Kirk H. Shelley, M.D., Ph.D.

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Education:

Institution	Year	Degree
St. John's University N.Y.,N.Y.	1972-1976	B.S. Chemistry Magna cum laude
Hershey Medical Center Pennsylvania State University	1976-1981	M.D./Ph.D. Biochemistry
Lenox Hill Hospital N.Y. ,N.Y.	1981-1984	Internal Medicine residency
Columbia Presbyterian Med Center N.Y. ,N.Y.	1989-1992	Anesthesia residency

Experience:

12/19-present Professor Emeritus of Anesthesiology
Yale University, New Haven, CT
Consulting regarding photoplethysmographic technology and noninvasive cardiovascular monitoring.

8/08-11/19 Professor of Anesthesiology
Yale University, New Haven, CT
Chief of Ambulatory Division consisting of 18 anesthesia attendings supporting 18 operating rooms accounting for over 16,000 cases/year. Founder of the Society of Mentors. Supervisor of a noninvasive cardiovascular monitoring laboratory. Scientific founder of CardioPhotonics LLC (Yale Start-Up) – Bethany, CT 2009

8/99-7/08 Associate Professor of Anesthesiology
Yale University, New Haven, CT
Medical Director of Ambulatory Operating Room consisting of 10 anesthesia attendings supporting 10 operating rooms accounting for over 8,000 cases/year. Member of residency review committee, Thesis advisor to Aymen Awad Alian. Sub-section editor (Anesth Analg)

8/97-7/99 Assistant Professor of Anesthesiology
Yale University, New Haven, CT
Member of Ambulatory Surgery Section, Member of ACCESS committee.

2/92-7/97 Assistant Professor of Anesthesiology and Medicine
Hershey Medical Center, Pennsylvania State University
Medical Practice Site Director of the Pre-Admission Center, Director of Special Projects – Education Lab, Chairman - Academic Computing and Networking Committee, Dept. of Anesthesia. Member of Education & Education Laboratory Committee.

7/84-7/89 Chief of Medical Services (Air Force rank: Major O-4)
Sheppard Regional Hospital, Sheppard AFB

Supervisor of three major medical departments (internal medicine, family practice and emergency room) consisting of thirteen physicians, six physician assistants, and support personnel. These departments accounted for approximately 6,000 outpatient visits and 100 hospital admissions per month. Management of a 12 bed intensive care unit in addition to supervision of multiple active clinical departments. Local project head of a DoD wide hospital computerization project. Awarded an USAF Meritorious Service Medal for this effort.

Distinctions:

First Air Force Physician approved for M.D., Ph.D. training through the Health Professions Scholarship Program (Penn State - 1976)

Basic Science Research Award (Penn State - 1980)

Ph.D. Thesis: Computer Image Processing of Electron Micrographs (PSU - 1981)

UpJohn Award for Creative Scholarship (Penn State - 1981)

Awarded USAF Meritorious Service Medal - (1989)

Nominated and Interviewed for position of Assistant Physician to the President of United States (White House, - 1989)

"Most Valuable Player" award for Penn. State University Anesthesia Departmental Dedication (1993)

1st Prize for Best Scientific Exhibit – Anesthesia Patient Safety Foundation (1993)

1st Prize for Best Exhibit - American Society of Anesthesiologists (1994)

Taekman, Jeffrey and Shelley, Kirk: The Anesthesia Cash Register. An Interactive Anesthetic Cost Analysis Program - $1,000 meritorious award for cost conscience from Anesthesia News (1994)

Gave testimony to the Committee on Government Reform and Oversight, House of Representatives, Congress of the United States on the topic of Consumer Health Informatics (1996)

1st Prize for Best Technology Abstract from the Society for Technology in Anesthesia – Ft. Lauderdale, FL (1997)

Co-winner of Best Technology Abstract from the Society for Technology in Anesthesia – Scottsdale, AZ (2001)

Invited presenter at ISIAMOV 2007 - invitation only conference occurring every 5 years, Duke University, NC. (2007)

Membership to Association of University Anesthesiologists (2007). Membership to the Educational Advisory Board (EAB) (2009-2012)

Visiting Fellow at the Biomedical Engineering Research Group at the School of Engineering and Mathematical Sciences. Barts and The London School of Medicine, City University, London England (2007, 2011 & 2014)

Honorary Master of Arts degree from Yale University (2010)

President of the Society for Technology In Anesthesia (2011)

Honorable Mention Award for Best Technology Abstract from the Society for Technology in Anesthesia – Las Vegas, NV (2011)

FDA Clinical Sedation Products Initiative workgroup member (2011)

Chairman of the Organizing Committee for the International Symposium Innovations and Applications of Monitoring Perfusion, Oxygenation and Ventilation (IAMPOV) planned for Yale 2012, an invitation only conference occurring every 5 years (2011-2012)

Faculty appointment as a visiting professor – City University, London England (2011-present)

The Harvey W. Wiley Lifetime Achievement Award (2012)

J. S. Gravenstein Award for lifetime achievement in the area of technology in anesthesia (2020)

Professional Standing:

Board Certified in Internal Medicine (1985) & Anesthesiology (1993)
New York State Licensure (1986 - present) - inactive
Pennsylvania State Licensure (1992 - present) - inactive
Connecticut State Licensure (1997 – present) - retired

Medical Societies:

American Society of Anesthesiologists
International Anesthesia Research Society
Society for Technology in Anesthesia
- chairman of research committee (2005-2010) & president (2011)
IEEE (Engineering in Medicine and Biology)
Association of University Anesthesiologists
Society for Computing and Technology in Anaesthesia (London, UK)

Ad Hoc Paper & Grant Reviewer:

Nature
PloS One
Anesthesia and Analgesia
Anesthesiology
Survey of Anesthesiology
Journal of Clinical Monitoring and Computing (Editorial Board Member)
Journal of Clinical Anesthesia
IEEE Transactions on Biomedical Engineering
Acta Anaesthesiologica Scandinavica
Journal of Applied Physiology
Journal of Biomedical Optics

American Journal of Physiology
Physiological Measurement
British Journal of Anaesthesia
Current Opinion in Anesthesia - Section Editor for Computing and Technology (2007-2009)
Computers in Biology and Medicine
International Journal of Cardiology
Medical & Biological Engineering & Computing
Israel Science Foundation
Medical Engineering & Physics
Computational and Mathematical Methods in Medicine
Annals of Biomedical Engineering
NIH - National Institute of Biomedical Imaging and Bioengineering (NIBIB)
Natural Sciences and Engineering Research Council of Canada (NSERC)
Dutch Heart Foundation & Technology Foundation (Netherlands)
Biomedical Signal Processing and Control

Mentoring:

Resident Faculty Advisor: Drs Haddadin, Popescu, Yennam, Itani, Tantawy, Wallace, Kong, Feinleib, Holt, Sherman, Obergfell, Alberti, Rosa, Schonberger, Yonemoto, Ruiter, Mirante, Kinney, Wong, Antony, Qin, Boominathan and Brecher.
Clinical Scientist Track Mentor: Drs. Jablonka, Gesquiere, Tamai, Fields, Awad, Haddadin and Wardhan.
Faculty Mentor: Drs. Alian, Vadivelu, Dabu-Bondoc, Salgar, Romero, Rinder, Aouad, Jablonka, Spencer, Drummond and Gendrachi.
Thesis Advisor: Drs. Zachary Walton, Matthew Mikhail and Paul Guillod

Bibliometrics:

Google Scholar: Publications – 195 ; *h*-index – 29 ; Citations – 3343
Scopus : Publications – 71 ; *h*-index – 21 ; Citations - 1756

Peer Reviewed Publications:

1. O'Brien, Laura; **Shelley, Kirk**; Towfighi, Javad; and McPherson, Alexander. Crystalline Ribosomes are Present in Brains of Senile Humans. Proc. Natl. Acad. Sci., 77(4), 2260-2264, (1980).

2. **Shelley, Kirk**; and McPherson, Alexander. Crystallographic Analysis of the Phytoagglutinin from Abrus precatorius by X-Ray Diffraction and Electron Microscopy. Arch. Biochem. Biophys., 202(2), 431-441, (1980).

3. **Shelley, Kirk**; Hillman, Barry; and McPherson, Alexander. Spatial Filtering of Electron Micrographs of Negatively Stained Alpha-Amylase Crystals. Ultramicroscopy, 5, 281-295, (1980).

4. **Shelley, Kirk**; and McPherson, Alexander. Spatially Filtered Images of B.subtilis Alpha-Amylase Crystals. Journal of Microscopy, 121(2), 201-210, (1981).

5. Mans, Anke; Biebuyck,Julien; **Shelley, Kirk**; and Hawkins, Richard. Regional Blood-Brain Barrier Permeability to Amino Acids After Portocaval Anastamosis. Journal of Neurochemistry, 38(3), 705-717, (1982).

6. **Shelley, Kirk**; Dickstein, Marc; and Shulman, Steven M. The Detection of Peripheral Venous Pulsation using the Pulse Oximeter as a Plethysmograph. Journal of Clinical Monitoring, 9(4), 283-287,(1993).

7. High, Kane; Nicholson, Thomas; Richard, Russell; Panol, George; **Shelley, Kirk**; and Snider, Michael. Effects of Blood Phase Oscillation on Gas Transfer in a Microporous Intravascular Lung. ASAIO Journal, 40(3), M735-739, (1994)

8. Murray, Bosseau; **Shelley, Kirk**; and Schneider, Arthur. Education for Practical Anesthesia. Current Opinion in Anaesthesiology, 7, 471-472, (1994)

9. **Shelley, Kirk**; Murray, Bosseau. Arterial-Pulse Oximetry Loops: A New Method of Monitoring Vascular Tone. Journal of Clinical Monitoring, 13(4), 223-228,(1997).

10. **Shelley, Kirk**; Haddadin, Ala S. Is *H. Pylori* Infection an Occupational Hazard for Anesthesiologists? Anesth Analg, 87(4), 973-974, (1998).

11. Aymen Awad, Wagih Ouda, Robert Stout, David Silverman, and **Kirk Shelley**. Different Response of Ear and Finger Pulse Oximeter Waveform to Cold Pressor Test. Anesth Analg, 92(6),1483-1486 (2001).

12. Aymen Awad, Ashraf Ghobashy, Robert Stout, David Silverman, and **Kirk Shelley**. How Does the Plethysmogram Derived from the Pulse Oximeter Relate to Arterial Blood Pressure in Coronary Artery Bypass Graft Patients? Anesth Analg 93(6), 1466-1471, (2001)

13. Nalini Vadivelu, Peter Harkness, Susan Richman, and **Kirk H. Shelley.** Special anesthetic concerns in mentally handicapped institutionalized patients undergoing gynecological procedures in an outpatient setting. Connecticut Medicine 68(6), 323-326 (2004)

14. **Kirk H. Shelley**, Doris Tamai, Denis Jablonka, Michael Gesquiere, Robert G. Stout, and David G. Silverman. The effect of venous pulsation on the forehead pulse oximeter waveform as a possible source of error in SpO2 calculation. Anesth Analg 100(3), 743-747, (2005)

15. **Kirk H. Shelley**, Denis H. Jablonka, Aymen A. Awad, Robert G. Stout, Hoda Rezkanna, David G. Silverman; What Is the Best Site for Measuring the Effect of Ventilation on the Pulse Oximeter Waveform? Anesth Analg 103(2), 372-377 (2006)

16. Aymen A. Awad, Hoda Rezkanna , Robert G. Stout, M. Ashraf M. Ghobashy, David G. Silverman, **Kirk H. Shelley** ; Analysis of the ear pulse oximeter waveform. Journal of Clinical Monitoring and Computing 20(3), 175-184 (2006)

17. **Kirk H. Shelley**, Aymen A. Awad, Robert G. Stout, David G. Silverman; The use of joint time frequency analysis to quantify the effect of ventilation on the pulse oximeter waveform. Journal of Clinical Monitoring and Computing 20(4), 81-87 (2006)

18. Doris Tamai, Aymen Alian, Humayun J. Chaudhry, and **Kirk Shelley.** Optimizing the medical management of diabetic patients undergoing surgery. Connecticut Medicine 70:621-30 (2006)

19. Robert B. Schonberger, William S. Worden, Kaveh Shahmohammadi, Kirsten Menn, Tyler J. Silverman, Robert G. Stout, **Kirk H. Shelley**, David G. Silverman; Topical non-iontophoretic application of acetylcholine and nitroglycerin via a translucent patch: A new means for assessing microvascular reactivity. Yale Journal of Biology and Medicine 78:229-235 (2007)

20. Michael J. Gesquiere, Aymen A. Awad, David G. Silverman, Robert G. Stout, Denis H. Jablonka, Tyler J. Silverman, and **Kirk H. Shelley**. Impact of Withdrawal of 450 ml of Blood on Respiration-Induced

Oscillations of the Ear Plethysmographic Waveform. Journal of Clinical Monitoring and Computing 21:277-82 (2007)

21. Aymen A. Awad, Ala S. Haddadin, Hossam Tantawy, Tarek M. Badr, Robert G. Stout, David G. Silverman, **Kirk H. Shelley**. Correlation of the plethysmographic waveforms with systemic vascular resistance. Journal of Clinical Monitoring and Computing 21: 365 - 372 (2007)

22. **Kirk Shelley**; Photoplethysmography: beyond the calculation of SpO2 and pulse rate. Anesth Analg 105(8): S31 - S36 (2007)

23. Sheng Lu, Ph.D.; He Zhao; Kihwan Ju; Kyungsoo Shin, Ph.D.; Myoungho Lee, Ph.D.; **Kirk Shelley**, M.D.; Ki Chon, Ph.D. Can photoplethysmography variability serve as an alternative approach to obtain heart rate variability information? Journal of Clinical Monitoring and Computing 22:23 - 29 (2008)

24. Denis H Jablonka, Aymen A. Awad, Robert G Stout, David G Silverman, and **Kirk H Shelley**; Comparing the effect of arginine vasopressin on ear and finger photoplethysmography. Journal of Clinical Anesthesia 20: 90 - 93 (2008)

25. Phillips, Justin P; Kyriacou, Panayiotis A; Jones, Deric P; **Shelley, Kirk H**; Langford, Richard M; Pulse oximetry and photoplethysmographic waveform analysis of the esophagus and bowel. Current Opinion in Anaesthesiology 21(6), p 779–783 (2008)

26. Aaron M. Fields, Craig S. Freiberg, Alexandra Fickenscher, and **Kirk H. Shelley**. Patients and Jargon: Are We Speaking the Same Language? Journal of Clinical Anesthesia. 20 (5), p 343-346 (2008)

27. Richa Wardhan and **Kirk Shelley**. Peripheral Venous Pressure Waveform. Current Opinion in Anaesthesiology 22 (6), p 814-21 (2009)

28. Vadivelu N, Gesquire M, Mitra S, **Shelley K**, Kodumudi G, Xia Y, et al. Safety of local anesthesia combined with monitored intravenous sedation for American Society of Anesthesiologists 3 and 4 patients undergoing lower limb-preservation procedures. Journal of Foot and Ankle Surgery 49 (2), p 152-4 (2010)

29. Shishir Dash, **Kirk H. Shelley**, David G. Silverman, and Ki H. Chon. Estimation of respiratory rate from ECG, photoplethysmogram and piezoelectric pulse transducer signals: a comparative study of time-frequency methods. IEEE Transactions on Biomedical Engineering 57 (5), p 1099-1107 (2010)

30. Moore, Chris; Tham, Edward; Samuels, Kathleen; Dziura, James; McNamara, Robert; Stachenfeld, Nina; **Shelley, Kirk**; & Silverman, David. Tissue Doppler of Early Mitral Filling Correlates with Simulated Volume Loss in Healthy Subjects. Academic Emergency Medicine 17, p 1162–1168 (2010)

31. Taekman, Jefferey and **Shelley, Kirk**. Virtual Environments in Healthcare: Immersion, Disruption, and Flow. International Anesthesiology Clinics 48 (3), p101-121 (2010)

32. Zachary D Walton, Panayiotis Kyriacou, David G Silverman, & **Kirk H Shelley**. Measuring Venous Oxygen Saturation Using the Photoplethysmographic Waveform. Journal of Clinical Monitoring and Computing 24 (4), p 295-303 (2010)

33. Selvaraj N, Mendelson Y, **Shelley KH**, Silverman DG, Chon KH. Statistical approach for the detection of motion/noise artifacts in photoplethysmogram. Conf Proc IEEE Eng Med Biol Soc 2011, p 4972-5 (2011)

34. Selvaraj N, Scully CG, **Shelley KH**, Silverman DG, & Chon KH. Early detection of spontaneous blood loss using amplitude modulation of photoplethysmogram. Conf Proc IEEE Eng Med Biol Soc 2011:p5499-5502 (2011)

35. Nandakumar Selvaraj, **Kirk H. Shelley**, David G. Silverman, Nina Stachenfeld, Nicholas Galante, John P. Florian, Yitzhak Mendelson, and Ki H. Chon. A novel approach using time-frequency analysis of pulse-oximeter data to detect progressive hypovolemia in spontaneously breathing healthy subjects. IEEE Transactions on Biomedical Engineering 58 (8), p 2272-2279 (2011)

36. Aymen A. Alian, Nicholas J. Galante, Nina S. Stachenfeld, David G. Silverman, and **Kirk H. Shelley**. Impact of Central Hypovolemia on Photoplethysmographic Waveform Parameters in Healthy Volunteers. Part 1: Time Domain Analysis. Journal of Clinical Monitoring and Computing 25 (6), p 377-385 (2011)

37. Aymen A. Alian, Nicholas J. Galante, Nina S. Stachenfeld, David G. Silverman, and **Kirk H. Shelley**. Impact of Central Hypovolemia on Photoplethysmographic Waveform Parameters in Healthy Volunteers. Part 2: Frequency Domain Analysis. Journal of Clinical Monitoring and Computing 25 (6), p 387-396 (2011)

38. Aymen A Alian and **Kirk H. Shelley**. Respiratory Physiology and the Impact of Different Modes of Ventilation on the Photoplethysmographic Waveform. Sensors 12, p 2236-2256 (2012)

39. Christopher G. Scully, Nandakumar Selvaraj, Frederick W. Romberg, Richa Wardhan, John Ryan, John P. Florian, David G. Silverman, **Kirk H. Shelley**, and Ki H. Chon. Detection of 900 ml Blood Withdrawal by Amplitude Modulation Analysis of the Photoplethysmographic Waveform. Anesthesia & Analgesia 115 (1), p 74-81 (2012)

40. Selvaraj, N., **K. H. Shelley**, D. G. Silverman, N. Stachenfeld and K. H. Chon. "Autonomic control mechanism of maximal lower body negative pressure application." Conf Proc IEEE Eng Med Biol Soc: p 3120-3123 (2012)

41. Phillips, J. P., A. Belhaj, K. Shafqat, R. M. Langford, **K. H. Shelley** and P. A. Kyriacou. "Modulation of finger photoplethysmographic traces during forced respiration: Venous blood in motion?" Conf Proc IEEE Eng Med Biol Soc: p 3644-3647 (2012)

42. Susan Dabu-Bondoc, Nalini Vadivelu, Chantelle Shimono, Annette English, Boonsri Kosarussavadi, Feng Dai, **Kirk Shelley**, and Jessica Feinleib. Intravenous Dextrose Administration Reduces Postoperative Antiemetic Rescue Treatment Requirements and PACU Length of Stay. Anesthesia & Analgesia 117 (3):p. 591-596 (2013)

43. Amit Shah, and **Kirk H. Shelley**. Is pulse oximetry an essential tool or just another distraction? The role of the pulse oximeter in modern anesthesia care. J Clin Monit Comput, 27(3): p. 235-42 (2013)

44. Charles Odonkor, Robert Schonberger, Feng Dai, **Kirk Shelley**, David Silverman, and Paul Barash. New Utility for an Old Tool: Can a Simple Gait Speed Test Predict Ambulatory Surgical Discharge Outcomes? American Journal of Physical Medicine & Rehabilitation 92(10):p. 849-63. (2013)

45. Zhu R, Atteya G, **Shelley KH**, Silverman DG, Alian AA. Analysis of plethysmographic waveform changes induced by beach chair positioning under general anesthesia. Journal of Clinical Monitoring and Computing. 28(6) p.591-596 (2014)

46. Alian A, Galante N, Stachenfeld N, Silverman D and **Shelley K**. Impact of Lower Body Negative Pressure Induced Hypovolemia on Peripheral Venous Pressure Waveform Parameters in Healthy Volunteers. Physiological Measurement 35(7): p.1509-20 (2014)

47. Alian A, and **Shelley K**. Photoplethysmography. Practice & Research: Clinical Anaesthesiology 28 p.395-406 (2014)

48. Dabu-Bondoc, S. and **Shelley, K**. Management of Comorbidities in Ambulatory Anesthesia: A Review. Ambulatory Anesthesia 2 p.39-51 (2015)

49. Aymen A. Alian, MD, Gourg Atteya, MD, Dorothy Gaal, MD, Thomas Golembeski, MD, Brian G. Smith, MD, David G Silverman, MD, **Kirk H. Shelley, MD PhD.** Ventilation induced modulation of pulse oximeter waveforms: a method for the assessment of early changes in intravascular volume during spinal fusion surgery in pediatric patients. Anesthesia & Analgesia, 123(2):p.346-56 (2016)

50. Natasa Reljin, Gary Zimmer, Yelena Malyuta, **Kirk Shelley**, Yitzhak Mendelson, David J Blehar, Chad E Darling, and Ki H Chon. Using support vector machines on photoplethysmographic signals to discriminate between hypovolemia and euvolemia. PloS one 13:3 (2018)

51. Michard, F. and **K. Shelley**, Should We Monitor Pulsus Paradoxus via Pulse Oximetry in Patients with COVID-19 and Acute Respiratory Failure? Am J Respir Crit Care Med, 202(5): p. 770-771. (2020)

52. Michard, F., **K. Shelley**, and E. L'Her, COVID-19: Pulse oximeters in the spotlight. J Clin Monit Comput, 35(1): p. 11-14. (2021)

53. Wu, H.T., A. Alian, and **K. Shelley**, A new approach to complicated and noisy physiological waveforms analysis: peripheral venous pressure waveform as an example. J Clin Monit Comput, 35(3): p. 637-653. (2021)

54. Aymen Alian, Yu-Lun Lo, **Kirk Shelley**, and Hau-Tieng Wu, Reconsider phase reconstruction in signals with dynamic periodicity from the modern signal processing perspective. Foundations of Data Science Accepted – In Press (2022)

Abstracts:

55. **Shelley, Kirk**; Dickstein, Marc; and Shulman, Steven M;. Can Pulse Oximeters Detect Peripheral Venous Pulsation? Society for Technology in Anesthesia - New Orleans, LA, March 1993

56. **Shelley, Kirk**; Arterial-Pulse Oximetry Loops: A New Method of Monitoring Vascular Tone. Society for Technology in Anesthesia - Phoenix, AZ, Jan. 1995

57. Weisz J; Fritz-Wolz G; Dabbs D; **Shelley K**; Brodie A; and Brown T. Expression of aromatase in epithelial and stromal cells in terminal lobular ductal units and in epithelial cells of cysts in normal human mammary gland. Proceedings of the American Association for Cancer Research, 36(A1631), pg. 273, (1995)

58. Taekman Jeffrey; Kingsley Charles; and **Shelley, Kirk**. Medical Education over the Internet. Academic Medicine, 71(5), 525, May 1996

59. **Shelley, Kirk**; Murray, Bosseau. Arterial-Pulse Oximetry Loops: A dose-response curve for phenylephrine. Awarded 1st Prize for Best Technology Abstract from the Society for Technology in Anesthesia – Ft. Lauderdale, FL Jan. 1997

60. **Shelley, Kirk** and Fehr, David. The Quantitative Evaluation of Education CD-ROMs. Journal of Clinical Monitoring and Computing, 14 (7-8), 533, December (1998)

61. **Shelley, Kirk** and Fehr, David. The Quantitative Evaluation of Education CD-ROMs. Anesthesia & Analgesia, 86(2S), S185, (1998)

62. **Shelley, Kirk**; Haddadin, Ala S. Is *H. Pylori* Infection an Occupational Hazard for Anesthesiologists? Anesthesiology, 89(3A), A1199, (1998)

63. Stout, RG; Tantawy, H; Shaheen, Y; Devavaram, P; Gangaharappa, R, Reddy, A; Ferneini, EM; Almouzayn; **Shelley, Kirk** and Silverman, DG. The effect of eutectic mixture of local anesthetic (EMLA) on skin perfusion. Anesthesia & Analgesia, 88 (2), S388, (1999)

64. **Kirk Shelley**, Bob Stout, and David Silverman. The pulse oximeter waveform compared to the laser Doppler waveform. Journal of Clinical Monitoring and Computing, 15 (3-4), 247, May (1999)

65. **Kirk Shelley**, Bob G. Stout, and David G. Silverman. The use of joint time frequency analysis of the pulse oximeter waveform to measure the respiratory rate of ventilated patients. Anesthesiology, 91(3A), A583, (1999)

66. Aymen Awad, Wagih Ouda, Robert Stout, David Silverman, and **Kirk Shelley**. Different Response of Ear and Finger Photoelectric Plethysmography (Pulse Oximeter Waveform) to Vasoconstrictive Stimuli. Anesthesiology, 93 (3A): A583 Suppl. S SEP (2000)

67. Aymen Awad, Ashraf Ghobashy, Robert Stout, David Silverman, and **Kirk Shelley**. Blood Pressure Determination using the Pulse Oximeter Waveform. Co-winner for Best Technology Abstract from the Society for Technology in Anesthesia – Scottsdale, AZ Jan. 2001

68. Zhu Q, Awad A, Stout R, Silverman D, **Shelley K**; Skin vasomotion induced by feet immersion in cool water. ASA (A666) – Oct 2001

69. Mihai V. Podgoreanu, Joseph P. Mathew, **Kirk H. Shelley**; Respiratory Influences on Left Area Variability Assessed with Echocardiographic Acoustic Quantification. ASA (A178) – Oct 2001

70. Awad A, Stout RG, Silverman DG, Zhu Q, Ghobashy AM, **Shelley K**: Comparison of finger plethysmographic waveforms and SVR. IARS 2002

71. Nalini Vadivelu, Peter Harkness, Susan Richman, and **Kirk Shelley**; Special Anesthetic Concerns in Mentally Challenged Patients undergoing Gynecological Procedures in an Ambulatory Setting. PGA (P9086) – Dec 2002

72. Aymen A. Awad, Robert G. Stout, M. Ashraf M. Ghobashy, David G. Silverman, and **Kirk H. Shelley**. How does the plethysmographic & laser Doppler waveform relate to cardiac output of coronary artery bypass graft patients? Society for Technology in Anesthesia – Jan 2003 (A26 -Anesth Analg 2003;97 S8)

73. Nalini Vadivelu, Michael Gesquiere, Christine Rinder, Peter Blume, and **Kirk Shelley**; Analysis of outcome for limb salvage procedures with sedation and foot block in 83 ASA III and IV patients in an Ambulatory Setting. PGA (P9058) – Dec 2003

74. **Kirk H. Shelley**, Doris Tamai, Denis Jablonka, Michael Gesquiere, Robert G. Stout, and David G. Silverman; The Effect of Venous Pulsation on the Forehead Pulse Oximeter Waveform as a Possible Source of Error in SpO2 Calculation. Society for Technology in Anesthesia – Jan 2004 (A28-Anesth & Analg 2004;98 S12)

75. Denis H Jablonka, Aymen A Awad, Robert G Stout, David G Silverman, and **Kirk H Shelley**; What is the optimum site to measure the effect of spontaneous ventilation on the pulse oximeter waveform? ASA (A191) Annual Meeting Abstracts 2004

76. Denis H Jablonka, Aymen A Awad, Robert G Stout, David G Silverman, and **Kirk H Shelley**; Ear plethysmographic changes during hemodialysis. ASA (A588) Annual Meeting Abstracts 2004

77. Denis H Jablonka, Doris N Tamai, Robert G Stout, David G Silverman, and **Kirk H Shelley**; The effect of vasopressin on ear pulse plethysmography and its implications on cerebral blood flow. ASA (A249) Annual Meeting Abstracts 2004

78. Michael J. Gesquiere, Aymen A. Awad, **Kirk H. Shelley**, Robert G Stout, David G. Silverman. Can Ear Plethysmography Detect Moderate Blood Loss in Healthy, Non-Intubated Volunteers? ASA (A180) Annual Meeting Abstracts 2004

79. Mo C, Stout RG, **Shelley KH**, Tantawy H, Silverman DG: Acute microcirculatory effects of nicotine in non-smoking volunteers. ASA (A246) Annual Meeting Abstracts 2004

80. Diaz VA, Hagedorn C, Menn K, Stout R, **Shelley K**, Gesquire M, Tomai D, Silverman D, Adelman R. Laser Doppler flowmetry study of systemic vasoconstriction after topical 2.5% phenylephrine eye drops. Investigative ophthalmology & visual science 45:U974 (2004)

81. Adam J. Shelley, Robert G. Stout, David G. Silverman and **Kirk H Shelley**. Time Domain Analysis of the Photoelectric Plethysmograph Waveform. Anesth Analg Vol. 101, number 6S (S71); Society for Technology in Anesthesia, Annual Meeting - Miami, Jan 2005

82. Awad AA, Gesquiere M, **Shelley KH**, Silverman DG, Stout RG: Differing effects of spontaneous and positive pressure ventilation on heart rate variability. IARS (1169) Annual Meeting Abstracts 2005

83. Aaron Fields, Craig Freiberg and **Kirk Shelley**: Patients and Jargon: Are We Speaking the Same Language? ASA (A611) Annual Meeting Abstracts 2005

84. Lee J. Grant and **Kirk H. Shelley**: The Virtual Medical Conference: A proposal for the use of Massively Multiplayer Online (MMO) technology to conduct and experience large scale scientific meetings from home. Society for Technology in Anesthesia, Annual Meeting – San Diego, Jan 2006

85. Aymen Alian, Tyler J. Silverman, **Kirk H. Shelley**, David G. Silverman, and Robert G. Stout: Independence of EMLA-Treated Forehead from Systemic Vasoconstrictive Tone ASA (A1230) Annual Meeting Abstracts 2006

86. Veena Salgar, Michael Mulick, Keith J. Ruskin, and **Kirk H. Shelley**: A Pedometer Study of Anesthesiologists: How Far Do We Walk on a Regular Workday? ASA (A1303) Annual Meeting Abstracts 2006

87. J M Watkins-Pitchford, D Jablonka, N Vadivelu MD, **K H Shelley**, and R Sinatra: A Comprehensive Computing Solution on a Zero Budget. Society for Technology in Anesthesia, Annual Meeting – Orlando, FL, Jan 2007

88. Feinleib J.L., Silverman T., Stout R.G., **Shelley K.H.**, and Silverman D.G. Changes in Finger and Forehead Blood Flow upon Squatting and Standing. IARS meeting (S-52) March 2007

89. Aaron M Fields, Kerryn M Rock, David G Silverman, Robert G Stout, and **Kirk H Shelley**; Response of the Ear Photoplethysmograph (PPG) Waveform to Fluid Bolus in Post-CABG Patients. ASA (A456) Annual Meeting 2007

90. Lisbeysi Calo, Tyler J. Silverman, Alexander Nissen, **Kirk H. Shelley,** David G. Silverman; Differing Responses of the Finger and Toe to a Vasoconstrictive Stimulus. ASA (A1324) Annual Meeting 2007

91. Aymen Alian, Louvonia Boone , David G. Silverman, **Kirk H. Shelley**; Heart Rate Variability As a Predictor of Post-Spinal Hypotension in Patients Scheduled for C-section. ASA (A668) Annual Meeting 2007

92. Alexander F. Nissen, B.A., Lisbeysi Calo, M.D., Tyler J. Silverman, **Kirk H. Shelley, M.D., Ph.D**., David G. Silverman, M.D; Sensitivity of Acetylcholine and Nitroglycerin-Induced Vasodilation to Endothelial Impairment. ASA (A291) Annual Meeting 2007

93. L Calo, A Nissen, T Silverman, L Boone, **K Shelley**, D Silverman; Comparison of Sympathetic to Parasympathetic Vasomotion in the Forehead, Finger, and Foot. IARS 82nd Clinical and Scientific Congress (#1107) March 2008

94. Lars J. Grimm, B.S., Nicholas J. Galante, B.S., Aymen A. Alian, M.D., David G. Silverman, M.D., **Kirk H. Shelley, M.D., Ph.D.** Differing Responses of Forehead and Finger Plethysmograph Width to Hypovolemia ASA (A674) Annual Meeting 2008

95. Nicholas J. Galante, B.S., Lars J. Grimm, B.S., Aymen A. Alian, M.D., David G. Silverman, M.D., **Kirk H. Shelley, M.D., Ph.D.** Change in Plethysmographic Waveform of Amplitude during Hypovolemia: Finger vs. Forehead ASA (A675) Annual Meeting 2008

96. Lars J. Grimm, B.S., Nicholas J. Galante, B.S., Aymen A. Alian, M.D., **Kirk H. Shelley, M.D., Ph.D.,** David G. Silverman, M.D.; Influence of Heart Rate on Changes in Plethysmographic Width during Hypovolemia ASA (A676) Annual Meeting 2008

97. Aymen A. Alian, M.D., Frederick W. Romberg, MSEE, Nicholas J. Galante, B.S., **Kirk H. Shelley, M.D., Ph.D.,** David G. Silverman, M.D.; Laser Doppler Flowmetry of the Forehead and Finger Microvasculature during Hypovolemia ASA (A902) Annual Meeting 2008

98. Aymen A. Alian, M.D., Nina Stachenfeld, Ph.D., Nicholas J. Galante, B.S., David G. Silverman, M.D., **Kirk H. Shelley, M.D., Ph.D**.; Changes in Continuous Finger Arterial Pressure Waveforms during Lower Body Negative Pressure. ASA (A915) Annual Meeting 2008

99. Aymen A. Alian, M.D., Richa Wardhan, M.D., Nicholas J. Galante, B.S., David G. Siverman, M.D., **Kirk H. Shelley, M.D., Ph.D.;** The Impact of Lower Body Negative Pressure on the Peripheral Venous Pressure Waveform. ASA (A1509) Annual Meeting 2008

100. Nicholas G. Galante, B.S., Aymen A. Alian, M.D., Lars G. Grimm, B.S., David G. Silverman, M.D., **Kirk H. Shelley, M.D., Ph.D**.; The Ear PPG Oscillates at the 0.12-0.18 Hz Autonomic Frequency during Lower Body Negative Pressure. ASA (A1686) Annual Meeting 2008

101. Kathleen Samuels, Keith J. Ruskin, Awad El-Ashry, Nicholas Galante, Aymen Awad, **Kirk Harry Shelley**, David G. Silverman, Edward Tham, Christopher L. Moore and Nina Stachenfeld. Evaluation of a Field Measurement of Stroke Volume During Lower Body Negative Pressure. Aerospace Medical Association's 80th Annual Scientific Meeting 2009

102. Moore, Christopher MD; Tham, Edward MD; Samuels, Kathleen; Silverman, David; **Shelley, Kirk MD**; Ruskin, Keith MD and Stachenfeld, Nina PhD. Tissue Doppler by Emergency Physician Echocardiography Correlates with Preload Reduction During Simulated Hypovolemia in a Lower Body Negative Pressure Model. Society for Academic Emergency Medicine (A925) Annual Meeting 2009

103. Kathleen J. Samuels, B.A., Keith J. Ruskin, M.D., Awad A. El-Ashry, M.D., **Kirk H. Shelley, M.D., Ph.D.,** David G. Silverman, M. Changes in Middle Cerebral Artery and Forehead Microvascular Flow during Simulated Hypovolemia. (A187) ASA Annual Meeting, New Orleans, 2009

104. Richa Wardhan, M.D., John C. Ryan, B.S., David G. Silverman, M.D., **Kirk H. Shelley, M.D., Ph.D.,** YanYun Wu, M.D., Ph.D. Changes in Hematocrit during Acute Blood Withdrawal in Healthy Volunteers (A364) ASA Annual Meeting, New Orleans, 2009

105. Kathleen J. Samuels, B.A., Keith J. Ruskin, M.D., Vahid Mohsenin, M.D., **Kirk H. Shelley, M.D.,** David G. Silverman, M.D. Responses of Transcranial Doppler Measurements to Progressive Simulated Hypovolemia. (A526) ASA Annual Meeting, New Orleans, 2009

106. Kathleen J. Samuels, B.A., Awad A. El-Ashry, M.D., Nina Stachenfeld, Ph.D., **Kirk H. Shelley, M.D.,Ph.D**., David G. Silverman, M.D. High Frequency Oscillations in the Forehead Microvasculature during Hypovolemia (A521) ASA Annual Meeting, New Orleans, 2009

107. Awad A. El-Ashry, M.D., John C. Ryan, B.S., Richa Wardhan, M.D., **Kirk H. Shelley, M.D., Ph.D.,** David G. Silverman, M.D. Early Changes in Heart Rate Variability and Vascular Tone during Blood Withdrawal from Volunteers (A882) ASA Annual Meeting, New Orleans, 2009

108. Richa Wardhan, M.D., John C. Ryan, B.S., Awad A. El-Ashry, M.D., David G. Silverman, M.D., **Kirk H. Shelley, M.D., Ph.D.** Respiration-Induced Oscillations of Peripheral Venous Waveform during Blood Replacement (A725) ASA Annual Meeting, New Orleans, 2009

109. Richa Wardhan, M.D., John C. Ryan, B.S., Robert G. Stout, M.D., **Kirk H. Shelley, M.D., Ph.D**., David G. Silverman, M.D. The Effect of Positive Expiratory Pressure on the Venous Waveform during Hypovolemia. (A1437) ASA Annual Meeting, New Orleans, 2009

110. Awad A. El-Ashry, M.D., Kathleen J. Samuels, B.A., **Kirk H. Shelley, M.D., Ph.D**., Aymen A. Alian, M.D., David G. Silverman, M. Heart Rate Variability during Simulated Hypovolemia: Evidence of a Role for Parasympathetics. (A1105) ASA Annual Meeting, New Orleans, 2009

111. Vadivelu N, Dabu-Bondoc **S**, Salgar V, **Shelley K**, Rose A. Sedation and Operating Room Time in Patients Undergoing Topical Anesthesia or Retrobulbar Block for Cataract Surgery. 62nd PostGraduate Assembly in Anesthesiology (PGA) annual meeting in New York, New York; December 2009

112. R. K. Modak, M. Watkins-Pitchford, **K. Shelley**. Work and power characteristics of breathing displayed using dynamic 3-D respiratory loops induced by etomide. IARS 84nd Clinical and Scientific Congress March 2010

113. Oprea AD, Wardhan R, Schlangel M, **Shelley KH**, Silverman DG: The Pulse Transit Time Conundrum: Diverging Responses of the Cardiac and Vascular Components. (A634) ASA Annual Meeting, San Diego, 2010

114. Oprea AD, Elwin M, **Shelley KH**, Silverman TJ, Silverman DG: Differing Responses of the Finger and Forehead Microvasculature to Transdermal Nitroglycerin. (A634) ASA Annual Meeting, San Diego, 2010

115. Oprea AD, Wardhan R, Moore C, **Shelley KH**, Silverman DG, Tham E, Fat I, Alian AA, Ryan JC. R-Wave to Ear Plethysmograph Time Identifies Changes in Pre-Ejection Period During Blood Withdrawal. (A1696) ASA Annual Meeting, San Diego, 2010

116. Oprea AD, Stachenfeld N, Elwin M, Grabarek A, Silverman DG, Silverman TJ, **Shelley KH**: Responses of the Microvasculature to Nicotine and Nitroglycerin. (A1543) ASA Annual Meeting, San Diego, 2010

117. Schlangel M, Oprea AD, **Shelley KH**, Ryan JC, Silverman DG: Macrovascular and Microvascular Transit Times during a Hypovolemia Challenge. (A1400) ASA Annual Meeting, San Diego, 2010

118. Alian AA, Galante NJ, Wardhan R, Silverman DG, **Shelley KH**. The Impact of Lower Body Negative Pressure on Peripheral Venous Pressure Waveforms. (A574) ASA Annual Meeting, San Diego, 2010

119. Alian AA, Galante NJ, Stachenfeld N, Silverman DG, **Shelley KH**, Oprea AD, Alian R. A Study of Pulse Transit Time During LBNP. (A036) ASA Annual Meeting, San Diego, 2010

120. Oprea AD, Kenny AS, Stachenfeld N, Silverman TJ, Silverman DG, Grabarek a, **Shelley KH**: Effects of a Transdermal Anticholinesterase on Microvascular Vasodilation. (A1336) ASA Annual Meeting, San Diego, 2010

121. Zachary D Walton, Panayiotis Kyriacou, David G Silverman, **Kirk H Shelley**. Measuring Venous Oxygen Saturation Using the Photoplethysmographic Waveform. (A191) ASA Annual Meeting, San Diego, 2010

122. Aymen A. Alian, M.D., Nicholas J. Galante, B.S., Salman Haider,M.D., David G. Silverman, M.D., **Kirk H. Shelley**, M.D., Ph.D. Impact of central hypovolemia on photoplethysmography waveform parameters in healthy volunteers. Part 1: Time Domain Analysis. Society for Technology in Anesthesia, Annual Meeting – Las Vegas, NV, Jan 2011 – won Honorable Mention Award

123. Aymen A Alian, M.D., Nicholas J Galante, B.S., Salman Haider , Lars G Grimm, B.S., David G Silverman, M.D., **Kirk H Shelley**, M.D., Ph.D. Impact of central hypovolemia on

photoplethysmography waveform parameters in healthy volunteers. Part 2: Frequency Domain Analysis. Society for Technology in Anesthesia, Annual Meeting – Las Vegas, NV, Jan 2011

124. Brooke Albright MD, Aymen Alian MD, Raj Modak MD, **Kirk Shelley** MD PhD, David Silverman MD, Qing Bing Zhu MD, Susan Garwood MD, Irena Vaitkeviciute MD, Salman Haider MD, Feng Dai PhD, and Wanda M Popescu MD. Sonogram of the Internal Jugular Vein: A Feasible Non-invasive Tool for Volume Assessment of Patients undergoing Cardiac Surgery? Society for Technology in Anesthesia, Annual Meeting – Las Vegas, NV, Jan 2011

125. **Kirk Shelley**, Aymen Alian, Adam Shelley, Zachary Walton and David Silverman. A Method for Determining the Peripheral Venous/Arterial Compliance Ratio. Association of University Anesthesiologists, Philadelphia, PA, May 2011

126. Frederick T. Conlin, M.D., K Karisa Walker, M.D., **Kirk Shelley, M.D.,Ph.D.,** Michelle Diu, M.D. National Trends on Endotracheal Tube Cuff Pressure Monitoring in Teaching Institutions. (A1109) ASA Annual Meeting, Chicago, IL Oct 2011

127. Brooke E. Albright, M.D., Raj Modak, M.D., **Kirk Shelley, M.D.,** David Silverman, M.D., Aymen Alian, M.D. Sonogram of the Internal Jugular Vein: A Feasible Non-invasive Tool for Volume Assessment of Patients Undergoing Cardiac Surgery. (A1663) ASA Annual Meeting, Chicago, IL Oct 2011

128. Aymen A. Alian, M.D., Salman Haider, M.D., Ferne Braveman, M.D., Reim A. Awad, Student, **Kirk H. Shelley, M.D.,Ph.D** EKG Respiratory Changes Induced by Incentive Spirometry During Preoperative Hydration of Spontaneously Breathing Pregnant Women. (A679) ASA Annual Meeting, Chicago, IL Oct 2011

129. Richard Zhu, B.S., Aymen A. Alian, M.D., Richa Wardhan, M.D., John C. Ryan, M.D., **Kirk H. Shelley, M.D.,Ph.D.** Integrated Assessment of Hypovolemia with the Photoplethysmograph and EKG. (A1172) ASA Annual Meeting, Chicago, IL Oct 2011

130. Kathryn K. Walker, M.D., Frederick Conlin, M.D., Feng Dai, Ph.D., **Kirk Shelley, M.D.,Ph.D.,** Michelle W. Diu, M.D. Factors that May Influence Consistent Endotracheal Tube Cuff Overinflation Among Anesthesia Providers. (A068) ASA Annual Meeting, Chicago, IL Oct 2011

131. Gourg Atteya MD, Nishanthi Kandiah MD, Thomas Golembeski MD, Brian Smith MD, **Kirk Shelley MD. PhD**, and Aymen A. Alian MD. Plethysmographic and arterial waveform analysis during scoliosis cases using frequency analysis as a method of detecting changes in pre-load (venous) volume status. IAMPOV meeting, Yale, New Haven, CT June 2012

132. Gourg Atteya MD, Haleh Saadat MD, Thomas Golembeski MD, Tal Levy MD, **Kirk Shelley MD, PhD**, and Aymen A. Alian MD. Impact of fluid resuscitation on plethysmographic and arterial waveform parameters. IAMPOV meeting, Yale, New Haven, CT June 2012

133. Gourg Atteya MD, Nishanthi Kandiah MD, Jill Arthur MD, Dorothy Gaal MD, Brian Smith MD†, **Kirk Shelley MD, PhD**, and Aymen A. Alian MD. Impact of somatosensory spinal evoked potential (SSEP) on plethysmographic and arterial waveform parameters during scoliosis cases. IAMPOV meeting, Yale, New Haven, CT June 2012

134. Aymen Alian MD, Gourg Atteya MD, Haleh Saadat MD, Tal Levy MD, Jill Arthur MD and **Kirk Shelley MD, PhD**. Effect of intraoperative hypotension treatment (i.e. fluid boluses and phenylephrine

doses) on the peripheral venous/arterial compliance ratio. IAMPOV meeting, Yale, New Haven, CT June 2012

135. Samrawit A. Goshu BS, Saeeda Qadri MD, Hina Nazar, MD, Michael Ancuta MD, Tyler J. Silverman, BA, **Kirk Shelley, MD, PhD**, and David G. Silverman, M. Assessment of Local Vasodilation by Photoplethysmography and Laser Doppler Flowmetry. (A839) ASA Annual Meeting, Washington DC, Oct 2012

136. Nyasha George, B.S., Gourg Atteya, M.D., Beshoy Esmat, M.D., Kristin Richards, M.D., **Kirk H. Shelley, M.D.,Ph.D**., David G. Silverman, M.D., Aymen A. Alian, M.D. Plethysmographic Respiratory Changes Induced by Incentive Spirometry in Spontaneously Breathing Dialysis Patients. (A829) ASA Annual Meeting, Washington DC, Oct 2012

137. Zachary Walton, M.D.,Ph.D., Aymen Alian, M.D., **Kirk Shelley, M.D.,Ph.D**. Comparison of Ventilatory-Induced Variations in Mean Arterial Pressure and Pulse Pressure Using Coherence Analysis. (A275) ASA Annual Meeting, Washington DC, Oct 2012

138. Gourg Atteya, M.D., Nyasha George, B.S., Beshoy Esmat, M.D., Mark Perazella, M.D., **Kirk H. Shelley, M.D.,Ph.D.,** David G. Silverman, M.D., Aymen A. Alian, M.D. Impact of Dialysis on Plethysmographic Respiratory Variability. (A393) ASA Annual Meeting, Washington DC, Oct 2012

139. Charles A. Odonkor, M.A., Robert Schonberger, M.D., Feng Dai, Ph.D., **Kirk Shelley, M.D.,Ph.D.,** David Silverman, M.D., Paul Baras. Does Preoperative Walking Speed Predict Readiness for Discharge Time in Ambulatory Surgery Patients? (A056) ASA Annual Meeting, Washington DC, Oct 2012

140. Susan Dabu-Bondoc, MD, Gourg Atteya, MD, Sarah Anne Bondoc, **Kirk Shelley, MD, PhD** and Feng Dai, PhD. Postoperative Antiemetic and Analgesic requirements in Patients undergoing Minimally Invasive Parathyroidectomy under MAC anesthesia. PGA Annual Meeting, NYC, NY (2012)

141. Aymen Alian MD, Gourg Atteya MD, Thomas Golembeski MD, Tal Levy MD, Jill Arthur MD, **Kirk Shelley MD, PhD**. Tracking intravascular volume changes in children during spinal fusion surgery utilizing frequency analysis of plethysmographic waveforms. STA Annual meeting, Phoenix Arizona Jan (2013)

142. Charles A. Odonkor, BSc, MA; Robert B. Schonberger, MD; Feng Dai, PhD; **Kirk H. Shelley, MD, PhD**; David G. Silverman, MD; Paul G. Barash, MD. WALK THIS WAY: UTILITY OF A MOBILITY-PERFORMANCE TEST IN A PREDICTION MODEL OF AMBULATORY SURGICAL OUTCOMES. AAP Annual Meeting, New Orleans, LA, March 2013.

143. Gourg Atteya, Nishanthi Kandiah, Thomas Golembeski, **Kirk Shelley**, Aymen A. Alian. Frequency analysis of plethysmographic and arterial waveforms during spinal fusion surgery; a novel method of assessment of intravascular blood volume .SPA annual meeting. Red Rock Resort, Las Vegas, NV, Abstract ID: 121116183150417-487 March (2013)

144. Aymen A. Alian, Nyasha George, Gourg Atteya, **Kirk H. Shelley**. Assessment of intravascular volume status in spontaneously breathing patients utilizing photoplethysmographic (PPG) induced respiratory variability. 5AAAC (5th All Africa Anesthesia Conference), Egypt (poster presentation abstract #23) April (2013)

145. Gourg Atteya, Nishanthi Kandiah, **Kirk Shelley**, Aymen A. Alian. Plethysmographic and arterial waveform analysis during spinal fusion surgery using frequency analysis as a method of detecting changes in intravascular volume status. 5AAAC (5th All Africa Anesthesia Conference), Egypt (oral presentation) April (2013)

146. Gourg Atteya, Nishanthi Kandiah, Thomas Golembeski, Brian Smith, **Kirk Shelley**, Aymen A. Alian. Plethysmographic and arterial waveform analysis during spinal fusion surgery using frequency analysis as a method of detecting changes in pre-load (venous) volume status. 6th Triennial Congress of the International Federation of Paediatric Orthopaedic Societies , Toronto, Ontario, Canada. May (2013)

147. Gourg Atteya, Nishanthi Kandiah, Thomas Golembeski, Brian Smith, **Kirk Shelley**, Aymen A. Alian. Tracking Intravascular Volume Changes in Children during Spinal Fusion Surgery Using Frequency Analysis of Dynamic Plethysmographic Waveforms. Scoliosis Research Society (SRS), 20th International Meeting on Advanced Spine Techniques (IMAST), Vancouver, British Columbia, Canada June (2013)

148. Susan Dabu-Bondoc MD, Roberta Hines, MD, **Kirk Shelley, MD PhD**, Gail Watrous, RN, Xiangyu Cong PhD, Tianzhou Ma MS, Li Qin PhD, Feng Dai PhD. Complications in the Postanesthesia Care Unit: Then and Beyond. (A4206) ASA Annual Meeting, San Francisco, CA Oct 2013

149. Susan Dabu-Bondoc MD, Feng Dai PhD, Gail Watrous RN, Li Qin PhD, Xiangyu Cong PhD, Tianzhou Ma MS, **Kirk Shelley MD**, Roberta Hines MD. Cardiovascular events: Still constitute a major proportion of complications in the Postanesthesia Care Unit. (A3034) ASA Annual Meeting, San Francisco, CA Oct 2013

150. I-Hsun Liang, M.D., Siqin Nie, M.D., Samrawit Goshu, M.D., Aymen Alian, M.D., **Kirk Shelley, M.D.,Ph.D.,** David G. Silverman, M.D. Can We Estimate Blood Volume With a Plethysmograph? Eliminating Background, Reducing Impact of Attenuation (A2214) ASA Annual Meeting, San Francisco, CA Oct 2013

151. I-Hsun Liang, M.D., Siqin Nie, M.D., Nina Stachenfeld, Ph.D., **Kirk Shelley, M.D.,Ph.D.,** Aymen Alian, M.D., David G. Silverman, M. Can Photoplethysmography Approximate Simulated Blood Loss During Lower Body Negative Pressure? (A3101) ASA Annual Meeting, San Francisco, CA Oct 2013

152. Brian G. Smith, MD FAAP, Gourg Atteya, MD, Thomas Golembeski, MD, Tal Levy, MD, Jill Arthur, MD, **Kirk Shelley, MD PhD** and Aymen Alian, MD. Tracking Intravascular Volume Changes In Children During Spinal Fusion Surgery Utilizing Frequency Analysis Of Plethysmographic Waveforms (Abstract ID# 20082) American Academy of Pediatrics National Conference Orlando, FL Oct 2013

153. Vicki Bing, B.S., I-Hsun Liang, M.D., Siqin Nie, M.D., Aymen Alian, M.D., **Kirk Shelley, M.D., Ph.D**., Nina Stachenfeld, Ph.D., David G. Silverman, M.D. Monitoring Arterial And Venous Volume Response To Release of Lower Body Negative Pressure (LBNP) Using Photoplethysmograph (PPG). Society for Technology in Anesthesia (STA) Annual Meeting, Orlando FL, January, 2014

154. Siqin Nie, MD, I-Hsun Liang, MD, Feng Dai, Ph.D, Nick Florio, BS, Vicki Bing, BS, **Kirk H. Shelley, MD/Ph.D**, Aymen Alian, MD, David G. Silverman, MD. Optimizing Measurement of The AC Component (Height) of the Photoplethysmographic (PPG) Signal. Society for Technology in Anesthesia (STA) Annual Meeting, Orlando FL, January, 2014

155. Siqin Nie, M.D., Nina Stachenfeld, Ph.D., Aymen Alian, M.D., **Kirk Shelley, M.D., Ph.D.,** David G. Silverman, M.D. Autocentering The PPG Waveform: Is It Worth The Price? Society for Technology in Anesthesia (STA) Annual Meeting, Orlando FL, January, 2014

156. I-Hsun Liang, M.D., Siqin Nie, M.D. , Samrawit Goshu, M.D., Saeeda Qadri, M.D. , Nina Stachenfeld, Ph.D. , Aymen Alian, M.D., **Kirk Shelley, M.D., Ph.D.** Integrated Monitoring of Arterial And Venous Components of Plethysmographic Signals. Society for Technology in Anesthesia (STA) Annual Meeting, Orlando FL, January, 2014

157. Aymen Alian MD, Adam J Shelley MS, Lee Hingula MD, Lila Baaklini MD,David G Silverman, MD, **Kirk H Shelley MD, PhD**. Impact of Incentive Spirometry (IS) Breathing on Infra Red Finger Photoplethysmographic (IR-PPG) Waveform Provided by the Sentec Digital Monitor. Society for Technology in Anesthesia (STA) Annual Meeting, Orlando FL, January, 2014

158. I-Hsun Liang, MD, Siqin Nie MD, Lee Hingula MD, Adam J Shelley MS, David G Silverman, MD, **Kirk H Shelley MD, PhD**, Aymen A Alian MD. Impact of Different Breathing Patterns on Peripheral Venous Pressure (PVP). Society for Technology in Anesthesia (STA) Annual Meeting, Orlando FL, January, 2014

159. Lee Hingula, MD, Siqin Nie, MD, Lila Baaklini MD, Adam J Shelley MS, **Kirk H Shelley, MD, PhD**, Aymen A Alian, MD. Impact of Different Breathing Patterns on Finger Photoplethysmographic (PPG) Parameters. Society for Technology in Anesthesia (STA) Annual Meeting, Orlando FL, January, 2014

160. Terence Rafferty, MD, Reim Alian, **Kirk Shelley, MD, PhD** and Aymen Alian, MD. Impact of Hydrostatic Pressure on Peripheral Venous Pressure Measurements. Society for Technology in Anesthesia (STA) Annual Meeting, Orlando FL, January, 2014

161. Aymen A Alian, Adam J Shelley, Lee Hingula, David G Silverman, **Kirk H Shelley**: Analysis of the modulation of the IR finger photoplethysmographic waveform by incentive spirometry. (A4020) American Society of Anesthesiologists (ASA) New Orleans, LA October 2014

162. Aymen A Alian, Lee Hingula, Adam J Shelley**, Kirk H Shelley**, David G Silverman : Analysis of Muller, Valsalva and Incentive spirometry breathing patterns on peripheral venous pressure. (A3243) American Society of Anesthesiologists (ASA) New Orleans, LA October 2014

163. Lee Hingula, Adam J Shelley, **Kirk H Shelley**, David G Silverman, Aymen A Alian: Analysis of Muller, Valsalva and Incentive spirometry breathing patterns on finger photoplethysmographic (PPG) waveform. (A3282) American Society of Anesthesiologists (ASA) New Orleans, LA October 2014

164. Siqin Nie, M.D., I-Hsun Liang, M.D., Nina Stachenfeld, Ph.D., Aymen A. Alian, M.B.,B.Ch., M.D., **Kirk H. Shelley, M.D., Ph.D.,** David G. Silverman, M.D: The Cost of Autocentering the PPG Waveform: Is It Worth The Price? (A4114) American Society of Anesthesiologists (ASA) New Orleans, LA October 2014

165. Siqin Nie, M.D., I-Hsun Liang, M.D., Feng Dai, Ph.D., Nick Florio, B.S., Vicki Z. Bing, B.S., **Kirk H. Shelley, M.D., Ph.D.,** Aymen A. Alian, M.B.,B.Ch., M.D., David G. Silverman, M.D: Measuring the AC Component (Height) of the Photoplethysmographic Signal. (A4262) American Society of Anesthesiologists (ASA) New Orleans, LA October 2014

166. Vicki Zhu Jun Bing, B.S., I-Hsun Liang, M.D., Siqin Nie, M.D., Aymen A. Alian, M.B.,B.Ch., M.D., **Kirk H. Shelley, M.D., Ph.D.,** Nina Stachenfeld, Ph.D., David G. Silverman, M.D.: Photoplethysmographic Delineation of Arterial and Venous Volume Responses to Release of Lower Body Negative Pressure (LBNP). (A3241) American Society of Anesthesiologists (ASA) New Orleans, LA October 2014

167. I-Hsun Liang, M.D., Siqin Nie, M.D., Samrawit A. Goshu, M.D., Saeeda Qadri, M.D., Nina Stachenfeld, Ph.D., Aymen A. Alian, M.B.,B.Ch., M.D., **Kirk H. Shelley, M.D.,** Ph.D., David G. Silverman, M.D.: Distinguishing Arterial And Venous Components of Plethysmographic Signals. (A2102) American Society of Anesthesiologists (ASA) New Orleans, LA October 2014

168. Mueez Qureshi, B.S., Zingg Tobias M.D., **Kirk Shelley M.D. Ph.D.,** and Aymen Alian M.D.: Effect of Pneumoperitoneum During Laparoscopic Surgery on Plethysmographic and Peripheral Venous Pressure Waveforms. (A7) Society for Technology in Anesthesia (STA) Annual Meeting, Tucson AZ, January, 2015

169. Terence Rafferty, MD, MBA, **Kirk Shelley, MD, PhD**, Aymen Alian, MD: Pulse Oximetry-Derived Left Ventricular Function Data Sets. (A23) Society for Technology in Anesthesia (STA) Annual Meeting, Tucson AZ, January, 2015

170. David G. Silverman, M.D.,I-Hsun Liang, M.D., Aymen Alian, M.D., **Kirk Shelley, M.D., Ph.D.,** and Nina Stachenfeld, Ph.D. Normalizing PPG Signals to the AC Component – Applications for Monitoring Volume Loss. (A24) Society for Technology in Anesthesia (STA) Annual Meeting, Tucson AZ, January, 2015

171. Matthew Mikhail, **Kirk Shelley** and Aymen Alian.: Temporal, Amplitude and Complexity Comparison of the Photoplethysmographic Waveforms from Commercial Pulse Oximeters. IAMPOV, Tokyo Japan, October 2015 awarded an *Honorable Mention *.

172. Terence Rafferty, MD, MBA, **Kirk Shelley, MD, PhD**, Aymen Alian, MD. Impact of Surgical Stimulation and Vasodilators on Pulse Oximetry Derived Left Ventricular Function Data Sets. (A4) Society for Technology in Anesthesia (STA) Annual Meeting, Palm Beach, FL, January 2016

173. Alian, A.A. and **Shelley, K.,** 2016, May. PULSE OXIMETER USE BEYOND SATURATION DETERMINATION: PPG AUGMENTED INDEX & ARTERIAL COMPLIANCE. Society for Technology in Anesthesia (STA) Annual Meeting, Palm Beach, FL, January 2016

174. Aymen Alian, MD, **Kirk Shelley, MD, PhD**; Comparison of Different Methods of Frequency Analysis of the Clinical Waveforms. (A5) Society for Technology in Anesthesia (STA) Annual Meeting, Palm Beach, FL, January 2016

175. Qureshi, M., **Shelley, K.** and Alian, A.. Effect of Pneumoperitoneum During Laparoscopic Surgery on Plethysmographic and Peripheral Venous Pressure Waveforms. Society for Technology in Anesthesia (STA) Annual Meeting, Palm Beach, FL, January 2016

176. Silverman, D.G., Liang, I., Alian, A., **Shelley, K**. and Stachenfeld, N., May. Normalizing PPG Signals to the AC Component-Applications for Monitoring Volume Loss. Society for Technology in Anesthesia (STA) Annual Meeting, Palm Beach, FL, January 2016

177. Aymen A. Alian, MD, **Kirk H. Shelley, MD PhD.** Ventilation induced modulation of pulse oximeter waveforms: a method for the assessment of early changes in intravascular volume during spinal fusion surgery in pediatric patients. 9th Dubai Anaesthesia, Dubai UAE March 2016

178. Aymen A Alian, MD, **Kirk H Shelley MD, PhD.** Pulse Oximeter beyond Saturation: PPG Augmented Index and Arterial Compliance. IARS, San Francisco, USA May 2016

179. Tiantian Shi, Christopher Choi, Mahmoud Ahmed, **Kirk H. Shelley**, David G. Silverman, Aymen A. Alian. (A4002) Comparison of Plethysmographic Augmented Index at Finger and Forehead, American Society of Anesthesiologists (ASA) Chicago, Il October 2016

180. Tiantian Shi, Christopher Choi, Mahmoud Ahmed, **Kirk H. Shelley**, David G. Silverman, Aymen A. Alian. A New Noninvasive Tool for Assessment of Mild to Moderate Hypovolemia. (A2139) American Society of Anesthesiologists (ASA) Chicago, Il October 2016

181. Tiantian Shi, Christopher Choi, **Kirk H Shelley**, David G Silverman, Aymen A Alian. Augmented Index of Finger Pulse Oximeter During Mild Hypovolemia. Anesth & Analg (Vol. 124, pp. 117-118) Society for Technology in Anesthesia (STA) Annual Meeting, San Diego, California, January 2017

182. Shi, T., **Shelley, K.H.,** Silverman, D.G. and Alian, A.A., May. Effect of Phenylephrine on PPG Augmented Index and Local Vascular Compliance. Anesth & Analg (Vol. 124, pp. 119-121). Society for Technology in Anesthesia (STA) Annual Meeting, San Diego, California, January 2017

183. Choi, C., Alian, A. and **Shelley, K.**, 2017, May. Visibility of Pulse Pressure Variability in Spontaneously Breathing Patients. Anesth & Analg (Vol. 124, pp. 28-29). Society for Technology in Anesthesia (STA) Annual Meeting, San Diego, California, January 2017

184. Shi, T., **Shelley, K.H**. and Alian, A.A., 2017, May. The Effect of Phenylephrine on Peripheral Pressure Volume Loops. Anesth & Analg (Vol. 124, pp. 122-123). Society for Technology in Anesthesia (STA) Annual Meeting, San Diego, California, January 2017

185. Choi, C., **Shelley, K.** and Alian, A., 2017, May. The Use of Incentive Spirometry to Reveal Pulse Pressure and Systolic Pressure Variability in Spontaneously Breathing Patients. Anesth & Analg (Vol. 124, pp. 227-228). Society for Technology in Anesthesia (STA) Annual Meeting, San Diego, California, January 2017

186. Hesham Ezz, M.B.,Ch.B., Nadeem Elbetebsi, M.B.,Ch.B., Sophisa Sophonphatana, M.D., **Kirk Shelley**, M.D., PhD., Aymen A. Alian, M.D. Cerebral and Somatic Oxygenation (Nonin SenSmart OEM) During the Lower Body Negative Pressure. (A4056) ASA Annual Meeting, Chicago, Illinois October 2017

187. Abdubadie K., Nadeem E., Ezz H., Sophonphatana S, **Shelley K.H**., Alian A.A. The feasibility of utilizing tissue oximetry to assess the endothelial dysfunction-Pilot study. 71 Post Graduate Assembly in Anesthesiology. PGA, NY 2017

188. Jose G., Ezz H., Sophonphatana S., Nadeem E., Khaled J., **Shelley K.H**., Alian A. Can we use peripheral venous pressure (PVP) variability during leg raise test to predict hypovolemia during Lower body negative pressure? 71 Post Graduate Assembly in Anesthesiology. PGA, NY 2017

189. Ezz H., Chavez J., Sophonphatana S., Nadeem E., Heerdt P.M., **Shelley K.H.**, Alian A. Percent change of stroke volume during passive leg raise (PLR) test as a predictor of tolerance to hypovolemia during Lower body negative pressure. 71 Post Graduate Assembly in Anesthesiology. PGA, NY 2017

190. Elbetebsi N., Kutubi A., Ezz H., Sophonphattana S., **Shelley K.H.**, Alian A: Pilot Study: "An assessment of the endothelial function utilizing finger pulse oximetry (PPG) waveform". 71 Post Graduate Assembly in Anesthesiology. PGA 2017

191. Khaled J., Gabriel J., Ezz H., Nadeem E., Sophonphatana S., **Shelley K.H**., Alian A. Hemodynamic and finger PPG width changes during lower body negative pressure. 71 Post Graduate Assembly in Anesthesiology. PGA 2017

192. Sophonphatana S., Jose G., Ezz H., Nadeem E., Khaled J., **Shelley K.H**., Alian A. Is it necessary to correct for heart rate when we are discussing PPG width during hypovolemia? 71st Post Graduate Assembly in Anesthesiology. PGA 2017

193. Aymen Alian, Hesham Ezz, Jose Chavez, Nadeem Elbetebsi , Sophisa Sophonphattana, **Kirk Shelley**, Passive leg raise (PLR) test as a predictor of tolerance of lower body negative pressure (LBNP). Society for Technology in Anesthesia (STA) Annual Meeting, Turnberry Isle, Miami, January 2018

194. Alian Aymen, Ezz Hesham, Chavez Jose, Kutubi Abdubadie, **Shelley Kirk**. Study of the Finger PPG Width During Lower Body Negative Pressure. Society for Technology in Anesthesia (STA) Annual Meeting, Turnberry Isle, Miami, January 2018

195. Alian Aymen, Choi Christopher, Ezz Hesham, Elbetebsi Nadeem, **Shelley Kirk**. Cerebral vs Somatic Oxygenation as an Early Detector of Hypovolemia. Society for Technology in Anesthesia (STA) Annual Meeting, Turnberry Isle, Miami, January 2018

196. Elbetebsi Nadeem, Kutubi Abdubadie, Alian Aymen, **Shelley Kirk**. Pilot Study: Utilizing Finger Pulse Oximetry Waveform for Evaluating Endothelial Function. Society for Technology in Anesthesia (STA) Annual Meeting, Turnberry Isle, Miami, January 2018

197. Alian Aymen, Choi Christopher, Ezz Hesham, Elbetebsi Nadeem, Shelley Kirk. Cerebral vs Somatic Oxygenation as an Early Detector of Hypovolemia. Society for Technology in Anesthesia (STA) Annual Meeting, Turnberry Isle, Miami, January 2018

198. Abdullah Yassin Elsayed, Mona Ganash, Mai Khairy Elshafey, Samar Seleem, Somaia Mohamed, Aymen Alian and **Kirk Shelley.** Impact of Preload Changes on Peripheral Venous Pressure (PVP), Stroke Volume (SV) and Thoracic Fluid Content (TFC) in Healthy Volunteers ANESTHESIA AND ANALGESIA 128, 5-6 2018

199. A Alian, C Choi, H Ezz, N Elbetebsi, **K Shelley**. Cerebral vs Somatic Oxygenation as an Early Detector of Hypovolemia ANESTHESIA AND ANALGESIA 127, 22-22 2018

200. A Alian, H Ezz, J Chavez, N Elbetebsi, S Sophonphattana, **K Shelley**. Passive Leg Raise (PLR) Test as a Predictor of Tolerence to Lower Body Negative Pressure (LBNP) ANESTHESIA AND ANALGESIA 127, 17-18 2018

201. N Elbetebsi, A Kutubi, A Alian, **K Shelley**. Pilot Study: Utilizing Finger Pulse Oximetry Waveform for Evaluating Endothelial Function ANESTHESIA AND ANALGESIA 127, 15-16 2018

202. A Alian, H Ezz, J Gabriel, A Kutubi, **K Shelley**. Study of the Finger PPG Width During Lower Body Negative Pressure ANESTHESIA AND ANALGESIA 127, 19-21 2018

203. Samar Seleem, Somaia Mohamed, Aymen Alian, **Kirk Shelley**. Impact of Preload Changes on Peripheral Venous Pressure (PVP), Stroke Volume (SV) and Thoracic Fluid Content (TFC) in Healthy Volunteers Am J Physiol Heart Circ Physiol 36 (11), 1875-81 2019

204. AM Eid, M Elgamal, M Eid, A Alian, **K Shelley.** Use of Continuous Noninvasive Arterial Pressure Cycle Duration to Predict Hypovolemia in Low Body Negative Pressure. Society for Technology in Anesthesia (STA) Annual Meeting, Scottsdale, Arizona 2019

205. M Elgamal, A Yang, M Eid, A Eid, AA Alian, **K Shelley**. Study of Nasal Pulse Oximeter Amplitude During LBNP Induced Hypovolemia. Society for Technology in Anesthesia (STA) Annual Meeting, Scottsdale, Arizona 2019

206. M Eid, M Elgamal, A Eid, AA Alian, **K Shelley**. Nasal Pulse Oximeter: New Site for Monitoring Central Blood Volume During LBNP Induced Hypovolemia. Society for Technology in Anesthesia (STA) Annual Meeting, Scottsdale, Arizona 2019

207. **Kirk Shelley**, Mona Ganash, Abdullah Yassin Elsayed, Mai Khairy Elshafey, Somaia Mohamed, Samar Seleem, Aymen Alian. Cerebral and Somatic Tissue Oximetry During Different Physiologic Challenges. Society for Technology in Anesthesia (STA) Annual Meeting, Scottsdale, Arizona 2019

208. Anna-Maria E Eid, Aymen Alian, **Kirk Shelley**, Mohamed Elgamal, Mohamed Eid. Different Responses of Healthy Humans Subjected to Lower Body Negative after Induced Hypovolemia Noninvasive Arterial Pressure Cycle Duration and Heart Rate. Society for Technology in Anesthesia (STA) Annual Meeting, Scottsdale, Arizona 2019

209. A. Ibrahim, M. ElGamal, A. Eid, **K. Shelley**, A. Alian. Assessment of Volume Status in Spontaneously Breathing Patients. Society for Technology in Anesthesia (STA) Annual Meeting, Austin, Texas 2020

210. M Elgamal, AM Eid, A Ibrahim, K Tran, A Alian, **K Shelley**. Utilization of HRV to Detect Impending Shock. Society for Technology in Anesthesia (STA) Annual Meeting, Austin, Texas 2020

211. K Tran, FH Netter, AM Eid, A Ibrahim, **K Shelley**, A Alian. Tracking Intravascular Volume Using Frequency Analysis of Peripheral Venous Pressure Waveforms. Society for Technology in Anesthesia (STA) Annual Meeting, Austin, Texas 2020

212. E Nagourney, AM Eid, K Tran, A Ibrahim, M Elgamal, **K Shelley**, A Alian. Monitoring Changes in Photoplethysmography During Lower Body Negative Pressure Induced Hypovolemia: Differences by Site and Sex. Society for Technology in Anesthesia (STA) Annual Meeting, Austin, Texas 2020

213. Abubakr El Sobky, Mohamed Y Elgamal, Ahmad Ibrahim, Kirk Shelley, Aymen Alian. Detection of blood volume changes utilizing Peripheral Venous Pressure (PVP) waveform analysis. Anesthesia & Analgesia 132 (5 S-Suppl) 179-180 Society for Technology in Anesthesia (STA) Annual Meeting, Virtual via Zoom 2021

Chapters:

214. **Shelley, Kirk** and Hensley, Frederick. Perioperative Blood Loss *in* Blood: Hemostasis, Transfusion, and Alternatives in the Perioperative Period edited by Carol L. Lake, M.D. and Roger A. Moore, M.D., Raven Press, New York, (1995)

215. **Shelley, Kirk** and Shelley, Stacey. Pulse Oximeter Waveform: Photoelectric Plethysmography *in*: Clinical Monitoring edited by Carol Lake, Roberta Hines and Casey Blitt., W.B. Saunders Company, Philadelphia (2001)

216. **Shelley, Kirk**, Shelley, Stacey and Bell, Charlotte. Monitoring in Unusual Environments *in*: Clinical Monitoring edited by Carol Lake, Roberta Hines and Casey Blitt., W.B. Saunders Company, Philadelphia (2001)

217. Aymen Alian and **Kirk Shelley**. Pulse oximeter waveform: Photoplethysmography *in:* Physiological Monitoring in the Critical Care Setting (Monitorage des Paramètres Physiologiques en Situation critique) edited by Cannesson M & Lehot JJ, Arnette, Paris (2012)

218. Rongjie Jiang and **Kirk Shelley**. Uremia *in:* The 5-Minute Anesthesia Consult edited by Nina Singh-Radcliff, Lippincott Williams & Wilkins, Philadelphia (2012)

219. Aymen Alian and **Kirk Shelley**. Photoplethysmography: Analysis of the Pulse Oximeter Waveform *in:* Monitoring Technologies in Acute Care Environments edited by Jesse Ehrenfeld and Maxime Cannesson, Springer (2014)

220. Aymen Alian and **Kirk Shelley** PPG in Clinical Monitoring *in:* Photoplethysmography: Technology, Signal Analysis and Applications edited by Panicos Kyriacou and John Allen, Elsevier (2021)

Letters, Editorials and Commentaries:

221. Mentzer, Steven; Murray WB; and **Shelley, Kirk**. Global Department of Anesthesiology Formed. Anesthesiology 81:780, (1994).

222. Taekman, Jeffrey; Kingsley, Charles, **Shelley, Kirk** and Mentzer, Steven. The Penn State Anesthesia Electronic Case Conference. Anesthesiology 83, 887-888, (1995)

223. **Shelley KH**: Survey of Anesthesiology 1998;42(3):168. (Commentary on Trivedi NS, Ghouri AF, Shah NK, et al: Effects of motion, ambient light, and hypoperfusion on pulse oximeter function. J. Clin. Anesth., 1997; 9: 179-183)

224. **Shelley KH**: Survey of Anesthesiology 1998;42(3):169. (Commentary on Trivedi NS, Ghouri AF, Shah NK, et al: Pulse oximeter performance during desaturation and resaturation: A comparison of seven models. J. Clin. Anesth., 1997; 9: 184-188

225. **Shelley KH**: Survey of Anesthesiology 1999;43(2):111. (Commentary on Gaba DM, Howard SK, Flanagan B, et al: Assessment of clinical performance during simulated crises using both technical and behavioral ratings. Anesthesiology, 1998; 89: 8-18)

226. **Shelley KH**: Survey of Anesthesiology 1999;43(2):112. (Commentary on Devitt JH, Kurrek MM, Cohen MM, et al: Testing internal consistency and construct validity during evaluation of

performance in a patient simulator. Anesth. Analg., 1998; 86: 1160-1164)

227. **Kirk Shelley**: Anesthesiology News 26(4): p1 (2004) (Commentary on Douglas E: Quest for Depth-of-Anesthesia Monitor Takes a Major Twist.)

228. **Kirk Shelley**; Sometimes a Bit of Regulation Can Be a Good Thing…(Editorial) Journal of Clinical Anesthesia, 16(2): p81-82, (2004).

229. **Kirk Shelley**: Anesthesiology News 30(9): p1 (2004) (Commentary on Douglas E: Anesthesiologists Respond More Quickly to New Graphic Display.)

230. **Kirk Shelley** Anesthesiology News 31(3) : (2005) (Commentary on Vlessides, M.: In a Small Randomized Study ... Patients Relaxed, Satisfied With DVD Diversion During Surgery.)

231. **Kirk Shelley** Anesthesiology News 31(5) : (2005) (Commentary on Pembrook, L.: According to Investigators in New Zealand ... New Noninvasive Device Can Assess Arterial Tone in ICU.)

232. **Kirk Shelley**: Anesthesiology News 31(6): p6 (2005) (Commentary on Douglas E: Vibro-Tactile Alarm Frees Clinician To Focus Directly on Patient.)

233. Keith Ruskin and **Kirk Shelley**; Patent Medicine and The "Black Box (Editorial) Anesth Analg 100:743-7 (2005)

234. **Kirk Shelley**: Anesthesiology News 31(7): p58-59 (2005) (Commentary on Douglas E: Validation Studies Compare Three Sedation Monitors.)

235. **Kirk Shelley**: Anesthesiology News 31(9): p50-51 (2005) (Commentary on Douglas E: Transtracheal Pulse Oximetry Device may Advance Monitoring.)

236. **Kirk Shelley**: Anesthesiology News 31(9): 7 (2005) (Commentary on Douglas E: Rating and Acceptance of Scientific Abstracts are Highly Variable.)

237. **Kirk Shelley**: Anesthesiology News 31(10): p24-27 (2005) (Commentary on Pembrook L: Pulse Oximetry can Identify Obstructive Sleep Apnea.)

238. **Kirk Shelley**: Anesthesiology News 31(10): p16-19 (2005) (Commentary on Vlessides M: Device Displays 3-Dimensional Color Image of Heart Sounds.)

239. **Kirk Shelley**: Anesthesiology News 32(6): p41-43 (2006) (Commentary on Douglas E: "Intelligent" System Could Automate Anesthesia Administration.)

240. **Kirk Shelley**: Anesthesiology News 33(1): 1,30-31 (2007) (Commentary on Douglas E: Novel Respiratory Sensor May Find Wide Use in Hospitals..)

241. **Shelley, K.H.,** Jablonka, D.H., Awad, A.A., Stout, R.G., Rezkanna, H., Silverman, D.G. Using pulse oximetry waveform analysis to guide fluid therapy: Are we there yet? Anesthesia and Analgesia, 104 (6), pp. 1607-1609. (2007)

242. **Shelley, K.H.** Is the automation of anesthesia possible or even desirable? (Editorial) Current Opinion in Anaesthesiology 21(6), p 748-749 (2008)

243. Aymen A. Alian, MD, **Kirk H. Shelley**, MD PHD. Review of Understanding Anesthesia Equipment book. 5th ed. by Dorsch JA, Dorsch SE. Anesthesiology 109 (4); 754-755, 2008.

244. Maxime Cannesson, Aymen A. Alian, MD, **Kirk H. Shelley**, MD PHD Oscillations in the Plethysmographic Waveform Amplitude: Phenomenon Hides Behind Artifacts. Anesthesiology 111(1); pp. 206-207, (2009).

245. James Szocik and **Kirk Shelley**. Ethics, CME, Industry and Anesthesia (Editorial) Current Opinion in Anaesthesiology 22, (6); pp. 755-756 (2009)

246. **Kirk Shelley**: Anesthesiology News 36(5): p1&26 (2010) (Commentary on Marcus A: Difficult Airway? It's as Plain as the Nose….)

247. James Szocik and **Kirk Shelley**. Conflict of Interest and the Academic Innovator (Editorial) Association of University Anesthesiologists Newsletter (Spring 2011)

248. **Kirk Shelley**: Anesthesiology News 37(4): p22 (2011) (Commentary on Marcus A: Gaming Unit Could Help Prevent Post-procedure Falls.)

249. **Kirk Shelley**; Noninvasive Hemodynamic Monitoring; ASA Newsletter September 2011

250. **Kirk Shelley**; Is Automation of Anesthesia Inevitable? (Editorial) Association of University Anesthesiologists Newsletter pp 8-11 (Fall 2011)

251. **Kirk Shelley**: Anesthesiology News 38(2): (2012) (Commentary on John Dillion: Seeing the (Green) Light In the OR.)

252. **Kirk H. Shelley** M.D, Ph.D., Aymen A. Alian M.D., Adam J. Shelley M.S. The role of the photoplethysmographic waveform in the care of high risk surgical patients. Anesthesiology 118 (6), p 1479-1480 (2013)

253. **Shelley, K.** and M. Cannesson "Off-Label" Use of Clinical Monitors: What Happens When New Physiologic Understanding Meets State-of-the-Art Technology." (Editorial) Anesth & Analg 119(6): 1241-1242. (2014).

254. **Kirk Shelley**: Health Leaders: March p 64-67 (2015) (Commentary on Tinker Ready: Automation and Anesthesia.)

255. **Shelley, Kirk** and Barker, Steve " Disclosures, what is necessary and sufficient?." (Editorial) Anesth & Analg 122(20): pg.309-308 (2016).

256. Philip E Bickler, Maxime Cannesson, **Kirk H Shelley** Trends and Challenges in Clinical Monitoring: Papers From the 2015 IAMPOV Symposium. (Editorial) Anesth & Analg 124(1) pg.2-3 (2017)

257. **Kirk Shelley** The Ratio of Ratios and the Nobel Prize *in* Tribute to Dr. Takuo Aoyagi, Inventor of the Pulse Oximetry. Journal of Anesthesia 35:672-673 (2021)

258. Kyriacou, P. A., P. H. Charlton, R. Al-Halawani and **K. H. Shelley**. "Inaccuracy of pulse oximetry with dark skin pigmentation: clinical implications and need for improvement." British Journal of Anaesthesia. Accepted available on-line (2022)

Media Coverage:

1. Pulse Oximetry Monitoring at the Forehead May Be Better. Anesthesiology News 30(10) 33-35, (2004)

2. Medical Jargon: It's Still Mostly Greek to Your Patients. Anesthesiology News 31(11) (2005)

3. Detecting Blood Loss - A simple finger-clip device is able to monitor blood loss accurately -- without the need for more invasive or expensive procedures. MIT Technology Review December 2005 <http://www.technologyreview.com/biomedicine/16019/>

4. Diving deep into a data wave to make surgery safer. Medicine@Yale 2(3): page 6 (2006) <http://www.medicineatyale.org/v2i3_may_june2006/datawave.html>

5. Virtual Medical Conferences Would Allow "Attendees" to Stay at Home. Anesthesiology News 32(6): page 1 (2006)

6. Anesthesiologist finds a new way to manage blood loss in the operating room. Yale Medicine page 9 Autumn (2006) http://yalemedicine.yale.edu/ym_au06/rounds.html

7. Q&A With STA President Kirk Shelley, MD, PhD. Anesthesiology News 37(5): page 14 (2011)

8. Ask The Experts (OpenAnesthesia.org : IARS:PodCast) - June 2011 - Kirk Shelley Released May 30, 2011 Non-invasive clinical monitoring http://openanesthesia.org/index.php?title=Audio/Video#June_2011:__Non-invasive_clinical_monitoring

9. Panel Looks Forward to Role of Automation in Anesthesia. Anesthesiology News 38 (7) July 2012

Patents:

METHOD OF ASSESSING BLOOD VOLUME USING PHOTOELECTRIC PLETHYSMOGRAPHY – PCT WO 2004/080300 filed 1/2/04; issued 10/24/11; US patent: US 2007/0032732 A1; US patent: US 2010/0016739 A1; issued: 8/28/12 EP Patent 1,601,287 B1 US Patent 8,251,912; issued 12/19/2012
Kirk H. Shelley, Adam J. Shelley, David G. Silverman, and Bob G. Stout

VOLUME STATUS MONITOR; PERIPHEAL VENOUS PRESSURE, HYPERVOLEMIA AND COHERENCE ANALYSIS – PCT WO 2010/045556 filed 8/16/09; US 2010/0191128 A1, US Patent 8,727, 997; issued 5/20/2014
Kirk Shelley, David Silverman and Adam Shelley

SYSTEMS AND METHODS UTILIZING PLETHYSMOGRAPHIC DATA FOR DISTINGUISHING ARTERIAL AND VENOUS SATURATIONS – PCT filed June 15, 2010, US Patent Application No: 2012/0150,002
Kirk Shelley, David Silverman and Zachary Walton

APPARATUS, SYSTEMS AND METHODS ANALYZING PRESSURE AND VOLUME WAVEFORMS IN THE VASCULATURE – Filing date: 7/12/2011 US20130184594, WO2012009350A1, WO2012009350A9, EP 2593000 A1
Kirk Shelley, and David Silverman

Scientific founder of CardioPhotonics LLC (Yale Start-Up) – Bethany, CT 2009

Scientific Exhibits:

Manned and presented a scientific exhibit "The Use of Interactive Multimedia Displays in Anesthesia" by **Shelley, Kirk**; Schneider, Arthur; Mentzer, Steven and Halm, Michael at American Society of Anesthesiologists meeting. Washington, DC, October 1993. Awarded First Place Prize from the Anesthesia Safety Foundation.

Mentzer S, Murray WB, Schneider AJL, Marshall WK, **Shelley KH**, Taekman J, Vaduva S, Foster PA and Roeckel M. "Implementation of Cognitive Science in Anesthesiology Education and Training". This exhibit won the First Prize for the Best Scientific Exhibit at the meeting at the American Society of Anesthesiologists meeting. San Francisco, CA, October 1994.

Speaking Engagements & Visiting Professorships:

Hosted a one day symposium on using technology in medical education "Teaching and Learning with Technology" in conjunction with The Center for Academic Computing at University Park. Hershey Medical Center. June 8, 1993.

Invited speaker to School of Business on the topic of "Multimedia meets Medicine" University Park, PA November 23, 1993.

Presented at Technology Classroom Showcase: "New Tools of the Trade" sponsored by The Center for Information Technology. Hershey Medical Center. January 25, 1994.

Invited speaker to the Society for Academic Emergency Medicine Annual Meeting on the topic of "Computer Aided Instruction" Washington, D.C. May 12 1994.

Visiting Professor to University of Rochester; presenting on "Multimedia Displays", Rochester NY May 18-19 1994.

Invited presenter at "Robotic Surgery Conference" on Plethysmograph Technology . Hershey Medical Center. March 25, 1995

Supervised a role-acting interactive consent workshop as a part of a department education retreat that was developed by the candidate to teach the techniques of difficult patient-physician communication. Jan, 6, 1996

Invited presenter at Society for Technology in Anesthesia Panel on Information Management Technology. American Society of Anesthesiologists. Oct 21, 1998

Invited presenter on Internet Communication Technology at the Society for Technology in Anesthesia. Jan 22nd, 1999

Organized and supervised a three-day human simulation course. This course involved the training of residents using computer simulation technology. For the duration of the departmental library was converted into a mock operating room for training purposes. Yale July 1999

Chaired the research presentations at the Society for Technology in Anesthesia annual meetings. Jan 2000 - 2010.

Invited presenter of an award winning abstract at the Society for Technology in Anesthesia. Jan 2001.

Visiting Professor to Dartmouth College; Hanover, NH. Nov, 2001.

Headed an invited technology workshop at Society of Ambulatory Anesthesia, May 2002

Presented invited lecture on "The Use of PDAs in the OR" at Society of Ambulatory Anesthesia, May 2003

Grand rounds presentation at Yale University on "Research Application of Laser Doppler & Plethysmographic Monitoring of Blood Flow" Feb 2004

Visiting Professor to Henry Ford Hospital presenting on the topic "Case studies in Pulse Oximetry".; Detroit, MI. Dec, 2005.

Program Chairman of the annual STA (Society for Technology In Anesthesia) meeting, San Diego, CA. Jan 2006

Presented invited lecture on "Analysis of the photoplethysmographic waveform: Designing the 3rd generation of pulse oximeters" as a Distinguished Speaker for the Institute for Security Technology Studies (ISTS), Dartmouth College; Hanover, NH. Feb 2006

Grand Rounds Presentation at Boston University, MA on "Ambulatory Operating Room Leadership & Management. Lessons learned…" Boston University March 2006

Organized and presented at a gathering of international plethysmographic researchers on the topic "Atlas of Pulse Oximeter Waveforms". Chicago Oct 2006

Invited presenter on "Photoplethysmography: beyond the calculation of SpO2 and pulse rate." at ISIAMOV 2007 (International Symposium on Innovations and Advancements in Monitoring Oxygenation and Ventilation), Duke University, NC. March 2007

Cardiology Grand Rounds on "Photoplethysmography: beyond the calculation of SpO2 and pulse rate." at Yale University. June 2007

Invited presenter on "What's new in Pulse Oximetry?" at Society for Computing and Technology in Anaesthesia, Royal College of Anaesthetists, London England. Nov 2007

Visiting Fellow at the Biomedical Engineering Research Group at the School of Engineering and Mathematical Sciences. Barts and The London School of Medicine, City University, London England, Nov 2007

Invited presenter on "Photoplethysmography: beyond the calculation of SpO2 and pulse rate." at Claude Bernard University, Louis Pradel Hospital, Lyon France. Nov 2007

Invited participant in an advisory panel "Brain Function Monitoring: History, Role and Relevance" New York, New York, May 2008

Plenary presenter on “Photoplethysmography: beyond the calculation of SpO2 and pulse rate.” at BIS2009 (Biosignal Interpretation Conference), Yale University, New Haven. June 2009

Moderated a “Young Researchers Workshop” panel Annual STA (Society for Technology In Anesthesia) meeting, Palms Springs, FL. Jan 2010

Ophthalmology Grand Rounds on “Anesthesia and the Elderly.” at Yale University. May 2010

Visiting Professorship at Worcester Polytechnic Institute, Worcester, MA March 2011

Visiting Fellow at the Biomedical Engineering Research Group at the School of Engineering and Mathematical Sciences. Barts and The London School of Medicine, City University, London England, April 2011

Invited presenter on “The Future of Noninvasive Cardiac Monitoring” at the IARS annual meeting, Vancouver, Canada, May 2011

Invited presenter on “Unrealized Opportunities in Photoplethysmography” at Pulse Oximetry, Anesthesia and Beyond, Vancouver, Canada, May 2011

Visiting Professorship at Cornell/ Memorial Sloan Kettering Cancer Center, NYC Jan 2012

Organized and ran a workshop on Non-Invasive Cardiovascular Workshop at the STA Annual Meeting, Palm Beach, FL Jan 2012

Invited presenter on “Transforming a Bedside Observation to a Clinical Monitor: What is the Path Forward?” at the IARS annual meeting, Boston, MA May 2012

Invited presenter on “Photoplethysmography to Detect Vascular Compliance” at the IAMPOV (Innovations and Applications of Monitoring of Perfusion, Oxygenation, and Ventilation) meeting, Yale, New Haven, CT June 2012

Invited presenter on “Venous/Arterial Compliance Ratio Calculation” at the STA (Society for Technology in Anesthesia) Annual Meeting, Phoenix, Arizona Jan 2013

Invited presenter on “Future clinical use of photoplethysmography” at the Korean Society for Anesthetic Pharmacology (KSAP) meeting, Biomedical Research Institute, Seoul National University Hospital, Seoul, Korea Feb 2013

Invited presenter on “Non-invasive Hemodynamic Monitoring: Clinical Use of Photoplethysmography” at The Second Sino-America Forum on Anesthesia meeting held at Xiang-Ya School of Medicine in Changsha, China Sept 2013

Invited presenter on “Pulse Oximeter Waveform Analysis” at Union Hospital, Tongi Medical College, Huazhong University in Beijing China Sept 2013

Visiting Professorship to Fitzpatrick Institute for Photonics, Duke University, Durham Nov 2013

Invited presenter on “Advances in Photoplethysmographic Analysis” at the STA (Society for Technology in Anesthesia) Annual Meeting, Las Vegas, Nevada Jan 2014

Visiting Fellow at the Biomedical Engineering Research Group at the School of Engineering and Mathematical Sciences, City University, London England, April - May 2014

Invited presenter on "Pulse Oximeter Waveform (PPG): Beyond oxygen saturation and heart rate determination…" at the City University, London, England, May 7, 2014

NIH Study Panel: National Institute of Biomedical Imaging and Bioengineering (NIBIB) RFA-EB-14-002, Blood Pressure Measurement Technologies for Low-Resource Settings in the US and India (U01). March 11, 2015

Invited presenter on "Pediatric fluid management using the pulse oximeter waveform (PPG)" to the Biomedical Engineering Department at the University of Connecticut, Storrs, CT , April 10, 2015

First opponent for thesis defense of Lars Øivind Høiseth titled: Assessment of Fluid Responsiveness and Volume Status Using Minimally and Noninvasive Techniques, University of Oslo, Norway, June 5, 2015

Member of the Organizing Committee for the International Symposium Innovations and Applications of Monitoring Perfusion, Oxygenation and Ventilation (IAMPOV). This is an invitation only conference occurring every 5 years: Tokyo, Japan 2015

Panel moderator of "Novel Monitoring Developments" session at IAMPOV Tokyo, Japan October 4, 2015

Keynote presentation as the 2020 J. S. Gravenstein Award for lifetime achievement at the 2020 STA Annual Meeting, January 17, 2020

Invited speaker on "Inaccuracy of Pulse Oximeters on Dark Skin Pigmentation Patients." FDA - Division of Biophysics, April 20, 2022

Educational Projects:

The Electronic Receptionist - a multimedia informational kiosk system about the faculty members in the department of anesthesia. Consisting of over 140 MB of software resources, this program has been demonstrated numerous times as an introduction to multimedia programming. Audiences have included the Penn State Board of Trustees as well as an award winning demonstration at a national anesthesia convention. 1994

Arterial Line Placement - An industry supported (Arrow International) interactive multimedia educational computer program. Using a combination of photographs, video clips and audio tracks the program teaches the history, indications and procedure of arterial line placement. 1995

Peripherally Inserted Central Venous Catheter - Part of an ongoing series of instructional computer programs designed to teach all aspects of medical device usage. Funded by Arrow International this program had contributions from four nationally recognized experts. This CD-ROM had two printings. 1996

Co-PI for evaluation of an major educational project named Pulse!!. It is a high-fidelity, virtual environment that mirrors real world clinical settings by combining modeling and simulation technology with game-based technologies. Pulse!! The Virtual Clinical Learning Lab is funded through the Office of Naval Research with an investment approaching $10 million dollars. It is being developed at Texas A&M. Yale was selected as a primary test center for this project. 2006-2008

Founded and faculty advisor for the Yale Anesthesiology Interest Group (AIG). Its purpose is to introduce and foster medical student understanding of and interest in the specialty of Anesthesiology. Though mentoring programs, informal dinners, lectures & workshops students are exposed to the many aspects of anesthesiology. The AIG endeavors to educate students about the profession of anesthesiology from a perspective that is not covered in the medical school curriculum. 2006-2010

Founded the Society of Mentors (SoM). It is designed to help departmental faculty to become more competitive on an academic level. Its mission is to educate and guide junior faculty through the academic system. Its goal is to assist them to become "promotable". 2014-present