

# ARCHIVES

OF

## OTOLARYNGOLOGY— HEAD & NECK SURGERY

The ARCHIVES OF OTOLARYNGOLOGY—HEAD & NECK SURGERY is a member of the consortium of AMA journals listed below. The complete text of all AMA journals is available online from Dialog Information Services and Ovid Technologies, Inc.

**The Journal of the American Medical Association (JAMA)**

**Archives of Dermatology**

**Archives of Facial Plastic Surgery**

**Archives of Family Medicine**

**Archives of General Psychiatry**

**Archives of Internal Medicine**

**Archives of Neurology**

**Archives of Ophthalmology**

**Archives of Otolaryngology—Head & Neck Surgery**

**Archives of Pathology & Laboratory Medicine**

**Archives of Pediatrics & Adolescent Medicine**

**Archives of Surgery**

The ARCHIVES OF OTOLARYNGOLOGY—HEAD & NECK SURGERY (ISSN 0886-4470) is published monthly by the American Medical Association, 515 N State St, Chicago, IL 60610-0946, and is an official publication of the Association. The ARCHIVES OF OTOLARYNGOLOGY—HEAD & NECK SURGERY reaches more than 11 000 readers in over 80 countries each month. Periodicals postage rates paid at Chicago, IL and at additional mailing offices. GST registration number: 12622 5556 RT. Canada Post International Publications Mail (Canadian Distribution) Sales Agreement No. 319066.

Printed in the USA.

Official publication for American Academy of Facial Plastic and Reconstructive Surgery, Inc, American Society for Head and Neck Surgery, and American Society of Pediatric Otolaryngology.

**SUBSCRIPTION RATES**—The personal subscription rates for the ARCHIVES OF OTOLARYNGOLOGY—HEAD & NECK SURGERY are \$195 for 1 year (12 issues) in the United States and US possessions; \$245 in the Americas; £145 outside the Americas. The institution rates for 1 year are \$295 in the United States; \$395 in the Americas; £245 outside the Americas. Special rates for residents and medical students are available. Address all subscription communications to: Subscriber Services Center, American Medical Association, PO Box 10946, Chicago, IL 60610-0946. Phone: (800) 262-2350. Fax: (312) 464-5831. E-mail: ama-subs@ama-assn.org. For mailing addresses outside the United States and US possessions, see International Subscription Information.

**CHANGE OF ADDRESS**—POSTMASTER, send all address changes to ARCHIVES OF OTOLARYNGOLOGY, c/o Subscriber Services, American Medical Association, 515 N State St, Chicago, IL 60610. Please notify us of address change at least 6 weeks in advance to ensure uninterrupted service. Include both old and new addresses, a recent mailing label, and new ZIP code. For mailing addresses outside the United States and US possessions, see International Subscription Information.

**SUBSCRIBER SERVICES**—For information about subscribing to any of the AMA publications, change of address, missing issues, or purchasing back issues, please contact Subscriber Services Center, American Medical Association, PO Box 10946, Chicago, IL 60610-0946, or call (800) 262-2350 or (312) 670-SUBS (670-7827) between 8:30 AM and 4:30 PM CST. Fax: (312) 464-5831. E-mail: ama-subs@ama-assn.org. For mailing addresses outside the United States and US possessions, see International Subscription Information.

**INTERNATIONAL SUBSCRIPTION INFORMATION**—Subscriptions outside the United States and US possessions are served according to geographic region. Please address correspondence to the following 2 offices based on delivery address: (1) For delivery in North America, Central America, and South America, contact Subscriber Services, AMA, PO Box 10946, Chicago, IL 60610-0946. Phone: (312) 670-7827. Fax: (312) 464-5831. E-mail: ama-subs@ama-assn.org. (2) For delivery outside the Americas, contact JAMA & Archives Journals, Reader Services Centre, PO Box 299, London WC1H 9TD, England. Phone: +44 (0)171-383-6270. Fax: +44 (0)171-383-6402. E-mail: jama-archives@dial.pipex.com.

**REPRINTS**—Authors place their reprint order at the time the edited typescript is reviewed and should allow 4 to 6 weeks for delivery following publication. Requests for individual reprints should be sent directly to the author at the address shown in the article.

For bulk reprint orders for distribution by commercial organizations, please contact Wanda Bartolotta, 500 Fifth Ave, #2210, New York, NY 10110. Phone: (212) 354-0050. Fax: (212) 354-1169. E-mail: wanda\_bartolotta@ama-assn.org. For reprint orders in limited quantities for distribution by educational organizations and for author reprints, please contact Reprint Coordinator, 515 N State St, Chicago, IL 60610. Phone: (312) 464-4594. Fax: (312) 464-4849.

**PERMISSIONS**—Contact Rhonda Bailey, Permissions Assistant, 515 N State St, Chicago, IL 60610. Phone: (312) 464-2513.

**ADVERTISING PRINCIPLES**—Each advertisement in this issue has been reviewed and complies with the principles governing advertising in AMA scientific publications. A copy of these principles is available on request. The appearance of advertising in AMA publications is not an AMA guarantee or endorsement of the product or the claims made for the product by the manufacturer.

**WORLD WIDE WEB ADDRESS**—<http://www.ama-assn.org>.

**OTOLARYNGOLOGY HOME PAGE**—<http://www.ama-assn.org/oto>.

### Publication Staff

Offices: 515 N State St, Chicago, IL 60610

Editorial Processing Department,  
Archives Journals

**Director:** Paula Glitman

**Manager:** Lise M. Stevens

**Freelance Manager:** Diane L. Cannon

**Freelance Coordinators:**

Mark Berthold  
Connie Manno

**Electronic Editing Specialist:**

Paul Frank

**Assistant Electronic Editing Specialist:**

Monica Mungle

**Senior Copy Editors:**

Dee E. Egger  
Brandt Martin

**Copy Editors:**

Keith Huff  
John McFadden  
Carol L. Seymour

**Editorial Assistant:** Wanda Hill

Scientific Information  
& Multimedia Group

**Staff Assistant:** Helga Fritz

New Media Editorial Office

**Associate Editor:** Marty Suter

**Assistant Editors:**

Deborah Flapan  
Neil Shankman

**Staff Assistant:** Marla A. Hall

Production & Distribution Division

**Manager, Budgets & Costs:**

Bonnie Van Clevon

**Publishing Manufacturing Analyst:**

Diane Darnell

**Office Manager:** Karen Branham

**Production Assistant:** Shannon Epplert

Advertising & Production  
Department

**Director:** Karen Adams-Taylor

**Production Specialist:** Terri Hanley

**Manager, Advertising Services:**

Carole Piszker

**Manager, Production Services:**

Susan Price

**Supervisor, Production Services:**

Betty Frigerio

**Production Associates:**

Mary Anne Donley  
Mari Guizzetti  
Sarah Powell  
Denise Steinhauser  
Jo Anne Turner

**Production Assistants:**

Bryan Irzyk  
Beth A. Rillema

Distribution

**Distribution Manager:** Paul Gasielki

**Distribution Analyst:**

Michelle Robinson

**Traffic Control Specialist:**

Victoria Buckner



Specialty Journal Division Office

**Assistant to the Publisher:**

Christine Hearne

Circulation & Content  
Marketing Division

**Administrative Assistant:**

Millette Jackson-Bates

Circulation Processing Department

**Director:** Beverly Martin

Circulation Development  
Department

**Director:** Bina Oza

**Circulation Marketing Managers:**

Robert Herling  
Audrey Mathies

Licensing & Permissions  
Department

**Director:** Norman Frankel

**Permissions:** Rhonda Bailey

**International Coordinator:** Sharon Ali

Electronic Production Department

**Director:** Linda Knott

**Manager, Composition & Pagination:**

Phil Arko

**Electronic Production Specialists:**

Brenda Chandler-Grayer  
Heather Crego  
Karl Elvin  
Amy Evers  
Mary Ann Kuranda  
Sandra Lopez

**Manager, Graphics:** Charl Richey

**Electronic Imaging Specialists:**

Joe Amft  
Noel Chaparro  
Maria Kowalkowski  
JoAnne Weiskopf

**Manager, Proofreading:**

Teresa H. Omiotek

**Proofreaders:**

David Antos  
Daniel James  
Mary Kay Tinerella  
Barbara Wojtowicz

**Manager, Database & New Media:**

Mary Ellen Johnston

**Indexer:** Kathy Gaydar

**New Media Specialists:**

Gail Barrett  
Paul Boscoe  
Joel Brammeier  
Regina Brownlee  
La'son J. Diggs  
Anne McBride  
Melanie Parenti  
Angela Smits

**Production Assistant:** Ruth Sprague

# ARCHIVES

OF

## OTOLARYNGOLOGY- HEAD & NECK SURGERY

www.ama-assn.org/oto

VOL 125 NO. 5, MAY 1999

### ORIGINAL ARTICLES

**Trends in Educational Placement and Cost-Benefit Considerations in Children With Cochlear Implants** 499  
*Howard W. Francis, MD; Mary E. Koch, MA; J. Robert Wyatt, MD, MBA; John K. Niparko, MD*

**Risk Factors for Hearing Loss From Meningitis in Children: The Children's Hospital Experience** 509  
*Audie L. Woolley, MD; Katharine A. Kirk, PhD; Alfred M. Neumann, Jr, MD; Sean M. McWilliams, MS; Judy Murray, CRNP; Deborah Freind, MSc; Brian J. Wiatrak, MD*

**Causes of Pediatric Sensorineural Hearing Loss: Yesterday and Today** 517  
*Kathleen R. Billings, MD; Margaret A. Kenna, MD*

**Congenital Airway Abnormalities in Patients Requiring Hospitalization** 525  
*Ken W. Altman, MD, PhD; Ralph F. Wetmore, MD; Roger R. Marsh, PhD*

**Meta-analysis of Pediatric Tympanoplasty** 530  
*Jeffrey T. Vrabec, MD; Ronald W. Deskin, MD; James J. Grady, DrPH*

**Topical Ofloxacin Treatment of Otorrhea in Children With Tympanostomy Tubes** 537  
*Joseph E. Dohar, MD; Eric T. Garner, MD; Richard W. Nielsen, MD; Merril A. Biel, MD, PhD; Mindell Seidlin, MD*

**Adenotonsillectomy in Children With von Willebrand Disease** 547  
*Gregory C. Allen, MD; Derek R. Armfield, MD; Franklin A. Bontempo, MD; Lawrence A. Kingsley, DrPH; Nira A. Goldstein, MD; J. Christopher Post, MD*

**Interference by Aerobic and Anaerobic Bacteria in Children With Recurrent Group A  $\beta$ -Hemolytic Streptococcal Tonsillitis** 552  
*Itzhak Brook, MD, MSc; Alan E. Gober, MD*

**Human Insulinlike Growth Factor 1 Gene Transfer Into Paralyzed Rat Larynx: Single vs Multiple Injection** 555  
*Akihiro Shiotani, MD; Bert W. O'Malley, Jr, MD; Michael E. Coleman, PhD; Paul W. Flint, MD*

**Prognostic Value of the Pilocarpine Test to Identify Patients Who May Obtain Long-term Relief From Xerostomia by Acupuncture Treatment** 561  
*Maria Blom, DDS, MSc; Sigvard Kopp, DDS, PhD; Thomas Lundeberg, MD, PhD*

### American Medical Association

Physicians dedicated to the health of America



Copyright 1999 by the American Medical Association. All rights reserved. Reproduction without permission is prohibited.

All articles published, including editorials, letters, and book reviews, represent the opinions of the authors and do not reflect the policy of the American Medical Association, the Editorial Board, or the institution with which the author is affiliated, unless this is clearly specified.

**E. Ratcliffe Anderson, Jr, MD**  
Executive Vice President,  
Chief Executive Officer

**Lynn E. Jensen, PhD**  
Chief Operating Officer

**Paul J. Blackney**  
Senior Vice President,  
Publishing & Business Services

**Robert L. Kennett**  
Vice President, Publishing

**Peter L. Payerli**  
Publisher

**Peter G. Messina**  
National Sales Manager

**Geoffrey A. Flick**  
Manager, Marketing Services

**Cheryl Iverson**  
Director, Editorial Processing Division

**Vanessa Hayden**  
Director, Production &  
Distribution Division

**James A. Skowrenski**  
Director, Circulation &  
Content Marketing Division

**Advertising Offices: East:** Philip G. Soufleris,  
119 Cherry Hill Rd, 3rd Flr, Parsippany,  
NJ 07054 (973)263-9191.

**Midwest/West:** J. P. Cahill & Associates,  
341 S Waiola Ave, La Grange, IL 60525  
(708) 352-0322.

**AMA Classified Advertising Department:**  
Thalia Moss, 800-262-2260.

**Evaluation of Acupuncture for Pain Control After Oral Surgery: A Placebo-Controlled Trial** 567  
*Lixing Lao, PhD, LAC; Stewart Bergman, DDS; Gayle R. Hamilton, PhD; Patricia Langenberg, PhD; Brian Berman, MD*

**Use of Alternative Medicine Among Patients With Head and Neck Cancer** 573  
*Paul D. Warrick, BSc, Pharm; Jonathan C. Irish, MD, MSc, FRCSC, FACS; Mary Morningstar, BSc, RD; Ralph Gilbert, MD, FRCSC; Dale Brown, MB, FRCSC; Patrick Gullane, MB BCH, FRCSC, FACS*

#### CLINICAL NOTES

**Transnasal Endoscopic Repair of Congenital Defects of the Skull Base in Children** 580  
*Thierry Van Den Abbeele; Monique Elmaleh; Philippe Herman; Martine François; Philippe Narcy*

**Sinonasal-Mucosa-Associated Lymphoid Tissue Lymphoma** 585  
*Michael J. Babb, MD; Raul M. Cruz, MD; Balaram Puligandla, MD*

**Lemierre Syndrome and Acute Mastoiditis** 589  
*Robert J. Stokroos, MD, PhD; Johannes J. Manni, MD, PhD; Jelle R. de Kruijk, MD; Eduard R. Soudijn, MD, PhD*

#### RESIDENT'S PAGE: IMAGING

**Imaging Quiz Case 1** 592  
*Misha Amagasu; Dennis Lee, MD; Charles D. Bluestone, MD*

**Imaging Quiz Case 2** 593  
*Glenn G. Gray, MD; Erich Voigt, MD; Frank Breuer, MD; Lewis M. Rothman, MD*

#### CLINICAL CHALLENGES IN OTOLARYNGOLOGY

**Ludwig Angina: A Review of Current Airway Management** 596  
*Bradley F. Marple, MD*

**Ludwig Angina** 599  
*Francis B. Quinn, Jr, MD*

**Ludwig Angina: A Review of Current Airway Management** 600  
*William W. Shockley, MD*

#### REGULAR DEPARTMENTS

**Obituary** 495

**Web Forum** 495

**Classified Advertising** 602

**Index to Advertisers** 608

**Instructions for Authors—**  
 See January 1999 issue, page 5, or visit the Web site at [www.ama-assn.org/oto](http://www.ama-assn.org/oto).

## ARCHIVES

OF

### OTOLARYNGOLOGY— HEAD & NECK SURGERY

*Editor:*  
**Michael E. Johns, MD**  
 Emory University  
 Woodruff Health Sciences  
 Administration Building  
 Suite 408  
 1440 Clifton Rd NE  
 Atlanta, GA 30322  
*Assistant Editors:*  
**John K. Niparko, MD**  
 Baltimore, Md  
**William J. Richtsmeier, MD, PhD**  
 Durham, NC  
*Editorial Assistant:*  
**Trina L. Johns**  
*Production Manager:*  
**Catherine A. Alden**  
 (404) 778-2322  
 (404) 778-3100 FAX  
 e-mail: [aohns@emory.edu](mailto:aohns@emory.edu)

*Editorial Board:*  
**Elliot Abemayor, MD, PhD**  
 Los Angeles, Calif  
**John G. Batsakis, MD**  
 Houston, Tex  
**Margaret S. Brandwein, MD**  
 New York, NY  
**Robin T. Cotton, MD**  
 Cincinnati, Ohio  
**Marvin P. Fried, MD**  
 Boston, Mass  
**Patrick J. Gullane, MD**  
 Toronto, Ontario  
**Lauren D. Holinger, MD**  
 Chicago, Ill  
**Paul R. Lambert, MD**  
 Charlottesville, Va  
**Wayne F. Larrabee, Jr, MD**  
 Seattle, Wash  
**Robert H. Miller, MD**  
 New Orleans, La

**H. Bryan Neel III, MD, PhD**  
 Rochester, Minn  
**Jay F. Piccirillo, MD**  
 St Louis, Mo  
**Clarence T. Sasaki, MD**  
 New Haven, Conn  
**Richard J. H. Smith, MD**  
 Iowa City, Iowa  
**Fred J. Stucker, MD**  
 Shreveport, La  
*Section Editors:*  
*Clinical Challenges in Otolaryngology*  
**Karen H. Calhoun, MD**  
 Galveston, Tex  
**Ronald B. Kuppersmith, MD (Assistant)**  
 Houston, Tex  
*Online Editor*  
**Michael A. Rothschild, MD**  
 New York, NY

*Resident's Page: Imaging*  
**R. Nick Bryan, MD**  
**S. James Zinreich, MD**  
 Baltimore, Md  
*Resident's Page: Pathology*  
**Frederic B. Askin, MD**  
**William H. Westra, MD**  
 Baltimore, Md  
*American Academy of Facial Plastic and Reconstructive Surgery News*  
**Dale H. Rice, MD**  
**Maisie Shindo, MD**  
 Los Angeles, Calif  
*American Society for Head and Neck Surgery News*  
**David W. Eisele, MD**  
 Baltimore, Md  
*American Society of Pediatric Otolaryngology News*  
**Sally R. Shott, MD**  
 Cincinnati, Ohio