



## Geoffrey Lighthall

Professor of Anesthesiology, Perioperative and Pain Medicine (Adult MSD)

### CLINICAL OFFICE (PRIMARY)

- **Anesthesia Department**

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### Bio

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### CLINICAL FOCUS

- Anesthesia
- Critical Care Medicine
- Cardiac and Thoracic Anesthesia

### ACADEMIC APPOINTMENTS

- Professor - University Medical Line, Anesthesiology, Perioperative and Pain Medicine

### PROFESSIONAL EDUCATION

- Board Certification: Critical Care Medicine, American Board of Anesthesiology (2001)
- Board Certification: Anesthesia, American Board of Anesthesiology (2000)
- Fellowship: Stanford University Anesthesiology Fellowships (2000) CA
- Residency: Stanford University Anesthesiology Residency (1999) CA
- Internship: Santa Clara Valley Medical Center Internal Medicine Residency (1996) CA
- Medical Education: University of Maryland School of Medicine (1995) MD
- MD, University of Maryland , Medicine (1995)
- PhD, University of Maryland , Physiology (1993)

### COMMUNITY AND INTERNATIONAL WORK

- Anesthesia outreach in developing countries, Mexico

### Research & Scholarship

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### CURRENT RESEARCH AND SCHOLARLY INTERESTS

I. Medical Emergency Teams

Medical Emergency Teams (or METs for short) are groups that perform rapid assessment and stabilization of patients in response to signs of clinical deterioration. They have arisen in response to data demonstrating that many opportunities to reverse clinical decline are not acted upon in a time frame that would prevent further deterioration, or progression to cardiac arrest. I have implemented a MET at the VA Palo Alto and am looking at the clinical impact of this intervention; I have also developed programs for team training and technical skill development applicable to MET operation.

Work in the field has led the development of "patient deterioration" as an almost separate field in resuscitation. In such, the following questions are areas of active investigation:

1. What are the best methods to detect patients who are deteriorating and how can we optimize the sensitivity and specificity of such methods?
2. Does earlier attention by critical care personnel really alter the course of patients with deteriorating conditions?
3. Either way, who really benefits from ICU care?
4. Where can/ should septic patients be managed?
5. What monitoring schemes, including complex analytic methods should be employed on regular hospital wards?
6. How should ward nurses be trained to detect deteriorating patients?

## II. Critical Care Education

One of my interests centers on the use of patient simulation as an educational and training tool in critical care. Human patient simulation offers an ever-changing laboratory for developing and testing educational methods as well as participating in our current strength - critical care team training. Earlier projects led to the development of a performance assessment tool to evaluate teams managing septic shock and use of this methodology to evaluate whether classroom instruction improved the management of management of simulated patient emergencies.

The VA simulation center has moved around a bit in the past few years, and now has a permanent home, so I am excited to expand the use of simulation for critical care skill development and team training.

## Teaching

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### GRADUATE AND FELLOWSHIP PROGRAM AFFILIATIONS

- Anesthesia (Fellowship Program)

## Publications

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### PUBLICATIONS

- **Lactate Predicts Both Short- and Long-Term Mortality in Patients With and Without Sepsis.** *Infectious diseases*  
Villar, J., Short, J. H., Lighthall, G.  
2019; 12: 1178633719862776

- **The association of clinical frailty with outcomes of patients reviewed by rapid response teams: an international prospective observational cohort study** *CRITICAL CARE*  
So, R. L., Bannard-Smith, J., Subbe, C. P., Jones, D. A., van Rosmalen, J., Lighthall, G. K., METHOD Study Investigators  
2018; 22: 227
- **Perioperative Surgical Home Reduces Rapid Response Calls to a Postoperative Surgical Ward: How Anesthesiologists Are Improving the Inpatient Safety Net.** *Seminars in cardiothoracic and vascular anesthesia*  
Walters, T. L., Kim, T. E., Mariano, E. R., Lighthall, G. K.  
2018: 1089253218761813
- **Survival After Long-Term Residence in an Intensive Care Unit.** *Federal practitioner : for the health care professionals of the VA, DoD, and PHS*  
Lighthall, G., Verduzco, L.  
2016; 33 (6): 18–27
- **Evaluating the Impact of Classroom Education on the Management of Septic Shock Using Human Patient Simulation.** *Simulation in healthcare*  
Lighthall, G. K., Bahmani, D., Gaba, D.  
2016; 11 (1): 19-24
- **Understanding Decision Making in Critical Care.** *Clinical medicine & research*  
Lighthall, G. K., Vazquez-Guillamet, C.  
2015; 13 (3-4): 156-168
- **Routine postoperative care of patients undergoing coronary artery bypass grafting on cardiopulmonary bypass.** *Seminars in cardiothoracic and vascular anesthesia*  
Lighthall, G. K., Olejniczak, M.  
2015; 19 (2): 78-86
- **Perioperative Maintenance of Tissue Perfusion and Cardiac Output in Cardiac Surgery Patients.** *Seminars in cardiothoracic and vascular anesthesia*  
Lighthall, G. K., Singh, S.  
2014; 18 (2): 117-136
- **Videos in clinical medicine: Laryngeal mask airway in medical emergencies.** *New England journal of medicine*  
Lighthall, G., Harrison, T. K., Chu, L. F.  
2013; 369 (20)
- **An institution-wide approach to redesigning management of cardiopulmonary arrests** *The joint commission journal of patient safety*  
Lighthall, G., Mayette M, Harrison TK  
2013; 39 (4): 157-166
- **Abnormal vital signs are associated with an increased risk for critical events in US veteran inpatients (vol 80, pg 1264, 2011)** *RESUSCITATION*  
Lighthall, G. K., Markar, S., Hsiung, R.  
2012; 83 (7): E153
- **Introduction of a Rapid Response System at a United States Veterans Affairs Hospital Reduced Cardiac Arrests** *ANESTHESIA AND ANALGESIA*  
Lighthall, G. K., Parast, L. M., Rapoport, L., Wagner, T. H.  
2010; 111 (3): 679-686
- **Using in situ simulation to improve in-hospital cardiopulmonary resuscitation.** *Joint Commission journal on quality and patient safety / Joint Commission Resources*  
Lighthall, G. K., Poon, T., Harrison, T. K.  
2010; 36 (5): 209-216
- **Abnormal vital signs are associated with an increased risk for critical events in US veteran inpatients** *RESUSCITATION*  
Lighthall, G. K., Markar, S., Hsiung, R.  
2009; 80 (11): 1264-1269
- **Evaluating the management of septic shock using patient simulation** *CRITICAL CARE MEDICINE*  
Ottestad, E., Boulet, J. R., Lighthall, G. K.  
2007; 35 (3): 769-775

- **Use of a fully simulated intensive care unit environment for critical event management training for internal medicine residents** *CRITICAL CARE MEDICINE*  
Lighthall, G. K., Barr, J., Howard, S. K., Gellar, E., Sowb, Y., Bertacini, E., Gaba, D.  
2003; 31 (10): 2437-2443
- **INTUBATION FACTORS ASSOCIATED WITH 30AND 90-DAY MORTALITY IN CRITICALLY ILL PATIENTS**  
Lighthall, G., Li, Y.  
LIPPINCOTT WILLIAMS & WILKINS.2023: 462
- **USE OF POINT-OF-CARE ULTRASOUND IN EVALUATING UNSTABLE PATIENTS OUTSIDE INTENSIVE CARE UNITS**  
Gupta, P., Lighthall, G., Htet, N.  
LIPPINCOTT WILLIAMS & WILKINS.2023: 574
- **Variations in Code Team Composition During Different Times of Day and Week and by Level of Hospital Complexity** *JOINT COMMISSION JOURNAL ON QUALITY AND PATIENT SAFETY*  
Li, Y., Lighthall, G. K.  
2022; 48 (11): 564-571
- **Defining Physiological Decompensation: An Expert Consensus and Retrospective Outcome Validation.** *Critical care explorations*  
Mitchell, O. J., Dewan, M., Wolfe, H. A., Roberts, K. J., Neefe, S., Lighthall, G., Sands, N. A., Weissman, G., Ginestra, J., Shashaty, M. G., Schweickert, W. D., Abella, B. S.  
2022; 4 (4): e0677
- **A NATIONAL SURVEY DESCRIBING DIURNAL AND WEEKLY VARIATIONS OF CODE TEAM COMPOSITION**  
Li, Y., Lighthall, G.  
LIPPINCOTT WILLIAMS & WILKINS.2022: 593
- **Mortality of Patients Requiring Escalation to Intensive Care within 24 Hours of Admission in a Mixed Medical-Surgical Population.** *Clinical medicine & research*  
Leong, J. n., Madhok, J. n., Lighthall, G. K.  
2020
- **Differences in identification of patients' deterioration may hamper the success of clinical escalation protocols** *QJM-AN INTERNATIONAL JOURNAL OF MEDICINE*  
De Bie, A. R., Subbe, C. P., Bezemer, R., Cooksley, T., Kellett, J. G., Holland, M., Bouwman, R. A., Bindels, A. H., Korsten, H. M., Barach, P., Beaugrand, H., Breen, D., Byrne, et al  
2019; 112 (7): 497-504
- **Quality metrics for the evaluation of Rapid Response Systems: Proceedings from the third international consensus conference on Rapid Response Systems.** *Resuscitation*  
Subbe, C. P., Bannard-Smith, J. n., Bunch, J. n., Champunot, R. n., DeVita, M. A., Durham, L. n., Edelson, D. P., Gonzalez, I. n., Hancock, C. n., Haniffa, R. n., Hartin, J. n., Haskell, H. n., Hogan, et al  
2019; 141: 1-12
- **Corrigendum to "Quality metrics for the evaluation of Rapid Response Systems: Proceedings from the third international consensus conference on Rapid Response Systems" [Resuscitation 141 (2019) 1-12].** *Resuscitation*  
Subbe, C. P., Bannard-Smith, J. n., Bunch, J. n., Champunot, R. n., DeVita, M. A., Durham, L. n., Edelson, D. P., Gonzalez, I. n., Hancock, C. n., Haniffa, R. n., Hartin, J. n., Haskell, H. n., Hogan, et al  
2019; 145: 93-94
- **A Novel Bedside-Focused Ward Surveillance and Response System** *JOINT COMMISSION JOURNAL ON QUALITY AND PATIENT SAFETY*  
Sebat, F., Vandegrift, M., Childers, S., Lighthall, G. K.  
2018; 44 (2): 94-100
- **Dreamland: The True Tale of America's Opiate Epidemic.** *Anesthesia and analgesia*  
Lighthall, G. K.  
2017
- **Clinical outcomes of patients seen by Rapid Response Teams: A template for benchmarking international teams.** *Resuscitation*  
Bannard-Smith, J., Lighthall, G. K., Subbe, C. P., Durham, L., Welch, J., Bellomo, R., Jones, D. A.  
2016; 107: 7-12

- **Postoperative care of cardiac surgery patients . . . Finishing what you started.** *Seminars in cardiothoracic and vascular anesthesia*  
Lighthall, G. K.  
2015; 19 (2): 77
- **Safer tracheostomy: a proposal for the routine use of an airway exchange catheter during tracheostomy.** *A & A case reports*  
Olejniczak, M., Lighthall, G.  
2014; 3 (11): 146-148
- **Percutaneous tracheostomy at the bedside: 13 tips for improving safety and success.** *Journal of intensive care medicine*  
Maxwell, B. G., Ganaway, T., Lighthall, G. K.  
2014; 29 (2): 110-115
- **Laryngeal Mask Airway in Medical Emergencies** *NEW ENGLAND JOURNAL OF MEDICINE*  
Lighthall, G., Harrison, T. K., Chu, L. F.  
2013; 369 (20)
- **The pharmacology of airway management in critical care.** *Journal of intensive care medicine*  
Consilvio, C., Kuschner, W. G., Lighthall, G. K.  
2012; 27 (5): 298-305
- **Generation of early warnings with smart monitors: The future is all about getting back to the basics!** *CRITICAL CARE MEDICINE*  
Lighthall, G. K.  
2012; 40 (8): 2509-2511
- **The evolving role of preoperative testing in vascular surgery patients: can a little knowledge be dangerous?** *Seminars in cardiothoracic and vascular anesthesia*  
Verduzco, L. A., Lighthall, G. K.  
2011; 15 (3): 75-84
- **Use of physiologic reasoning to diagnose and manage shock States.** *Critical care research and practice*  
Lighthall, G.  
2011; 2011: 105348-?
- **Resident Training and RRSs** *TEXTBOOK OF RAPID RESPONSE SYSTEMS: CONCEPT AND IMPLEMENTATION*  
Lighthall, G. K., DeVita, M. A., Hillman, K., Bellomo, R.  
2011: 347-55
- **Perioperative intravascular fluid assessment and monitoring: a narrative review of established and emerging techniques.** *Anesthesiology research and practice*  
Singh, S., Kuschner, W. G., Lighthall, G.  
2011; 2011: 231493-?
- **"Identifying the hospitalised patient in crisis"-A consensus conference on the afferent limb of Rapid Response Systems** *RESUSCITATION*  
DeVita, M. A., Smith, G. B., Adam, S. K., Adams-Pizarro, I., Buist, M., Bellomo, R., Bonello, R., Cerchiari, E., Farlow, B., Goldsmith, D., Haskell, H., Hillman, K., Howell, et al  
2010; 81 (4): 375-382
- **A Controllable Patient Monitor for Classroom Video Projectors** *SIMULATION IN HEALTHCARE*  
Lighthall, G. K., Harrison, T. K.  
2010; 5 (1): 58-60
- **The Difficulty of Implementing Clinical Guidelines Unmasked Using Simulation** *SIMULATION IN HEALTHCARE-JOURNAL OF THE SOCIETY FOR SIMULATION IN HEALTHCARE*  
Lighthall, G.  
2009; 4 (4): 191-92
- **Using the rapid response system to provide better oversight of patient care processes.** *Joint Commission journal on quality and patient safety / Joint Commission Resources*  
Moore, M. S., Howard, S. K., Lighthall, G.  
2007; 33 (11): 695-?

- **The use of clinical simulation systems to train critical care physicians.** *Journal of intensive care medicine*  
Lighthall, G. K., Barr, J.  
2007; 22 (5): 257-269
- **Genetic variants of the P-glycoprotein gene Abcb1b modulate opioid-induced hyperalgesia, tolerance and dependence** *PHARMACOGENETICS AND GENOMICS*  
Liang, D., Liao, G., Lighthall, G. K., Peltz, G., Clark, D. J.  
2006; 16 (11): 825-835
- **Findings of the First Consensus Conference on Medical Emergency Teams** *CRITICAL CARE MEDICINE*  
DeVita, M. A., Bellomo, R., Hillman, K., Kellum, J., Rotondi, A., Teres, D., Auerbach, A., Chen, W., Duncan, K., Kenward, G., Bell, M., Buist, M., Chen, et al  
2006; 34 (9): 2463-2478
- **The value of simulation training during anesthesia residency** *ANESTHESIOLOGY*  
Lighthall, G. K.  
2006; 105 (2): 433-433
- **An interchangeable Mapleson A-E breathing system is practical and cost effective** *ACTA ANAESTHESIOLOGICA SCANDINAVICA*  
Robinson, M., Lighthall, G. K.  
2006; 50 (1): 45-49
- **Fluid management in hospitalized patients.** *Comprehensive therapy*  
Meinke, L., Lighthall, G. K.  
2005; 31 (3): 209-223
- **Alterations in spinal cord gene expression after hindpaw formalin injection** *JOURNAL OF NEUROSCIENCE RESEARCH*  
Li, X. Q., Lighthall, G., Liang, D. Y., Clark, J. D.  
2004; 78 (4): 533-541
- **Identification of salt-sensitive genes in the kidneys of Dahl rats** *JOURNAL OF HYPERTENSION*  
Lighthall, G. L., Hamilton, B. P., Hamlyn, J. M.  
2004; 22 (8): 1487-1494
- **Correction of intraoperative coagulopathy in a patient with neurofibromatosis type I with intravenous desmopressin (DDAVP)** *INTERNATIONAL JOURNAL OF OBSTETRIC ANESTHESIA*  
Lighthall, G. K., Morgan, C., Cohen, S. E.  
2004; 13 (3): 174-177
- **Asystole during successive electroconvulsive therapy sessions: A report of two cases** *JOURNAL OF CLINICAL ANESTHESIA*  
Robinson, M., Lighthall, G.  
2004; 16 (3): 210-213
- **Dexmedetomidine fails to cause hyperalgesia after cessation of chronic administration** *ANESTHESIA AND ANALGESIA*  
Davies, M. F., Haimor, F., Lighthall, G., Clark, J. D.  
2003; 96 (1): 195-200
- **Heme oxygenase type 2 modulates molecular changes during chronic behavioral and exposure to morphine** *NEUROSCIENCE*  
Liang, D., Li, X., Lighthall, G., Clark, J. D.  
2003; 121 (4): 999-1005
- **An improved method for topical cerebral cooling during deep hypothermic circulatory arrest** *JOURNAL OF THORACIC AND CARDIOVASCULAR SURGERY*  
Lighthall, G. K., Cartwright, C. R., Haddow, G. R.  
2000; 120 (2): 403-404
- **A comparison of the onset and clinical duration of high doses of cisatracurium and rocuronium** *JOURNAL OF CLINICAL ANESTHESIA*  
Lighthall, G. K., Jamieson, M. A., Katolik, J., Brock-Utne, J. G.  
1999; 11 (3): 220-225
- **THE CHROMOSOMES OF LEISHMANIA** *PARASITOLOGY TODAY*

Lighthall, G. K., GIANNINI, S. H.  
1992; 8 (6): 192-199