

PROMOTION RECOMMENDATION
THE UNIVERSITY OF MICHIGAN
MEDICAL SCHOOL
DEPARTMENT OF SURGERY
DEPARTMENT OF OBSTETRICS AND GYNECOLOGY

George B. Mychaliska, M.D., associate professor of surgery, with tenure, Department of Surgery, and associate professor of obstetrics and gynecology, without tenure, Department of Obstetrics and Gynecology, Medical School, is recommended for promotion to professor of surgery, with tenure, Department of Surgery, and professor of obstetrics and gynecology, without tenure, Department of Obstetrics and Gynecology, Medical School.

Academic Degrees:

M.D.	1991	University of California, San Francisco
M.S.	1989	University of California, Berkeley
B.S.	1986	University of California, Los Angeles

Professional Record:

2010-present	Associate Professor of Surgery, University of Michigan
2010-present	Associate Professor of Obstetrics and Gynecology, University of Michigan
2004-2010	Assistant Professor of Surgery, University of Michigan
2004-2010	Assistant Professor of Obstetrics and Gynecology, University of Michigan
2001-2004	Assistant Professor of Surgery and Pediatrics, Washington University of Medicine, St. Louis

Summary of Evaluation:

Teaching: Dr. Mychaliska is recognized as an enthusiastic and effective teacher and mentor of undergraduate students, medical students, residents, post-doctoral research fellows, and clinical fellows. He devotes substantial effort teaching clinical trainees at the bedside, operating room and clinic (500+ hours/year). He is an active participant in twice weekly teaching conferences and the educational lecture series. In addition to his teaching related to pediatric surgery, he teaches a diverse group of students, residents and fellows in the emerging field of fetal therapy. Dr. Mychaliska is working with a data architect to develop a comprehensive database for infants with birth defects which will be used for educating students, residents and faculty in the field of prenatal diagnosis, fetal therapy and long-term outcomes of complex malformations. As evidenced by his resident evaluations and select letters, the quality and effectiveness of his teaching are consistently high. In the past five years, his aggregate evaluations by trainees (n=104) has consistently averaged over 8 on a 1-9 scale. In addition to his clinical teaching, Dr. Mychaliska's most important teaching contribution consists of individualized research and professional mentoring for which he devotes considerable time and effort (250 hours/year). He has provided major research mentoring for five undergraduate students, 19 medical students, and 12 post-doctoral research fellows. In addition, he has provided substantial clinical, research, and professional mentoring for seven junior faculty.

Research: Dr. Mychaliska's translational and clinical research dovetails with his areas of clinical expertise. His main areas of research are development of an artificial placenta for treatment of prematurity, Congenital Diaphragmatic Hernia (CDH), Extracorporeal Life Support (ECLS, ECMO), and application of prenatal diagnosis and treatment. His scholarly work is currently supported by three NIH grants. Dr. Mychaliska's basic science research focuses on the development of an extracorporeal artificial placenta to support premature infants. This high-risk / high-reward project has the potential to revolutionize the treatment of prematurity—by recapitulating the intrauterine environment, mechanical ventilation and other iatrogenic therapies associated with prematurity would be avoided. He has assembled a multidisciplinary team of investigators to create a complex fetal sheep model of veno-venous extracorporeal life support. His work has demonstrated prolonged support with excellent gas exchange, stable hemodynamics and ongoing lung growth with brain protection using artificial placenta support without mechanical ventilation. Dr. Mychaliska has been consistently funded for the past decade and recently received both an NIH R01 and R44 totaling \$4.2 million. His work is revolutionary and clinical translation is anticipated within five years.

Dr. Mychaliska has had a sustained and productive research effort in understanding the pathophysiology and optimal treatment of congenital diaphragmatic hernia (CDH). He has contributed discoveries in basic science, translational research, and clinical research (institutional, database driven, multi-institutional, and a prospective randomized trial). He has been at the forefront of novel approaches to improve the outcomes of patients with severe CDH. Early in his career, he contributed to the early understanding of fetal treatment for CDH. More recently, he was the principal investigator on a prospective randomized clinical trial evaluating the safety and efficacy of Perflubron-induced lung growth in neonates with CDH which required an FDA IND. Since 2008, he has been the site PI for an NIH-sponsored multi-institutional study of the molecular genetic analysis of CDH which has yielded many important discoveries. Dr. Mychaliska has also been active in clinical research in the areas of prenatal diagnosis, fetal therapy and ECMO. As part of the North American Fetal Therapy Network, he is the site PI on several multi-institutional clinical research projects related to fetal therapy. In addition to his published work, he has presented his work at numerous national and international conferences and invited lectures.

Recent and Significant Publications:

Gray B, El-Sabbagh A, Rojas-Pena A, Kim A, Gadepalli S, Koch M, Capizzani T, Bartlett R, Mychaliska GB: Development of an artificial placenta IV: 24 hour veno-venous extracorporeal life support in premature lambs. *American Society of Artificial Internal Organs Journal* 58:148-154, 2012.

Gray BW, El-Sabbagh A, Zakem SJ, Koch KL, Rojas-Pena A, Owens GE, Rabah R, Bartlett RH, Mychaliska GB: Development of an artificial placenta V: 70 hour veno-venous extracorporeal life support after ventilatory failure in premature lambs. *Journal of Pediatric Surgery* 48:145-153, 2013.

Bryner B, Gray BW, Perkins E, Hoffman HR, Owens G, Barks J, Rojas-Peña A, Bartlett R, Mychaliska GB: An extracorporeal artificial placenta supports extremely premature lambs for one week. *Journal of Pediatric Surgery* 50:44-49, 2015.

Mychaliska GB, Bryner B, Dechert R, Kreutzman J, Becker M, Hirschl R: Safety and efficacy of perflubron-induced lung growth in neonates with congenital diaphragmatic hernia: Results of a prospective randomized trial. *Journal of Pediatric Surgery* 50:1083-1087, 2015.

Coughlin M, Werner N, Gajarski R, Gadepalli SK, Hirschl RB, Barks J, Treadwell MC, Ladino-Torres M, Kreutzman J, Mychaliska GB: Prenatally diagnosed severe CDH: Mortality and morbidity remain high. *Journal of Pediatric Surgery*. 2015, Nov 10.

Service: Dr. Mychaliska has provided substantial and innovative contributions to the clinical missions of the University of Michigan Health System. He was recruited to build a fetal therapy program and is the founding director of the Fetal Diagnosis and Treatment Center (FDTC). Under his leadership, this multidisciplinary program has grown to become the only comprehensive fetal therapy program in Michigan that is recognized nationally and internationally for its clinical excellence and innovative approaches. This program has been essential to the success of Mott Children's Hospital both in terms of enlarging the market share of the most complex patients and securing significant down-stream revenue. Given the success and clinical volume of the FDTC, Dr. Mychaliska has established and serves as the program director for the University of Michigan Fetal Diagnosis and Treatment Fellowship. He has continued the tradition of excellence in ECMO at the University of Michigan as the co-director of the ECMO Program. Aligned with his extensive research effort in CDH, he was the founding clinical lead for the University of Michigan Multidisciplinary CDH Clinic which has become a thriving clinical programmatic effort which has made a considerable difference in the lives of patients with CDH. He has also provided clinical leadership as the only MPLAN surgical director at Mott Children's Hospital.

Dr. Mychaliska was appointed as the associate chair for faculty development in the Department of Surgery in 2015. In this leadership role, he is an active participant in the Surgery Advisory Committee and was appointed as co-chair of the Department of Surgery Strategic Faculty Investment Committee. He has engaged the faculty at all levels with both a Symposium for Junior Faculty Development and a Department of Surgery Leadership Development Program. In this capacity, he also became the lead for the Department of Surgery Diversity, Equity and Inclusion initiative which has already resulted in significant changes in this important area. Given his research experience and commitment, he is also a member of the Department of Surgery Research Advisory Committee. Dr. Mychaliska has made many contributions on a national level in his areas of interest and expertise. He is serving his second term on the American Pediatric Surgical Association Fetal Diagnosis and Treatment Committee. He has also served on the Program Committee for three years. For the American Academy of Pediatrics, Surgical Section he has contributed to both the Publication Committee and Committee on the Delivery of Surgical Care. He has contributed to the Program Committees for the Extracorporeal Life Support Organization (ELSO) and the Advanced Therapies for Respiratory Failure meetings. He is actively engaged with the North American Fetal Therapy Network. Since 2008, Dr. Mychaliska has been on the editorial board for *Pediatric Surgery International*. He is also an ad hoc reviewer for several specialty journals.

External Reviewers:

Reviewer A: "...the success of the Fetal Diagnosis and Treatment Center in Ann Arbor is in large part a testimony to his leadership. Remarkably, he has even been able to develop a training fellowship in Fetal Treatment—a welcome initiative if we want the specialty to flourish and attract the next generation of fetal doctors."

Reviewer B: "Several of his scientific publications are recognized as the definitive studies related to the use of Perflubron in the management of children with congenital diaphragmatic hernia. Furthermore, his work related to the development of an artificial placenta represents the foundation upon which this novel technology will be further developed into a clinically useful modality."

Reviewer C: “George is a thought leader in fetal and neonatal medicine, and a highly-respected member of the fetal surgical community. He has made significant contributions to our understanding of the management of fetuses with congenital anomalies. In his prodigious research career, he is an innovator on the topic of the artificial placenta and has moved that field forward through funded research resulting in numerous peer-reviewed papers and national and international presentations.”

Reviewer D: “Dr. Mychaliska is an internationally recognized expert in the relatively new complex field of fetal surgery...his extremely creative work surrounding artificial placentas and the support of potentially premature children and their immature lungs has garnered international attention and admiration.”

Reviewer E: “He is the international leader in this area and his work will significantly change the outcome for the premature population when he has refined this therapy so it can be applied clinically. His work in this area is supported through two NIH grants...”

Summary of Recommendation:

Dr. Mychaliska is an outstanding academic pediatric surgeon. He is a superb teacher and mentor and has made substantial interdisciplinary contributions in both the clinical and research arenas. I am very pleased to recommend George B. Mychaliska, M.D. for promotion to professor of surgery, with tenure, Department of Surgery, and professor of obstetrics and gynecology, without tenure, Department of Obstetrics and Gynecology, Medical School.



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

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