

### **Carol Lynn Rosen, M.D.**

**office: 216-844-4999**

**fax: 216-844-4998**

**email: [carol.rosen@case.edu](mailto:carol.rosen@case.edu)**

#### **EDUCATION AND POSTGRADUATE TRAINING:**

College: B.S. in Biology 1972, University of Wisconsin, Madison  
Medical School: M.D. 1976, University of Illinois, Chicago  
Internship/Residency: PL1/2 St. Louis Children's Hospital, Washington University 1976-1978  
PL3 Texas Children's Hospital, Baylor College of Medicine 1978-1979  
Fellowship: PL4/5 Postdoctoral Fellow, Pediatric Pulmonary, 1979-1981  
Visiting Fellow: PL6/7 Visiting Research Fellow, Pulmonary, Columbia University, 1/86  
12/88

#### **PROFESSIONAL APPOINTMENTS:**

##### Case Appointments

Associate Professor of Pediatrics, Case Western Reserve University, 7/99-present

##### Hospital Appointments

Attending Physician, UHHS, Cleveland, OH 7/99-present

##### Other Institutions and Hospital Appointments

Associate Professor of Pediatrics, Yale University School of Medicine, 7/95 – 6/99

Assistant Professor of Pediatrics, Yale University School of Medicine, 1/89 - 6/95

Assistant Professor of Pediatrics, Baylor College of Medicine 7/82-6/85\*

Instructor of Pediatrics, Baylor College of Medicine 7/81-6/82

Attending Physician, Yale New Haven Hospital, New Haven, CT 1/89-6/99

Attending Physician, Texas Children's Hospital, Houston, TX 7/81/6/85

\*Family Move - see Training – Visiting Research Fellow at Columbia from 1/96 to 12/88

Military Service: N/A

Honors and Awards: none

#### **Grants:**

NHLBI K23 Mentored Patient-Oriented Research Career Development Award, HL04426, Evaluation of Diagnostic Tests for Pediatric Sleep Apnea, 8/1/00 – 7/31/05, 75% effort. Total Direct Costs = \$351,750

NIH/NHLBI HL70916-01, 07/01/02-06/30/06, Outcomes of Sleep Disorder Breathing in Adolescents (S. Redline, P.I.), 0 salary (because of K23 restrictions), 5% effort as co-investigator.

NIH/NHLBI R01 HL94092, 09/01/99-08/31/04, Sleep Heart Health – Reading Center (Susan Redline, PI), 0 salary (because of K23 restrictions), 5% effort as co-investigator

Collaboration with Dr. Jeff Blumer, Center for Drug Research, NIH sponsored Pediatric Pharmacotherapy Network – development of a Reading Center for Pediatric PSG and Actigraphy Studies to Evaluate Pharmacotherapy for Pediatric Insomnia 15% salary support (1 year) for phase I trial of hypnotic in children in 2003/2004.

## Licensure

Ohio 1999 ##35-07-6470-R, expires 4/01/2006  
Connecticut 1989 #029351, issued 8/12/88; expired 11/30/99  
New York 1986 #165568, issued 3/5/86, (inactive)  
Texas 1979 #G2077, issued 6/82 (expired 11/30/92)  
Missouri 1978 # R8531 issued 6/9/78; (expired 6/30/81) under maiden name Carol L. Katz

## Certification

American Academy of Pediatrics, 12/6/81, #26959; Fellow-AAP, 1982  
Sub-Board Certified, Pediatric Pulmonology, 7/14/89, #246, Recertification 97-03; 03-10  
American Board of Sleep Medicine, 4/6/98, #1142

## Professional Service

Study Section: NIH SBIR Scientific Review Group (Pulmonary, GI, Toxicology) since 2002  
Editorial Boards: none; ad hoc reviewer for American Journal of Respiratory and Critical Care Medicine, Sleep, Pediatrics, J Pediatrics

## Professional Societies:

American Academy of Sleep Medicine (AASM)  
Clinical Practice Committee since 2002, vice chairperson 2003  
Task Force on Pharmacotherapy for Pediatric Insomnia, 2002-3  
Member of International Classification of Sleep Disorder's Revision Committee  
Member of Task Force to Assess Revision of Sleep Study Scoring Criteria (Age Considerations and Cardiac Scoring)

American Board of Sleep Medicine (ABSM)

Board of Directors, since 6/2002

Part I Exam Committee 2002; co-chairperson Pt 1 Committee 2003

Advisory Group: Member of the DSMB for NIH/NHLBI R01-HL67209-01 (Dr. M Aloia, PI) "Motivating Adherence to CPAP in Obstructive Sleep Apnea"

## Committees

University: n/a

School: n/a

Department: Promotion and Tenure Committee, since 10/2002

Hospital: GCRC Protocol Review Committee for Scientific Advisory since 8/2001

Scientific Advisory Committee

## Educational Activities

Residency Education

Prepare yearly core lecture on SIDS/Infant Apnea

Pediatric Pulmonary Division

Supervise Pediatric Pulmonary Fellows during their 1 month Pediatric Sleep Elective (clinic, PSG)

Pediatric Neurology or Behavioral Pediatrics Division

Supervise Pediatric Residents during elective for focus on Sleep Medicine (clinic, PSG review)

Supervise Behavioral Medicine Fellows and Psychology Trainees in Rainbow Sleep Clinic

Medical Director, Pediatric Sleep Services at RB&C

Coordinate monthly UHHS Sleep Case Conference for professional staff

Assist in training/QA of UHHS sleep technologists at month staff meeting

## Publications:

Articles (peer-reviewed)

Rosen CL, Storfer-Isser A, Taylor HG, Kirchner HL, Emancipator JL, Redline S. Increased Behavioral Morbidity in School-Aged Children with Sleep-Disordered Breathing. Pediatrics (accepted for publication 12/04).

Hart CN, Palermo TM, Rosen CL. Health-Related Quality of Life among Children Presenting to a Pediatric Sleep Disorders Clinics. Behav Sleep Med (accepted for publication).

Spilsbury JC, Storfer-Isser A, Drotar D, Rosen CL, Kirchner HL, Redline S. Sleep Behavior in an Urban U.S.

Sample of School-Aged Children, Arch Pediatr Adolesc Med 2004 (in press).

Grischkan, J., A. Storfer-Isser, C. Rosen, E. Larkin, H. Kirchner, A. South, D. Wilson-Costello, R. Martin, and R. Redline. 2004. Variation In Childhood Asthma Among Former Preterm Infants. J Pediatr 2004;144(3):321-6.  
 Friedlander SL, Larkin EK, Rosen CL, Palermo TM, Redline S. Decreased Quality of Life Associated with Obesity in School-Aged Children. Arch Pediatr Adolesc Med 2003; 157:1206-121.  
 Owens JA, Rosen CL, Mindell JA. Medication Use in the Treatment of Pediatric Insomnia: Results of a Survey of Community-Based Pediatricians Pediatrics 2003;111(5):e628-35.

Rosen CL, Larkin EK, Kirchner HL, Emancipator JL, Bivins SF, Surovec SA, et al. Prevalence and risk factors for sleep-disordered breathing in 8- to 11-year-old children: association with race and prematurity. J Pediatr 2003;142(4):383-9.

Rosen CL, Palermo TM, Larkin EK, Redline S. Health-related quality of life and sleep-disordered breathing in children. Sleep 2002;25(6):657-66

Monahan KJ, Larkin EK, Rosen CL, Graham G, Redline S. Utility of Noninvasive Pharyngometry in Epidemiologic Studies of Childhood Sleep-disordered Breathing. Am J Respir Crit Care Med 2002;165(11):1499-503.

Tang JPL, Rosen, CL, Larkin EK, DiFiore JM, Arnold JL, Surovec SA, Youngblut JM, Redline S. Identification of Sleep-Disordered Breathing in Children: Variation with Event Definition. Sleep 2002;72-29.

Morton S, Rosen C, Larkin E, Tishler P, Aylor J, Redline S. Predictors of sleep-disordered breathing in children with a history of tonsillectomy and/or adenoidectomy. Sleep 2001;24(7):823-9.

Kirk VG, MD, Morielli A, Gozal D, Marcus CL, Waters KA, D'Andrea LA, Rosen CL, Deray MJ, Brouillette RT. Treatment of Sleep-Disordered Breathing in Children with Myelomeningocele. Pediatr Pulmonol 2000; 30:445-452.  
 Rosen CL. Clinical Features of Obstructive Sleep Apnea Hypoventilation Syndrome in Otherwise Healthy Children. Pediatr Pulmonol 1999; 27:403-409

Marcus CL, Ward SD, Mallory GB, Rosen CL, Beckerman RC, Weese-Mayer DE, Brouillette RT, and Brooks LJ. Use of nasal continuous positive airway pressure for childhood obstructive sleep apnea syndrome. J Pediatr 1995; 127:88-94.

Bell C, Dubose R, Seashore, J, Touloukian R, Rosen C, et al. Infant apnea detection after herniorrhaphy. 1995 J Clin Anesth 7:219-223.

Chidekel AS, Bazzzy AR, Rosen CL. Rhinovirus infections associated with severe lower respiratory tract illness and worsening lung disease in infants with bronchopulmonary dysplasia. Pediatric Pulmonol 1994; 18:261-263.

D'Andrea LA, Rosen CL and Haddad GG. Severe hypoxemia in children with upper airway obstruction during sleep does not lead to significant changes in heart rate. Pediatr Pulmonol 1993; 16:362-269.

Rosen CL, Schechter WS, Mellins RB, Haddad GG. Effect of acute hypoxia on metabolism and ventilation in awake piglets. Respir Physiol 1993; 91:307-319.

Rosen CL, Novotny EJ, D'Andrea LA, Petty EM. Klippel-Feil sequence and sleep disordered breathing in two children. Am Rev Resp Dis 1993; 147:202-204.

Rosen CL, D'Andrea L, Haddad GG. Adult criteria for obstructive sleep apnea do not identify children with serious obstruction. Am Rev Resp Dis 1992; 146:1231-1234.

Singh M, Rosen CL, Chang KJ, and Haddad GG. Plasma  $\beta$ -casomorphin-7 immunoreactive peptide increases after milk intake in the newborn but not adult dogs. Pediatr Res 1989; 26:35-38.

Rosen CL, Côté A, and Haddad, GG: Effect of enkephalins on cardiac output and regional blood flow in conscious dogs. American Journal of Physiology: Heart and Circulatory Physiology 1989; 25:H1651-1656.

Rosen CL, Frost JD Jr, Glaze DG: Child Abuse and recurrent infant apnea. Pediatrics 1986; 109:1065-1067.

Rosen CL, Glaze DG, Frost JD Jr: Home monitor follow-up of persistent apnea and bradycardia in preterm infants. Amer J Dis Child 1986; 140:547-550.

Splaingard ML, Frates RC Jr, Jefferson LS, Rosen CL, Harrison GM. Home negative pressure ventilation: report of 20 years experience in patients with neuromuscular disease. Arch Phys Med Rehab 1985; 66:239-242.

Rosen CL, Glaze DG, Frost JD Jr: Hypoxemia associated with feeding in the preterm infant and full term neonate. Amer J Dis Child 1984; 138: 623-628.

Rosen CL, Frost JD Jr, Harrison GM: Infant apnea: polygraphic studies and follow-up monitoring. Pediatrics 1983; 71:731-736.

Rosen CL, Frost JD Jr, Bricker T et al: Two siblings with recurrent cardiorespiratory arrest: Munchausen syndrome by proxy or child abuse? Pediatrics 1983;71:715-720.

Mantovani H, Katz (Rosen) CL, Gellman E et al: Infantile botulism in Missouri. Missouri Medicine 1978; 65:160.

**Book Chapters or Review Articles**

- Meoli AL, Rosen CL, Kristo D, Kohrman M, Gooneratne N, Aguillard RN, et al. Upper airway management of the adult patient with obstructive sleep apnea in the perioperative period--avoiding complications. *Sleep* 2003;26(8):1060-5.
- Meoli, A. L., C.L. Rosen, D. Kristo, M. Kohrman, N. Gooneratne, R. N. Aguillard, R. Fayle, and R. Troell. 2003. Nonprescription treatments of snoring or obstructive sleep apnea: an evaluation of products with limited scientific evidence. *Sleep* 2004;26(5):619-24.
- Rosen CL. Obstructive sleep apnea syndrome in children: controversies in diagnosis and treatment. *Pediatr Clin North Am* 2004;51(1):153-67, vii.
- Owens JA, Palermo TM, Rosen CL. Overview of Current Management of Sleep Disturbances in Children: II – Behavioral Interventions. *Current Therapeutic Research: Clinical and Experimental*, 2002. 63(Suppl B): p. B388.
- Rosen, CL. Maturation of Breathing during Sleep - Infants Through Adolescence. In: Loughlin GM, Marcus CL, Carroll, JL, eds. *Sleep and Breathing during Sleep in Children - A Developmental Approach*, New York, Marcel Dekker, Inc, 2001;147: 181-206.
- Rosen, CL. Diagnostic Approaches to Childhood Obstructive Sleep Apnea Hypopnea Syndrome. *Sleep and Breathing*. *Sleep and Breathing* 2000;4:177-182
- Rosen CL, Bazy-Asaad A, Haddad, GG. Respiratory Control in Children - Clinical Aspects. In: Altose MD and Kawakami Y, eds. *Control of Breathing in Health and Disease*, New York: Marcel Dekker, Inc, 1999;135:289-366.
- Rosen CL. Sudden Infant Death Syndrome. In: *UpToDate in Medicine*, Rose, BD (Ed), UpToDate, Wellesley, MA, 1997.
- Rosen CL. Apparent life-threatening event in infants. In: *UpToDate in Medicine*, Rose, BD (Ed), UpToDate, Wellesley, MA, 1997.
- Rosen CL. Evaluation of the child with snoring or suspected obstructive sleep apnea. In: *UpToDate in Medicine*, Rose, BD (Ed), UpToDate, Wellesley, MA, 1997.
- Rosen CL. Management of the child with snoring or obstructive sleep apnea. In: *UpToDate in Medicine*, Rose, BD (Ed), UpToDate, Wellesley, MA, 1997.
- Rosen CL. Sleep Disorders in Infancy, Childhood and Adolescence. *Current Opinion in Pulmonary Medicine* 1997; 3(6):449-455.
- Rosen CL. Obstructive Sleep Apnea Syndrome (OSAS) in Children: Diagnostic Challenges. *Sleep* 1996; 19(10): S274-S277.
- American Thoracic Society Statement: Standards and Indications for Cardiopulmonary Sleep Studies in Children. *Am J Respir Crit Care Med* 1996; 886-878. Committee member
- Rosen CL and Haddad GG. Obstructive Sleep Apnea/Hypoventilation in Children. In: Behrman RE, Kliegman R, and Arvin AM, eds. *Nelson Textbook of Pediatrics*, 15th ed., pp. 1195-1197, 1996; update for 16th ed in 2002.
- American Thoracic Society Statement: Indications and Standards for Use of Nasal Continuous Positive Airway Pressure (CPAP) in Sleep Apnea Syndromes. *Am J Respir Crit Care Med* 1994; 1738-1745. Drafted section on use of CPAP in Children with Carole Marcus
- Rosen CL. Assessment of respiratory control. In: Loughlin G and Eigen H, eds. *Respiratory Diseases: Diagnosis and Management of Children and Adolescents*, Baltimore, MD: Williams and Wilkins, 1994, pp. 135-146.
- Haddad GG and Rosen CL. Ventilatory response to hypoxia: Integrated, cellular and molecular aspects. In: Haddad GG and Farber J, eds. *Developmental Neurobiology of Breathing*, New York: Marcel Dekker, 1991.
- Rosen CL. Pulmonary Alveolar Microlithiasis. In: Oski FA, DeAngelis C, Feigin RD, Warshaw JB, eds. *Principles and Practice of Pediatrics*, Philadelphia: J B Lippincott, 1994, 1508.

**Invited Papers/Workshops/Short Courses****Local**

4/6/2004, Invited Speakers for colloquium series "Case Conversations on Children in Research and Policy", sponsored by the Schubert Center for Child Development and the Case Consortium for Children, Families and Communities, spoke with Susan Redline on "Risk Factors and Outcomes for Sleep Apnea in Children", audience Case faculty, staff and students interested in child development, n= 20, 1.5 contact hours.

4/3/2004 Community Health Education - Invited Speaker at the HealthSpace Museum for National Sleep Awareness Week, 20 parents & children, topic "Sleep Well, Do Well", 30 minute presentation.

2/19/2004, Cleveland Clinic Foundation, Sleep Medicine Core Lecture. Title: Evaluation and Diagnosis of Pediatric Sleep Apnea . 1 hr presentation. Audience 10 faculty, sleep medicine fellows, sleep technicians

1/27/2004 Pulmonary Fellows Core Lecture, "SIDS and ALTE Update, 4 attendees, 1 hour presentation

12/9/2003 RB&C Pediatrics Today workshop on Adolescent Update "Sleep Problems in Teenagers" 1 hour 60 community physicians MD

8/27/2003, RB&C, New Pediatric Interns (n=30)-Core Curriculum, "Infant Apnea and SIDS"

4/28/2003 – "What Pediatric Residents Should Know About PSG" – Field Trip to the RBC sleep lab

4/3/2003 – "Presenting Your Research Results" – 20 pediatric residents working on their Senior Thesis; 2 hour session with MaryAnn O’Riordan

3/31/2003 – "Screening for Pediatric Sleep Disorders" – 30 pediatric residents; 1 hr didactic/interactive session

3/01/2003 – Case Discussions for Pediatric Residents – SDB and Narcolepsy; 1 hour RAP clinic: 3 faculty and 6 residents.

2/21/03 – Faculty Discussant for 2 Sleep Cases in the Pediatric Department’s "Attending Stumper" series

11/12/2003, Physician Host/Community Educator for RBC Circle of Friends sponsored dinner to discuss Sleep Problems in Children,

8/23/2002, RB&C, New Pediatric Interns (n=30)-Core Curriculum, "Infant Apnea and SIDS"

5/31/2002, RB&C, Research in Progress, Faculty, "Sleep Medication Use in Children", 1 hours, 10 faculty and post graduate trainees

4/18/2002 – Division of Clinical Epidemiology Workshop, Presentation to Senior Pediatric Residents (n=10), 1 hour, "How to Present Your Research Findings"

3/20/2002 – Core Seminar for 15 ENT residents and Pediatric ENT faculty; 2 hrs; Sleep Disordered Breathing in Children

3/12/2002 "Overview of Sleep – A developmental perspective". Speaker in ½ day workshop on Understanding Sleep and Sleep Disorders in Young Adults sponsored by the University Counseling Services of CWRU. Audience: 25 professionals who provide counseling services and dorm supervision to CWRU students.

10/30/01 Pediatrics Today Presentation "Respiratory Complications of Obesity" 1 hour 90 local physicians MDs

4/12/2001 – Invited Speaker, Cleveland Clinic Foundation Sleep Medicine Case Conference – Title: Pediatric Obstructive Sleep Apnea. 1 hr presentation for 20 faculty, fellows, sleep technicians

#### Regional

3/26/2004, Invited speaker for the CME course sponsored by Cleveland Clinic Foundation in Cleveland - Recent Advances in Sleep Medicine: A Clinical and Technical Update. Title: "Monitoring Respiratory Function During Polysomnography". Audience: 60 physicians and 20 technicians, 2 contact hours.

10/10/2003 Speaker of Workshop entitled Healthy Kids Learn Better RB&C sponsored program for North East Ohio Educational Association "Sleep Well, Do Well in School" for School Nurses

#### National or International

6/30/2004, Invited Speaker, Prader-Willi Syndrome, US Science Day in Huron, OH. Talk entitled: Evaluation of sleep disorders in Prader-Willi Syndrome. Audience: 50 scientists interested in Prader-Willi research.

6/8/2004, Invited Speaker for APSS in Philadelphia – Associated Polysomnographic Technologists. Talk entitled: Special Services Needed Within The Community To Support A Pediatric Sleep Program. One hour presentation to 200 registered polysomnography technologists.

6/5/2004, Invited Speaker for Associated Professional Sleep Societies Symposium (APSS) in Philadelphia on

Advanced Polysomnography Course about the Importance of Video in Pediatric Polysomnography. Forty minute presentation entitled: Value of Value of Video-PSG in Pediatric Polysomnography – A Pulmonary Point of View. Audience: 150 sleep medicine specialists.

5/26/2004, Invited Speaker for American Thoracic Society Symposium on Sleep-Disordered Breathing in Children in Orlando. 20 minute presentation entitled: The Epidemiology of Childhood Sleep Disordered Breathing: What Do We Know About Prevalence in Light of the “New” Morbidities of Childhood SDB? Audience: 100 pediatric pulmonary sleep medicine specialists – faculty and trainee level physicians.

2/21/2004, ABSM Advanced Sleep Medicine Course, Denver, CO, Invited Speaker for 2 presentations “Overview of Sleep Apnea and Snoring in Children” and “Sleep Disorders the Present in Childhood”, 100 Sleep Professionals

1/31/2004 Invited Speaker, American College of Chest Physicians 2004, Sleep Medicine Course Phoenix, AZ, Invited Speaker for 2 presentations: “Pediatric Sleep Apnea” and “Pediatric Non-Respiratory Sleep Disorders”, each 45 minutes, 120 pulmonary physicians.

1/16/2004 22nd Annual Conference on Sleep Disorders in Infancy and Childhood, Palm Springs, CA, Invited Speaker “Epidemiology of Sleep-Disordered Breathing (SDB) in Children” 200 Attendees (Physicians and some nurses, allied health professionals), 45 minute presentation; also presented literature “Year in Review” for Pediatric Sleep Disorders, 15 minute presentation

10/26/2003, ACCP Annual Meeting in San Diego, Invited Speaker for course of Sleep Disorders for Pulmonary Fellow interested in Sleep Training, “Pediatric Sleep Disorders”.

4/23/2003 – “Epidemiology of Sleep-Disordered Breathing in Children” invited speaker for international conference in Seville, Spain – 1 hour; 100 sleep professionals from Spain

2/28/03 – Grand Rounds for Norwalk Sleep Center, Norwalk, CT – Sleep Disordered Breathing in Children – Audience: 15 including center faculty, sleep trainees, pulmonary fellows, and PSG staff.

11/3/2002, ACCP Annual Meeting in San Diego, Invited Speaker for course of Sleep Disorders for Pulmonary Fellows interested in Sleep Training, “Pediatric Sleep Disorders”.

6/10/2002, Invited Speaker, APSS Annual Meeting in Seattle. Meet the Professor Presentation: “Polysomnography in Children”.

6/09/2002, APSS Annual Meeting in Seattle, Invited Speaker for APSS National Meeting Symposium on Childhood Parasomnias on “Nocturnal GER in Children”

5/18/2002, Invited Speaker, ATS Annual Meeting in Atlanta, Invited Discussant for the NHLBI/ATS Career Investigator Award Workshop

6/10/01 APSS Meet the Professor Polysomnography in Children, 1 hour, 30 sleep professionals (MD, RT, PSG Techs)

6/6/01 APSS Course Workshop on Pediatric Sleep Services 4 hours, 60 MD attendees

5/18/2001 ATS Workshop on Pediatric Sleep Disorders, San Francisco, “Medical Management of OSA” 1 hr, 200 subspecialty MD attendees

Abstract (Oral or Poster Presentations)

6/6/2003 – APSS Annual Meeting, Chicago, IL – Poster Presentation “Alpha Intrusion: Prevalence and Association with Sleep Complaints in the Sleep Heart Health Study”

6/12/2002, APSS Annual Meeting in Seattle, Invited Speaker for APSS National Meeting Discussion Group on “Sleep Medication Use in Children – Preliminary Results of National Survey” – manuscript submitted

6/11/2002, APSS Annual Meeting in Seattle, Oral Abstract Presentation “Decline in Health-Related Functional Status in Children with Sleep-Disordered Breathing”

5/19/2002, ATS Annual Meeting in Atlanta, Poster Presentation “Behavioral Outcomes in Sleep Disordered

Breathing in Children”

**Other Relevant Activities:**

Co-Director, UHHS Sleep Center, an AASM-accredited comprehensive sleep center

Medical Director, RB&C Pediatric Sleep Services, responsible for oversight of 2-bed pediatric sleep laboratory housed in RB&C, supervision of technical staff, QA; interpretation of 400 overnight sleep studies/year and 100 clinic visits per year