

## **CURRICULUM VITAE**

**NAME** Lara Ferrario, M.D.

**TITLE** Associate Professor of Anesthesiology  
Division Director of Neuroanesthesiology  
Director Neuroanesthesiology Fellowship Program

**BUSINESS** McGovern Medical School at UTHealth (formerly The University of Texas Medical School at Houston)  
Department of Anesthesiology  
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Houston, TX 77030

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**CITIZENSHIP** U.S.A.

**GRADUATE EDUCATION**

11/1986 – 03/1993 Faculty of Medicine and Surgery  
University of Milan, Milan, Italy  
Title: M.D.

**POSTGRADUATE EDUCATION**

03/1993 – 02/1994 Elective Internship in Critical Care  
Policlinic Hospital, Milan, Italy

03/1994 – 06/1996 Research Fellowship  
Department of Anesthesiology  
State University of New York, Upstate Medical University,  
Syracuse, New York

11/1994 – 06/1998 Residency in Anesthesiology and Critical Care  
University of Milan, Policlinic Hospital of Milan, Italy

06/1998 – 06/1999 Rotating Internship  
Loyola University Medical Center, Maywood, Illinois

07/1999 – 06/2001 Anesthesiology Residency  
Loyola University Medical Center, Maywood, Illinois

07/2002 – 11/2003 Anesthesiology Residency  
McGovern Medical School at UTHealth (formerly The University

of Texas Medical School at Houston), Houston, Texas

## **ACADEMIC APPOINTMENTS**

- 2003 – 20013                      Assistant Professor of Anesthesiology  
Department of Anesthesiology  
McGovern Medical School at UTHealth (formerly The University  
of Texas Medical School at Houston), Houston, Texas
- 2013 – Present                      Associate Professor of Anesthesiology  
Department of Anesthesiology  
McGovern Medical School at UTHealth (formerly The University  
of Texas Medical School at Houston), Houston, Texas

## **HOSPITAL APPOINTMENTS**

- 2003 – Present                      Attending Anesthesiologist  
Memorial Hermann Hospital, Houston, Texas
- 2008 – Present                      Director, Neuroanesthesiology Division  
Memorial Hermann Hospital, Houston, Texas

- Act as a liaison and facilitate communication and patient care between the operating room and Neurosurgical Intensive Care Unit
- Developed course syllabus with key words review for residents' education rotating through the subspecialty of neuroanesthesiology
- Developed course written examinations
- Developed clinical protocol for follow-up of patients in the neurosurgical postoperative course
- Established a detailed protocol for the recovery of patients during post-operative care in collaboration with the Neuro Intensive Care Unit Team
- Introduced a peri-operative protocol for the care of patients with increased intracranial pressure undergoing general anesthesia for surgical procedures
- Established several clinical protocols for the anesthetic care of patients undergoing several complex neurosurgical procedures (i.e. sitting craniotomies, craniotomies for aneurysm clipping and AVM, pineal cysts resection, and complex spine surgeries)
- In co-operation with the departments of neuroradiology, neurosurgery and neurology establish stroke protocol guidelines to achieve the status of Level One Stoke Center for the Memorial Hermann Hospital in the Texas Medical Center.

- 2009 – Present                      Director, Neuroanesthesia Fellowship  
 Memorial Hermann Hospital, Houston, Texas
- Established the Texas Medical Board-approved Fellowship in Neuroanesthesia
  - Developed the fellowship structure with detailed clinical rotations and fellow responsibilities
  - Introduced a clinical research protocol with resident participation
  - Serve as mentor to fellows
  - Serve on the National Taskforce for the accreditation of the Neuroanesthesiology fellowship

2017 – Present                      Member of the Transfer Committee

**ACTIVE LICENSURE**

- 1993 – Present                      Italian/European License in Medicine and Surgery #436  
 Office of State Examination, Milan, Italy
- 2003 – 2005                        Texas Medical Temporary License (40411)
- 2005 – 2019                        Texas Medical License (M1091)

**CERTIFICATION**

- 1998 – Present                      European Board Certification in Anesthesia and Intensive Care  
 (4439)  
 Ministry of Health, Italy
- 1998 – Present                      ACLS Certification
- 2006 – 2016                        American Board of Anesthesiology
- 2016 – 2026                        American Board of Anesthesiology (Recertification)
- 2016 – Present                      FATE (Focus Assessed Transthoracic Echocardiography)  
 Certification

**PROFESSIONAL ORGANIZATIONS**

1999 – Present                      American Society of Anesthesiologists

1999 – Present	Texas Society of Anesthesiologists
2008 – Present	Society of Neurosurgical Anesthesia and Critical Care
2015 – Present	Society of Neurosurgical Anesthesia and Critical Care – Research Committee
2016 – Present	Society of Neurosurgical Anesthesia and Critical Care – Member of National Taskforce for the Accreditation of the Neuroanesthesia Fellowship

## **HONORS AND AWARDS**

1994 – 1995	Scholarship (\$15,000): granted by the Italian Ministry of Education for Advanced Specialty Training in Foreign Countries
1994	Scientific Merit Award and Best Poster Presentation presented at the European Society of Intensive Care Medicine. International Symposium on Intensive Care and Emergency Medicine; Brussels, Belgium: Respiratory drive measurement without occlusion maneuver as a predictor of weaning.

## **RESEARCH GROUP MEMBERSHIP**

1993 – 1994	The Scientific Committee of GILAP (Italian Group of Laparoscopy): a multicenter, controlled, prospective study for the evaluation of the complications of laparoscopic surgery.
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## **ACTIVE RESEARCH PROJECTS**

Co-PI Use of oral Aprepitant in the prevention of PONV following pineal cyst resection - A single center Retrospective Study.

Co-Investigator IRB: HSC-MS-12-0055 - The Opioid-Sparing and Analgesic Effects of IV Acetaminophen in Craniotomy: A Prospective, Randomized, placebo-Controlled, Double-Blind Study". Funded by Cadence Pharmaceuticals.

Co-Investigator TEG Platelets Mapping in Patients Undergoing Carotid.

## **MCGOVERN MEDICAL SCHOOL AT UTHEALTH COMMITTEES**

### **Department of Anesthesiology**

2006 – Present	Residency Education Committee
2009 – Present	Clinical Competence Committee
2017 – Present	Scheduling Committee

## **CURRENT TEACHING RESPONSIBILITIES**

- Fellow and resident education both in the operating rooms and during scheduled departmental lectures (in both Grand Round presentation format and in PBLD lectures format) with an emphasis on Neuroanesthesiology.

- Mentoring and educating colleagues during complex and challenging Neuroanesthesia clinical cases.

## **SUPERVISORY TEACHING NEUROANESTHESIA FELLOWS**

2010 – 2011	George Aguilar, MD
2013 – 2014	Tara Thomas, MD
2014 – 2015	Christiano Dos Santos, MD
2015 – 2016	Shilpa Dabhade, MD
2016 – 2017	Elise Lofton, MD
2017 – 2018	Heider Al Darkazali, MD

## **PUBLICATIONS**

### **Abstracts**

1. Caldiroli D, Carozzi C, **Ferrario L**, Brule' JF, Guzzetti S, Malliani A: Power spectrum analysis in the study of sympathetic and vagal activities in patients with tetraplegia. *Pathologie Rachidienne et Souffrance Neurologique*; 50-1, 1991 (Italian)
2. Rossi F, Marino M, Valenza F, Tubiolo D, **Ferrario L**, Anastasaki M, Gattinoni L: Gastrointestinal tonometry: validation and reliability of the method. An in vitro study. *International Symposium of Anesthesia and Intensive Care*; 19-21, 1992 (Italian)
3. Vicardi P, Bernasconi F, Cerisara M, **Ferrario L**, Tubiolo D, Pelosi P, Gattinoni L: Computerized program for the evaluation of the buffer system of the whole blood: a comparison between tonometry and Siggard-Andersen nomogram. *International Symposium of Anesthesia and Intensive Care*; 36, 1993 (Italian)
4. Pelosi P, Valenza F, Crotti S, **Ferrario L**, Cerisara M, Gattinoni L: TAC study of

- barotrauma. Recent Advances in the Treatment of the Adult Respiratory Distress Syndrome, Evangelische Akademie; A22, 1993
5. Croci M, Pelosi P, Elena A, Solca M, **Ferrario L**, Tubiolo D: Heat and moisture exchangers performance with volume and temperature changes. International Symposium of Anesthesia, Pain, Intensive Care, and Emergency Medicine; 50-2, 1993
  6. Vicardi P, Ravagnan I, **Ferrario L**, Tubiolo D, Crotti S, Pelosi P: Hemodynamic effects of positive end-expiratory pressure during assisted ventilation. Therapy and Hemodynamic Monitoring in ICU; 135-7, 1993 (Italian)
  7. **Ferrario L**, Tubiolo D, Pelosi P, Ravagnan I, Vicardi P, Negroni L, Gattinoni L: Respiratory mechanics in normal subjects and in patients with acute respiratory failure during spontaneous breathing. Intensive Care Medicine S20: S39, 1994
  8. Pelosi P, Cereda M, Foti G, Giacomini M, Tubiolo D, **Ferrario L**, Pesenti A: Lung compliance and resistance in mechanically ventilated patients with acute lung injury: effects of functional residual capacity. Intensive Care Med S20: 349, 1994
  9. Tubiolo D, **Ferrario L**, Vicardi P, Pelosi P, Brazzi L, Gattinoni L: Respiratory drive measurement without occlusion maneuver as a predictor of weaning. Clinical Intensive Care S5: 54, 1994
  10. Valenza F, Pelosi P, Crotti S, **Ferrario L**, Vicardi P, Gattinoni L: Recruitment of previously collapsed lung areas in mechanically ventilated patients with Acute Respiratory Distress Syndrome (ARDS): regional effects of ventilation and positive end-expiratory pressure. Am J Respir Crit Care Med 149: A73, 1994
  11. Vicardi P, Ravagnan I, **Ferrario L**, Crotti S, Negroni L, Pelosi P: Effects of positive end-expiratory pressure on hemodynamics and respiratory mechanics during pressure support ventilation. Clinical Intensive Care S5: 60, 1994
  12. Pelosi P, Tubiolo D, **Ferrario L**, Valenza F, Ravagnan I, Gattinoni L: Estimation of respiratory drive without occlusion maneuver. Am J Respir Crit Care Med 149: A74, 1994
  13. Ravagnan I, Pelosi P, Tubiolo D, **Ferrario L**, Vicardi P, Brazzi L: Effects on respiratory mechanics of heat and moisture exchangers (HME) during pressure support ventilation. Am J Respir Crit Care Med 149: A801, 1994
  14. Aveni M, Fumagalli M, Leoni A, Celeste E, Tubiolo D, **GILAP**: Prevalence of nausea and/or vomiting in patients after laparoscopic cholecystectomy. International Symposium of Anesthesia and Intensive Care 29, 1994 (Italian)
  15. Tubiolo D, **Ferrario L**, Vicardi P, Pelosi P, Brazzi L, Gattinoni L: Measurement of respiratory drive (PO.1) without occlusion maneuver during respiratory insufficiency. International Symposium of Anesthesia and Intensive Care 33, 1994 (Italian)

16. Crotti S, Andreoni P, Pelosi P, Ravagnan I, **Ferrario L**, Gattinoni L: Distribution of the ventilation in ARDS patients: effects of PEEP. *International Symposium of Anesthesia and Intensive Care*; 47, 1994 (Italian)
17. Pelosi P, Crotti S, Valenza F, Tubiolo D, **Ferrario L**, Gattinoni L: Tidal volume distribution during mechanical ventilation in ARDS patients: the effects of PEEP on regional compliance. *Minerva Anestesiol* S60: 177, 1994
18. **Ferrario L**, Amin HM, Sugimori K, Searles B, Camporesi EM, Hakim TS: Localization of the site of action of EDRF on pulmonary vasculature using the double occlusion technique. *Eighth Annual Charles Ross Research Poster Session Publication of Abstract*; 112, 1994
19. Hakim TS, Sugimori K, **Ferrario L**: Analysis of the double occlusion tracings to partition vascular resistance into four segments. *FASEB* 9: A274, 1995
20. **Ferrario L**, Amin HM, Sugimori K, Searles B, Camporesi M, Hakim TS: Site of action of EDRF on pulmonary vasculature by using the double occlusion technique in the rat. *FASEB* 9: A274, 1995
21. Sugimori K, **Ferrario L**, Amin HM, Hakim TS, Camporesi EM: Effects of acute hyperbaric oxygen (HBO) exposure on vascular reactivity in isolated rat pulmonary arteries. *FASEB* 9: A276, 1995
22. Amin HM, **Ferrario L**, Sugimori K, Brennan S, Hakim TS, Camporesi EM: Effects of acute exposure to hyperbaric oxygen and 24 hours of recovery on prostacyclin concentration. *FASEB* 9: A424, 1995
23. Sugimori K, Amin HM, **Ferrario L**, Hakim TS, Camporesi EM: Changes in vascular reactivities of isolated aorta and pulmonary artery following acute exposure to hyperbaric oxygen (HBO) and 18 hours of recovery in rats. *Undersea Hyperb Med* S22: 63, 1995
24. Amin HM, **Ferrario L**, Hakim TS, Camporesi EM: Effects of exposure to hyperbaric oxygen on blood rheology in the rat. *Undersea Hyperb Med* S22:64, 1995
25. **Ferrario L**, Amin HM, Sugimori K, Brennan S, Hakim TS, Camporesi EM: Acute exposure to hyperbaric oxygen increases prostacyclin release in the pulmonary circulation. *Undersea Hyperb Med* S22: 65, 1995
26. Carlin RE, **Ferrario L**, Boyd JT, McGraw DJ, Hakim TS: Nitric oxide (NO) concentration in exhaled gas of rabbit lungs. *Am J Respir Crit Care Med*; 153: A814, 1996
27. **Ferrario L**, Amin HM, Camporesi EM, Hakim TS: Exhaled nitric oxide in endotoxin-treated rats: isolated perfused lung versus intact animal. *FASEB* 10:A96, 1996

28. Amin HM, **Ferrario L**, Hakim TS, Camporesi EM: Effects of desferrioxamine versus PEG-superoxide dismutase on increased prostacyclin (PGI<sub>2</sub>) concentration after acute exposure to hyperbaric oxygen. FASEB 10:A356, 1996
29. Amin HM, **Ferrario L**, Sauro MD, Hakim TS, Camporesi EM: Effects of exposure to hyperbaric oxygen on nitric oxide production in the rat. FASEB Journal; vol. 10: A1018, 1996
30. **Ferrario L**, Amin HM, Weissbrich O, Hakim TS, and Camporesi EM: Effects on hyperbaric oxygen exposure on exhaled nitric oxide concentration in a septic rat model. Undersea Hyperb Med S23: 68, 1996
31. Amin HM, **Ferrario L**, Hakim TS, Camporesi EM: Effect of different durations of exposure to hyperbaric oxygen on circulating prostacyclin in the rat. Undersea Hyperb Med S23: 69, 1996
32. Hakim TS, **Ferrario L**, Freedman JC, Carlin RE, Camporesi EM: Site of ATP-induced vascular contraction and dilation in the isolated rat lung. Anesthesiology S85: A1139, 1996
33. **Ferrario L**, Amin HM, Camporesi EM, Hakim TS: Measurement of expired nitric oxide concentration (eNO) in isolated lung preparation. Anesthesiology S85: A1140, 1996
34. Van den Berg AA, **Ferrario L**, Mansoor Z, Wang S: Combined spinal-epidural analgesia (CSEA): loss of resistance (LOR) to no saline reduces spinal needle dural puncture pain. Anesthesiology 99: A1163, 2003.
35. Hagberg CA, **Ferrario L**, Vahdat K, Khalil B: Comparison of the Intersurgical I-Gel and LMA Unique in non-obese adult patients – A pilot study. Anesthesiology 109: A533, 2008.
36. Maheshwari P, Artime C, Normand K, **Ferrario L**, Altamirano A, Aijazi H, Hagberg CA. Flexible Optical Intubation via the Ambu Aura-I versus Blind Intubation via the Single Use Intubation LMA – A Prospective Randomized Clinical Trial. Society of Airway Management, 2013.
37. Ghebremicael S, Dabhade S, **Ferrario L**, Artime CA, Normand K, Vanga N. Incidence of postop nausea and vomiting in patients undergoing pineal cyst resection. Society of Neuroscience in Anesthesiology and Critical Care, 2016
38. Lima DS, Lofton EC; Ghebremichael S, Sridhar S, Vanga N, Ramirez-Chapman AL, **Ferrario L**. Anesthetic Management of Moyamoya Disease Revascularization Procedures. Society of Neuroscience in Anesthesiology and Critical Care, 2017



## **Articles in Peer-Reviewed Journals**

1. Pelosi P, Solca M, Ravagnan I, Tubiolo D, **Ferrario L**, Gattinoni L: Effects of heat and moisture exchangers on minute ventilation, ventilatory drive, and work of breathing during pressure-support ventilation in acute respiratory failure. *Crit Care Med* 24: 1184-8, 1996
2. **Ferrario L**, Amin HM, Sugimori K, Camporesi EM, Hakim TS: Site of action of endogenous nitric oxide on pulmonary vasculature in rats. *Pflugers Arch* 432: 523-7, 1996
3. Hakim TS, Sugimori K, **Ferrario L**. Analysis of the double occlusion which provides four pressure gradients. *Eur Respir J* 9: 2578-83, 1996
4. Carlin RE, **Ferrario L**, Boyd JT, Camporesi EM, McGraw DJ, and Hakim TS. Determinants of nitric oxide in exhaled gas in isolated rabbit lung. *Am J Respir Crit Care Med* 155: 922-7, 1997
5. Hakim TS, **Ferrario L**, Freedman JC, Carlin RE, Camporesi EM. Segmental pulmonary vascular responses to ATP in rat lungs: role of nitric oxide. *J Appl Physiol* 82: 852-8, 1997
6. Cattano D, **Ferrario L**, Maddukuri V, Sridhar S, Khalil Y, Hagberg C. A randomized clinical comparison of intersurgical I-Gel and LMA Unique in non obese adults during general surgery. *J Minerva Anesthesiol* 77(3): 292-7, 2011
7. Cattano D, Lam NC, **Ferrario L**, Seitan C, Vahdat K, Wilcox DW, Hagberg CA. Dexmedetomidine Versus Remifentanyl for Sedation During Awake Fiberoptic Intubation. *Anesthesiology Research and Practice*. Vol. 2012, Article ID 753107, 2012.
8. Cattano D, **Ferrario L**, Patel CB, Normand K, Seitan C, Hagberg CA. Laryngeal Tube Suction-D, Combitube and Proseal Laryngeal Mask Airway: Randomized Clinical Trial. *J. Anesth Clin Sci*. ISSN 2049-9752. 2012  
doi: <http://dx.doi.org/10.7243/2049-9752-1-8>
9. Cattano D, **Ferrario L**, Patel CB, Maddukuri V, Melnikov V, Gumbert SD, Altamirano AV, Hagberg CA. Utilization of C-MAC videolaryngoscopy for direct and indirect assisted endotracheal intubation. *J. Anesth Clin Sci*. 2013,  
<http://www.hoajonline.com/journals/pdf/2049-9752-2-7.pdf>
10. Artime CA, Altamirano A, Normand KC, **Ferrario L**, Aijazi H, Cattano D, Hagberg CA. Flexible optical intubation via the Ambu Aura-i vs blind intubation via the single-use LMA Fastrach: a prospective randomized clinical trial. *J Clin Anesth*. 9(33):41-6, 2016

## **Book Chapters**

1. Pelosi P, Cereda M, Foti G, Crotti S, Tubiolo D, **Ferrario L**, Pesenti A, and Gattinoni L. Respiratory mechanics and gas exchanges during laparoscopic cholecystectomy. In: A Capomagi, A De Sanctis, and L Maffia (eds). *Proceedings of the International Symposium on Update and Prospective in Mini-invasive Surgery*; pp. 199-201, 1993
2. Pelosi P, Cavallone L, Tubiolo D, **Ferrario L**, Palandi A, Maestri M, and GILAP. Anesthesia during laparoscopy. In: A Braschi, M Chiaranda, L Gattinoni, A Pesenti, and E Raimondi (eds). *Proceedings of the International Symposium of Anesthesia and Intensive Care*; Springer Verlag, pp. 124-7, 1994 (Italian)
3. Pelosi P, Tubiolo D, Palandi A, Maestri M, Croci M, Fumagalli M, Aveni M, and **GILAP**. Prevalence of nausea and vomiting after laparoscopic and laparotomic cholecystectomy: a preliminary report of a multicenter, controlled, prospective trial. In: A Gullo (eds). *Proceedings of the International Symposium on Anesthesia, Pain, Intensive Care, and Emergency Medicine: Selected Papers*; Fogliazza Editore, Italy, pp. 113-5, 1994
4. Croci M, Cavallone L, Fumagalli M, Maestri M, Palandi A, Pelosi P, and **GILAP**. Lung function in laparoscopic surgery. In: A Gullo (eds). *Proceedings of the International Symposium on Anesthesia, Pain, Intensive Care, and Emergency Medicine: Selected Papers*; Fogliazza Editore, Italy, pp. 555-63, 1994
5. Pelosi P, Cavallone L, Aveni M, Palandi A, Maestri M, Tubiolo D, and **GILAP**. A multicenter, prospective, controlled trial on anesthetic implications of laparoscopic cholecystectomy: preliminary results. In: A Gullo (eds). *Proceedings of the International Symposium on Anesthesia, Pain, Intensive Care, and Emergency Medicine: Selected Papers*; Fogliazza Editore, Italy, pp. 565-74, 1994
6. Hakim TS, Sugimori K, **Ferrario L**, Camporesi EM. Nitric oxide and control of the pulmonary circulation. In: Camporesi EM, Caroli GC, Pizzola A, and Vezzani G (eds). *Proceeding of The International Symposium on Update of Hyperbaric Oxygen Therapy*; La Commerciale Editore, Fidenza, Italy, pp. 65-74, 1995
7. Hakim TS, Amin HM, **Ferrario L**, Camporesi EM. Hyperoxia-induced injury in the pulmonary circulation. In: Camporesi EM, Caroli GC, Pizzola A, and Vezzani G (eds). *Proceeding of The International Symposium on Update of Hyperbaric Oxygen Therapy*; La Commerciale Editore, Fidenza, Italy, pp. 168-73, 1995
8. Osborne I, **Ferrario L**. The difficult airway in neurosurgery. In: Benumof and Hagberg's: Airway Management. 3<sup>rd</sup> Ed. Elsevier Eds. 2012
9. **Ferrario L**. Extubation catheters. In: Hagberg's: The difficult airway. A practical guide. Oxford University Press. 2013

10. **Ferrario L.** Intubation stylets. In: The difficult airway. A practical guide. Oxford University Press. 2013

### **SEMINARS AND COURSES**

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|---------|---|
| 03/2016 | FATE (Focus Assessed Transthoracic Echocardiography) Course                   |
| 04/2016 | AAMC Mid-Career Women Faculty Leadership Development Seminar<br>Austin, Texas |