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**BIOGRAPHICAL SKETCH**

NAME: Harriet W. Hopf, MD

eRA COMMONS USER NAME (credential, e.g., agency login): HWHOPF

POSITION TITLE: Professor of Anesthesiology, Perioperative &amp; Pain Medicine; Adjunct Professor of Bioengineering, University of Utah

**EDUCATION/TRAINING**

INSTITUTION AND LOCATION	DEGREE (if applicable)	Completion Date MM/YYYY	FIELD OF STUDY
Yale University, New Haven, CT	BA	05/1982	Biology
Dartmouth Medical School, Hanover, NH	MD	06/1986	Medicine
University of Minnesota, Minneapolis, MN	Intern	06/1987	Surgery
University of California, San Francisco, San Francisco, CA	Research Fellow	12/1988	Surgery
University of California, San Francisco, San Francisco, CA	Resident	12/1991	Anesthesiology
University of California, San Francisco, San Francisco, CA	Research Fellow	06/1992	Anesthesiology

**A. Personal Statement**

The focus of my research career has been interdisciplinary, collaborative, translational research that advances the science and practice of anesthesiology and perioperative medicine. My own research has contributed to 1) advances in scientific understanding, specifically in the areas of wound healing and oxygen delivery and 2) advances in perioperative patient management, specifically related to surgical site infection prevention. Much of the research cited below was funded by NIH through a collaborative, interdisciplinary P50 Center grant (NIGMS RCG P50 GM27345), *A Study of Wound Healing, Infection, and Inflammation*. My roles on the grant included Co-Investigator from 1989-1994, PI of one of the projects and Grant Associate Director from 1995-2005, and Associate Director of the UCSF Wound Healing Laboratory from 1996-2006. The research was facilitated by trainees on the UCSF *Academic Training in Trauma and Burns* NIH 5T32 GM08258, on which I served as a mentor (1992-2006) and Executive Committee member (1996-2006). During that time, I was also Co-Investigator on NIH NHLBI SCOR P50HL54476, *Tissue Oxygen During Anemia and Red Blood Cell Transfusion* which complemented the wound healing and oxygen delivery work of the P50 grant. I am currently site PI for the NIH 5R01AI155752, *The BASIC trial: Improving implementation of evidence-based approaches and surveillance to prevent bacterial transmission and infections*, evaluating implementation strategies for perioperative infection control.

In recent years, the environmental impact of infection control measures, particularly single use disposable devices (e.g., laryngoscopes) and supplies (e.g., gowns), has become the central focus of my work on infection control. As a member of the Advisory Board and Planning Committee, I helped plan and execute the 2018 Yale SOM Workshop on Environmental Sustainability in Clinical Care, which resulted in publication of "The Green Print: Advancement of Environmental Sustainability in Healthcare" in *Resources, Conservation, and Recycling* which received the Most Downloaded Paper Award in 2020. Given my expertise and experience in infection prevention, implementation, and healthcare sustainability, I am uniquely qualified to lead Aim 3 of the proposed trial *Implementing risk-based contact precautions: toolkits, outcomes, and environmental impact*, that is, to develop an optimization strategy for the selection of PPE and the approach to contact precautions that incorporates infection control effectiveness, supply costs, provider experience, and environmental costs.

## **B. Positions and Honors**

### **Positions and Employment**

2023 – 2026	Academic Senate Presidential Succession, University of Utah
2022 – Present	Executive Director of Faculty Development & Academic Affairs, Dept of Anesthesiology
2021 - 2022	Director of Faculty Development and Mentoring, Department of Anesthesiology
2020 – 2021	Special Assistant to the Senior Vice President for Academic Affairs (Provost), University of Utah. Facilitated the COVID-19 response across campus.
2020 - 2023	Academic Senate Executive Committee, Member, University of Utah
2020 – 2021	Co-Chair, Library Futures Task Force, University of Utah
2020 – Present	Co-Director, Utah Coaching and Advancement Network (U-CAN), U of U Health
2019 – Present	Chair, Surveillance System Administrators Committee, University of Utah
2018 – 2019	Interim Associate Vice President for Faculty, University of Utah
2016 - 2018	Senior Special Assistant in the Office for Faculty, University of Utah
2012 – 2016	Associate Dean for Academic Affairs, University of Utah School of Medicine
2011 - 2018	Vice Chair for Faculty Development, Department of Anesthesiology, University of Utah
2009 - 2013	Director of Women in Medicine and Science, University of Utah School of Medicine
2009 – 2022	Hospital Infection Control Committee, University of Utah Health
2009 - 2018	Director of Resident Research Training, University of Utah, Dept of Anesthesiology
2008 – 2018	Chair, Perioperative Infection Control Committee
2008 - Present	Adjunct Professor, University of Utah, Department of Biomedical Engineering
2006 - 2008	Medical Director, Intermountain Healthcare Urban Central Region Wound Care Services
2006 - Present	State License (UT) - Physician (MD)
2006 - Present	DEA Certificate (UT) - Physician (MD)
2006 - Present	Professor, University of Utah, Department of Anesthesiology, Salt Lake City, UT
1998 - 2006	Faculty, UCSF / UCB Bioengineering Graduate Group, San Francisco, CA
1996 - 2006	Associate Director, UCSF Wound Healing Laboratory, San Francisco, CA
1993 - Present	American Board of Anesthesiology (Anes), Certified - does not expire; passed voluntary recertification exam in 2009; enrolled in Maintenance of Certification in Anesthesiology
1992 - 2006	Assistant Professor / Associate Professor / Professor in Residence, University of California, San Francisco, Departments of Anesthesia and Surgery, San Francisco, CA

### **Other Experience and Professional Memberships**

2022 – Present	ASA Committee on Academic Anesthesiology
2022 - Present	Association for the Advancement of Medical Instrumentation (AAMI) Committee on Sustainability
2020 – Present	Faculty Member, Executive Leadership in Academic Medicine (ELAM), Drexel University
2020 - Present	American Society of Anesthesiologists (ASA) Committee on Occupational Health
2018 - Present	ASA Committee on Women Anesthesiologists (Ad hoc in 2018-19)
2019 – 2022	ASA Committee on Equipment and Facilities
2019 – Present	ASA Committee on Professional Diversity
2015 – 2018	Steering Committee, AAMC Group on Faculty Affairs
2013 – 2023	Board of Directors, Foundation for Anesthesia Education and Research (FAER); Chair-Elect 2018-2019; Chair 2019-2021, Nominations Committee Chair 2021-2023
2015 – 2023	Associate Editor, <i>Anesthesiology</i>

2010 – 2015	ASA Infection Control Task Force
2011 – 2022	American Society of Anesthesiologists Ad Hoc Committee on Environmental Health (previously Task Force / Subcommittee on Environmental Sustainability)
2009 - 2020	Editorial Board, <i>Wound Repair and Regeneration</i>
2001 - 2013	Wound Healing Society BOD (2001-4, 2015-18), Secretary (2006-10), Presidential succession (2009-13), Council of Past Presidents (2019-2022)

## **Honors**

2022	Most Downloaded Paper Award, <i>The Green Print: Advancement of Environmental Sustainability in Healthcare; Resources, Conservation, and Recycling, 2020.</i>
2020	Selected as one of 250 images on Utah Women 2020 Mural, public art commemorating the 100 <sup>th</sup> anniversary of the 19 <sup>th</sup> Amendment ( <a href="http://womensmural.com/">http://womensmural.com/</a> )
2019	Inaugural Women in Anesthesiology Distinguished Service Award
2018	Fellow of the American Society of Anesthesiologists (FASA)
2017	Linda K. Amos Award for Distinguished Service to Women, University of Utah
2014 - Present	Fellow, University of Utah Academy of Health Science Educators
2013	YWCA Utah Outstanding Achievement Award in Medicine and Health
2013	FAER Mentoring Excellence in Research Award
2012	Fellow of Undersea and Hyperbaric Medicine (FUHM)
2011 - Present	FAER Academy of Research Mentors in Anesthesiology
2008 - 2009	Fellow, Executive Leadership in Academic Medicine Program, Drexel University
2004 - 2006	UCSF Haile T. Debas Academy of Medical Educators
1999	Inaugural UCSF Graduate Students Association Faculty Mentorship Award

## **C. Contributions to Science**

The first four areas outlined below represent a primary research focus, the measurement and control of tissue oxygenation to optimize wound healing and resistance to infection, which contributed to both scientific understanding and advances in patient management. Many studies were funded by NIH GM RCG P50 GM27345 from 1989-2005. The fourth and fifth represent recent areas of focus: sustainability in anesthesiology and gender equity in medicine. \*Trainee co-author

- 1) **Methods of measuring wound oxygen.** Control of tissue O<sub>2</sub> levels requires the ability to measure tissue pO<sub>2</sub> and tissue perfusion. We investigated the accuracy, precision, feasibility, and usefulness of a number of minimally invasive and non-invasive devices. These devices enabled the advances outlined below.
  - a. **Hopf HW**, Viele M, Watson JJ, Feiner J, Weiskopf R, Hunt TK, Noorani M, Yeap H, Ho R, Toy P. (2000). Subcutaneous perfusion and oxygen during acute severe isovolemic hemodilution in healthy volunteers. *Arch Surg*, 135:1443-9. [Cited by 65; Funded by NIH NHLBI SCOR P50HL54476]
  - b. **Hopf HW**, Hunt TK, Scheuenstuhl H, West JM, Humphrey LM\*, Rollins MD. (2003). Methods of measuring oxygen in wounds. *Methods Mol Med*, 78, 389-416. [Funded by NIH GM RCG P50 GM27345 and NIH 5T32 GM08258]
  - c. Fife CE, Smart DR, Sheffield PJ, **Hopf HW**, Hawkins G, Clarke D (2009). Transcutaneous oximetry in clinical practice: consensus statements from an expert panel based on evidence. *Undersea Hyperb Med*. 36:43-53. [Cited by 183]
  - d. Liu S\*, Shah SJ, Wilmes LJ, Feiner J, Kodibagkar VD, Wendland MF, Mason RP, Hylton N, **Hopf HW**, Rollins MD\*(2011). Quantitative tissue oxygen measurement in multiple organs using (19) F MRI in a rat model. *Magn Reson Med*. 66:1722-30. [Cited by 70; Funded by a FAER Mentored Research Training Grant (Rollins PI and Hopf, Mentor, and NIH GM RCG P50 GM27345)]

- 2) **Wound Hypoxia and SSI.** TK Hunt demonstrated in the 1960s that wound hypoxia is common. Working with Hunt, we demonstrated that wound/subcutaneous pO<sub>2</sub> in well-perfused healthy volunteers is ~65 mmHg and the k<sub>m</sub> for O<sub>2</sub> for superoxide production by neutrophils is 40-80 mmHg, suggesting bacterial killing is O<sub>2</sub>-limited. Clinically, we demonstrated postoperative wound hypoxia is common and predicts SSI. Using the Utah Population Database, we demonstrated a genetic contribution to SSI. In collaboration with mathematicians, we created a mathematical model to predict the effect of high inspired O<sub>2</sub>.
- Allen DB\*, Maguire JJ, Mahdavian M, Wicke C\*, Marcocci L, Scheuenstuhl H, Chang M\*, Le AX\*, **Hopf HW**, Hunt TK. (1997). Wound hypoxia and acidosis limit neutrophil bacterial killing mechanisms. *Arch Surg*, 132:991-6. [Cited by 627] [Funded by NIH GM RCG P50 GM27345 and NIH 5T32 GM08258]
  - Hopf HW**, Hunt TK, West JM, et al. (1997). Wound tissue oxygen tension predicts the risk of wound infection in surgical patients. *Arch Surg*, 132:997-1004; discussion 1005. [Cited by 845; Funded by NIH GM RCG P50 GM27345]
  - Lee JP\*, **Hopf HW**, Cannon-Albright L (2013). Empiric evidence for a genetic contribution to predisposition to surgical site infection. *Wound Rep Regen* 21:211-5.
  - Jayathilake C, Maini PK, **Hopf HW**, McElwain S, Byrne HM, Flegg MB, Flegg JA (2019). A mathematical model of the use of supplemental oxygen to combat surgical site infection. *Journal of Theoretical Biology* 466:11-23.
- 3) **Preventing Surgical Site Infection.** We hypothesized that excess catecholamine release in surgical patients decreases wound O<sub>2</sub> and reducing SNS activation could reduce SSI. Maintenance of normothermia in colon surgery patients reduced SSI by about two-thirds. This finding led to perioperative active warming of most surgical patients. Addition of supplemental O<sub>2</sub> has been controversial, but studies that control sympathetic tone generally show benefit and there has not been evidence of harm. The 2000 study (c) was the only to measure wound O<sub>2</sub>, which was significantly increased with high-inspired O<sub>2</sub>.
- Sheffield CW\*, Sessler DI, **Hopf HW**, Schroeder M, Moayeri A, Hunt TK, West JM. (1996). Centrally and locally mediated thermoregulatory responses alter subcutaneous oxygen tension. *Wound Repair Regen*, 4:339-45. [Cited by 143] [Funded by NIH GM RCG P50 GM27345 and NIH 5T32 GM08258]
  - Kurz A, Sessler DI, Lenhardt R, for the Study of Wound Infection and Temperature Group [**Hopf HW**, et al.] (1996). Perioperative normothermia to reduce the incidence of wound infection and duration of hospitalization. *N Engl J Med*, 334:1209-1215. [Cited by 3405]
  - Greif R, Akça O, Horn EP, Kurz A, Sessler DI [**Hopf HW**, et al.] (2000). Supplemental Perioperative O<sub>2</sub> To Reduce the Incidence of Surgical Wound Infection. *N Engl J Med*, 342:161-7. [Cited by 1343]
  - Mackintosh M\*, Gertsch MC\*, **Hopf HW**, Pace, NL, White J, Morris R\*, Morrissey C\*, Wilding V\*, Herway S\*. (2012) High Intraoperative Inspired Oxygen Does Not Increase Postoperative Supplemental Oxygen Requirements. *Anesthesiology*. 117:271-279.
- 4) **Sustainability in Anesthesiology.** Anesthesiology's continued impact as the patient safety specialty requires reducing the environmental impact of the care we deliver. My research focuses on reducing reliance on single use disposable devices (SUDs), especially in infection control. SUDs are perceived to reduce infection risk and cost (excluding environmental cost), but, for most devices, there is no evidence to they reduce infections, while the long-term cost and environmental impact are substantially higher. Transitioning back to a circular economy, however, is complex.
- Sherman JD, **Hopf HW**. (2018) Balancing Infection Control and Environmental Protection as a Matter of Patient Safety: The Case of Laryngoscope Handles. *Anesth Analg*; 127:576-579. [Cited by 68]
  - Sherman JD, Thiel C, MacNeill AM, Eckelman MJ, Dubrow R, **Hopf H**, et al. (2020) The Green Print: Advancement of Environmental Sustainability in Healthcare. Resources, Conservation, and Recycling. 161:104882 [Cited by 166]
  - Thiel CL, Sherman JD, **Hopf HW** (2020). Use of Disposable Perioperative Jackets and Surgical Site Infections. *JAMA Surg*. 155:453-454.
  - MacNeill AJ, **Hopf HW**, Khanuja A, Alizamir S, Bilec MM, Eckelman MJ, Hernandez L, McGain F, Simonsen KA, Thiel C, Young SB, Lagasse R, Sherman JD (2020). A Call for Medical Device Industry Transformation: Toward a Circular Economy. *Health Affairs*. 39:2088-2097. [Cited by 146]

- 5) **Gender Equity in Medicine.** Despite gender parity in medical school graduates for more than 20 years, women (especially women with intersectional identities) remain underrepresented in leadership roles and recognition in academic medicine. While initial efforts focus on identifying disparities, future research will aim at identifying and evaluating approaches that successfully advance equity.
- a. Gurgel RK, Cardon BR, Allen CM, Presson AP, Kelly B, **Hopf HW**, Choi SS, Miller RH. Evaluating Gender Parity in Operative Experience for Otolaryngology Residencies in the United States. *The Laryngoscope*. 2020, 130:1651-1656. doi:10.1002/lary.28306. [Cited by 18; Funded by American Academy of Otolaryngology, University of Utah Population Health Research Foundation, NIH grant UL1TR002538]
  - b. Leslie K, **Hopf HW**, Houston P, O'Sullivan E. Women, Minorities and Leadership in Anesthesiology: Take the pledge. *Anesth Analg* (2017) 124:1394-1396. [Cited by 54]
  - c. Singhal D, Bank AM, Poorman JA, Doshi T, Parekh R, Parangi S, **Hopf HW**, Chandrabose R, Larson A, Silver JK. (2020) Representation of women plenary speakers at the American Academy of Neurology annual meeting. *Neurology* 95:e3045-e3059. [Cited by 15].
  - d. Hobson-Rohrer WL, Olson LM, **Hopf HW**, Winter LC, Byington, CL (2021). "The Adjunct Faculty are our Lifeblood": An Institution's Response to Deliver Value to Volunteer Community Faculty. *Family Medicine*; ;53(2):133-8.

**Complete List of Published Work in My Bibliography:**

<https://www.ncbi.nlm.nih.gov/myncbi/1rCljMA91NIAP/bibliography/public/>