

PROMOTION RECOMMENDATION
THE UNIVERSITY OF MICHIGAN
MEDICAL SCHOOL
DEPARTMENT OF ANESTHESIOLOGY

Sachin Kheterpal, M.D., associate professor of anesthesiology, with tenure, Department of Anesthesiology, Medical School, is recommended for promotion to professor of anesthesiology, with tenure, Department of Anesthesiology, Medical School.

Academic Degrees:

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| M.B.A. | 2004 | University of Michigan |
| M.D. | 1999 | University of Michigan |
| B.S. | 1996 | University of Michigan |

Professional Record:

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| 2014-present | Associate Professor of Anesthesiology, University of Michigan |
| 2008-2014 | Assistant Professor of Anesthesiology, University of Michigan |
| 2002-2004 | Global General Manager, General Electric Medical Systems Information Technologies |
| 2000-2002 | Engineering Manager, General Electric Medical Systems Information Technologies |
| 1994-2000 | Chief Operating Officer, Systems Engineering Consults |

Summary of Evaluation:

Teaching: Dr. Kheterpal is an active didactic, career, clinical, and research educator. He provides research through the Michigan Institute for Clinical and Health Research, and career mentorship for many medical students considering entrepreneurial, business administration, software development, or industry careers. Based on his background as a software entrepreneur and corporate executive before his academic career, Dr. Kheterpal has lectured regarding alternative career pathways, dual degree planning, and integration of research and industry relationships. Clinically, he is responsible for teaching anesthesiology residents and liver transplant fellows the management of the most complex situations and appropriate use of advanced therapeutic and diagnostic procedures. His teaching evaluations establish an effective, patient and evidence-based teaching method. Didactically, Dr. Kheterpal created and continues to advance a nationally-unique anesthesiology intern research rotation, which consists of a month-long didactic and practicum exposure to perioperative research and evidence-based-medicine. He plays an international role in the didactic teaching and scientific mentorship of students, residents, fellows, and junior faculty as they conduct perioperative outcomes research. Of the four current or recent NIH T-32 scholars in the department's T-32 program, one of which he is the co-principal investigator, he has served as the primary mentor for three. One graduate of the program has successfully transitioned to NIH K funding and has joined our faculty. Two other scholars were successfully renewed for their second year of NIH T32 fellowship and will transition to faculty positions with research support. Dr. Kheterpal also serves on the mentorship committee for several other K awardees in the Department of Internal Medicine, Family Medicine, and Obstetrics and Gynecology. He has expanded his research mentorship role internationally, establishing a year-long anesthesiology outcomes research fellowship at the University of Michigan.

Research: Dr. Kheterpal has transitioned from a perioperative outcomes researcher to an observational research methodological expert. With more than 75 peer-reviewed publications, he has expanded his

reputation within the field of perioperative medicine, establishing the University of Michigan as the data and research coordinating center for the Multicenter Perioperative Outcomes Group (MPOG); the pre-eminent anesthesiology and perioperative research infrastructure in the United States, which includes data from ten million patients across 40 hospitals. MPOG has expanded to a consortium that integrates with surgical outcomes registries and is the foundation for the newly formed Initiative for Multicenter Perioperative Clinical Trials (IMPACT). Dr. Kheterpal is fully funded by the NIH and industry. He is the site principal investigator for several multicenter NIH funded studies, and the co-investigator on numerous NIH R and U awards. He is also the principal investigator of a major three-year consumer electronics and software industry-sponsored longitudinal study of wearable sensors, genomics, and trajectories of health enrolling 7,000 patients.

Recent and Significant Publications:

Kheterpal S, Shanks A, Tremper KK: Impact of a Novel Multiparameter Decision Support System on Intraoperative Processes of Care and Postoperative Outcomes. *Anesthesiology* 128(2): 272-282, 2018.

Brummett CM, Waljee JF, Goesling J, Moser S, Lin P, Englesbe MJ, Bohnert ASB, Kheterpal S, Nallamothu BK: New persistent opioid use after minor and major surgical procedures in United States adults. *JAMA Surg* 152(6): e170504, 2017.

de Graaff JC, Pasma W, van Buuren S, Duijghuisen JJ, Nafiu OO, Kheterpal S, van Klei WA: Reference values for noninvasive blood pressure in children during anesthesia: A multicentered retrospective observational cohort study. *Anesthesiology* 125(5): 904-913, 2016.

Aziz MF, Brambrink AM, Healy DW, Willett AW, Shanks A, Tremper T, Jameson L, Ragheb J, Biggs DA, Paganelli WC, Rao J, Epps JL, Colquhoun DA, Bakke P, Kheterpal S: Success of intubation rescue techniques after failed direct laryngoscopy in adults: A retrospective comparative analysis from the Multicenter Perioperative Outcomes Group. *Anesthesiology* 125(4): 656-666, 2016.

Bender SP, Paganelli WC, Gerety LP, Tharp WG, Shanks AM, Housey M, Blank RS, Colquhoun DA, Fernandez-Bustamante A, Jameson LC, Kheterpal S: Intraoperative lung-protective ventilation trends and practice patterns: a report from the Multicenter Perioperative Outcomes Group. *Anesth Analg* 121(5): 1231-1239, 2015.

Service: Dr. Kheterpal has significant institutional, national, and international administrative service. In 2017, he was appointed associate dean for research information technology. In this role, he is responsible for identifying research IT needs for Michigan Medicine faculty and providing the Medical School Office of Research and the Health Information Technology and Services leadership specific, actionable strategy to maximize the research competitiveness and impact of University of Michigan faculty. At a campus-wide level, Dr. Kheterpal was appointed as the co-director of the University of Michigan Precision Health initiative, a three-year, \$40M effort supported by the deans of the Medical School, College of Engineering, School of Public Health and the provost. Nationally, he serves on numerous NIH committees. In 2015, Dr. Kheterpal was requested to participate on the NIH Precision Medicine Initiative Working Group as one of only 19 members. The report created by the working group served as the blueprint for the one million participant cohort program. He currently serves on the advisory panel for the NIH Precision Medicine Initiative. As a result of his significant contributions in these capacities, Dr. Kheterpal was invited to serve on the NIH Council of Councils in 2017. He advises the national biomedical research strategy of the NIH at the highest levels, working directly with institute directors in many situations. At the international level, Dr. Kheterpal was appointed to

the International Anesthesia Research Society Board of Trustees in 2018. Composed of only 14 senior, influential anesthesiology leaders across the world, this board is responsible for directing an annual budget of \$10M spanning annual grant programs, a major peer-reviewed journal, and the pre-eminent annual international anesthesiology research conference. Dr. Kheterpal is one of twelve handling editors for the pre-eminent and highest impact international journal in our field, *Anesthesiology*. He is one of only seven faculty trained and selected to perform liver transplant anesthesia at Michigan Medicine.

External Reviewers:

Reviewer A: “The works of Dr. Kheterpal had significantly contributed to the development of MPOG, as a unique structure for academic and non-academic research based on routine data. I think his role as a promotor, mediator and inspirator is quite remarkable...he created a high level of reputation within the field of the real scientific –trialists...The scholarly impact is excellent...Dr. Kheterpal has reached significant impact in terms of service contribution. This is documented by his role in the Editorial Board of Anesthesiology and the role as part of the Board of Trustees of the IARS...Definitely yes, the criteria for becoming a full professor at [my institution] are fulfilled by Dr. Kheterpal.”

Reviewer B: “Dr. Kheterpal meets and exceeds all criteria that are required for a Professor with tenure at the two Departments of Anesthesiology in which I have worked...By my read of the University of Michigan criteria, he exceeds those as well...In terms of my personal criteria of what a Professor should be, Dr. Kheterpal exceeds those as well. I value first and foremost impact in a particular field. I am not a paper counter. I care about the quality of the person, their publications, their seminars, and their accomplishments - the rigor, the creativity, the integrity, the substance, and the durability. By these criteria, I consider Dr. Kheterpal to be one of the top five most impactful anesthesiologists in the area of perioperative outcomes research.”

Reviewer C: “He has consistently contributed to both national and international societies in various roles. Regarding editorial activities, he has recently been promoted from associate to full editorial board membership for the leading anaesthesiological research journal *Anesthesiology*. He has served on NIH committees and continues to actively shape the practice of medical routine data research through his MPOG involvement. Overall, his contributions are clearly excellent...Dr. Kheterpal would by far overfulfill all requirements at our institution for promotion and tenure.”

Reviewer D: “Dr. Kheterpal is one of the premier anesthesiologists working in and leading the field of database and outcomes research in the specialty. He enjoys a national and international reputation for these accomplishments...His research productivity and publication have been continued and consistent, both in general since his initial appointment, and since his promotion to Associate Professor in 2014. Through the publication of these datasets and outcomes, mostly in Anesthesiology and Anesthesia and Analgesia, and concomitant presentation of his findings at a number of invited presentations in anesthesiology departments and annual meetings, he has established a reputation as an accomplished investigator and leader in the field of retrospective observational database research.”

Reviewer E: “Dr. Kheterpal’s funding record, invitations for presentations, participation on editorial boards, and national/international committees speaks to his standing in the community. It is also clear that he has made important contributions to the University of Michigan teaching mission...Dr. Kheterpal is definitely at the top of the list. His quantitative skills and focus on precision medicine (genomics) for diagnosis and treatment puts him at the forefront of clinical medicine...Dr. Kheterpal is asked to serve on some of the most important national committees. He has attained expert status

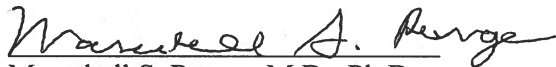
and is sought after for service, input and advice...There is no question that Dr. Kheterpal would be promoted to full Professor with tenure at my institution.”

Reviewer F: “Dr. Kheterpal has demonstrated to the world how electronic health information from multiple institutions can be systematically collected, combined and analyzed to produce meaningful new insights...His enthusiasm, communication skills, analytic abilities and extraordinary leadership led to the success of this multicenter perioperative data registry, despite very limited investment by the participants. Contrast his success with MPOG to a similar database launched at about the same time by the American Society of Anesthesiologists that included the backing of our national organization and enormous investment in building the database: the ASA database has yielded little in the way of meaningful research findings while MPOG continues to produce new and meaningful research at a rapid and accelerating pace...Dr. Kheterpal is well-recognized internationally for his role in defining this new field. He has used electronic health data to glean new insights.”

Reviewer G: “Dr. Kheterpal’s influence in our specialty and his reputation as an innovator bring honor to the University of Michigan, and more than qualify him for this much-deserved promotion...His importance to our field cannot be overstated...He has made multiple significant contributions to the University and our specialty. I would place Dr. Kheterpal in the top 10% of academic anesthesiologists based on the impact of his contributions to date. I am certain that he would readily be appointed as a Professor at (my institution) if we were fortunate enough to have the opportunity.”

Summary of Recommendation:

Dr. Kheterpal is an internationally renowned liver transplant anesthesiologist with a research focus on perioperative outcomes. He has extensive national and international service and has made a significant contribution through the development of the Multicenter Perioperative Outcomes Group. I am pleased to recommend Sachin Kheterpal, M.D. for promotion to professor of anesthesiology, with tenure, Department of Anesthesiology, Medical School.



Marschall S. Runge, M.D., Ph.D.
Executive Vice President for Medical Affairs
Dean, Medical School

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