazil  
Michelle Lavinsky Wolff - RS, Brazil  
Miguel Angelo Hyppolito - SP, Brazil  
Miguel Soares Tepedino - RJ, Brazil  
Milena de Almeida Torres Campanholo - SP, Brazil  
Mônica Alcantara de Oliveira Santos - SP, Brazil  
Murilo Catafesta das Neves - SP, Brazil  
Nélio Steffen - RS, Brazil  
Ney de Castro Júnior - SP, Brazil  
Norma de Oliveira Penido - SP, Brazil  
Olavo de Godoy Mion - SP, Brazil  
Onivaldo Cervantes - SP, Brazil  
Oswaldo Laércio M. Cruz - SP, Brazil  
Patrícia Ciminelli Pinto - RJ, Brazil  
Paulo Roberto Lazarini - SP, Brazil  
Pedro Luiz Mangabeira Albernaz - SP, Brazil  
Priscila Bogar Rappoport - SP, Brazil  
Priscila Carvalho Miranda - DF, Brazil  
Rafael da Costa Monsanto - SP, Brazil  
Rafael Russell Malinsky - RS, Brazil  
Raquel Salomone - SP, Brazil  
Rebecca Christina Kathleen Maunsell - SP, Brazil  
Regina H. G. Martins - SP, Brazil  
Regina Maria Marquezzini Chammes - SP, Brazil  
Reginaldo Raimundo Fujita - SP, Brazil  
Renata de Almeida Marcondes - SP, Brazil  
Renato Roithmann - RS, Brazil  
Renato Stefanini - SP, Brazil  
Ricardo Demarco - SP, Brazil  
Ricardo Neves Godinho - MG, Brazil  
Richard Louis Voegels - SP, Brazil  
Roberta Ribeiro de Almeida - SP, Brazil  
Roberto Campos Meirelles - RJ, Brazil  
Roberto Eustáquio dos Santos Guimarães - MG, Brazil  
Rodolfo Alexander Scalia - SP, Brazil  
Rodrigo de Paiva Tangerina - SP, Brazil  
Rodrigo de Paula Santos - SP, Brazil  
Rogério A. Deditivis - SP, Brazil  
Rogério Hamerschmidt - PR, Brazil  
Romualdo Suzano Louzeiro Tiago - SP, Brazil  
Rubens Vuono Brito Neto - SP, Brazil  
Rui Imamura - SP, Brazil  
Sady Selaimen da Costa - RS, Brazil  
Sandra Xavier - SP, Brazil  
Sergio Henrique Kiemle Trindade - SP, Brazil  
Signe Schuster Grasel - SP, Brazil  
Silke Anna Thereza Weber - SP, Brazil  
Silvio Antonio Monteiro Marone - SP, Brazil  
Silvio Caldas Neto - PE, Brazil  
Siomara Bamber de Oliveira - DF, Brazil  
Shirley Shizue Nagata Pignatari - SP, Brazil  
Sulene Pirana - MG, Brazil  
Tanit Ganz Sanchez - SP, Brazil  
Tatiana de Aguiar Vidigal - SP, Brazil  
Thais Gomes Abrahão Elias - DF, Brazil  
Thiago Freire Pinto Bezerra - PE, Brazil  
Tríssia Vassoler - PR, Brazil  
Vagner Antonio Rodrigues da Silva - SP, Brazil  
Wilma Terezinha Anselmo-Lima - SP, Brazil

### Scientific Papers Assessment Committee

Carlos Takahiro Chone  
Edilson Zancanella  
Eduardo Tanaka Massuda  
Edwin Tamashiro  
Eulalia Sakano  
Fabiana Cardoso Pereira Valera  
Fayez Bahmad Jr.  
João Paulo Mangussi Costa Gomes

Joel Lavinsky  
José Eduardo Lutaif Dolci  
Jose Vicente Tagliarini  
Luciano Rodrigues Neves  
Mariana de Carvalho Leal Gouveia  
Onivaldo Cervantes  
Osmar Mesquita Neto  
Reginaldo Raimundo Fujita

### External Consultants

**Ethics**  
Daniel Munhoz

**Neurology**  
Eduardo Vellutini

**Infectology**  
Guido Levi

**Clinical Pathology**  
Paulo Carneiro

**Rheumatology**  
Willian Chahade

**Evidence-Based Medicine**  
Edina Mariko Koga da Silva