PROGRAM BOOK

46TH ANNUAL MEETING

AMERICAN ASSOCIATION OF ENDOCRINE SURGEONS

Lexington KY

APRIL 18-20, 2026

Local Arrangements Chair:
Cortney Y. Lee, MD

Program Chair:
Abbey Fingeret, MD, MHPTT, PhD

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**as of March 18, 2026*

THE AMERICAN ASSOCATION OF

ENDOCRINE SURGEONS

46th Annual Meeting
April 18-20, 2026
Lexington, Kentucky

American Association of Endocrine Surgeons
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2019-2020	Allan Siperstein	Richard Hodin	James Lee	Paul Gauger	Tracy Wang
2018-2019	Herbert Chen	Sonia Sugg	James Lee	Paul Gauger	Sareh Parangi
2017-2018	Martha Zeiger	Carmen Solórzano	Rebecca S. Sippel	Paul Gauger	Sareh Parangi
2016-2017	Peter Angelos	Samuel Snyder	Rebecca S. Sippel	Cord Sturgeon	Sareh Parangi
2015-2016	Steven K. Libutti	Douglas L. Fraker	Rebecca S. Sippel	Cord Sturgeon	
2014-2015	Gerard Doherty	William B. Inabnet, III	Nancy D. Perrier	Cord Sturgeon	
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2012-2013	Miguel F. Herrera	Allan Siperstein	Nancy D. Perrier	Herbert Chen	
2011-2012	Ashok R. Shaha	Thomas J. Fahey, III	Peter Angelos	Herbert Chen	
2010-2011	Douglas B. Evans	Gerard M. Doherty	Peter Angelos	Steven K. Libutti	
2009-2010	Janice L. Pasieka	Jeffrey E. Lee	Peter Angelos	Steven K. Libutti	
2008-2009	Michael J. Demeure	Jeffrey F. Moley	Sally E. Carty	Steven K. Libutti	
2007-2008	Geoffrey B. Thompson	Terry C. Lairmore	Sally E. Carty	Douglas B. Evans	
2006-2007	Christopher R. McHenry	John B. Hanks	Sally E. Carty	Douglas B. Evans	
2005-2006	Robert Udelsman	Collin J. Weber	Janice L. Pasieka	Douglas B. Evans	
2004-2005	John A. Kukora	Andrew W. Saxe	Janice L. Pasieka	Geoffrey B. Thompson	
2003-2004	Paul LoGerfo	Ashok R. Shaha	Janice L. Pasieka	Geoffrey B. Thompson	
2002-2003	Quan-Yang Duh	Gary B. Talpos	Christopher R. McHenry	Geoffrey B. Thompson	
2001-2002	Clive S. Grant	Miguel F. Herrera	Christopher R. McHenry	Michael J. Demeure	
2000-2001	Barbara K. Kinder	Martha A. Zeiger	Christopher R. McHenry	Michael J. Demeure	
1999-2000	Jay K. Harness	John S. Kukora	Paul LoGerfo	Michael J. Demeure	
1998-1999	George L. Irvin, III	Barbara K. Kinder	Paul LoGerfo	Quan-Yang Duh	
1997-1998	Blake Cady	E. Christopher Ellison	Paul LoGerfo	Quan-Yang Duh	
1996-1997	Jon A. van Heerden	George L. Irvin, III	Jay K. Harness	Quan-Yang Duh	
1995-1996	Richard A. Prinz	Jeffrey A. Norton	Jay K. Harness	George L. Irvin, III	
1994-1995	John M. Monchik	Jon A. van Heerden	Jay K. Harness	George L. Irvin, III	
1993-1994	Orlo H. Clark	Glen W. Geelhoed	Blake Cady	George L. Irvin, III	
1992-1993	Robert C. Hickey	Patricia J. Numann	Blake Cady	Robert D. Croom, III	
1991-1992	Stuart D. Wilson	Joseph N. Attie	Blake Cady	Robert D. Croom, III	
1990-1991	Caldwell B. Esselstyn	Brown M. Dobyns	Richard A. Prinz	Robert D. Croom, III	
1989-1990	Colin G. Thomas, Jr.	Carl R. Feind	Richard A. Prinz	Jon A. van Heerden	
1988-1989	John R. Brooks	Melvin A. Block	Richard A. Prinz	Jon A. van Heerden	
1987-1988	Edward Paloyan	Caldwell B. Esselstyn	Stuart D. Wilson	Jon A. van Heerden	
1986-1987	Oliver Beahrs	Robert C. Hickey	Stuart D. Wilson		
1985-1986	Chiu-An Wang	Edward Paloyan	Stuart D. Wilson		
1984-1985	Leonard Rosoff	John M. Monchik	Stuart D. Wilson		
1983-1984	Stanley R. Friesen	John A. Palmer	John M. Monchik		
1982-1983	Edwin L. Kaplan	Blake Cady	John M. Monchik		
1981-1982	Norman W. Thompson	Orlo H. Clark	John M. Monchik		
1980-1981	Norman W. Thompson	Orlo H. Clark	John M. Monchik		

OLIVER COPE MERITORIOUS ACHIEVEMENT AWARD

In April of 1984 at the American Association of Endocrine Surgeons Meeting in Kansas City, Drs. Edward Kaplan, Jack Monchik, Leonard Rosoff, Norman Thompson and Stuart Wilson proposed to the Council a new achievement award. The award honors a member of the AAES in recognition for contributions in the field of endocrine surgery as an investigator, teacher and clinical surgeon. It is not an annual award but is to be given to members of our Association who truly aspire to the spirit of this award.

On April 15, 1985 at the annual meeting of the AAES in Toronto, our President, Leonard Rosoff announced the first member to receive this award, Dr. Oliver Cope. In giving this award to Dr. Cope the decision of the Council was that from this day forward the award would be known as the Oliver Cope Meritorious Achievement Award for the American Association of Endocrine Surgeons.

Oliver Cope, MD
Professor of Surgery, Harvard University and the Massachusetts General Hospital
Awarded in Ontario in April 1985.

Stanley R. Friesen, MD, PhD
Professor of Surgery, University of Kansas
Awarded in Detroit, MI in April 1994.
Dr. Friesen served as the President of our Association in 1983-1984.

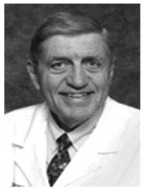
Norman W. Thompson, MD
Henry King Ransom Professor of Surgery, University of Michigan
Awarded in Atlanta, GA in April 2001.
Dr. Thompson served as our inaugural President from 1980-1982.

Jon A. van Heerden, MD
Professor of Surgery Mayo Clinic
Awarded in Charlottesville, NC in April 2004.
Dr. van Heerden served as our Recorder from 1987-1990, as our Vice-President in 1994-1995, and as President in 1996-1997.

Orlo H. Clark, MD
Professor of Surgery, UCSF Mount Zion Medical Center
Awarded in New York, NY in May 2006.
Dr. Clark served as our inaugural Vice-President from 1980-1982, and as President in 1993-1994.

Edwin L. Kaplan, MD
Professor of Surgery, University of Chicago
Awarded in Madison, WI in May 2009.
Dr. Kaplan served as our President in 1982-1983.

George L. Irvin, III, MD
Professor Emeritus of Surgery, University of Miami
Awarded in Pittsburgh, PA in April 2010.
Dr. Irvin served as our Recorder from 1993-1996, as Vice-President in 1996-1997, and as President in 1998-1999.



Stuart D. Wilson, MD
Professor Emeritus of the Department of Surgery, Medical College of Wisconsin Awarded in Baltimore, MD in April 2016.
Dr. Wilson served as our Secretary-Treasurer from 1984-1988 and President in 1991-1992.

Quan-Yang Duh, MD
University of California San Francisco
Awarded in Los Angeles, CA in April 2019.
Dr. Duh served as our Recorder from 1996-1999 and President in 2002-2003.

Janice Pasieka, MD
University of Calgary
Awarded virtually in April 2021
Dr. Pasieka served as our Secretary-Treasurer from 2003-2006 and President from 2009-2010.

Ashok Shaha, MD
Memorial Sloan Kettering Cancer Center
Awarded in Birmingham, AL in April 2023
Dr. Shaha served as our Vice President from 2003-2004 and President from 2011-2012

AAES MEMBERS OF DISTINCTION

Individuals who have made outstanding contributions to the discipline of Endocrine Surgical Disease:

J. Aidan Carney, MD, PhD, FRCPI, FRCP - Pathologist

Stuart D. Flynn, MD - Pathologist

Ian D. Hay, MBChB, MD, PhD - Endocrinologist

Virginia A. LiVolsi, MD - Pathologist

Frank W. LoGerfo, MD – Surgeon

Akira Miyauchi, MD, PhD – Surgeon

Anthony Guy Everson ("Ace") Pearse, MB BChir, MD, DSc – Endocrinologist, Histochemist

Thomas S. Reeve, AC, CBE - Endocrine Surgeon

F. John Service, MD, PhD - Endocrinologist

Britt Skogseid, MD, PhD - Endocrinologist

R. Michael Tuttle, MD - Endocrinologist

William F. Young, MD, MSc – Endocrinologist

RESIDENT/FELLOW PODIUM & POSTER COMPETITION WINNERS

The AAES Resident/Fellow Podium Competition was established in 1990 to encourage interest in endocrine surgery by those training as students and residents or fellows in general surgery. Presented work may be honored in either the Clinical or Basic Research categories. The AAES Poster Competition was established in 2007. The most recent competition winners are shown below.

2025

PODIUM: Anthony Saxton, MD - Duke University
"Expenses and Expectations for Endocrine Surgeries: A National Analysis of Price Transparency and Cost of Care"

PODIUM: Justin Bauzon, MD – Cleveland Clinic
"Utility of Genomics Resource for Intelligent Discovery (GRID) Molecular Profiling to Predict Aggressive Pathologic Features in Differentiated Thyroid Cancer"

INTERESTING CASE: Natalie Moreno, MD – The Johns Hopkins University School of Medicine
"An Endocrine Enigma: The Case of the Missing Parathyroid"

POSTER: Peter Abraham, MD – University of Alabama at Birmingham
"Cardiovascular and Metabolic Outcome in Patients with Mild Autonomous Cortisol Secretion: Adrenalectomy Versus Nonoperative Management"

POSTER: Alexa Lisevick, MD – Medical College of Wisconsin
"Metabolic Outcomes in Patients with Mild Autonomous Cortisol Secretion (MACS) after Unilateral Adrenalectomy"

2024

PODIUM: Rajam Raghunathan, MD - New York University, Grossman School of Medicine
"Can Large Language Models Address Unmet Patient Information Needs and Reduce Provider Burnout in the Management of Thyroid Disease?"

PODIUM: Christopher Carnabatu, MD - UT Southwestern
"Avoidable Biopsies? Validating computer-aided diagnosis (CAD) software in indeterminate thyroid nodules"

POSTER: Jordan Broekhuis, MD - Beth Israel Deaconess Medical Center
"An Assessment of Risk Factors for Bankruptcy Among Thyroid Cancer Patients in Massachusetts"

POSTER: Daniel Chopyk, MD, PhD - The Ohio State University
"Single-nuclei RNA sequencing of Adrenocortical Carcinoma Identifies Replication Stress and ATR Dependency"

All past awardees can be viewed online at
www.endocrinesurgery.org/competition-awards

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Sarina Bains, MD
Talia Burneikis, MD
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Stephanie Davis, MD
Tatiana Fedorova, MD
Patrick Hangge, MD
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Rafael Perez-Soto, MD
Alaa Sada, MD
Vivek Sant, MD
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PAST MEETINGS

The AAES Annual Meeting has been hosted in cities throughout the U.S., Canada, Latin America and elsewhere around the world since the first meeting in 1980. For a complete, historical list of all past AAES Annual Meeting locations, visit www.endocrinesurgery.org/past-meetings.

2025 **Milwaukee, Wisconsin**
Local Arrangements Chair:
Sophie Dream

2024 **Dallas, Texas**
Local Arrangements Co-Chairs:
Ana Islam and Sarah Oltmann

2023 **Birmingham, Alabama**
Local Arrangements Co-Chairs:
Brenessa Lindeman and Jessica Fazendin

2022 **Cleveland, Ohio**
Local Arrangements Chair:
Vikram D. Krishnamurthy

2021 **Virtual**
Program Chair:
Carrie Cunningham

2020 Canceled due to COVID-19 pandemic

2019 **Los Angeles, California**
Local Arrangements Co-Chairs:
Michael Yeh, Masha Livhits

2018 **Durham, North Carolina**
Local Arrangements Co- Chairs:
Sanziana Roman, Julie Ann Sosa

2017 **Orlando, Florida**
Local Arrangements Chair:
Mira Milas

2016 **Baltimore, Maryland**
Local Arrangements Chair:
John A. Olson, Jr.

2015 **Nashville, Tennessee**
Local Arrangements Chair:
Carmen Solórzano

2014 **Boston, Massachusetts**
Local Arrangements Chair:
Richard A. Hodin

2013 **Chicago, Illinois**
Local Arrangements Chair:
Peter Angelos

2012 **Iowa City, Iowa**
Local Arrangements Chair:
Ronald Weigel

2011 **Houston, Texas**
Local Arrangements Chair:
Nancy D. Perrier

2010 **Pittsburgh, Pennsylvania**
Local Arrangements Chair:
Sally E. Carty

2009 **Madison, Wisconsin**
Local Arrangements Chair:
Herbert Chen

2008 **Monterey, California**
Local Arrangements Chair:
Quan-Yang Duh

2007 **Tucson, Arizona**
Local Arrangements Chair:
Michael J. Demeure

2006 **New York, New York**
Local Arrangements Chair:
Ashok R. Shaha

2005 **Cancun, Mexico**
Local Arrangements Chair:
Miguel F. Herrera

PANEL SESSIONS

Attendees are welcome to attend any sessions unless specifically stated.

Lunch Session: Thyroidectomy: How I Do It

Saturday, April 18, 2026, 12:45 PM – 1:45 PM
Commercial promotion for this session provided by Hologic and Medtronic
Moderator: Marybeth Hughes, MD
Panelists: Jennifer Kuo, MD, Herbert Chen, MD, Richard Hodin, MD, Nancy Perrier, MD
This session will feature a panel of experienced endocrine surgeons presenting their individual approaches to thyroidectomy. Attendees will gain detailed insights into operative techniques, including strategies for vascular ligation, dissection methods, and technical nuances that optimize patient outcomes. By showcasing a diversity of operative practices, this session aims to enhance understanding of surgical variability and provide practical pearls for improving clinical performance.

Practical Applications of Artificial Intelligence in Endocrine Surgery

Saturday, April 18, 2026, 3:45 PM – 4:45 PM
Moderator: Joseph Bobadilla, MD
Panelists: Daniel Hashimoto, MD, MTP, Feibi Zheng, MD, Juan Pablo Pantoja, MD, and Denise Lee, MD
Artificial intelligence is rapidly transforming surgical practice, offering new tools for decision-making, predictive analytics, and workflow optimization. This panel will explore practical applications of AI in endocrine surgery, including its role in improving diagnostic accuracy, guiding operative planning, and enhancing patient safety. Experts will discuss current innovations, implementation challenges, and future directions, providing attendees with a roadmap for integrating AI into clinical practice responsibly and effectively.

Breakfast Session: Prevention, Identification, and Treatment of Post-Surgical Hypoparathyroidism

Monday, April 20, 2026, 7:00 AM – 8:00 AM
Moderator: Doug Turner, MD
Panelists: TK Pandian, MD, Jason Prescott, MD, Karen Devon, MD, and Sonya Khan, MD
Post-surgical hypoparathyroidism remains a significant challenge in endocrine surgery, impacting patient outcomes and quality of life. This session will review the incidence and prevalence of this complication, outline strategies and adjuncts for prevention, and present newly standardized diagnostic criteria. Attendees will also learn about recent basic science innovations, contemporary management approaches, and the long-term implications for patient care. The discussion will emphasize practical solutions and emerging therapies to optimize outcomes for affected patients.

PANEL SESSIONS *(continued)*

Advanced Cancer Tumor Board
Monday, April 20, 2026, 9:15 AM – 10:15 AM
Moderator: Thomas Fahey, MD
Panelists: Peter Sadow, MD, Naris Nilubol, MD, Mark Zafereo, MD, Omar El Kawkgi, MD, and Sarah Hamidi, MD
This multidisciplinary tumor board will address complex management strategies for advanced thyroid cancer. Discussions will include rapid response protocols for anaplastic thyroid carcinoma, neoadjuvant treatment approaches for locally advanced differentiated thyroid carcinoma, and surgical strategies for recurrent disease. Through case-based dialogue and expert commentary, participants will gain actionable insights into evidence-based care for these challenging clinical scenarios.

Great Debates Session
Monday, April 20, 2026, 11:30 AM – 12:30 PM
Moderator: Insoo Suh, MD
Panelists: James Lee, MD, Quan Duh, MD, Randall Owen, MD, Joyce Shin, MD, Jessica Shank, MD, and Toni Beninato, MD
Engage with leading experts as they debate some of the most controversial topics in endocrine surgery. This session will feature spirited discussions on robotics improving minimally invasive adrenalectomy, medical management being the first-line therapy for normocalcemic hyperparathyroidism, and unilateral lobectomy as a viable option for medullary thyroid cancer. Each debate will highlight the latest evidence, surgical experience, and clinical reasoning to help attendees refine their approach to these complex decisions.

BREAKOUT SESSIONS
Join a small group interactive breakout session led by experts in the field and offered in parallel to the scientific program. Pre-registration is required.

Operate or Observe: Mild Autonomous Cortisol Secretion (MACS)
Saturday, April 18, 2026, 9:00 AM – 10:00 AM
Moderator: Priya Dedhia, MD
Panelists: Alaa, Sada, MD, Catherine McManus MD, MS, FACS, Caitlin Hackett, MD, and Natalia Genere, MD
Mild autonomous cortisol secretion (MACS) represents a diagnostic and therapeutic gray zone. This session reviews current evidence on its metabolic risks and engages participants in debate over the role of surgery versus observation.

Building a Strong Multidisciplinary Clinical Program
Saturday, April 18, 2026, 3:00 PM – 4:00 PM
Moderator: Rebecca Sippel, MD
Panelists: David Schneider, MD, Louise Davies, MD, Molly Barrie, NP, and Lydia Sam, RN
As Endocrine Surgeons, so much of the care that we provide for our patients occurs outside of the operating room (pre-operative and post-operative phases of care). In this session we will discuss how we have partnered with our nurses, APPs, and colleagues to develop a streamlined multidisciplinary program to care for our patients.

Building Bridges: Strategies for Thriving in a New Institutional Environment
Saturday, April 18, 2026, 3:00 PM – 4:00 PM
Moderator: Jessica Fazendin, MD
Panelists: Irene Lou, MD, Lisa Reid, MD, Heather Wachtel, MD, and Sam Enumah, MD
Learn practical strategies to build trust, visibility, and partnerships when starting in a new institution. This interactive session helps endocrine surgeons strengthen connections that drive early and long-term success.

Highlights of the new ATA Guidelines
Sunday, April 19, 2026, 9:30 AM – 10:30 AM
Moderator: Hadzia Kazaure, MD
Panelists: Elizabeth Grubbs, MD, Christopher McHenry, MD, and Julie Ann Sosa, MD
This panel will discuss the new/updated ATA guidelines for the management of thyroid nodules and thyroid disease. The guidelines are extensive and this session will provide attendees with new “highlights.”

BREAKOUT SESSIONS *(continued)*

AI in Endocrine Surgery: Vision, Validation, and Collaboration

Sunday, April 19, 2026, 2:15 PM – 3:15 PM
Moderator: Sara Abou Azar, MD
Panelists: Kepal Patel, MD, Vivek Sant, MD, Xavier Keutgen, MD, Amin Madani, MD, Brenessa Lindeman, MD and Bo Wang, MD
The session will review current AI applications and future opportunities in Endocrine Surgery, combining expert lectures, a panel discussion, and a look at clinical and ethical implications.

Pearls, Logistics, and Best Practices for Adrenalectomy Perioperative Care

Monday, April 20, 2026, 9:00 AM – 10:00 AM
Moderator: C. Corbin Frye, MD
Panelists: Travis McKenzie, MD, Erin Berber, MD, Cortney Lee, MD, Jordan Broekhuis, MD, and Natalia Genere, MD
To reduce variability in perioperative adrenal care, this roundtable will address best practices on topics such as inpatient vs outpatient surgery, testing for adrenal insufficiency, and medication/steroid management in primary aldosteronism, hypercortisolism, and pheochromocytoma.

UCSF CAROL & ORLO H. CLARK DISTINGUISHED LECTURE IN ENDOCRINE SURGERY

Daniel Hashimoto, MD, MTP

Assistant Professor of Surgery & Active Surgeon, Penn Medicine

"Seeing is Believing: Multimodal AI and the Future of Surgical Care"

Saturday, April 18, 2026 at 2:00 PM

Daniel Hashimoto is assistant professor of surgery at the Hospital of the University of Pennsylvania and leads the department of surgery's Penn Computer Assisted Surgery and Outcomes (PCASO) Lab. His research focuses on leveraging computer vision to augment surgical decision-making in the operating room and to provide data-augmented guidance to surgeons during operations to improve patient outcomes and reduce the likelihood of intraoperative adverse events.

He has published in journals such as the New England Journal of Medicine, Nature Biotechnology, Medical Image Analysis, Annals of Surgery, and others. His work has been featured in CBS News, The Atlantic, PBS Newshour, the New York Times, and TED. He served as program chair for the clinical translation program CLINICCAI at MICCAI 2022 and serves on the working group for surgical informatics of the American Medical Informatics Association (AMIA) and the Committee on Emerging Surgical Technologies and Education for the American College of Surgeons. He is co-founder and vice chair of the Global Surgical AI Collaborative, a nonprofit that promotes the democratization of surgical care through the intersection of education, innovation, and technology.

UCSF CAROL & ORLO H. CLARK DISTINGUISHED LECTURE AT PRIOR MEETINGS

2025 **Jackie Siebel**, Vice President of Product Development and Quality at Sartori Company

2024 **Professor Jad Abumrad,** Distinguished Professor of Research at Vanderbilt University
How to Talk to a Human

2023 **Keith S. Heller, MD,** Retired, Professor of Surgery at NYU Langone Medical Center
Listening to our Artists

2022 **Thomas J. Giordano, MD, PhD,** University of Michigan
What Have We Learned From the Genomic Investigation of Endocrine Tumors?

2021 **André Lacroix, M.D., FCAHS, MD,** Centre hospitalier de l'Université de Montréal (CHUM)
Aberrant regulation of cortisol and aldosterone secretion in adrenal tumors and hyperplasias

2019 **Selwyn M. Vickers, MD, FACS,** University of Alabama School of Medicine
Relationships and Resilience: Lessons Learned from Mentors and Heroes

2018 **Julie Freischlag, MD FRCS,** Wake Forest University
Breakthrough to Brave

2017 **Jack A. Gilbert, PhD,** University of Chicago
Thyroid Cancer and the Microbiome

2016 **Steven A. Rosenberg, MD, PhD,** National Cancer Institute and George Washington University
The Curative Potential of T-cell Transfer Immunotherapy for Patients with Metastatic Cancer

2015 **Gary Hammer, MD, PhD,** University of Michigan
Translating Adrenal Stem Cells: Implications for Adrenal Disease

2014 **Yuri E. Nikiforov, MD, PhD,** University of Pittsburgh School of Medicine
Progress in Genomic Markers for Thyroid Cancer: How Does if Affect Patient Management?

2013 **Anders O.J. Bergenfelz, MD, PhD**, Lund University Hospital
Quality Control in Clinical Practice and Postgraduate Education in Endocrine Surgery

2012 **Atul A. Gawande, MD, MPH,** Brigham and Women's Hospital
Strategies for Improving Surgical Performance

2011 **Allan H. (Bud) Selig,** 9th Commissioner of Major League Baseball
Major League Baseball – 2011 Economic and Health Related Issues

2010 **Alexander J.B. McEwan, MB,** University of Alberta
The State of the Art of Radionucleotide Imaging and Therapy in Patients with Neuroendocrine Tumors

2009 **Jeffrey M. Trent, PhD,** Translation Genomics Research Institute
Genomics, and Biology Towards a More Personalized Medicine

2008 **F. John Service, MD, PhD,** Mayo Clinic
Hypoglycemia in Adults – 80th Anniversary of Hyperinsulinism

2007 **Virginia A. LiVolsi, MD,** University of Pennsylvania
Thyroid Nodule FNA and Frozen Section: Partners or Adversaries

2006 **Michael Bliss, PhD,** University of Toronto
Harvey Cushing and Endo- Criminology

2005 **David Duick, MD,** Phoenix, Arizona
Thyroid Nodules and Mild Primary Hyperparathyroidism: Examples of Clinical Perplexities or Unresolvable Conundrums

2004 **Edward R. Laws Jr, MD**, University of Virginia
The Diagnosis and Management of Cushing's Disease

2003 **Sissy M. Jhiang, MD**, The Ohio State University
Lessons From Thyroid Cancer: Genetics and Gene Therapy

2002 **William F. Young Jr., MD**, Mayo Clinic
Adrenal-Dependent Hypertension: Diagnostic Testing Insights

2001 **Andrew F. Stewart, MD**, University of Pittsburg
Parathyroid Hormone-Related Protein: From Hypercalcemia of Malignancy to Gene Therapy from Diabetes

2000 **James Shapiro, MD**, University of Alberta
Pancreatic Islet Cell Transplantation

1999 **James Hurley, MD**, Cornell University
Post-Operative Management of Differentiated Thyroid Cancer

1998 **Susan Leeman, PhD**, Boston University
The NeuroPeptides: Substance P and Neurotensin

1997 **Bertil Hamberger, MD, PhD**, Karolinska Institute
The Nobel Prize

1996 **Victor E. Gould, MD**, Rush-Presbyterian-Medical Center
The Diffuse Neuroendocrine System: Evolution of the Concept and Impact on Surgery

1995 **Ivor M.D. Jackson, MD**, Providence, Rhode Island
Regulation of TSH Secretion: Implications for Disorders of the Thyroid Function

1994 **Gordon J. Strewler, MD**, San Francisco, California
The Parathyroid Hormone Related Protein: Clinical and Basic Studies of a Polyfunctional Protein

1993 **John L. Doppman, MD**, National Institutes of Health
Recent Advances in Endocrinologic Imaging

1992 **Donald Coffey, PhD**, Bethesda, Maryland
New Concepts Concerning Cancer

1991 **Gregory B. Bulkley, MD**, Johns Hopkins University
Endothelial Xanthine Oxidase: A Radical Transducer of Signals and Injury

MEDICAL COLLEGE OF WISCONSIN-STUART D. WILSON, M.D. HISTORICAL LECTURE

Wen T. Shen, MD
NYU Langone Health, Professor of Clinical Surgery
"'The More We Looked, The More Glands We Found': Oliver Cope and Parathyroid Surgery"

Sunday, April 19, 2026 at 10:30 AM

Dr. Shen is a Professor of Surgery at NYU. Prior to joining NYU in 2025, he completed medical school, general surgery residency, and nearly two decades on faculty at UCSF. In addition to his clinical practice in endocrine surgery, Dr. Shen has academic interests in surgical education and the history of surgery. He has served numerous roles in the AAES, including Councilor, Vice President, Chair of the Program and Membership Committees, and Director/Dean of Endocrine Surgery University.

MEDICAL COLLEGE OF WISCONSIN-STUART D. WILSON, M.D. HISTORICAL LECTURE AT PRIOR MEETINGS

2025 **Jason Pinchot, MD**, Associate Professor (CHS) of Radiology at Medical College of Wisconsin

2024 **Janice Pasieka, MD FRCSC FACS,** University of Calgary
Pancreatic Neuroendocrine Tumours and the Surgical Endocrinologist: Learning the History to Preserve the Legacy

2023 **William R. Rainey, PhD,** University of Michigan
Historic and Cellular Origins of Primary Aldosteronism

2022 **Christopher McHenry, MD,** MetroHealth
A Historical Look at Cleveland: Its Healthcare Institutions and Contributions to Endocrine Surgery

2021 **Clifford Ko, MD, MS, MSHS, FACS, FASCRS,** American College of Surgeons
Evaluating and Achieving Surgical Quality in 2021

2019 **James McClintock, MD,** University of Alabama at Birmingham
From Penguins to Plankton - the Dramatic Impacts of Climate Change on the Antarctic Peninsula

2018 **John L. Cameron, MD,** John Hopkins Hospital
William Stewart Halsted; Our Surgical Heritage (Also an Endocrine Surgeon!)

2017 **David L. Nahrwold, MD,** Northwestern University
Surgery, Surgeons and their College

2016 **Samuel A. Wells, Jr., MD,** National Cancer Institute
The Diagnosis and Treatment of Thyroid Cancer: A Historical Perspective

2015 **Robert Beazley, MD,** Boston University School of Medicine
The Glands of Owen...Who Was Owen?

2014 **Patricia J. Numann, MD,** SUNY Upstate Medical University
Ode to an Indian Rhinoceros

2013 **Orlo H. Clark, MD,** University of California, San Francisco
Recognition of Endocrine Glands and Abnormalities by Artists and Surgeons

Wen T. Shen, MD, MA, University of California, San Francisco
From 'Kindred Spirits' to the Social Network

2012 **Murray F. Brennan, MD,** Memorial Sloan-Kettering Cancer Center
Re-Operative Parathyroid Surgery Circa 1975

2011 **Jon A. van Heerden, MD,** Medical University of South Carolina
Pheochromocytoma Resection: Now and Then

2010 **Norman W. Thompson, MD,** University of Michigan
The Time Was Right

ANNUAL MEETING INFORMATION

ACCREDITATION

PROGRAM OBJECTIVES

This activity is designed for all endocrine surgeons seeking the latest developments in endocrine surgical technique and related research. The intent of the program is to improve the quality of patient care and improve overall patient safety. Audience participation and interaction will be encouraged. The content and format of the program have been determined based on evaluations and suggestions of attendees of previous programs.

At the completion of this activity, attendees will be able to:

1. Recognize the impact of social determinants of health in the diagnosis and management of endocrine diseases.
2. Describe the feasibility and outcomes of newly developed protocols, techniques, and guidelines in the management of thyroid, parathyroid, adrenal, and GI neuroendocrine diseases
3. Compare and contrast protocols for the management of thyroid, parathyroid and adrenal diseases.

CONTINUING MEDICAL EDUCATION CREDIT INFORMATION

Accreditation

This activity has been planned and implemented in accordance with the accreditation requirements and policies of the Accreditation Council for Continuing Medical Education (ACCME) through the joint providership of American College of Surgeons and the American Association of Endocrine Surgeons. The American College of Surgeons is accredited by the ACCME to provide continuing medical education for physicians.

AMA PRA Category 1 Credits™

The American College of Surgeons designates this live activity for a maximum of 19.50 credits *AMA PRA Category 1 Credits™*. Physicians should claim only the credit commensurate with the extent of their participation in the activity.

Of the *AMA PRA Category 1 Credits™* listed above, a maximum of 6.25 credits meet the requirements for Self-Assessment.

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CME CERTIFICATES AND EVALUATIONS

You may complete your attendance verification, meeting evaluation and self-assessment posttest online. You will receive your electronic CME certificate after completing the evaluation and post tests. Your final CME hours will be submitted to the ACS. Members of ACS will have their credits posted to the ACS website around 30 days post-activity if your ACS number is provided.

The website to claim your CME credits will be emailed to all Meeting attendees.

Credit Summary	CME	Self-Assessment
April 17, 2026		
Advanced Course: Mastery of Endocrine Surgery	4.50	
April 18, 2026		
Scientific Session 1 with Distinguished Moderator	1.25	1.25
UCSF Carol & Orlo H. Clark Distinguished Lecture	0.75	
Practical Applications of AI in Endocrine Surgery	1.00	
Presidential Address	1.00	
April 19, 2026		
Scientific Session 2	1.00	1.00
Scientific Session 3 with Distinguished Moderator	0.75	0.75
MCW Stuart D. Wilson, M.D. Historical Lecture	0.75	
Scientific Session 4	1.00	1.00
Scientific Session 5 with Distinguished Moderator	1.00	1.00
Interesting Cases Session	1.50	
April 20, 2026		
Breakfast Session: Prevention, Identification, and Treatment of Post-Surgical Hypoparathyroidism	1.00	
Scientific Session 6	1.25	1.25
Advanced Cancer Tumor Board	1.00	
Poster Spotlight Session	0.75	0.75
Great Debates	1.00	

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In accordance with the ACCME Accreditation Criteria, the American College of Surgeons must ensure that anyone in a position to control the content of the educational activity (planners and speakers/authors/discussants/moderators) has disclosed all financial relationships with any commercial interest (termed by the ACCME as “ineligible companies”, defined below) held in the last 24 months (see below for definitions). Please note that first authors were required to collect and submit disclosure information on behalf all other authors/contributors, if applicable..

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Man Him Matrix Fung
Isabel Garcia
Bhargavee Gnana
Daniel Gomez Carrillo
Syed Haider
Jessica Hall
Kristen HoSang
Catherine Jensen
Anastasios Karneris
Hadiza Kazaure
Xavier Keutgen
Alexis Korman
Eric Kuo
JungHak Kwak
Sarah Landau
Maarten Lastdrage
Seungho Lee
Denise Lee
James Lee
Cortney Lee
William Lightle
Eddy Lincango
Brenessa Lindeman
Natalie Liu
Patricia Lu
Yan Luk
Sarah Lund
Kelcie Lushefski
Megan McClanahan
Kelly McCoy
Christopher McHenry
Paige McKinley
Jessica McMullin
Milanie Milan
Natalie Moreno
Russ Mudgway
Naris Nilubol
Moon Young Oh
Lily Owei
Randall Owen
Mayur Pabba
Lydia Pan
Dominque Pataroque
Dhruv Patel
Varun Pathak
Joshua Preston
Mack Qin
Suedeh Ranjbar
Marina Robson Chase
Raj Roy
Alaa Sada
Vivek Sant
David Schneider
Young-Ji Seo
Neha Shafique
Omair Shariq
Wen Shen
Joyce Shin
Rebecca Sippel
Niranjna Swaminathan
Andrew Thornton
Kristin Trone
Hunter Underwood
Anh Vu
Heather Wachtel
Mithlesh Wanchoo
Bo Wang
Jennine Weller
Anne Worth
Steven Xie
Michael Yeh
Stephanie Yu
Rui Zheng-Pywell

AGENDA

THURSDAY, APRIL 16, 2026

7:00 AM – 5:00 PM	Endocrine Surgery University (Invitation only) Satellite Symposia – No CME Credit Provided
6:30 PM – 8:30 PM	Endocrine Surgery University, Fireside Chat Dinner (Invitation only)

FRIDAY, APRIL 17, 2026

7:30 AM – 1:00 PM	Endocrine Surgery University, continued (Invitation only) Satellite Symposia – No CME Credit Provided
9:00 AM – 11:00 AM	Pickleball (additional fee, limited spots)
12:00 PM – 5:00 PM	Golf (additional fee, limited spots)
1:00 PM – 5:00 PM	AAES Fellows' Ultrasound Course (Invitation only) University of Kentucky Simulation Center
1:00 PM - 5:00 PM	AAES Advanced Course: Mastery of Endocrine Surgery (additional fee)
1:00 PM – 5:00 PM	AAES Council Meeting (Invitation only)
3:00 PM – 7:00 PM	Annual Meeting Registration Opens
6:00 PM – 8:00 PM	AAES Council Dinner (Invitation only)
6:30 PM – 8:30 PM	Past President's Dinner, hosted by the AAES Foundation (Invitation only)
8:00 PM – 10:00 PM	Welcome Social (Mane on Main)

SATURDAY, APRIL 18, 2026

All program sessions will take place at the Central Bank Center, Ballroom 2-3 unless otherwise noted

7:00 AM – 8:00 PM	New Member Breakfast (Invitation only, Meeting Room 6)
7:00 AM – 6:00 PM	Registration Open (Ballroom Foyer)
8:00 AM – 9:30 AM	Poster Judging (Meeting Rooms 2, 3, 4, 5)
9:00 AM – 10:00 AM	Breakout Session 1: Operate or Observe: Mild Autonomous Cortisol Secretion (MACS) (Meeting Room 7)
10:00 AM – 11:00 AM	AAES Opening Session
11:00 AM – 12:15 PM	Scientific Session I with Distinguished Moderator (Papers 1-6)
12:15 PM – 2:00 PM	Lunch Break with Sponsors & Poster Viewing
12:45 PM – 1:45 PM	Lunch Session: Thyroidectomy: How I Do It
2:00 PM – 2:45 PM	UCSF Carol & Orlo H. Clark Distinguished Lecture Dr. Daniel Hashimoto
2:45 PM – 3:45 PM	Break with Sponsors & Poster Viewing (Ballroom 1)
3:15 PM – 3:30 PM	Product Theater: Veracyte, Inc.
3:00 PM – 4:00 PM	Breakout Session 2: Building a Strong Multidisciplinary Clinical Program (Meeting Room 7) Breakout Session 3: Building Bridges: Strategies for Thriving in a New Institutional Environment (Meeting Room 4)
3:45 PM – 4:45 PM	Panel Session: Practical Applications of Artificial Intelligence in Endocrine Surgery
4:45 PM – 5:00 PM	Break
5:00 PM – 6:00 PM	Presidential Address, Sareh Parangi, MD
6:00 PM – 7:00 PM	President's Reception (Ballroom Foyer)

SUNDAY, APRIL 19, 2026

7:00 AM – 8:00 PM	Registration Open
7:00 AM – 8:00 AM	AAES Foundation Board Meeting & Breakfast (by invitation only)
7:30 AM – 8:30 AM	Breakfast with Sponsors & Poster Viewing (Ballroom 1)
8:00 AM – 9:00 AM	Scientific Session II (papers 7-11)
9:00 AM – 9:45 AM	Scientific Session III (papers 12-14) with Distinguished Moderator
9:30 AM – 10:30 AM	Breakout Session 4: Highlights of the New ATA Guidelines (Meeting Room 7)
9:45 AM – 10:30 AM	Break with Sponsors and Poster Viewing (Ballroom 1)
10:00 AM – 10:15 AM	Product Theater: MIMEDX
10:30 AM – 11:15 AM	MCW Stuart D. Wilson, M.D. Historical Lecture Dr. Wen T. Shen
11:15 AM – 12:15 PM	Scientific Session IV (Papers 15-19)
12:15 PM – 1:45 PM	Lunch Break
12:30 PM – 1:30 PM	AAES Business Meeting (Active, Allied Specialist, Corresponding, and Senior members may attend)
1:45 PM – 2:45 PM	Scientific Session V (Papers 20-24) with Distinguished Moderator
2:15 PM – 3:15 PM	Breakout Session 5: AI in Endocrine Surgery: Vision, Validation, and Collaboration (Meeting Room 7)
2:45 PM –3:30 PM	Break with Sponsors and Poster Viewing (Ballroom 1)
3:00 PM -3:15 PM	Product Theater: Ascendis Pharma
3:30 PM – 5:00 PM	Interesting Cases Session AAES Vice President, James Howe, MD
7:00 PM – 10:00 PM	AAES Gala Celebration (Grand Ballroom 2-3 and Foyer) Theme: A Night at the Races

MONDAY, APRIL 20, 2026

7:00 AM – 10:45 AM	Registration Open
7:00 AM – 8:00 AM	Breakfast in the Exhibit Hall (Ballroom 1)
7:00 AM – 8:00 AM	Breakfast Session: Prevention, Identification, and Treatment of Post-Surgical Hypoparathyroidism
8:00 AM – 9:15 AM	Scientific Session VI (Papers 25-30)
9:00 AM – 10:00 AM	Breakout Session 6: Pearls, Logistics, and Best Practices for Adrenalectomy Perioperative Care (Meeting Room 7)
9:15 AM – 10:15 PM	Advanced Cancer Tumor Board
10:15 AM – 10:25 AM	AAES Awards Announcements Best Paper Awards Best Poster Awards Best Interesting Case Award New AAES Leadership for 2026-2027
10:25 AM – 10:45 AM	Break
10:45 AM – 11:30 AM	Poster Spotlight Session (Posters 1-7)
11:30 AM – 12:30 PM	Great Debates
12:30 PM	Meeting Adjourned

SCIENTIFIC PROGRAM

♦ Denotes Resident/Fellow Competition Paper
● Denotes Poster Spotlight Presentation

NOTE: Author listed in **BOLD** is the presenting author
Moderator listed in **BOLD** is the distinguished moderator

The Scientific Program includes only sessions that are eligible for CME credit. Credit amounts for each session are listed on page 35.

SCIENTIFIC PROGRAM

Saturday, April 18, 2026

10:00 AM – 11:00 AM

AAES OPENING SESSION

- Welcome to AAES
- In Memoriam
- Welcome to Lexington
- AAES Foundation
- Introduction of 2026 New Members
- Research Award Presentations and Announcements

11:00 AM – 12:15 PM

SCIENTIFIC SESSION I WITH DISTINGUISHED MODERATOR (PAPERS 1-6)

MODERATORS:
James Lee, MD, Columbia University Medical Center
Abbey Fingeret, MD, MHPTT, PhD, University of Nebraska

♦01. Tumor Behavior in Patient-Derived Pheochromocytoma and Paraganglioma Organoids
Hope A Feldman[1], Jonathan N Levi[2], Jiyoon Kim[3], Ines Donangelo[4], Run Yu[4], Alice Soragni[2], Patricia LM Dahia[5], James X Wu[1], Michael W Yeh[1], Masha J Livhits[1]
[1]*Division of Endocrine Surgery, Department of Surgery, University of California Los Angeles David Geffen School of Medicine,* [2]*Department of Orthopaedic Surgery, University of California Los Angeles David Geffen School of Medicine,* [3]*Biostatistics, UCLA Fielding School of Public Health,* [4]*Endocrinology, University of California Los Angeles David Geffen School of Medicine,* [5]*Division of Hematology and Medical Oncology, Department of Medicine, University of Texas Health San Antonio*

♦02. Metabolomic Profiling Identifies Functional Tumor Subtypes in Differentiated Thyroid Cancer
Joshua D Preston[1], Logan D Glosser[2], Zachery R Jarrell[3], Mihini S Senanayake[3], ViLinh Tran[3], Jennifer M Robertson[4], Collin J Weber[2], M. Ryan Smith[3], Yongliang Liang[3], Susan A Safley[2], Anee S Jackson[2], Snehal G Patel[2], Jyotirmay Sharma[2], Neil D Saunders[2], Young-Mi Go[3], Dean P Jones[3], Thomas Szabo Yamashita[2]
[1]*MD/PhD Program, Emory University SOM,* [2]*Department of Surgery, Emory University SOM,* [3]*Department of Medicine, Emory University SOM,* [4]*Emory Winship Cancer Institute*

♦03. A Little Bird Told Us: PARAKEET Testing Saves Time, Money, and Parathyroids
Alexis Desir[1], Kaustubh Gopal[1], Chukwubinyelum Amaechi[1], William Lightle[2], James W Suliburk[2], Raymon H Grogan[2], Ana Islam[1]
[1]*UT Southwestern, 2Baylor College of Medicine*

♦04. Human versus Artificial Intelligence Decision-Making for Radioactive Iodine Use in Differentiated Thyroid Cancer
Marina E Robson Chase[1], Jacob C Hubbuch[1], Colleen A McMullen[1], Daniel Davenport[1], Omar El Kawkgi[2], Nora Habib[3], Rachel Zalla[3], Alexandria Willis[4], Danielle Walsh[1], Oliver Fackelmayer[1], Cortney Lee1, William B Inabnet III[1]
[1]*Department of Surgery, University of Kentucky,* [2]*Department of Internal Medicine, University of Kentucky,* [3]*College of Medicine, University of Kentucky,* [4]*University of Kentucky*

05. Deep Learning Using Wearable Single-Lead ECG for Early Detection of Post-Thyroidectomy Hypocalcemia
Seungho Lee[1], Yeojin Kim[1], Yoon Kong[2], Ja Kyung Lee[2], Woochul Kim[1], Hyeong Won Yu[2], Su-jin Kim1, Young Jun Chai[3], June Young Choi[2], Kyu Eun Lee[1]
[1]*Department of Surgery, Seoul National University Hospital,* [2]*Department of Surgery, Seoul National University Bundang Hospital,* [3]*Seoul National University Boramae Medical Center*

♦06. Multicenter Experience of Radiofrequency Ablation for Toxic Thyroid Nodules: Periprocedural Management and Short-Term Outcomes
Suedeh Ranjbar[1], Kelsey N Larios[1], Elena G Hughes[1], Michael W Yeh[1], Masha J Livhits[1], Mayumi Endo[2], Tracy S Tylee[2], James X Wu[1], Michael Douek[3], Rizwan Zafer[4]
[1]*Endocrine Surgery, UCLA,* [2]*Endocrinology, University of Washington,* [3]*UCLA,* [4]*Department of Interventional Radiology, UCLA*

2:00 PM – 2:45 PM

UCSF CAROL & ORLO H. CLARK DISTINGUISHED LECTURE
Dr. Daniel Hashimoto

3:45 PM – 4:45 PM

PRACTICAL APPLICATION OF ARTIFICIAL INTELLIGENCE IN ENDOCRINE SURGERY
MODERATOR: Joseph Bobadilla, MD, University of Kentucky
PANELISTS: Daniel Hashimoto, MD, Penn Medicine, Feibi Zheng, MD, Baylor College of Medicine, Juan Pablo Pantoja, MD, Instituto Nacional de Ciencias Medicas y Nutricion Salvador Zubrian, Denise Lee, MD, Icahn School of Medicine at Mount Sinai Hospital

5:00 PM – 6:00 PM

PRESIDENTIAL ADDRESS
Sareh Parangi, MD

Sunday, April 19, 2026

8:00 AM – 9:00 AM

SCIENTIFIC SESSION II (PAPERS 7-11)

MODERATORS:

Douglas Fraker, MD, University of Pennsylvania

Judy Jin, MD, The Cleveland Clinic

07. It is Primary Hyperparathyroidism, Not the Thiazide

Daniel Gomez Carrillo[1], Rachael Caretti[1], Niranjna Swaminathan[1], Julia Kasmirski[1], Azeem Izhar[1], Raj Roy[1], Hameeda Arain[1], Varun Pathak[1], Peter Abraham[1], Andrea Gillis[1], Brenessa Lindeman[1], Sophie Dream[1], Herbert Chen[1]

[1]*University of Alabama at Birmingham*

08. Improvement in body composition and insulin resistance after parathyroidectomy for primary hyperparathyroidism: a prospective case-control study

Yan Luk[1], Matrix Man Him Fung[1], David Tak Wai Lui[2], Brian Hung Hin Lang[1]

[1]*Surgery, The University of Hong Kong,* [2]*Medicine, The University of Hong Kong*

♦09. Bone-Modifying Agents May Alter Biochemical Presentation and Operative Findings in Primary Hyperparathyroidism

Abigail C Chmiel[1], Genesys Giraldo[1], Caroline Jones[1], Meredith N Freeman[1], Naga M Yalla[1], William E Gillanders[1], John A Olson[1], Taylor C Brown[1]

[1]*Washington University in St. Louis*

♦10. An informed decision not to operate?: Evaluating the completeness of workup for patients with primary hyperparathyroidism

Lia D Delaney[1], Heather Day[1], Katherine Arnow Arnow[1], Elizabeth A McAninch[1], Patrick Weldon[1], Insoo Suh[2], Electron Kebebew[1], Carolyn S Seib[1]

[1]*Stanford University,* [2]*NYU Langone Health*

♦11. How frequently does parathyroidectomy and adjuvant treatment lead to clinically meaningful changes in bone mineral density? A multi-institutional study

Nicholas Druar[1], Caitlin Finn[1], Benjamin Cher[1], Vivek Sant[2], Patricia Lu[3], Megan Applewhite[3], Dana Anderson[3], Naim Maalouf[4], Jorge Esteban Mosquera[4], Rebecca Sippel[1], David Schneider[1], Simon Holoubek[1], Kristin Long1, Alexander Chiu[1], Louise Davies[1], Courtney Balentine[1]

[1]*University of Wisconsin - Madison,* [2]*UT Southwestern Medical Center,* [3]*University of Chicago Medicine,* [4]*University of Texas Southwestern*

9:00 AM – 9:45 AM

SCIENTIFIC SESSION III WITH DISTINGUISHED MODERATOR (PAPERS 12-14)

MODERATORS:

James Howe, MD, University of Iowa Health Care

Brian Untch, MD, Memorial Sloan-Kettering Cancer Center

♦12. Surgical Liver Debulking vs. Bland Embolization for Controlling Liver Metastases in Patients with Neuroendocrine Tumors: A Comparative Effectiveness Analysis

Patricia G Lu[1], Joseph Tobias[2], Daniel Appelbaum[3], Nicholas Feinberg[3], Kelvin Memeh[4], Abdul Khan[3], Divya Kumari[3], Mikin Patel[3], Osman Ahmed[3], James Michael Millis[1], Chih-Yi "Andy" Liao[5], Xavier Keutgen[1]

[1]*Department of Surgery, University of Chicago,* [2]*Department of Surgery, Boston Medical Center,* [3]*Department of Radiology, University of Chicago,* [4]*Department of Surgery, The Ohio State University,* [5]*Department of Medicine, University of Chicago*

♦13. Impact of Delay in Surgery After Diagnosis of Pancreatic Neuroendocrine Tumors: Should You Rush to Operate?

Anne L Worth[1], Rasa Zarnegar[1], Thomas J Fahey III[1], Brendan M Finnerty[1]

[1]*Endocrine Surgery, Weill Cornell Medical Center*

♦14.Genotype is associated with long-term risk of reintervention and distant metastases in patients undergoing surgery for multiple endocrine neoplasia type 1-related duodenopancreatic neuroendocrine tumors

Omair A. Shariq[1], Sutton Julsrud[1], Geoffrey B Thompson[1], Thorvardur R. Halfdanarson[2], Trenton R. Foster[1], Benzon M. Dy[1], William F Young, Jr.[3], Travis J McKenzie[1], Melanie L Lyden[1]

[1]*Division of Endocrine Surgery, Mayo Clinic,* [2]*Division of Medical Oncology, Mayo Clinic,* [3]*Division of Endocrinology, Diabetes, Metabolism, and Nutrition, Mayo Clinic*

10:30 AM – 11:15 AM

MCW STUART D. WILSON, M.D. HISTORICAL LECTURE

Wen T. Shen, MD

11:15 AM – 12:15 PM

SCIENTIFIC SESSION IV (PAPERS 15-19)

MODERATORS:

Linwah Yip, MD, University of Pittsburgh

Caitlin Yeo, MD, University of Calgary

♦15. Are the Robots Taking Over? Changes in Operative Approach for Adrenocortical Carcinoma in the U.S.

Dhruv J Patel[1], Alexa J Hughes[1], Signe M Braafladt[1], Alexandria D McDow[1], Christian C Frye[1], Ryan J Ellis[1], Karl Y Bilimoria[1], Anthony D Yang[1]

[1]*Department of Surgery, Indiana University*

♦16. Use of adrenal venous sampling in patients with hypercortisolism: when is there clinical value?

Lydia Pan[1], Joy Z Done[1], Alexis Korman[1], Kopal Kulkarni[1], Jason Fisher[1], Rachel Liou[1], Wen Shen[1], Insoo Suh[1]

[1]*NYU Langone Health*

♦17. Catecholamine-Induced Metabolic Dysfunction in PheochromocytomaParaganglioma Patients, and its Reversal after Curative Surgery: Results from Prospective PheoMet Study
Mithlesh Wanchoo[1], Samprati Dariya[1], Dileep Ramesh Hoysal[2], Preeti Dabadghao[3], Raghavendra Lingaiah[4], Namita Mohindra[5], Meera Srivastava[1], Manoj Shukla[3], Sabaretnam Mayilvaganan[1], Gyan Chand[1], Anjali Mishra[1], Gaurav Agarwal[1]
[1]*Endocrine & Breast Surgery, Sanjay Gandhi Postgraduate Institute of Medical Sciences,* [2]*Surgical Oncology, Tata Memorial Centre,* [3]*Endocrinology, Sanjay Gandhi Postgraduate Institute of Medical Sciences,* [4]*Pathology, Sanjay Gandhi Postgraduate Institute of Medical Sciences,* [5]*Radiology, Sanjay Gandhi Postgraduate Institute of Medical Sciences*

♦18. Cardiometabolic Improvements After Adrenalectomy for Mild Autonomous Cortisol Secretion
Alexis Korman[1], Joy Done[1], Arden Stromnes[1], Carolyn Seib[2], Sapir Nachum[1], Rachel Liou[1], Wen Shen[1], Insoo Suh[1]
[1]*NYU Langone Health, 2Standford Medicine*

♦19. The Utility of Cosyntropin Stimulation Test in the Assessment of Adrenal Function After Unilateral Adrenalectomy
Dogukan Akkus[1], Edip Memisoglu[1], Arturan Ibrahimli[2], Kamran Huseynli[1], Rafael Humberto Perez Soto[3], Eren Berber[1]
[1]*Endocrine Surgery, Cleveland Clinic,* [2]*Surgery, Washington University,* [3]*Endocrine Surgery, Instituto Nacional de Ciencias Medicas y Nutricion Salvador Zubiran*

1:45 PM – 2:45 PM
SCIENTIFIC SESSION V WITH DISTINGUISHED MODERATOR (PAPERS 20-24)
MODERATORS:
Antonia Stephen, MD, Massachusetts General Hospital
Randall Scheri, MD, Duke University School of Medicine

♦20. The Effect of Hospital Profit Status on Outcomes and Cost for Endocrine Surgery: A State-Based Analysis
Neha Shafique[1], Shane Williams[1], Sarah Landau[1], Rachael Acker[1], *Douglas L. Fraker*[1], *Heather Wachtel*[1], *Rachel R Kelz*[2]
[1]*University of Pennsylvania,* [2]*Endocrine and Oncologic Surgery, University of Pennsylvania*

21. Impact of a Cost Reduction Initiative Among High-Volume Endocrine Surgeons in a Large Health System
Eduardo Canalizo[1], Justin Bauzon[1], Angela Thelen[1], Amy Han[1], Gustavo Romero-Velez[1], Allan Siperstein[1]
[1]*Cleveland Clinic Foundation*

♦22. Before the Incision: How Thyroid Surgeons Foster Patient Trust Preoperatively
Sarah Lund[1], **Steven Xie**[1], Gurjit Sandhu[1], Catherine Jensen[1], Elizabeth Bacon[1], Hunter J. Underwood[1], David T. Hughes[1], Susan C. Pitt[1]
[1]*University of Michigan*

♦23. Factors associated with persistent or recurrent primary hyperparathyroidism after surgical treatment: A population-based cohort study of 4,400 patients
Florence Bénard[1], Rogeh Habashi[2], Jonas Shellenberger[3], Rebecca Griffiths[3], Antoine Eskander[4], Jesse D Pasternak[1], **Paige McKinely**[5]
[1]*University Health Network,* [2]*Brantford Community Healthcare System,* [3]*ICES, Queen's University,* [4]*Sunnybrook Health Sciences Centre* [5]*University of Toronto" after "Centre*

♦24. Specialized cancer care for medullary thyroid cancer: A SEER-Medicare study of Medicare Advantage and Fee-for-Service beneficiaries
Sarah I Landau[1], James Sharpe[2], Rachael C Acker[1], Neha Shafique[1], Douglas L Fraker[1], Heather Wachtel[1], Rachel R Kelz[1]
[1]*Department of Surgery, Hospital of the University of Pennsylvania,* [2]*Center for Surgery and Health Economics, University of Pennsylvania*

3:30 PM – 5:00 PM
INTERESTING CASES SESSION
MODERATOR: James R. Howe, MD, University of Iowa Health Care

Monday, April 20, 2026
7:00 AM – 8:00 AM
BREAKFAST SESSIOIN: PREVENTION, IDENTIFICATION, AND TREATMENT OF POST-SURGICAL HYPOPARATHYROIDISM
MODERATOR: Doug Turner, MD, University of Maryland
PANELISTS: TK Pandian, MD, Wake Forest University School of Medicine, Jason Prescott, MD, NYU Grossman School of Medicine, Karen Devon, MD, University of Toronto, Sonya Khan, MD, MD Anderson Cancer Center

8:00 AM – 9:15 AM
SCIENTIFIC SESSION VI (PAPERS 25-30)
MODERATORS:
Paul Guager, MD, University of Michigan
Lisa Reid, MD, Cooper University Hospital

♦25. Hazards of Delay: Should Early Parathyroidectomy be the Standard for Secondary Hyperparathyroidism of Renal Origin
Raj Roy[1], Rachael Caretti[1], Niranjna Swaminathan[1], Julia Kasmirski[1], Azeem Izhar[1], Daniel Gomez Carrillo[1], Hameeda Arain[1], Peter Abraham[1], Brenessa Lindeman[1], Andrea Gillis[1], Orlando M Gutierrez[1], Herbert Chen[1], Sophie Dream[1]
[1]*Endocrine Surgery, University of Alabama at Birmingham*

♦26. Effect of a Multidisciplinary Renal Hyperparathyroidism Conference on Surgical Management and Outcomes
Meghal Shah[1], Xhesika Shanja[1], **Marine Coste**[1], Gustavo Fernandez-Ranvier[1], Denise Lee[1], Randall Owen[1], Aida Taye[1]
[1]*Icahn School of Medicine at Mount Sinai*

♦27. Extent of Surgery and Survival in Localized Oncocytic Thyroid Carcinoma: Total Thyroidectomy versus Lobectomy
Eddy P Lincango[1], Omar El Kawkgi[2], Deema Al Souri[3], Hadiza S Kazaure[4], Tanaz M Vaghaiwalla[5], Julie A Sosa[6], Freddy J.K. Toloza[3]
[1]*University of Central Florida / HCA Florida Osceola,* [2]*Division of Endocrinology, Diabetes, and Metabolism, Department of Medicine, University of Kentucky, Lexington, Kentucky, U.S.A,* [3]*Metabolic Diseases Branch, National Institute of Diabetes and Digestive and Kidney Diseases, National Institutes of Health, Bethesda, Maryland, USA,* [4]*Department of Surgery, Duke University Medical Center, Durham, North Carolina, USA,* [5]*7 Division of Endocrine Surgery, DeWitt Daughtry Department of Surgery, University of Miami Leonard M. Miller School of Medicine, Miami, FL; University of Miami Leonard M. Miller School of Medicine, Miami, FL.,* [6]*Department of Surgery, University of California San Francisco (UCSF), San Francisco, California, USA*

♦28.Surgeon Acceptability of an Intervention to Promote Use of Thyroid Lobectomy for Small, Low-Risk Thyroid Cancer
Steven Xie[1], Liz Bacon[1], Sarah E Bradley[1], Brian Zikmund-Fisher[1], Michael Rubyan[1], Susan C Pitt[1]
[1]*University of Michigan Hospitals*

♦29. Evaluate or Ignore: National Variation in the Evaluation of Adrenal Incidentalomas in Over 250,000 Patients
Jessica K Hall[1], Joshua John Horns[1], Samantha Saperstein[1], Kennedy E Jensen[1], Lauren Slattery[2], Shaidy Moronta[3], Carrie E Cunningham[4], Fiemu Nwariaku[1], Jessica L McMullin1
[1]*Department of Surgery, University of Utah Health,* [2]*Department of Surgery, Maine Health Waldo Hospital,* [3]*Department of Surgery, Danbury Hospital,* [4]*Department of Surgery, Mass General Brigham*

♦30. Prophylactic central neck dissection does not prevent recurrence but increases intensity of surveillance: Long-term follow-up of a randomized trial
Benjamin Cher[1], **Caitlin B Finn**[1], Nicholas Druar[1], Alexandra Helbing[1], Travis Cotton[2], Megan K Applewhite[3], Jesse Pasternak[4], Sarah Oltmann[5], Ana Islam[5], Vivek Sant[5], James Suliburk[6], Reese Randle[7], Timothy Ullmann[8], Jason Liu[9], Naris Nilubol[10], Sarah Robbins[1], Nadine Connor[1], Alexander Chiu[1], Louise Davies[1], Kristin Long[1], David Schneider[1], Rebecca Sippel[1], Courtney Balentine[1]
[1]*University of Wisconsin,* [2]*Brown University Health,* [3]*Department of Surgery, University of Chicago,* [4]*University of Toronto,* [5]*Department of Surgery, University of Texas Southwestern Medical Center,* [6]*Baylor College of Medicine,* [7]*Wake Forest University School of Medicine,* [8]*Albany Medical Center,* [9]*Mass General Brigham,* [10]*National Cancer Institute*

9:15 AM – 10:15 AM
ADVANCED CANCER TUMOR BOARD
MODERATOR: Thomas Fahey, MD, Weill Cornell Medicine
PANELISTS: Peter Sadow, MD, MGH, Naris Nilubol, National Institute of Health, Mark Zafereo, MD, MD Anderson Cancer Center, Omar El Kawkgi, MD, University of Kentucky, Sarah Hamidi, MD, MD Anderson Cancer Center

10:45 AM – 11:30 AM
POSTER SPOTLIGHT SESSION (POSTERS 1-6)
MODERATORS: Lindsay Kuo, MD, Temple University Lewis Katz School of Medicine
Jordan Broekhuis MD, University of Nebraska Medical Center

●01. Hybrid Cervical and Robotic Assisted Thoracoscopic Resection of Substernal Goiters Is Superior to Sternotomy
Niranjna Swaminathan[1], Mehmet Kostek[1], Rongzhi Wang[1], Rachael Caretti1, Andrea Gillis[1], Sophie Dream[1], Brenessa Lindeman[1], Herbert Chen[1]
[1]*The University of Alabama at Birmingham*

●♦02. Prospective Comparison of Radiofrequency and Microwave Ablation for Toxic Thyroid Nodules
Andrew B Thornton[1], James Lee[2], Eric Kuo[2], Jennifer Kuo[2]
[1]*General Surgery, Columbia University Medical Center,* [2]*Endocrine Surgery, Columbia University Medical Center*

●♦03. Diagnostic Performance of Afirma GRID Signatures in Predicting Malignancy Among Oncocytic Thyroid Nodules
Andrew Thornton[1], Jennifer Kuo[2], James Lee[2], Eric Kuo[2]
[1]*General Surgery, Columbia University Medical Center,* [2]*Endocrine Surgery, Columbia University Medical Center*

●♦04. Balancing Benefit and Burden: Prolonged Iodine Retention After Lipiodol Lymphangiography Delays RAI Therapy in Patients with Chyle Leak Following Lateral Neck Dissection
Isabel C Garcia[1], Amber L Collier[1], Vivek R Sant[1], Sarah C Oltmann[1]
[1]*UT Southwestern*

●♦05. National Assessment of Chief Resident Thyroid and Parathyroid Entrustable Professional Activity Data
Peter J Abraham[1], Andrada Diaconescu[1], Julia Kasmirski[1], Rachael Caretti[1], Andrea Gillis[1], Sophie Dream[1], Herbert Chen[1], Abbey Fingeret[2], Brenessa Lindeman[1]
[1]*Surgery, UAB,* [2]*Surgery, University of Nebraska*

●♦06. Population-level Trends in Survival for Anaplastic Thyroid Carcinoma in the Era of Immunotherapy: An NCDB analysis
Dominique Pataroque[1], Doug Hanes[2], Joseph Sniezek[3]
[1]*Swedish Medical Center,* [2]*Cancer Research, Providence Portland Medical Center,* [3]*Head and Neck Surgery, Swedish Medical Center*

11:30 AM – 12:30 PM
GREAT DEBATES
MODERATOR: Insoo Suh, MD, NYU Langone Health
PANELISTS: James Lee, MD, Columbia University Medical Center, Quan Duh, University of California San Francisco, Randall Owen, MD, Mount Sinai Hospital, Icahn School of Medicine, Joyce Shin, MD, Cleveland Clinic, Jessica Shank, MD, University of Nebraska Medical Center, Toni Beninato, MD, Rutgers Cancer Institute of New Jersey

12:30 PM
MEETING ADJOURN

ABSTRACTS

♦ Denotes Resident/Fellow Competition Paper

NOTE: Author listed in **BOLD** is the presenting author

♦01. Tumor Behavior in Patient-Derived Pheochromocytoma and Paraganglioma Organoids

Hope A Feldman[1], Jonathan N Levi[2], Jiyoon Kim[3], Ines Donangelo4, Run Yu4, Alice Soragni[2], Patricia LM Dahia[5], James X Wu[1], Michael W Yeh[1], Masha J Livhits[1]
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Background: Pheochromocytomas and paragangliomas (PPGLs) are rare neuroendocrine tumors with limited therapeutic options in the metastatic setting. Patient derived tumor organoids (PTOs) utilize a three-dimensional culture method that preserves tumor characteristics and microenvironment to assess the efficacy of various treatments in the preclinical setting. We sought to evaluate clinical predictors of observed organoid behavior.

Methods: Tissue from patients undergoing surgical resection for PPGLs between April 2023 and August 2025 was collected, enzymatically digested with Collagenase IV and then preserved by snap freezing. PTOs were prepared by seeding primary tumor cells in Mammocult medium and Matrigel basement membrane. Tumor dissociation, PTO luminescence (an indication of more living cells), growth in hypoxia and normoxia and hormone secretion were compared with clinical factors.

Results: Tissue samples were collected from 26 patients, 23 from primary tumors and 3 from recurrence or metastatic sites. Among primary tumors only, the tumor size (r=0.516, p=.02) and absolute washout on adrenal CT (r = 0.727, p = 0.041) were positively correlated with tumor sample yield. Noncontrast HU demonstrated a moderate positive correlation with duration of tumor digestion (r = 0.595, p= 0.019), indicating that higher HU values were linked to longer digestion times. To date, 10 organoids were created from 6 patient samples. All PTOs demonstrated robust growth measured by luminescence, which was not associated with tumor size or preoperative metanephrine levels. The PTO harboring a somatic NF1 mutation showed markedly increased growth in hypoxia (4.5:1). All PTOs demonstrated the same metanephrine secretion profiles as their clinical counterparts other than a thoracic paraganglioma, which clinically secreted normetanephrine while PTO was non-secretory.

Conclusions: PTOs derived from pheochromocytoma exhibit luminescence and have the same metanephrine secretion profile as the primary tumor, confirming that PTOs provide a reliable model for studying PPGL biology. Additional PTOs will be created in the coming months to better assess clinical predictors of PTO growth in conditions such as hypoxia and to test targeted therapeutic strategies for patients with metastatic disease.

♦02. Metabolomic Profiling Identifies Functional Tumor Subtypes in Differentiated Thyroid Cancer

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Background: Differentiated thyroid cancers (DTCs) exhibit wide biological and clinical heterogeneity that is not fully explained by histologic subtype or conventional staging. Although metabolic reprogramming is a fundamental hallmark of cancer, its contribution to DTC progression remains poorly defined. Metabolomics—the comprehensive analysis of metabolites within biological systems—offers a means to identify stage-specific metabolic signatures that can improve biological understanding and potentially refine risk stratification.

Methods: Papillary thyroid carcinoma (PTC) (n=18), follicular thyroid carcinoma (FTC) (n=18), and follicular variant of papillary thyroid carcinoma (FV-PTC) (n=19) specimens were obtained from an institutional biorepository. Untargeted metabolomic profiling was performed using liquid chromatography-mass spectrometry. Thyroid cancer stage was assigned according to AJCC 8th-edition criteria using data derived from surgical pathology reports. For analysis, Stage I/II tumors were classified as “early-stage” and Stage III/IV as “advanced-stage.” Welch’s t-tests were used to compute p-values, and the Benjamini–Hochberg false discovery rate procedure was applied for multiple-comparison correction. Pathway enrichment analysis of all detected features was performed using Mummichog, and targeted evaluations of annotated metabolites were conducted to define global metabolic phenotypes and their relationships to pathological stage.

Results: Forty-nine patients had early-stage disease (n=35 Stage I, n=14 Stage II) and six had advanced-stage disease (n=5 Stage III, n=1 Stage IV); the advanced cases included three FTCs and three PTCs. After quality control, 17,467 unique metabolomic features were retained, of which 1,770 were significantly ($p<0.05$; $|\text{fold change}|>1.5$) elevated and 117 significantly decreased in advanced-stage cancers (Fig. 1A). Pathway enrichment analysis (Fig. 1B-C) revealed coordinated remodeling of fatty-acid, linoleate, and histidine metabolism in advanced-stage DTCs. Correspondingly, γ-linolenic acid, AMP, GMP, and S-adenosyl-L-homocysteine (Fig. 1D) were markedly increased ($q<0.05$), reflecting enhanced lipid synthesis, nucleotide turnover, redox imbalance, and methylation flux during tumor progression.

Conclusions: Metabolic phenotypes correlate closely with thyroid cancer stage, providing new evidence that DTC progression is accompanied by coordinated reprogramming of lipid, nucleotide, and one-carbon metabolism. These findings deepen understanding of DTC tumor biology and suggest that metabolomic profiling may complement existing risk-stratification frameworks. Prospective validation of metabolic phenotypes as predictors of recurrence and progression is warranted.

♦03. A Little Bird Told Us: PARAKEET Testing Saves Time, Money, and Parathyroids

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Background: Frozen section (FS) analysis is a clinically useful, commonly used adjunct during parathyroidectomy. However, FS prolongs operative time by ≥30 minutes and adds approximately $1,000–$3,000 in combined operating room (OR) and pathology costs per specimen. These downsides are amplified in hospitals or outpatient surgical centers without on-site pathology support. The PARAKEET assay is a novel point-of-care test developed to address these issues. It provides rapid (~60-second) biochemical confirmation of parathyroid tissue at a substantially reduced cost relative to FS. Here we use a Monte Carlo simulation to examine the time and costs savings that would result from replacing FS with the PARAKEET during parathyroidectomy.

Methods: We performed a 20,000-iteration Monte Carlo simulation comparing FS with PARAKEET using published OR costs and pathology billing rates for FS (CPT 88331). Inputs included OR cost per minute, minutes saved, FS pathology cost, and a PARAKEET kit cost of $300. Outcomes were per-case gross and net savings, annual budget impact at 300 cases/year, freed OR minutes, and added cases from capacity release. Sensitivity analyses were conducted across a range of operative times and cost assumptions to assess robustness.

Results: Substituting PARAKEET testing for FS is projected to yield a gross savings of $3,429 (95%UI,$2,464 -$4,429) in savings per case, driven primarily by decreased operative time and avoidance of pathology-related charges. At an institutional volume of 300 cases annually, PARAKEET provided projected net savings of $941,000 per year (95%UI,$649,000–$1,239,000). Additionally, eliminating FS-related OR downtime also freed an average of 9,000 minutes of OR time annually (95%UI,6,700–11,300 minutes), enabling an estimated 76 additional cases per year (95%UI,53–103). Sensitivity analyses confirmed robust cost-saving performance across all parameter ranges tested, including low-value scenarios (20-minute delay and $36/min OR cost), in which PARAKEET remained net cost-saving. The true cost savings are likely higher when accounting for pathology overhead, personnel, specimen transport, and OR inefficiencies, which vary significantly among institutions.

Conclusions: The innovative PARAKEET assay represents a markedly faster and less costly alternative to FS analysis. Adoption of this technology may markedly improve operative efficiency, reduce parathyroidectomy cost, and enhance equitable access to safe parathyroid surgery, particularly for institutions lacking on-site pathology services.

♦04. Human versus Artificial Intelligence Decision-Making for Radioactive Iodine Use in Differentiated Thyroid Cancer

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Background: The decision to administer postoperative radioactive iodine (RAI) therapy in differentiated thyroid cancer (DTC) is evolving. Given the growing utility of large language models (LLMs) in medical decision-making, we hypothesize that artificial intelligence (AI) models can inform recommendations regarding postoperative RAI therapy.

Methods: Following IRB approval, demographic, operative, and pathologic details from 100 adult patients with DTC who underwent total thyroidectomy were retrospectively extracted. A comprehensive literature review was conducted to model an appropriate RAI benchmark for each American Thyroid Association (ATA) risk category. Four AI platforms were queried for recommendations on the utility of postoperative RAI for each patient. Up to three clarifying prompts were provided in the absence of clear responses. The physician prescribed RAI treatment (human recommendation) and results of the AI queries (AI recommendation) were compared to the benchmark RAI rates using binomial exact tests.

Results: Of the 100 patients reviewed, the median age was 48 years and 81% were female. 2015 ATA risk stratification resulted in 59 low, 25 intermediate, and 16 high-risk patients. Physicians and Google Gemini recommended RAI in 24% and 19% of low-risk patients, respectively, which was statistically greater than the benchmark rate of 10%. In intermediate-risk patients, both physicians (92%) and Doximity GPT (76%) exceeded the RAI benchmark rate of 50%. In high-risk patients, Open Evidence recommended RAI at a significantly lower rate (69%) than all comparators.

Conclusions: LLMs that are not specifically trained for DTC management demonstrate variability in recommending RAI therapy. However, these platforms may complement human recommendations for RAI administration, with promise towards aligning RAI use with consensus guidelines.

05. Deep Learning Using Wearable Single-Lead ECG for Early Detection of Post-Thyroidectomy Hypocalcemia

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Background: Timely recognition of post-thyroidectomy hypocalcemia remains challenging. We evaluated whether deep-learning (DL) models trained on wearable single-lead electrocardiograms (ECG) can detect biochemical hypocalcemia defined by albumin-corrected calcium (CorrCa) <8.5 mg/dL and ionized calcium (iCa) <1.09 mmol/L, compared with a heart-rate–corrected QT interval (QTc) benchmark.

Methods: In a protocolized prospective cohort (N=51), at each visit—preoperative baseline (V1), postoperative day (POD) 1 (V2), POD2 (V3), 2–3 weeks (V4), and 2–3 months (V5)—we obtained synchronized laboratories (total Ca, iCa, albumin, magnesium, parathyroid hormone [PTH]) and four 30-s wearable single-lead ECG recordings within 60 minutes, and recorded hypocalcemia symptom severity using a standardized questionnaire. The primary endpoints were model discrimination summarized by area under the receiver-operating-characteristic curve (AUC) for CorrCa<8.5 mg/dL and iCa<1.09 mmol/L. Datasets were split at the patient level (subject-independent), with no subject overlap across the training, validation, and test sets. Architectures included DenseNet, ResNet, ResNeXt, RegNetY, and EfficientNet. Inputs preserved the native time/aspect ratio (144×1024, no zero-padding); square, zero-padded inputs served as comparators. QTc from contemporaneous 12-lead ECG served as a non-DL benchmark.

Results: On internal patient-wise splits, DL models using wearable single-lead ECG demonstrated clinically meaningful discrimination for both definitions. For CorrCa<8.5 mg/dL, the best AUC reached 0.971 (RegNetY), with other backbones 0.763–0.960. For iCa<1.09 mmol/L, the best model (ResNeXt) achieved AUC 0.801 (others 0.654–0.783). Aspect-preserving inputs (144×1024, no padding) consistently outperformed square, zero-padded inputs. QTc alone showed modest discrimination (AUCs of 0.538 for CorrCa <8.5 and 0.544 for iCa <1.09) and weaker correlations with contemporaneous calcium values than the DL outputs. Hypocalcemia prevalence using general definitions was as follows: CorrCa <8.0 mg/dL—V2 29.4%, V3 31.4%, V4 7.8%, V5 14.0%; iCa <1.05 mmol/L—V2 31.4%, V3 33.3%, V4 2.0%, V5 6.0%.

Conclusions: With synchronized lab–ECG acquisition after thyroidectomy, DL models trained on wearable single-lead ECG accurately detected biochemical hypocalcemia defined by CorrCa<8.5 mg/dL and iCa<1.09 mmol/L. The models achieved AUCs up to 0.971 and 0.801, respectively, supporting their use as an early warning tool. External, multi-institutional validation, model calibration, and decision-curve analyses are warranted prior to clinical deployment.

♦06. Multicenter Experience of Radiofrequency Ablation for Toxic Thyroid Nodules: Periprocedural Management and Short-Term Outcomes

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Background: Radiofrequency ablation (RFA) is an emerging minimally invasive therapy for toxic thyroid nodules. However, efficacy and periprocedural management are not well characterized. This study aims to characterize short-term clinical outcomes following RFA for toxic nodules.

Methods: A multicenter retrospective study of adults who underwent RFA for toxic thyroid nodules, 2017-2025. Patients were excluded if no postoperative TSH values were available. The primary outcome was normalization of TSH without antithyroid drugs (ATDs) following RFA. Secondary outcomes included emergency department (ED) visits for hyperthyroidism and periprocedural management strategies, including methimazole tapering versus immediate discontinuation. Descriptive and comparative analyses were performed.

Results: The cohort included 44 patients, predominantly female (82%), with a mean age of 44 years (IQR 43–60). Forty-five percent were on methimazole prior to RFA, and the mean nodule volume was 8 mL (IQR 4–19). After median follow-up of 12 months, 68% achieved TSH normalization off medication without recurrence of hyperthyroid symptoms. Patients who experienced RFA failure had significantly larger baseline nodule volumes compared to those with successful treatment (24.38 mL [IQR: 12.86-30.70] vs 8.96 mL [IQR: 5.2916.83]; p = 0.047). Of note, three patients (6.8%) experienced recurrence of hyperthyroidism after initial normalization of TSH. Among the 20 patients taking ATDs at time of procedure, 65% (13/20) discontinued antithyroid medication immediately, and 35% (7/20) underwent tapering. Two patients underwent cessation of methimazole prior to RFA due to intolerance of the medication. Four patients received periprocedural prednisone. No ED visits for thyrotoxicosis were reported.

Conclusions: RFA for toxic thyroid nodules was effective in 68% of patients. Some patients experienced recurrent hyperthyroidism after initial improvement, suggesting longer term follow-up is needed. Immediate discontinuation of methimazole following RFA appears safe in a limited series of patients.

07. It is Primary Hyperparathyroidism, Not the Thiazide

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Background: Thiazide diuretics are a common cause of hypercalcemia in clinical practice, and their use can mask the manifestation of primary hyperparathyroidism (PHPT). In this study we aimed to determine the prevalence of PHPT among patients with presumed thiazide-induced hypercalcemia.

Methods: We performed a retrospective cohort study (2005–2025) using a multi-institutional database. Adults with ≥2 serum calcium values >10.5 mg/dL after ≥1 month of thiazide use were identified. Patients with alternative causes of hypercalcemia (e.g., secondary hyperparathyroidism, advanced CKD, malignancy, granulomatous disease, lithium, hypoalbuminemia, calcium supplementation, vitamin D/A intoxication, etc.) were excluded. We quantified the rate of parathyroid hormone (PTH) testing and the prevalence of PHPT, defined as inappropriately elevated PTH (>50 pg/mL) in the setting of hypercalcemia. Treated and untreated patients with PHPT were compared using 1:1 propensity-score matching on age, sex, ethnicity, Charlson Comorbidity Index, tobacco use, PTH level, glucocorticoid use, glomerular filtration rate, prior fractures, and family history of osteoporosis. Outcomes were incident fractures, osteoporosis/osteopenia, and nephrolithiasis, reported as risk ratios with 95% conficence intervals.

Results: We identified 257,311 patients with two instances of hypercalcemia after one month of thiazide diuretic use. After excluding alternative causes of hypercalcemia, 92,122 patients were deemed at risk for PHPT. Of those, only 39% (n=35,778) underwent PTH assessment. Among those tested, 59% (n=21,030) had PHPT. In this PHPT cohort, the mean age was 68 ± 12, with 54% being female and 56% identifying as white. Just 8% (n=1,585) of these PHPT patients received treatment (parathyroidectomy, n=809; cinacalcet, n=776). After propensity score matching (n=1,492 per group), untreated patients had a significantly increased risk of developing osteoporosis/osteopenia (RR 1.50, 95% CI 1.14-1.99, p=0.003) and a higher risk of fracture (RR 1.25, 95% CI 0.90-1.75, p=0.1767) compared to treated patients. No difference in risk for nephrolithiasis was observed (RR 1.27, 95% CI 0.87–1.88; p=0.214).

Conclusions: In patients who develop recurrent hypercalcemia while on thiazides, PHPT is infrequently screened for and even less often treated. With over half of the tested patients having biochemical evidence of PHPT, the failure to evaluate PTH in this population resulted in a missed opportunity to intervene and avert long-term sequelae of PHPT.

08. Improvement in body composition and insulin resistance after parathyroidectomy for primary hyperparathyroidism: a prospective case-control study

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Background: Body composition parameters are established indices of metabolic risk. Recent studies have suggested that parathyroidectomy for primary hyperparathyroidism may improve metabolic outcomes. This prospective study compared the changes in body composition and insulin resistance in patients with primary hyperparathyroidism undergoing parathyroidectomy versus non-operative management.

Methods: Consecutive patients diagnosed with primary hyperparathyroidism in a tertiary institution and met indications for parathyroidectomy were prospectively recruited. The surgery group comprised of patients undergoing parathyroidectomy, while the non-surgery group comprised of patients who declined surgery. Metabolic assessment consisted of body composition measurements with bioelectrical impedance analysis and blood indices for Homeostasis Model Assessment for Insulin Resistance (HOMA-IR) score. The surgery group was assessed pre-operatively, at post-operative 3 months and 6 months; the non-surgery group was assessed at baseline and at the 6-month follow-up.

Results: Forty-six patients were analyzed (surgery: n=23; non-surgery: n=23). Thirty-two (69.6%) were females. Mean age was 65 years old. Baseline demographics, co-morbidities and body composition parameters were comparable. The surgery group had increased fat-free mass (median 40.1 vs 42.9kg, p=0.021), muscle mass (37.8 vs 40.3kg, p=0.021) and skeletal muscle mass (22.7 vs 24.3kg, p=0.021) at 3-month post-operatively; numerical increase in the indices was obtained at 6-month post-operatively compared to baseline. The non-surgery group had increased fat mass at 6 months (16.6 vs 18.4kg, p=0.031). Comparing the two groups, the non-surgery group had numerically a greater increase in fat proportion (-0.1% vs 0.6%, p=0.147) and fat mass (1.57% vs 3.77%, p=0.170) over 6 months, with a more pronounced effect in the subgroup with baseline body mass index <25kg/m2 (fat mass change -3.09% vs 6.57%, p=0.043). For HOMA-IR scores, the surgery group showed improvement at 3-month (3.36 vs 2.52, p=0.823) and 6-month (3.36 vs 2.79, p=0.794) post-operatively, and had a more favorable change across 6 months when compared to the non-surgery cohort (-0.18 vs 0.50, p=0.941) albeit statistical insignificance.

Conclusions: Parathyroidectomy may reduce fat mass and insulin resistance in patients with primary hyperparathyroidism, whereas non-surgical treatment may lead to increased fat mass. By improving body composition, parathyroidectomy may reduce metabolic risks.

♦09. Bone-Modifying Agents May Alter Biochemical Presentation and Operative Findings in Primary Hyperparathyroidism

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Background: Primary hyperparathyroidism (PHPT) is closely linked to bone metabolism, leading to increased bone resorption and osteoporosis. Bone-modifying agents (BMAs), including bisphosphonates, denosumab, and anabolic therapies, are commonly used to mitigate bone loss by altering calcium metabolism. However, their effect on the biochemical and operative presentation of PHPT has not been well characterized. This study evaluates the association between BMA use, biochemical markers, and operative findings among patients with PHPT.

Methods: A retrospective cohort study was conducted of patients who underwent parathyroidectomy for PHPT between 2019 and 2025 at a single tertiary referral center. Patients with secondary or tertiary hyperparathyroidism or parathyroid carcinoma were excluded. BMA use was defined as any history or active use of antiresorptive/anabolic therapy. Descriptive statistics and univariate analyses were performed to evaluate associations between BMA use and biochemical profile (serum calcium, parathyroid hormone [PTH]) and operative findings (single- vs. multigland disease, unilateral vs. bilateral exploration).

Results: A total of 899 patients met inclusion criteria, of whom 187 (20.8%) had a history of BMA use. Patients with BMA use were more likely to be female ($p < 0.001$), White ($p < 0.001$), and older on average (70 vs. 60 years, $p < 0.001$). Mean serum calcium was lower among BMA users compared with non-users (10.5 vs. 10.9 mg/dL, $p < 0.001$), and mean PTH levels were also lower (99.5 vs. 119.7 pg/mL, $p < 0.001$). Multigland disease was more frequent in BMA users (43% vs. 32%, $p = 0.03$), and bilateral neck exploration was also more common in this group (54% vs. 45%, $p = 0.033$).

Conclusions: In patients undergoing parathyroidectomy for primary hyperparathyroidism, use of bone-modifying agents is associated with distinct biochemical profiles, including lower serum calcium and PTH levels, and a higher prevalence of multigland disease requiring bilateral neck exploration. While these findings may suggest a potential influence of BMAs on the pathophysiology and surgical presentation of PHPT, further investigation is warranted to clarify the nature and extent of these associations. A more nuanced understanding of these relationships could inform preoperative planning and guide individualized evaluation strategies, particularly in patients with a history of bone medication use.

♦10. An informed decision not to operate?: Evaluating the completeness of workup for patients with primary hyperparathyroidism

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Background: Primary hyperparathyroidism (PHPT) is common and can cause significant morbidity, including osteoporosis/fractures, kidney stones, and chronic kidney disease (CKD). Although multidisciplinary guidelines recommend parathyroidectomy for “asymptomatic” patients with PHPT-associated end-organ damage, most patients are managed nonoperatively. The proportion of patients who undergo a complete workup to be accurately designated as appropriate for nonoperative management is unknown. We aimed to determine the completeness of workup in a national PHPT population based on concordance with guidelines from relevant International Workshops for the Evaluation and Management of PHPT.

Methods: We identified a national cohort with a new biochemical diagnosis of PHPT (2014-2023) who were “asymptomatic” (no history of atraumatic fracture, kidney stones, or ≥stage 4 CKD) and managed nonoperatively within 2 years using Truveta electronic health record and claims data. We evaluated if patients underwent guideline-concordant workup +/- 1 year of PHPT diagnosis, including: 1) 24-hour urine calcium measurement; 2) osteoporosis screen with DXA; 3) vertebral fracture screen (VFA); and 4) abdominal imaging for nephrocalcinosis/nephrolithiasis. Multivariable logistic regression was used to evaluate factors associated with more complete workup.

Results: We identified 29,271 patients with a new diagnosis of PHPT managed nonoperatively. Only 245 patients (1%) underwent a complete guideline-concordant workup including all 4 recommended tests, while 6,568 (22%) had ≥2 recommended tests completed. A total of 13,032 (45%) had no evaluation for PHPT-associated end-organ damage. The most common screening test was 24-hour urine calcium (26%, n=7682), followed by DXA (26%, n=7492), abdominal imaging for nephrocalcinosis/nephrolithiasis (19%, n=5481) and VFA (14%, n=4194), all of which were more likely to be completed in patients receiving specialty care (Figure 1). Multivariable regression demonstrated that calcium >11.2 mg/dL (OR 1.18, 95% CI:1.08-1.28), endocrinologist visit (OR 2.69, 95% CI:2.54-2.86) and surgeon visit (OR 1.63, 95% CI:1.52-1.74) were associated with increased odds of receiving ≥2 screening tests.

Conclusions: Among patients with “asymptomatic” PHPT, the majority did not receive a complete, guideline-recommended workup prior to proceeding with nonoperative management. Poor adherence to guideline-recommended care likely contributes to underdiagnosis of PHPT-associated end-organ damage and, ultimately, widespread undertreatment, highlighting an opportunity for interventions to improve treatment decisions outside of specialty settings.

♦11. How frequently does parathyroidectomy and adjuvant treatment lead to clinically meaningful changes in bone mineral density? A multi-institutional study

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Background: The Federal Drug Administration will soon approve a new standard for what constitutes a clinically meaningful improvement in bone mineral density (BMD) that predicts fracture prevention, defined as a ≥3.18% improvement in total hip BMD. We aimed to determine what proportion of patients who undergo parathyroidectomy for primary hyperparathyroidism achieve this benchmark, with or without bisphosphonates as adjuvant therapy.

Methods: We included 493 adults who underwent curative parathyroidectomy for primary hyperparathyroidism at three institutions and had BMD testing within three years prior to and after surgery. We calculated the proportion of patients whose total hip BMD improved by ≥3.18%, with subgroup analyses based on use of bisphosphonates before, within one year postoperatively, or greater than 1 year postoperatively.

Results: Mean age at surgery was 67± 9.7 years, and mean preoperative calcium was 10.6 mg/dL. Altogether, 43% patients (95% credible interval [CrI] 39%-48%) achieved meaningful BMD improvement within three years after parathyroidectomy. For patients not taking bisphosphonates before surgery, 43% (95% CrI 37%-50%) experienced a meaningful improvement in BMD with surgery alone and no bisphosphonates postoperatively. Similar rates were observed regardless of whether bisphosphonates were started within one year of surgery (49%, 95% CrI 37%-60%) or after one year (50%, 95% CrI 21%-79%). If patients were taking bisphosphonates before surgery and discontinued them postoperatively, the incidence of clinically meaningful improvement after parathyroidectomy was 37% (95% CrI 25%-51%). If bisphosphonates were restarted within one year of surgery, the rate of success was 54% (95% CrI 35%-71%), while success was achieved for 47% (95% CrI, 33%-61%) if medications were restarted more than one year after surgery.

Conclusions: Parathyroidectomy leads to a clinically meaningful improvement in BMD for <50% of patients, and the additive value and appropriate timing of bisphosphonates as adjuvant therapy is unclear. It is important to identify better adjuvant treatments to boost the effects of parathyroidectomy on BMD recovery so more patients can maximally benefit from surgery.

♦12. Surgical Liver Debulking vs. Bland Embolization for Controlling Liver Metastases in Patients with Neuroendocrine Tumors: A Comparative Effectiveness Analysis

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Background: Surgical liver debulking and catheter-based liver-directed therapies, such as bland embolization (TAE), are commonly used to control progression of neuroendocrine tumor liver metastases (NETLM). Comparison of surgery versus TAE for NETLM is challenging to perform due to confounding by indication. We sought to determine which of these locoregional therapies provides longer disease control using a comparative effectiveness analysis model.

Methods: We conducted a retrospective single-center cohort study applying a target trial emulation framework to compare first-line liver debulking with first-line TAE. Inverse probability of treatment weighting (IPTW) was estimated from primary tumor site, Ki-67 index, liver tumor volume (TV) (using DOTATATE PETs and MIM software), and extrahepatic metastases in order to balance treatment groups at the episode level. Weighted Kaplan-Meier analyses were used to estimate median progression-free survival (PFS) under the average treatment effect in the treated (ATT). Recurrent-event Cox regression was used to estimate the association between current treatment and the hazard of subsequent progression.

Results: Among 78 patients with NETLM (34 small bowel, 29 pancreas, 15 other), 24 (33%) underwent surgical debulking only, 23 (31%) surgery followed by TAE, 26 (36%) TAE only, and 5 (6%) TAE followed by surgery. Compared with patients who underwent surgery at any point, those treated with TAE only were more likely to have Ki-67 >20% (26.9% vs. 9.6%, p=0.03), extrahepatic metastases (50.0% vs. 15.4%, p=0.003), and greater liver tumor burden (median TV 231 mL vs. 150 mL, p=0.04). After IPTW, covariate balance improved substantially (median absolute standardized mean difference: 0.34 to 0.08). Weighted median PFS was 13 months for surgery-first (95% CI 12–19; effective sample size [ESS] 47) versus 9 months for embolization-first (95% CI 5–30; ESS 12; p = 0.003). In recurrent time-to-event models, Ki-67 >10% was the only predictor of progression (HR 2.65; 95% CI 1.17–6.00; p = 0.02).

Conclusions: By estimating the counterfactual outcomes among NETLM patients who received surgery first, this analysis suggests that TAE is associated with shorter progression free survival. Surgical debulking provides a longer duration of liver disease control in NETLM and should be considered first line in appropriately selected patients.

♦13. Impact of Delay in Surgery After Diagnosis of Pancreatic Neuroendocrine Tumors: Should You Rush to Operate?

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Background: Current guidelines for management of pancreatic neuroendocrine tumors (PNETs) suggest observation of localized PNETs <1cm can be considered, but it remains unclear if larger tumors have a propensity to spread. We aimed to assess the safety of delayed surgery on larger tumors and determine subgroup candidacy for active surveillance.

Methods: Resected M0, T1, T2, and T3 PNETs available in the Surveillance, Epidemiology, and End Results Program (SEER) from 2010 to 2022 were included. Demographics, interval from diagnosis to surgery, and disease-specific survival (DSS) were retrospectively analyzed. National Cancer Database (NCDB) patients were then reviewed to assess the effect of delay in surgery on incidence of pathologic upstaging and overall survival (OS).

Results: Overall, 4931 patients from SEER were included and 150 (3.0%) had disease-specific death. Multivariable analysis demonstrated no impact of 3- or > 6-month delay to surgery on DSS (p=0.44, 0.85). Overall, 6583 patients from NCDB were included. On multivariate analysis, delay in surgery by 3- or > 6-months had no significant impact on OS (p=0.65, 0.44) or odds of upstaging (p=0.52, 0.20). Subgroup analysis of T2 non-functional tumors (SEER n=1519, NCDB n=2781) demonstrated no difference in DSS (p=0.82, 0.87), OS (p=0.54, 0.28) or odds of upstaging (p=0.71, 0.10) with 3- or > 6-month delay to surgery. T2 subgroup patients undergoing active surveillance (NCDB, n=994) demonstrated decreased OS when compared to surgical treatment on multivariate analysis controlling for comorbidity score [HR 2.29, 1.87-2.79, p<0.001]. The median DSS and OS in the SEER and NCDB T2 subgroups were 15.5 months [IQR 5-44] and 19 months [IQR 7-39] while the median follow up was 19 months [IQR 8-43] and 42 months [IQR 28-60], respectively.

Conclusions: Delayed surgery is safe for localized PNETs without evidence of metastasis, and necessary time should be taken after diagnosis to optimize modifiable risk factors that do impact survival. Expanding the utilization of active surveillance in patients with T2 non-functional tumors should be approached cautiously due to the association of active surveillance with worse overall survival.

♦14. Genotype is associated with long-term risk of reintervention and distant metastases in patients undergoing surgery for multiple endocrine neoplasia type 1-related duodenopancreatic neuroendocrine tumors

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Background: Duodenal and pancreatic neuroendocrine tumors (DP-NETs) are the leading case of mortality in multiple endocrine neoplasia type 1 (MEN1) due to distant metastasis. Although surgery is the cornerstone of management, a subset of patients undergo reintervention for progression or hormone-related morbidity. The clinical and genetic determinants of reintervention and long-term oncologic outcomes after index DP-NET surgery in MEN1 remain unclear.

Methods: We performed a retrospective analysis of patients with genetically-confirmed MEN1 evaluated at our institution from 1985-2024. Clinicopathologic variables and germline MEN1 genotype (menin protein truncating vs non-truncating) were compared between patients who did and did not undergo reintervention for DP-NETs (defined as any subsequent surgery or locoregional therapy). Multivariable Cox proportional hazards models were used to identify predictors of reintervention and distant metastasis-free survival (DMFS).

Results: Among 153 MEN1 patients, 94 (61%) underwent surgical resection for DP-NETs (46% functional) at a median age of 40 years (IQR 28–49). Index procedures comprised distal pancreatectomy (58%), combined formal + parenchymal-sparing resections (25%), enucleation (7%), pancreaticoduodenectomy (4%), and total pancreatectomy (6%). Over a median follow-up of 13 years (IQR 7–20), 25/94 (27%) patients underwent 39 reinterventions, including n=13 ablations, n=8 completion pancreatectomies, n=6 lymphadenectomies, n=6 hepatectomies, n=4 combination resections, and n=2 enucleations. Median time to first reintervention was 5.5 years (IQR 2.3-11.4). Patients requiring reintervention were more likely to have functional tumors (64% vs 39%, P=0.03) and truncating MEN1 mutations (88% vs 59%, P=0.01), but did not differ in age, sex, largest tumor size, or regional nodal status. On multivariable Cox analysis, truncating mutations were associated with shorter time to reintervention (HR 2.3; 95% CI 1.28-4.11; P=0.005) and shorter DMFS (HR 4.93, 95% CI 2.51–9.70, P<0.001) while functional status and tumor size were not. Notably, 12/33 (36%) patients who developed distant metastases had a largest resected tumor ≤2 cm on final pathology.

Conclusions: Patients with truncating germline MEN1 mutations may experience a >2-fold higher risk of reintervention and ~5-fold higher risk of distant metastasis after index DP-NET surgery. These findings underscore the limitations of size-based surgical algorithms and highlight the need for improved biomarkers of DP-NET behavior in MEN1 to refine surveillance and surgical timing.

♦15. Are the Robots Taking Over? Changes in Operative Approach for Adrenocortical Carcinoma in the U.S.

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Background: Current guidelines recommend an open approach for surgical resection of adrenocortical carcinoma (ACC). Despite this recommendation, minimally invasive approaches to resection of ACC have been adopted. We hypothesize that the proportion of minimally invasive adrenalectomies for ACC has increased over time and is driven by robotic-assisted approaches; however, this has not compromised oncologic outcomes.

Methods: A retrospective intention-to-treat analysis was performed by surgical approach in patients undergoing surgical resection of ACC from the National Cancer Database (NCDB). Separate multivariable logistic regression models were built to compare factors associated with undergoing robotic surgery relative to open and laparoscopic approaches. Survival was assessed using Kaplan-Meier curves and a multivariable Cox regression analysis.

Results: Of 2,481 patients from 2010-2022, 1,618 (65.2%) underwent open adrenalectomy (OA), 555 (22.4%) underwent laparoscopic adrenalectomy (LA), and 308 (11.9%) underwent robotic adrenalectomy (RA). The proportion of robotic cases increased from 2010 (4.5%) to 2022 (20.7%) [Figure 1]. Median tumor sizes by approach were OA=12.0cm (IQR: 8.3-16.5cm), LA=7.5cm (5.0-10.0cm), and RA=7.0cm (4.9-9.5cm) [p<0.001]. On adjusted analysis of contemporary practices (2018-2022), patients undergoing resection had a higher probability of undergoing a RA compared to OA [Odds Ratio: 1.76, 95% CI: (1.23-2.52), p=0.002], and separately, a higher likelihood of undergoing a RA compared to LA [OR: 2.49, 95% CI: (1.71-3.62), p<0.001]. There were no significant differences in margin-positivity by approach on univariable (OA=21%, LA=23%, RA=17%, p=0.168) and multivariable analysis: RA vs OA [OR: 0.79 (0.50-1.23), p=0.3] vs. LA [OR: 0.65, (0.40-1.05), p=0.081]. Unadjusted 5-year overall survival rates by surgical approach were OA=48%, LA=51%, and RA=55% (p=0.063). Cox regression analysis revealed that surgical approach was not associated with survival (RA vs. OA/LA [HR: 1.13, (0.82-1.55), p=0.5]).

Conclusions: Minimally invasive surgery for ACC has greatly increased over the past decade. There is a role for utilizing the robotic platform with no associated compromise in oncologic efficacy, particularly for smaller, early-stage ACC.

♦16. Use of adrenal venous sampling in patients with hypercortisolism: when is there clinical value?

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Background: Adrenal venous sampling (AVS) is routinely performed to lateralize aldosterone hypersecretion, as cross-sectional imaging alone is inaccurate in up to 30% of cases. In contrast, AVS is not routinely employed for ACTH-independent autonomous hypercortisolism, and its utility in guiding surgical decision-making remains uncertain. We aim to define clinical scenarios in which AVS provides added value in autonomous hypercortisolism.

Methods: A single-center retrospective review was conducted of all patients who underwent AVS who had biochemical evidence of hypercortisolism between 1/1/2012 and 4/21/2025. Collected data included demographics, imaging findings, biochemical studies, AVS results, and management. Lateralization was determined by a lateralization ratio of > 4 using aldosterone as a reference hormone or a side-to-side ratio of > 2.

Results: Eighteen patients with autonomous hypercortisolism were included. Ten patients had isolated hypercortisolism, 7 had concurrent hyperaldosteronism and 1 had catecholamine co-secretion. Among isolated hypercortisolism cases, 90% were female, with median age 60.5 years (range: 41–76). Bilateral adrenal nodules were present in 6 patients, with mean nodule size 2.72±0.82 cm. Mean cortisol level after 1-mg dexamethasone suppression test was 6.7±4.5 ug/dL. Mean 24-hour urine cortisol level was 55.7±52 ug/dL. AVS lateralization corresponded to the side of the larger (if ≥ 0.2cm size difference) or unilateral nodule in 5 patients, was non-lateralizing in 4 patients, and in one patient, AVS correctly lateralized to the smaller of the two nodules (1.9 cm vs 2.0 cm) which enabled correct-side surgery and normalization of postoperative salivary cortisol. Seven patients with isolated hypercortisolism (70%) were managed operatively, with all nodules benign on pathology. In co-secreting cases, interpretation of AVS results was limited by inconsistency of alternate reference hormone availability.

Conclusions: Although AVS may not be necessary for patients with a single cortisol-secreting nodule or one of dominant size, there is a risk of incorrect-side surgery in cases of comparable-sized nodules. We propose the selective use of AVS for patients with bilateral nodules each > 1.5 cm. In cases of co-secretion with hyperaldosteronism, AVS is feasible only if a reference hormone within the normal range can be obtained.

♦17. Catecholamine-Induced Metabolic Dysfunction in PheochromocytomaParaganglioma Patients, and its Reversal after Curative Surgery: Results from Prospective PheoMet Study

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Background: Catecholamine excess in Pheochromocytoma–Paraganglioma(PCC-PPGL) results in numerous metabolic implications. Chronic catecholamine excess inhibits pancreatic β-cell function, and induces lipolysis, leading to insulin resistance and glucose intolerance. While retrospective studies have demonstrated impaired glucose homeostasis, prospective data characterizing glucose and lipid metabolism and the trajectory of recovery following curative surgery remain elusive.

Methods: PheoMet-a prospective intramurally-funded case control study, approved by Institute ethics committee recruited PCC-PPGL patients(n=40) and age, sex matched controls (nonfunctioning adrenal tumors, n=20) after informed consent. Nonfunctioning paraganglioma and comorbidities that could alter glucose and fat metabolism were excluded. Demographic, clinical, biochemical parameters were recorded; additionally-comprehensive glucose-and-lipid metabolic evaluation was undertaken. Oral glucose tolerance test(OGTT) was performed preoperatively, early-postoperatively(1–2 weeks, n=30), and at 6 months follow-up(n=20). Serum Glucose, Insulin and C-peptide were estimated at fasting, 30, 60, 90 and 120 minutes post-75gms glucose administration. Lipid profile, Free Fatty acids(FFA), Pro-Insulin, HbA1c and Derived indices {Homeostatic Model Assessment of Insulin Resistance(HOMA-IR); HOMA of β-cell Function(HOMA-β); insulinogenic index(IGI); disposition index(DI); glucose-to–C-peptide ratio} were calculated. Appropriate statistical tools were utilized for analysis.

Results: Study and control groups were comparable for Age(p=0.06) and sex-distribution(p=0.58). Preoperative blood-pressure was significantly higher in PCC–PPGL patients(p<0.01). Curative surgery resulted in normalization of urinary metanephrines in all. At baseline, PCC–PPGL patients exhibited significantly higher fasting and 60-min glucose(p<0.03) and blunted insulin and C-peptide responses at 30–90 min(p<0.05) compared to controls, with elevated HOMA-IR(p=0.011) and reduced IGI and DI(p<0.01), indicating catecholamine-mediated insulin resistance and β-cell dysfunction. Longitudinal analysis revealed marked postoperative metabolic recovery, fasting glucose declined(p<0.03), HOMA-β improved(p=0.009), and DI rose(p<0.001). HbA1c decreased progressively from 6.30±0.4% preoperatively to 5.63±0.2% at six months(p=0.0028). Lipid parameters showed reduced LDL(p=0.04) with transient rise in triglycerides/VLDL(p=0.01). Early postoperative and six-month follow-up glucose and insulin curves closely mirrored controls(p>0.05), confirming early and sustained normalization of metabolic function.

Conclusions: PCC–PPGL causes reversible catecholamine-driven metabolic derangement, characterized by insulin resistance, β-cell dysfunction, and dyslipidemia. Curative surgery leads to rapid and durable restoration of glucose tolerance, HOMA-IR, HOMA-β, and HbA1c, with normalization sustained at six months. Incorporating structured metabolic evaluation seems appropriate for comprehensive perioperative management and outcomes of PCC–PPGL patients.

♦18. Cardiometabolic Improvements After Adrenalectomy for Mild Autonomous Cortisol Secretion

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Background: Mild autonomous cortisol secretion (MACS) causes significant cardiometabolic morbidity, yet evidence for benefits following adrenalectomy remains mixed. Prior studies have been limited by small sample sizes and heterogeneous definitions of exposures and outcomes. This study evaluates the metabolic impact of adrenalectomy compared with non-operative management in MACS using granular, standardized biochemical criteria from Epic Cosmos, the largest single electronic health record system-based database, representing >300 million patient records.

Methods: MACS was defined biochemically using dexamethasone suppression test (DST) cortisol 1.8-10ug/dL, dexamethasone, and ACTH levels. Surgical patients underwent unilateral adrenalectomy and had biochemical resolution of hypercortisolism. Patients with hyperaldosteronism, pheochromocytoma, or overt Cushing's syndrome were excluded.
Between-group weighted logistic regression using inverse probability of treatment weighting was performed to adjust for differences in demographics, baseline cardiometabolic parameters, GLP-1 receptor agonist use, and Social Vulnerability Index. Starting time point was adrenalectomy date or, for non-operative patients, DST date plus median time to surgery calculated from the surgical group (102 days). Follow-up outcomes (A1C, lipid profile, BMI, and blood pressure (BP)) were assessed for categorical improvement at last follow up within 3 years. Outcomes were categorized using standardized national guidelines.

Results: From 2018-2025, 395 patients met inclusion criteria (54 surgical, 341 non-operative). Surgical patients were 74.1% female with a median age of 66 years, median post-DST cortisol of 3.2 µg/dL, and median outcome follow-up time of 1.5 years (IQR 0.8-2.1). Non-operative patients were 59.2% female with a median age of 69 years, median post-DST cortisol of 2.7 µg/dL, and median outcome follow-up time of 1.2 years (IQR 0.6-2.0). Surgical patients had a higher likelihood of categorical improvements in A1C (26.4% vs 9.6%, OR 3.37, p = 0.002), total cholesterol (11.7% vs 3.9%, OR 3.24, p = 0.033), and BMI (23.7% vs 12.1%, OR 2.25, p = 0.041). There were no significant differences in blood pressure between groups (33% vs. 27%, OR 1.33, p=0.41).

Conclusions: This is the largest cohort study to date evaluating metabolic outcomes after surgery for MACS. Adrenalectomy was associated with significant improvement in meaningful changes in A1C, BMI, and total cholesterol, supporting more widespread consideration for operative management in appropriate patients.

♦19. The Utility of Cosyntropin Stimulation Test in the Assessment of Adrenal Function After Unilateral Adrenalectomy

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Background: There are scant data in the literature regarding the assessment of adrenal function after unilateral adrenalectomy (UA). Most of the research has involved patients with mild autonomous cortisol secretion (MACS), with recent studies recommending to use cosyntropin stimulation test (CST) along with basal cortisol to diagnose secondary adrenal insufficiency. The aim of this study is to investigate the utility of CST in the assessment of postoperative adrenal function after unilateral adrenalectomy.

Methods: This was a retrospective institutional review board-approved study of patients who underwent UA, followed by basal AM cortisol and CST on postoperative day (POD) 1 to assess adrenal function from a departmental database between 2010 and 2025. The correlation between POD 1 cortisol and CST results was investigated using receiver operating curve (ROC) analysis for MACS and non-MACS groups separately.

Results: There were 157 patients with MACS, 70 patients with primary aldosteronism, 27 patients with pheochromocytoma and 17 patients with other pathologies. When POD 1 cortisol was less than 5 mg/dl, CST was abnormal in 88% of the patients in MACS group and 27% of patients in non-MACS group. When POD 1 cortisol was > 10 mg/dl, CST was normal in 100% of patients in both MACS and non-MACS groups. When POD 1 cortisol was between 5 and 10 mg/dl, CST was abnormal in 34% of patients in MACS and 7% of patients in non-MACS group. On ROC curve analysis, the optimal POD 1 cortisol level predicting an abnormal CST was less than 8.3 mg/dl in MACS group (sensitivity 92%, specificity 77%) and less than 6 mg/dl in non-MACS group (sensitivity 90%, specificity 64%). Overall, 30% of patients in MACS group and 12% of patients in non-MACS group were discharged home on steroids.

Conclusions: To the best of our knowledge, this is the largest single-center experience assessing adrenal function after UA using POD 1 cortisol and CST. The result show that the correlation between these tests is different for MACS versus non-MACS patients and that a selective, rather than a routine performance of CST may be possible based on different POD 1 cortisol cut-offs in these patient groups.

♦20. The Effect of Hospital Profit Status on Outcomes and Cost for Endocrine Surgery: A State-Based Analysis

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Background: For-profit (FP) hospital ownership status is becoming increasingly common in the United States raising questions of how financial structures may impact costs and quality of care, particularly for complex surgical operations. We aimed to investigate the association of hospital profit status with costs and clinical outcomes for endocrine surgery, hypothesizing that treatment at FP hospitals would be associated with lower costs and worse outcomes.

Methods: We performed a retrospective cohort study of adult (>18 years) patients undergoing parathyroidectomy, thyroidectomy, or adrenalectomy, at either FP or not-for-profit (NFP) hospitals using the Healthcare Cost and Utilization Project (HCUP) State Inpatient and State Ambulatory Surgery Databases (2016-2021). Multivariable regression was used to assess outcomes including length of stay, total costs and costs per day for index encounter, and 30-day readmission rate, with a stratified analysis for procedure type.

Results: Among 91,731 patients, 13,364 (14.6%) received care at FP hospitals with the remaining at NFP hospitals. The cohort included 102 FP hospitals and 219 NFP hospitals. Patients treated at FP hospitals had higher multimorbidity rates (6.0 vs. 4.6%, $p<0.0001$) and were less likely to be privately insured (50.5% vs 54.4%, $p<0.0001$). Thyroidectomies comprised a higher proportion of endocrine surgical procedures at FP hospitals compared to NFP hospitals (73.7% vs 59.9%, $p<0.0001$). FP hospitals were less likely to use minimally invasive approaches to adrenalectomy (74.4% vs 77%, $p=0.006$). FP hospitals had shorter length of stay, lower total costs, and similar 30-day readmission rates compared to NFP hospitals in the overall cohort (Table). These trends persisted on stratified analysis for thyroidectomies and parathyroidectomies, whereas the trends for length of stay and total costs were reversed for adrenalectomies though did not reach statistical significance (Table).

Conclusions: Hospital profit status is associated with differences in cost and clinical outcomes for patients undergoing endocrine surgery. Despite treating a more medically complex population, FP hospitals had lower index admission costs and a shorter length of stay compared to NFP hospitals, which did not appear to impact readmission rates. These findings suggest an opportunity for quality improvement and learning between hospitals with different profit structures.

21. Impact of a Cost Reduction Initiative Among High-Volume Endocrine Surgeons in a Large Health System

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Background: Hospital economics are challenged by increased labor and supply costs with limited growth in reimbursement. While individual surgeons have little impact on these factors, they can control instrumentation and disposables used in the operating room. Recognizing this, we implemented a targeted cost reduction initiative among high-volume endocrine surgeons and compared its financial impact with other surgical cohorts performing equivalent procedures.

Methods: A cost optimization program was introduced at the end of 2024 among surgeons from the Endocrine Surgery Department within our tertiary institution. The initiative had two components: (1) individualized cost feedback and education on rational use of disposable instruments and (2) partnership with contracting vendors to identify lower-cost alternatives. Financial data from January 2024 through September 2025 were analyzed. Data from the Endocrine Surgery Department was benchmarked against high-volume (>50 thyroid/parathyroid cases per year) and low-volume surgeons outside the department who did not undergo the intervention. Five procedural categories were evaluated: (1) all cases combined, (2) parathyroidectomy, (3) thyroid lobectomy, (4) total thyroidectomy, and (5) complex cases (reoperations, total thyroidectomy with central or lateral neck dissection or concurrent parathyroidectomy).

Results: Financial data were analyzed for 3,024 thyroid and parathyroid procedures, of which 2,315 (76%) were performed by endocrine surgeons. At baseline, endocrine surgeons demonstrated 14% and 16% lower direct costs compared with high- and low-volume surgeons, respectively. Following implementation, endocrine surgeons achieved an additional 17% overall direct cost reduction ($p<0.001$). The non-intervention groups showed overall increases of 5% and 15% ($p=0.1$ and <0.001, respectively. Figure 1). Cost reductions for Endocrine Surgeons were observed across all procedure types—parathyroidectomy (−16%), lobectomy (−22%), total thyroidectomy (−14%), and complex cases (−13%)—while no reduction occurred in the comparison groups, which instead demonstrated progressive cost escalation ($p=0.1$ to <0.001). Cost variability within the department decreased during the study period ($p<0.001$).

Conclusions: Costs rise predictably over time, as shown by the non-intervention groups. Targeted surgeon-driven interventions can significantly reduce costs and enhance value. This initiative demonstrated that endocrine surgeons achieved sustained cost reductions compared with peer groups and offers a scalable model for other service lines seeking to maintain profitability under constrained payment models.

♦22. Before the Incision: How Thyroid Surgeons Foster Patient Trust Preoperatively

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Background: Patient trust in physicians has declined over recent decades, underscoring the growing importance of fostering trust in physician-patient relationships. Surgical residents are often distanced from this trust-building process, as current training does not emphasize preoperative counseling or continuity of care. Understanding what behaviors surgeons currently use to build trust may guide educational strategies to better prepare residents for the future, but how surgeons actively cultivate trust is poorly understood. This study aimed to identify trust-building behaviors used by surgery attendings during preoperative counseling for thyroidectomy.

Methods: Consenting patients with high-risk indeterminate thyroid nodules or clinically low-risk thyroid cancer, their surgeons, and trainees were audio-recorded during preoperative clinic visits. Audio recordings were transcribed verbatim and de-identified. Open coding and inductive thematic analysis were performed focused on trust-building behaviors.

Results: Across three academic centers, transcripts from 69 patients seen by 14 surgeons (6 otolaryngologists and 8 endocrine surgeons) and 14 surgical trainees (5 medical students, 7 surgical residents, and 2 fellows) were analyzed. Eight themes emerged: six described attending behaviors and two described trainee behaviors. To build trust, attendings exhibited the following behaviors: 1) practicing bi-directional and closed-loop communication, 2) building a personal connection with patients, 3) demonstrating expertise, 4) acknowledging the uncertainty inherent to work-up and/or management, 5) respecting patient agency in decision-making, and 6) streamlining the care process. While these behaviors occurred throughout patient care visits, they were often initiated during a specific phase of counseling as illustrated in Figure 1. With respect to trainee behaviors, trainees laid the groundwork for attending-patient trust by deferring to their attending's expertise. Surgical trainees additionally modeled their attending's trust-building behaviors, but tended to rely on 1) open communication skills and 2) developing a personal connection with patients instead of other behaviors.

Conclusions: These results demonstrate several discrete trust-building behaviors that attendings used to initiate and build trust when counseling patients and inform a proposed model for teaching trust-building to trainees. While trainees already model some of these behaviors, more advanced skills were not observed, identifying specific trust-building behaviors as a focus for formal training.

♦23. Factors associated with persistent or recurrent primary hyperparathyroidism after surgical treatment: A population-based cohort study of 4,400 patients

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Background: Parathyroidectomy is the standard of care and sole curative treatment for primary hyperparathyroidism (PHPT), yet persistent or recurrent PHPT following surgery remains a concern. While high-volume centers consistently report cure rates exceeding 95%, population-based data on the influence of surgeon volume, patients' characteristics and biochemical profile are limited. This study aimed to identify factors associated with non-cure after parathyroidectomy for PHPT.

Methods: We conducted a retrospective population-based cohort study of 4,400 patients who underwent parathyroidectomy between 2016 and 2019 in Ontario. Multivariable Poisson regression models estimated relative risks (RR) for persistence or recurrence, sequentially adjusted for patient, hospital, and surgeon characteristics. Variables examined included demographics, biochemical severity, and surgical practice factors.

Results: Overall, 4,091 patients (92.9%) were identified as biochemically cured, defined as having maintained normocalcemia within a year after surgery. Older age (≥55 years) was associated with a lower risk of persistent (<6 months after surgery) or recurrent (>6 months after surgery) PHPT (RR 0.78, p=0.026). Sex, socioeconomic status, and comorbidity burden showed no significant associations. Patients with benign parathyroid adenomas were less likely to experience recurrence (RR 0.48, p<0.001). Intermediate calcium levels at diagnosis were associated with higher recurrence risk (RR 1.74, p<0.001) compared to lower calcium levels, defined as corrected calcium <2.85 mmol/L or ionized calcium <1.75 mmol/L. However, preoperative PTH was not predictive.
Surgical factors showed nonsignificant but clinically meaningful trends: intraoperative PTH monitoring was associated with approximately 50% lower failure risk. Higher surgeon or hospital volume correlated with improved outcomes. Only surgeons performing >40 parathyroidectomies/year, or >15 parathyroidectomies/year but working in a high-volume hospital, met the American Association of Endocrine Surgeons (AAES) benchmark for cure (≥95%).

Conclusions: In this population-based cohort, older age, having a diagnosis of parathyroid adenoma and having lower preoperative calcium levels were protective against persistent or recurrent PHPT. Although not statistically significant, higher-volume centers and intraoperative PTH monitoring appeared beneficial, highlighting the importance of specialized surgical expertise and standardized intraoperative protocols in optimizing cure rates.

♦24. Specialized cancer care for medullary thyroid cancer: A SEER-Medicare study of Medicare Advantage and Fee-for-Service beneficiaries

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Background: Medullary thyroid cancer (MTC) is rare and requires specialty knowledge. Medicare Advantage (MA) is associated with reduced access to top-rated cancer hospitals and worse outcomes for complex cancer surgery than traditional Fee-for-Service (FFS) Medicare but whether this applies to MTC is unknown. We compared access to accredited cancer centers and oncologic outcomes between MA and FFS beneficiaries with MTC. We hypothesized that MA would be associated with reduced access to cancer centers and worse disease-specific outcomes.

Methods: This was a retrospective cohort study of MA and FFS beneficiaries aged ≥65.5 years who underwent surgery for a new diagnosis of MTC in the SEER-Medicare database (2016-2021). Primary exposure was Medicare plan. Outcomes included treatment at a Commission on Cancer (CoC) accredited hospital, re-operation defined as neck dissection >30 days after the index operation, and risk of death from MTC. Logistic regression and Cox proportional hazards regression models evaluated risk-adjusted outcomes between Medicare plans. Separate models were used to evaluate for effect modification by treating hospital CoC accreditation.

Results: We identified 536 patients of which 212 (39.6%) were enrolled in MA and 324 (60.4%) in FFS. Tumor size, disease stage, and operation type did not differ significantly by Medicare plan. A higher proportion of MA beneficiaries had surgery at CoC accredited hospitals than FFS beneficiaries (45.8% vs 27.9%; p < 0.001) with no differences in the use of ambulatory (MA: 59.0%, FFS: 53.7%) or inpatient (MA: 36.8%, FFS: 38.3%; p = 0.173) facilities. The unadjusted overall rate of re-operation was 6.0%. After adjustment, hospital CoC accreditation status modified the effect Medicare plan on the risk of re-operation (Table). A greater proportion of MA beneficiaries experienced cancer-related death than FFS beneficiaries (8.0% vs. 3.7%; p = 0.05) with no difference in risk after adjustment (HR:1.65 (ref: FFS), p = 0.30).

Conclusions: MA beneficiaries more commonly underwent MTC surgical treatment at accredited cancer centers, but this did not modify their risk of re-operation. With FFS, treatment at an accredited cancer center was associated with a reduced risk of re-operation. Understanding how Medicare plan influences access to high quality surgical care will benefit older adults with MTC.

♦25. Hazards of Delay: Should Early Parathyroidectomy be the Standard for Secondary Hyperparathyroidism of Renal Origin

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Background: Surgical management is recommended in patients with kidney-related secondary hyperparathyroidism (SHPT) when parathyroid hormone (PTH) levels exceed the 9x normal and patients have complications. Patients may benefit from parathyroidectomy in preventing complications from prolonged SHPT with earlier parathyroidectomy performed for PTH threshold alone. We aimed to examine the impact of timing of parathyroidectomy on clinical outcomes in patients with SHPT and PTH exceeding 9x normal.

Methods: We constructed a retrospective cohort study using a multi-institutional dataset to create a cohort of adults diagnosed with SHPT. Patients were stratified into two groups based on timing of parathyroidectomy from the first instance of a PTH measurement ≥600 pg/ml into early (<2 years) or delayed (>2 years). Only patients with a concurrent diagnosis of chronic kidney disease stage 5 (CKD 5) or eGFR <=15 were included. Those with prior kidney transplant (KT) were excluded. Cohorts were propensity matched on demographics, Charlson comorbidities, BMI, labs, dialysis dependence and medication use.

Results: There were 1,466 patients identified who underwent parathyroidectomy without prior KT. The mean age was 45, with 50% female and 43% black. Of these, 966 (65.9%) underwent early parathyroidectomy, while 500 (34.1%) underwent delayed parathyroidectomy. Median time to surgery was 34 days in the early and 3.9 years in the delayed group. KT occurred in 12.2% of early and 29.6% of delayed patients at median intervals of 1.9 and 3.3 years, respectively.
Patients were matched 1:1 at index PTH elevation (n=632). Baseline laboratory values were similar, including serum calcium was (8.8±1.2 vs. 9.3±1.1 mg/dl) and creatinine (9.3±5.8 vs. 9.1±4.4 mg/dl) in the delayed vs early group. Delayed parathyroidectomy was associated with a higher risk of incident fatigue (HR1.9, 95% CI 1.3-3.0, p=0.001), osteoporosis (HR1.9, 95% CI 1.3-3.3, p=0.01) and hypercalcemia (HR1.8, 95% CI 1.3-2.5, p<0.0001). While rates of renal osteodystrophy were comparable (p=0.2), cardiovascular complications were more frequent in the delayed group, including a 95% higher risk of acute myocardial infarction (p=0.01) and a 45% higher risk of ischemic heart disease (p=0.02).

Conclusions: Early parathyroidectomy performed at a PTH threshold of 9x normal may mitigate the risk of SHPT complications.

♦26. Effect of a Multidisciplinary Renal Hyperparathyroidism Conference on Surgical Management and Outcomes

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Background: Multidisciplinary conferences (MDCs) improve coordination and decision-making in complex endocrine disorders. We previously reported that a renal hyperparathyroidism (rHPT) MDC influenced surgical selection patterns. In this expanded analysis, we include a larger cohort and assess the impact of evolving medical management on operative decision-making, biochemical outcomes, and complications.

Methods: We conducted a retrospective cohort study of patients with rHPT evaluated in a tertiary endocrine surgery practice between 2021–2024. Patients seen before MDC implementation were classified as Pre-MDC, while those presented at the MDC formed the MDC group. Patients were categorized as secondary or tertiary rHPT. Baseline characteristics were compared using nonparametric and Fisher's exact tests. Surgical recommendation was analyzed among all patients, and surgical performance and outcomes among those with follow-up. Biochemical success was defined as parathyroid hormone (PTH) < 600 pg/ml for secondary rHPT and normal PTH for tertiary rHPT at 6 months. Composite 30-day complications included hematoma, nerve injury, hypocalcemia, hypercalcemia, emergency visit, or readmission. Odds ratios (ORs) with 95% confidence intervals (CIs) were calculated.

Results: A total of 112 patients were analyzed (80 secondary, 32 tertiary rHPT). Demographics and baseline laboratory values were similar between Pre-MDC (n = 39) and MDC groups (n = 73). Surgical recommendation was less frequent after MDC implementation (58.5% vs 87.5%; OR 0.22, 95% CI 0.07–0.67, p = 0.007). Among patients with outcome data (n = 95), surgery was performed in 44% of MDC versus 83% of Pre-MDC patients (OR 0.17, 95% CI 0.06–0.47, p = 0.001). Among surgical patients, noncure occurred in 6%, recurrence in 4%, and biochemical success in 90%, with no difference between groups (p > 0.05). The composite 30-day complication rate was 14% (11% Pre-MDC vs 16% MDC; OR 1.52, 95% CI 0.45–5.52, p = 0.58). The later cohort coincided with advanced medical therapies (e.g., etelcalcetide), which may have contributed to fewer recommendations for surgery.

Conclusions: In an expanded cohort building on prior data, MDC implementation was associated with fewer surgical recommendations and operations but comparable biochemical and perioperative outcomes. Advances in medical therapy likely refined patient selection for parathyroidectomy without compromising safety or cure.

♦27. Extent of Surgery and Survival in Localized Oncocytic Thyroid Carcinoma: Total Thyroidectomy versus Lobectomy

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Background: Oncocytic thyroid carcinoma (OTC) has historically been treated with total thyroidectomy (TT) and radioactive iodine (RAI). However, OTC demonstrates limited RAI avidity, raising questions about the oncologic benefit of more extensive surgery. We therefore compared total thyroidectomy (TT) and thyroid lobectomy (TL) in patients with localized OTC to evaluate differences in overall survival (OS) and disease-specific survival (DSS).

Methods: The Surveillance, Epidemiology, and End Results (SEER) database was queried for adult patients (>18 years) diagnosed with localized (AJCC T1-T3a, N0, M0) OTC from 2000 to 2021. Demographic factors, tumor characteristics, and extent of surgery data were collected. The primary outcomes were 5 and 10-year OS and DSS. Kaplan-Maier methods and Cox proportional hazard modeling were used to estimate survival hazard ratios (HRs) and 95% confidence intervals (CIs).

Results: A total of 3,762 patients with localized OTC were identified; 3,049 patients (81%) underwent TT and 618 (16%) TL. The cohort was predominantly White (83%) and female (69%). The median age at diagnosis was 59 years (IQR 47 – 69), and the median follow-up was 92 months (IQR, 37–153). RAI was documented in 64% of patients following TT. OS at 5- and 10-years was lower after TL compared to TT (TT 93.0% vs TL 89.2%, p=0.05; TT 83.3% vs TL 82.1%, p=0.05; respectively). In contrast, DSS did not differ by surgery extent (5 years: ≥98.6%, p=0.80; 10-year ≥96.9% in both groups; p=0.80) (Figure 1). In the subgroup analysis by surgical extent within tumor-size strata, OS did not differ for tumors ≤4 cm (5 years: TT 91.9% vs TL 93.4%; p=0.40). However, for tumors >4 cm, TL was associated with significantly worse OS (5 years: TT 93.7% vs TL 76.4%; p=0.007). In multivariable Cox regression, only patient age remained an independent predictor of OS (HR 1.08 per year; 95%CI, 1.06–1.11; p<0.001). The limited number of events precluded additional analyses of DSS.

Conclusions: These findings challenge the conventional practice of total thyroidectomy in the management of oncocytic thyroid carcinoma. Nonetheless, total thyroidectomy remains advisable for patients with tumors larger than 4 cm. Prospective studies are needed to validate these results and refine patient-specific surgical decision-making.

♦28. Surgeon Acceptability of an Intervention to Promote Use of Thyroid Lobectomy for Small, Low-Risk Thyroid Cancer

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Background: With the 2025 American Thyroid Association guidelines supporting de-escalation of thyroidectomy for low-risk thyroid cancer, interventions that distill guideline recommendations and facilitate rapid adoption are needed. This study evaluated the acceptability of a novel surgeon-directed intervention designed to increase thyroid lobectomy use among surgeons.

Methods: This concurrent triangulation mixed-methods study recruited general surgeons and otolaryngologists who perform thyroidectomy using purposive and snowball sampling. Acceptability was quantitatively assessed using the validated Theoretical Framework of Acceptability (TFA), which measures affective attitude, self-efficacy, perceived effectiveness, intervention coherence, burden, opportunity cost, and ethics on 5-point Likert scales. Qualitative interviews were analyzed inductively using thematic analysis and explored impressions, perceived strengths and limitations, and usefulness of the intervention.

Results: Twenty-two surgeons completed the TFA and twelve participated in interviews. Participants were 46.8±9.7 years-old; 54.5% were male, 63.6% White, and averaged 12.5 years in practice. Most were endocrine surgery fellowship-trained (72.7%), practiced in academic settings (68.8%), and performed >100 thyroidectomies/year (54.5%). TFA scores (Figure 1) demonstrated good general acceptability as well as positive attitudes toward and confidence in the ability to use the intervention. Scores also revealed strong perceived effectiveness and clarity about how the intervention could improve decision-making, and minimal concern for burden of incorporating the intervention into practice or ethical consequences. Qualitative findings reinforced quantitative results and emphasized the tool's clarity, user-friendliness, and practical nature. Surgeons noted it could be "helpful… especially for low-volume surgeons," "[hung] in clinic," or "[replace] some of the lit that we hand patients." One surgeon appreciated the "appropriate amount" of information included, the intervention's ability to guide shared decision-making about surgical options, and benefits vs. risks that was "easier than having to do it all on my own." Drawbacks included its limited applicability for non-English speaking patients, perceived inability to change "mindset" in patients with a "get it all out" attitude, and concern about opening a "rabbit hole" of questions.

Conclusions: This novel intervention was acceptable among thyroid surgeons with strong ratings across all domains of the TFA. Surgeons valued the tool's practicality, clarity, and usability in guiding patient discussions and supporting decision-making for low-risk thyroid cancer.

♦29. Evaluate or Ignore: National Variation in the Evaluation of Adrenal Incidentalomas in Over 250,000 Patients

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Background: Incidental adrenal lesions (incidentalomas) are commonly found on abdominal imaging obtained for unrelated indications. Available data on the incidence, evaluation, and management of adrenal incidentalomas are primarily based on single-institution retrospective studies that may not be nationally representative. Our aim was to evaluate national rates and predictors of guideline concordant adrenal incidentaloma follow-up using a large, well-established national claims database (Merative MarketScan).

Methods: Using the MarketScan database, we identified a national cohort of patients >18 years old with adrenal masses discovered on imaging. Outcomes of interest included biochemical workup, repeat imaging, and surgical intervention. We performed descriptive, comparative, and multivariable analyses to determine the rates and predictors of guideline concordant workup and assessed geographic trends. These findings were then compared to data from a single quaternary referral institution and previously published institutional studies.

Results: Among 263,725 patients with adrenal masses, only 2.2% received a complete biochemical workup. We found that only 19.2% received any biochemical testing, 59.1% underwent follow-up imaging, and <2% ultimately underwent adrenalectomy. On multivariable analysis, hypertension, private insurance, and female sex were significant predictors of receiving adrenal biochemical workup. Older age and a prior cancer diagnosis were associated with lower rates of biochemical workup. Patients located in the Northeast and West regions of the US were more likely to undergo biochemical workup.

Conclusions: National rates of guideline concordant evaluation for patients with adrenal incidentalomas are low. Patient comorbidities, region of residence, and insurance status influenced rates of follow-up. Targeted interventions for high-risk patients and efforts to address regional disparities may help improve national adherence to guideline-recommended evaluation

♦30. Prophylactic central neck dissection does not prevent recurrence but increases intensity of surveillance: Long-term follow-up of a randomized trial

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Background: Only one randomized trial in the United States evaluated whether prophylactic central neck dissection (pCND), in addition to total thyroidectomy (TT), could reduce recurrence for patients with cN0 papillary thyroid carcinoma (PTC). One-year outcomes showed no oncologic benefit of pCND. We present long-term follow up comparing risk of recurrence and intensity of post-operative surveillance in patients undergoing pCND with TT compared to TT alone.

Methods: Patients from the original randomized trial were followed for a mean of 8.2 years. The primary outcome was re-intervention for recurrence after normalizing for duration of follow-up, and the secondary outcome was the cumulative frequency of biopsies, imaging studies, and clinic visits. Post-operative follow-up was standardized in the first year, and then patients were managed according to local practice patterns. To add robustness and improve precision, we used Bayesian analysis to synthesize results with the existing body of evidence.

Results:Among 58 patients with cN0 PTC, 29 were randomized to TT alone and 29 to TT with pCND. Mean tumor size was 2.2±0.2cm and 28% of pCND patients had positive lymph nodes. During long-term follow-up, we observed no recurrences requiring re-intervention in either group. The predicted risk of long-term recurrence for patients receiving TT was 4% (95% credible interval (CrI) 1.2% - 9.9%) and 1% (95% CrI 0.1% - 5.4%) when adding pCND. During postoperative surveillance, the pCND group experienced more biopsies, imaging studies, and clinic visits with a mean of 15.3 for pCND patients compared to 14.3 for TT alone. Overall, pCND was associated with an average increase of 24% (95% CrI 4.7%-46.3%) in biopsies, imaging studies, and clinic visits after adjusting for age, nodal positivity, lymphovascular invasion, and tumor size.

Conclusions: For patients with cN0 PTC, pCND in addition to TT is unlikely to meaningfully reduce recurrence, showing that short-term results from the original trial were durable in long-term follow-up. Additionally, pCND increased the intensity of post-operative surveillance compared to TT alone.

POSTERS

♦ Resident/Fellow Competition Poster
● Poster Spotlight Paper

NOTE: Author listed in **BOLD** is the presenting author

●♦01. Hybrid Cervical and Robotic Assisted Thoracoscopic Resection of Substernal Goiters Is Superior to Sternotomy

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Background: Substernal goiters (SSGs) often require sternotomy for safe resection. Hybrid cervical and robotic-assisted thoracoscopic surgery (RATS) offers a less invasive alternative, though underutilized in the U.S. We report the largest U.S. series comparing hybrid and sternotomy approaches and propose a CT-based model to guide operative planning.

Methods: We reviewed 7,370 thyroidectomies (2012–2023) and identified 255 patients with intrathoracic thyroid glands (below the sternal notch). Of these, 34 required thoracic surgery assistance: hybrid cervical + RATS (n=16), sternotomy (n=13), or cervical with deep mediastinal dissection (n=5).

Results: Among 34 patients, demographics were similar between hybrid and sternotomy groups, age (61.4 vs 62.3 years), female (50.0% vs 64.3%), Black (57.1%), White (42.9%), and BMI (33.7 ± 7.4 vs 32.1 ± 8.7). Preoperative symptoms were comparable, including dysphagia (69% vs 71%), dyspnea (63% vs 50%), neck swelling (75% vs 64%), and voice changes (25% vs 29%). Operative outcomes favored the hybrid approach, with shorter operative time (205 vs 331 minutes, p=0.0002), less blood loss (195 vs 520 mL, p=0.0053), shorter stay (2.5 vs 4.6 days, p=0.0003), and fewer chest tubes (25% vs 92%, p=0.0006). ICU admission was lower in hybrid patients (13% vs 29%). Complication rates were similar for hypocalcemia (14%), hoarseness (29%), and RLN injury (7%). Intraoperative complications occurred in 14% of sternotomy cases (p=0.20) and none in the hybrid group (p=0.01) while mortality occurred only in the sternotomy group (15%).

Conclusions: Hybrid cervical and RATS is superior to sternotomy for SSG.

●♦02. Prospective Comparison of Radiofrequency and Microwave Ablation for Toxic Thyroid Nodules

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Background: There is growing interest in minimally invasive techniques such as microwave ablation (MWA) and radiofrequency ablation (RFA) for treating toxic thyroid nodules. Evidence suggests these modalities are safe, effective, and lower-cost alternatives to surgery, but direct comparisons remain limited. This study prospectively compares the two techniques at a single academic center, with the goal of clarifying whether differences in performance exist that could guide their respective roles in thyroid nodule management.

Methods: We prospectively enrolled 12 patients undergoing MWA and 47 undergoing RFA for toxic thyroid nodules. The primary outcome was nodule volume reduction ratio (VRR). Secondary outcomes included nodule volume, cosmetic and symptom scores, complications, and thyroid function. Follow-up occurred at 1, 3, 6, and 12 months with ultrasound, clinical scoring, and laboratory testing. Wilcoxon signed-rank and Fisher's exact tests were used for comparisons.

Results: RFA patients had longer follow-up than MWA (6.67 [5.4–12.83] vs. 4.73 [2.48–6.3] months, p=0.03). MWA patients were older (55 [39–65] vs. 40 [28–56] years, p=0.06). Baseline nodule volume was larger in the MWA group (6.03 cc [2.34–11.06]) than in the RFA group (4.38 cc [0.97–10.24]). Both techniques produced substantial and durable volume reduction, with the greatest rate of reduction within the first 3 months. At 12 months, VRR was 87.0% (81.4–96.4) for MWA and 84.9% (67.9–92.2) for RFA (p=0.46). Final median volumes were 0.50 cc (0.27–2.06) for MWA and 0.40 cc (0.07–1.80) for RFA. TSH normalized from suppressed baseline values in both groups. No major complications occurred. Symptom scores improved from 5 (3–7) to 0 (0–1) with RFA and from 3.5 (2–6) to 0.5 (0–1) with MWA. Cosmetic scores improved from 2 (1–3) to 0.5 (0–1) in both groups.

Conclusions: Both RFA and MWA achieved marked and durable reduction in nodule volume, with parallel improvements in symptoms and cosmesis. TSH normalized after treatment in both groups. Although nodules were larger at baseline in the MWA arm, final volumes were similar, suggesting MWA may have a role in treating larger nodules. Further study in larger cohorts is needed to confirm these findings.

●♦03. Diagnostic Performance of Afirma GRID Signatures in Predicting Malignancy Among Oncocytic Thyroid Nodules

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Background: Evaluation of thyroid nodules with oncocytic features currently relies on qualitative cytologic assessment. This study evaluated the diagnostic performance of Afirma® Genomic Resource for Intelligent Discovery (GRID) in detecting oncocytic changes on cytology and predicting malignancy among nodules with oncocytic changes.

Methods: A retrospective review was performed of thyroid nodules with indeterminate cytology (Bethesda III–IV) and Afirma-suspicious molecular testing at single academic center from 2018–2025. Hürthle Cell Index was tested for association with oncocytic change. Among oncocytic cytology positive nodules, GRID signatures were evaluated for association with malignancy using univariable and multivariable logistic regression. Diagnostic accuracy was assessed with AUC, sensitivity, specificity, PPV, and NPV.

Results: 360 nodules (Bethesda III = 259, IV = 101) were analyzed; 243 underwent resection and 140 (57%) were malignant. Thirty-nine nodules showed oncocytic change on cytology, 22 (56%) were malignant. Final diagnoses included oncocytic carcinoma (6, 15%), papillary carcinoma (8, 21%), follicular carcinoma (1, 3%), NIFTP (5, 13%), and papillary microcarcinoma (2, 5%).
The Hürthle Cell Index predicted oncocytic cytology (OR 7.56 per SD, CI 4.70–13.38, $p < 0.001$) with excellent discrimination (AUC 0.88, CI 0.83–0.94). Among oncocytic-positive nodules, Angiogenesis Hallmark (OR 0.42, $p = 0.05$), Epithelial Mesenchymal Transition Hallmark (EMT) (OR 0.49, $p = 0.07$), and Apical Junction Hallmark (OR 0.61, $p = 0.17$) were negatively associated with malignancy. mTOR Complex 1 Signaling Hallmark was positively associated with malignancy (OR 1.63, $p = 0.17$). No signature was significant in multivariable analysis. In rule-out testing (sensitivity ≥ 90%), E2F Targets Hallmark had the most balanced performance (sensitivity 0.91, specificity 0.41, PPV 0.67, NPV 0.78, residual risk 0.22).

Conclusions: Afirma GRID Hürthle Cell Index accurately identifies oncocytic cytology. Reduced Apical Junction expression in malignancy suggests loss of polarity, and increased mTOR signaling is consistent with its role in thyroid cancer tumorigenesis. Downregulation of angiogenesis and EMT signatures is counterintuitive and warrants further investigation. No single GRID signature achieved sufficient accuracy to serve as a stand-alone rule-out test. Larger cohorts are needed to define the potential of GRID signatures for malignancy risk refinement in oncocytic thyroid nodules.

●♦04. Balancing Benefit and Burden: Prolonged Iodine Retention After Lipiodol Lymphangiography Delays RAI Therapy in Patients with Chyle Leak Following Lateral Neck Dissection

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Background: Radioactive iodine (RAI) is recommended for patients with advanced differentiated thyroid cancer (DTC). Postoperative chyle leak (CL) following lateral neck dissection (LND) is a rare complication which may require lymphangiography and thoracic duct embolization. Lipiodol is the primary agent used for lymphangiography and embolization of the thoracic duct. Lipiodol introduces a large and persistent iodine load, which may delay RAI. We sought to characterize the impact of Lipiodol after CL on RAI administration for DTC.

Methods: Retrospective chart review was performed of patients undergoing LND for DTC. Demographics, RAI timing, urine iodine clearance, and post-therapy whole-body scan findings were compared between patients who developed CL requiring Lipiodol and those that did not. Statistical analysis was performed using Student t-test, Fischer's exact test, and Mann-Whitney U Test.

Results: 100 patients between 2014-2025 were included. 3 patients (3%) developed high-volume CL requiring Lipiodol. Age was similar between groups (52.3±12.7 vs. 41.3±16.1 years, $p=0.24$). Sex breakdown was 67% female in the Lipiodol group vs. 75% in controls ($p=1.0$). Charlson Comorbidity Index scores did not differ (median 3 [IQR2-4] vs. 2 [2-3], $p=0.51$). Time from surgery to RAI was prolonged with Lipiodol (478 days [IQR 89-828] vs. 74.5 days [48-119], $p =0.03$). Lipiodol patients demonstrated persistently elevated urine iodine levels (median 1607.45 ug/L), exceeding the recommended threshold (<300 ug/L) for safe RAI administration (Figure 1). Post-RAI whole-body scan demonstrated no residual disease in 66.67% of Lipiodol patients vs. 70.2% of controls. Uptake consistent with distant metastasis was observed in 5.3% of controls and 0% of Lipiodol patients.

Conclusions: Lipiodol for CL after LND was associated with significant delay in RAI administration, prolonged iodine retention, and uncertain interpretability of the post-therapy whole body scan. This study sheds light on a poorly studied, rare, but sometimes necessary treatment of CL after LND. A multi-institutional study will likely be necessary to provide power to draw conclusions on long-term effects.

●♦05. National Assessment of Chief Resident Thyroid and Parathyroid Entrustable Professional Activity Data

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Background: Multiple studies of faculty and resident perceptions have shown that graduating general surgery residents are not comfortable performing straightforward thyroid/parathyroid operations independently. Entrustable Professional Activities (EPAs) including thyroid/parathyroid disease were implemented across general surgery residency programs in July 2023. Data from the first year of EPA implementation were utilized to evaluate general surgery chief resident competence with thyroid/parathyroid operations compared to other operations.

Methods: National EPA data from the American Board of Surgery were reviewed for PGY-5 residents from July 2023–June 2024. Thyroid/Parathyroid EPAs were extracted, and entrustment levels were compared based on case complexity, phase category, and month of completion. Other general surgery EPAs, including gallbladder, anorectal, breast, inguinal, and cutaneous neoplasms, were used as comparison groups.

Results: In total, 12,611 general surgery EPAs were completed for PGY-5 residents from July 2023-June 2024. Of these, 426 (3.4%) were for thyroid/parathyroid disease, with the majority (72%, n=307) intraoperative. At least one operative thyroid/parathyroid EPA was completed by 128 trainees, with only 45% (n=57) achieving practice readiness for at least one microassessment. Only 40% (n=123) of the operative thyroid/parathyroid EPAs were rated as practice ready, which was significantly lower than the other EPA comparison groups (Table 1). A significant temporal relationship ($p<0.01$) was observed as the practice readiness rate for operative thyroid cases increased from 0% in July 2023 to 58% for cases performed in May 2024 (last full month of academic year). A positive case-volume relationship was observed, with 49% practice readiness for thyroid/parathyroid EPAs among PGY-5 residents logging ≥5 assessments compared to 32% practice readiness among those with <5 operative thyroid assessments ($p<0.01$). Thyroid/parathyroid entrustment levels did not vary significantly by case complexity ($p=0.30$).

Conclusions: Nationally, less than half of graduating general surgery residents achieved a practice ready status for thyroid/parathyroid EPAs, which is considerably lower than other comparable general surgery EPAs. This discordance raises important questions about inclusion of thyroid and parathyroid surgery in core general surgery requirements. Longitudinal studies across multiple years of EPA implementation are needed to corroborate these findings.

●♦06. Population-level Trends in Survival for Anaplastic Thyroid Carcinoma in the Era of Immunotherapy: An NCDB analysis

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Background: Anaplastic thyroid carcinoma (ATC) is rare, yet remains one of the most aggressive solid tumors. Recent advances, including targeted therapy for BRAF V600E–mutated disease and immune checkpoint inhibition, have demonstrated meaningful survival gains in early trials and institutional reports. Whether these improvements are reflected at the population level remains to be clarified. We evaluated national survival trends in ATC in the NCDB.

Methods: We identified 4,397 adults diagnosed with ATC from 2004–2021 in the NCDB as their first primary cancer. Patients with missing survival data or unclear receipt of immunotherapy as part of initial treatment were excluded. Treatment eras were defined as pre-immunotherapy (2004–2015), early adoption (2016–2018), and contemporary (2019–2021). Survival outcomes were compared across eras and by immunotherapy receipt using Kaplan–Meier analysis and multivariable Cox regression adjusted for demographic, treatment, and clinical presentation factors. Associations with immunotherapy were evaluated among patients diagnosed in 2017–2021, during which 173 of 182 total immunotherapy cases occurred.

Results: Median overall survival improved significantly in the contemporary era (5.39 months; 95% CI 4.76–5.88) compared with early adoption (4.04 months; 95% CI 3.52–4.63) and pre-immunotherapy periods (3.78 months; 95% CI 3.55–4.01; $p < .0001$). Patients who received immunotherapy had substantially longer median survival than those who did not (12.88 vs 3.91 months; $p < .0001$). On multivariable analysis, diagnosis during 2016–2018 (HR 0.80; 95% CI 0.74–0.87; $p < .001$) and 2019–2021 (HR 0.71; 95% CI 0.66–0.78; $p < .001$) was associated with decreased mortality relative to 2004–2015. Immunotherapy use remained independently associated with improved survival (HR 0.41; 95% CI 0.33–0.50; $p < .001$), which persisted in time-dependent analysis (HR 0.58; 95% CI 0.47–0.71; $p < .0001$).

Conclusions: In this national cohort, ATC survival improved significantly in the contemporary era, corresponding with rapid uptake of immunotherapy-based treatment strategies. Despite ongoing poor prognosis and limitations inherent to NCDB data, these findings demonstrate meaningful population-level progress and emphasize the importance of continued expansion of precision-guided care for ATC.

♦07. Evaluate or Ignore: National Variation in the Evaluation of Adrenal Incidentalomas in Over 250,000 Patients

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Background: Incidental adrenal lesions (incidentalomas) are commonly found on abdominal imaging obtained for unrelated indications. Available data on the incidence, evaluation, and management of adrenal incidentalomas are primarily based on single-institution retrospective studies that may not be nationally representative. Our aim was to evaluate national rates and predictors of guideline concordant adrenal incidentaloma follow-up using a large, well-established national claims database (Merative MarketScan).

Methods: Using the MarketScan database, we identified a national cohort of patients >18 years old with adrenal masses discovered on imaging. Outcomes of interest included biochemical workup, repeat imaging, and surgical intervention. We performed descriptive, comparative, and multivariable analyses to determine the rates and predictors of guideline concordant workup and assessed geographic trends. These findings were then compared to data from a single quaternary referral institution and previously published institutional studies.

Results: Among 263,725 patients with adrenal masses, only 2.2% received a complete biochemical workup. We found that only 19.2% received any biochemical testing, 59.1% underwent follow-up imaging, and <2% ultimately underwent adrenalectomy. On multivariable analysis, hypertension, private insurance, and female sex were significant predictors of receiving adrenal biochemical workup. Older age and a prior cancer diagnosis were associated with lower rates of biochemical workup. Patients located in the Northeast and West regions of the US were more likely to undergo biochemical workup.

Conclusions: National rates of guideline concordant evaluation for patients with adrenal incidentalomas are low. Patient comorbidities, region of residence, and insurance status influenced rates of follow-up. Targeted interventions for high-risk patients and efforts to address regional disparities may help improve national adherence to guideline-recommended evaluation.

♦08. Is Unilaterally Selective Adrenal Vein Sampling Adequate to Determine Operability in Primary Aldosteronism?

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Background: Technical failure in bilateral adrenal vein cannulation can occur in 10-30% of adrenal vein sampling (AVS) procedures for primary aldosteronism. Recent studies propose that the relative aldosterone secretion index (RASI) with cutoff values >2.55 and <0.96 or the left adrenal vein to inferior vena cava index (LAV/IVC) with cutoff values ≥5.5 and ≤0.5 can be used to determine unilateral versus bilateral disease using incomplete datasets. We aimed to assess the accuracy of these indices.

Methods: Patients with primary aldosteronism who underwent adrenal vein sampling cases from one tertiary-care institution were reviewed (n=208). Unilateral disease was defined as patients who underwent adrenalectomy with a resulting biochemical cure. Bilateral disease was defined as patients with non-conclusive lateralization index or conclusive lateralization followed by adrenalectomy without a biochemical cure. LAV/IVC was calculated by dividing the left aldosterone/cortisol ratio by the same ratio in the IVC. Right and left RASI were calculated using the same formula for each respective side. Accuracy was assessed by generating area under receiver operating characteristic (AROC) curves, and testing characteristics were calculated.

Results: There were 45 patients with unilateral disease and 57 with bilateral disease. RASI accuracy for diagnosing ipsilateral and contralateral disease using AROC was 0.81 and 0.88, respectively. Sensitivity, specificity, PPV, and NPV were calculated using RASI>2.55 as a cutoff for ipsilateral disease (73%, 80%, 59%, 88%) and RASI<0.96 as a cutoff for contralateral disease (87%, 78%, 61%, 94%). LAV/IVC accuracy for diagnosing left and right unilateral disease using AROC was 0.82 and 0.91, respectively. Sensitivity, specificity, PPV, and NPV were calculated using ≥5.5 as a cutoff for left-sided unilateral disease (30%, 100%, 100%, 80%) and ≤0.5 as a cutoff for right-sided unilateral disease (72%, 93%, 69%, 94%). Use of RASI or LAV/IVC would have resulted in 27 or 6 inappropriate adrenalectomies and would have missed 6 or 24 cases of true unilateral disease, respectively.

Conclusions: RASI can be used to confirm bilateral disease but may not be adequate to determine lateralization in primary aldosteronism. LAV/IVC appears adequate to confirm left-sided disease but may not be sufficient to diagnose bilateral disease.

♦09. Multifocality and Bilaterality in Sporadic Medullary Thyroid Cancer: A Systematic Review and Meta-analysis

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Background: The standard of care in sporadic medullary thyroid carcinoma (sMTC) consists of at least total thyroidectomy (TT) and central node dissection. Lobectomy has been proposed for selected patients, based on the presumed low prevalence of multifocal and bilateral disease; however, this has not been rigorously evaluated. Therefore, we conducted a meta-analysis to assess the frequency of multifocality and bilaterality in sMTC and their association with oncological outcomes.

Methods: A comprehensive search of Medline, Embase, Scopus, and Cochrane databases from inception to March 2025 identified studies reporting multifocality or bilaterality in sMTC confirmed by negative germline RET mutation. Only patients undergoing TT were eligible. Multifocality and bilaterality were the primary outcomes, analyzed as prevalence ratios (PRs) with 95% confidence intervals (CIs) using a random-effects model. Secondary outcomes included mortality, structural recurrence, biochemical cure, and development of distant metastasis, expressed as odds ratios (ORs) or relative risks (RRs). The risk of bias was assessed using the Newcastle-Ottawa scale.

Results: Thirty-six retrospective studies comprising 4,169 patients met the inclusion criteria. Median patient age ranged from 38.7 to 58.6 years. More than half were female (54.5%), had tumors >2 cm (54.9%), and ≥N1 status (57.2%). Most lacked extrathyroidal extension (77.4%) and underwent central neck dissection (85.8%). The pooled prevalence of multifocality was 19.1% (95%CI 15.9–22.7%), and bilaterality was 10.3% (95%CI 6.7–15.3%), with higher rates in Asian cohorts (22% [95%CI 17–28%] and 13% [95%CI 8–20%], respectively). Unifocal tumors had a lower mortality risk compared with those with multifocal disease at >5 years of follow-up (RR 0.41; 95%CI 0.22–0.75). Unifocality also was associated with reduced structural recurrence at ≤5 years (OR 0.15; 95%CI 0.09–0.23), but at >5 years, rates were comparable between groups (OR 0.23; 95%CI 0.05–1.14). Biochemical cure was more likely in unifocal cases at >5 years (OR 8.15; 95%CI 2.79–23.86), while distant metastasis was less likely at both ≤5 years (OR 0.12; 95%CI 0.04–0.31) and >5 years (OR 0.25; 95%CI 0.12–0.52) in multifocal cases. Evidence certainty was rated low.

Conclusions: Low-certainty evidence indicates that the prevalence of multifocality and bilaterality is relatively low among patients with genetic sMTC and suggests more favorable oncologic outcomes in unifocal disease.

♦10. Variation in medullary thyroid cancer guideline concordance and outcomes by surgeon specialization: A SEER-Medicare retrospective cohort study

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Background: Guideline-concordant surgical treatment of medullary thyroid cancer (MTC) is associated with improved outcomes. Surgeon volume and specialization are associated with differences in thyroid surgical outcomes but the influence of surgeon specialization on guideline concordance is unknown. We examined variation in MTC guideline concordance, hypothesizing that treatment by specialized surgeons would be associated with higher rates of guideline concordance and improved outcomes.

Methods: We performed a retrospective cohort study of patients aged ≥65.5 years who underwent surgery for a new diagnosis of MTC using the SEER-Medicare database (2016-2021). Primary exposure was surgeon specialization. Surgeons were classified as otolaryngology (ENT) or general surgery (including surgical oncology) using the Medicare Provider Specialty Code. General surgeons were further divided into high volume (>9 annual thyroidectomies) and low volume (<9 annual thyroidectomies) to reflect endocrine specialization. Outcomes included guideline concordance based on the American Thyroid Association 2015 MTC Guidelines, and re-operation defined as neck dissection >30 days after the index operation. Univariate analyses compared guideline concordance by surgeon specialization. Multivariable logistic regression evaluated risk-adjusted re-operation rates.

Results: We identified 487 patients of which 127 (26.1%) were treated by a general surgeon (GS), 56 (11.5%) by an endocrine-specialized general surgeon (EndoGS), and 304 (62.4%) by an ENT. EndoGS performed more of their thyroidectomies in the ambulatory setting (75.0%) compared with GS (63.6%) and ENT (50.0%; p=0.002). The distribution of cancer stages was similar across surgeon groups. Rates of preoperative and postoperative guideline concordance differed significantly by surgeon specialization with similar rates of intraoperative concordance (Table). ENT ordered significantly more preoperative CT scans (53.9%) than EndoGS (33.9%) and GS (34.9%); p<0.001). Overall, 30 patients (6.0%) underwent a re-operation during the study period. After risk-adjustment, EndoGS and ENT demonstrated lower odds of re-operation compared with GS, though this did not reach statistical significance (EndoGS: OR 0.22 [95% CI: 0.03, 1.80], p=0.159; ENT: OR 0.71 [0.32-1.60], p=0.412).

Conclusions: Surgeon specialization is associated with variation in MTC guideline concordance across the perioperative continuum. Increasing adherence to evidence-based practices may provide a mechanism for less specialized surgeons to provide high quality care and improve outcomes for MTC patients.

♦11. Comprehensive DNA/RNA Panel Adds No Diagnostic Yield to 11-gene DNA Panel-Negative Thyroid Nodules

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Background: Molecular testing is crucial for managing thyroid nodules, particularly those with indeterminate cytology. Our previous study demonstrated that an 11-gene DNA panel is effective in assessing malignancy risk and reducing unnecessary surgeries. However, it is unknown whether a more extensive panel could identify additional mutations in cases deemed negative by the initial 11-gene DNA panel. This study aimed to evaluate the additional diagnostic yield of a comprehensive DNA/RNA gene panel on fine-needle aspiration (FNA) samples that were negative on the 11-gene DNA panel.

Methods: From a prospective cohort of 278 thyroid nodules, we identified 162 cases that had no detectable mutations when tested with an 11-gene DNA panel. This panel analyzed key point mutations and indels in 11 genes: BRAF, RAS (NRAS, HRAS, KRAS), EZH1, DICER1, EIF1AX, PTEN, TP53, PIK3CA, and the TERT promoter. The original FNA samples from these 162 mutation-negative nodules were subsequently analyzed using a comprehensive DNA/RNA panel, which covers variants in 1,782 genes and 151 RNA fusions. The primary outcome was the detection of any new, clinically relevant genetic alterations.

Results: An 11-gene DNA panel applied to 278 thyroid nodules yielded a positive call rate of 41.7% (BRAF 16.2%, RAS 12.6%, others 11.5%, double mutation 1.4%). For the 115 indeterminate nodules in the cohort, the rate was 40.0% (BRAF 4.3%, RAS 19.1%, others 15.7%, double mutation 0.9%). The remaining 162 (58.3%) nodules with no detectable mutations were selected for this study. Within this mutation-negative subgroup, 30 nodules (18.5%) were surgically resected, and histopathology confirmed malignancy in 12 of these cases. Subsequent analysis of all 162 samples with the comprehensive DNA/RNA panel did not detect any new, clinically significant gene mutations or fusions. The molecular findings remained negative across the entire sub-cohort, including in the cases of confirmed malignancy.

Conclusions: In thyroid nodules that test negative with an 11-gene DNA panel, a subsequent, more extensive DNA/RNA panel does not provide additional diagnostic information. This finding suggests that for an initial molecular workup, the 11-gene DNA panel is a sufficient and cost-effective tool for risk stratification, reinforcing its clinical utility in the management of thyroid nodules.

12. Exploring Associations Between Socioeconomic Status and Allostatic Load in Patients with Pancreatic Neuroendocrine Tumors

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Background: Health outcome disparities exist among pancreatic neuroendocrine tumor (PNET) patients with exposure to adverse social determinants of health leading to worse overall survival. Elevated allostatic load (AL), a marker of cumulative physiological stress, is linked to higher disease burden in multiple malignancies, but its relationship with socioeconomic disparities in PNETs remains unclear. This study examined associations between the individual Socioeconomic Deprivation Index (iSDI) and AL in PNET patients.

Methods: We conducted a retrospective cohort study using the All of Us Research Program to identify adult patients with PNET who completed “The Basics” survey for demographic and socioeconomic data. Socioeconomic deprivation was assessed using iSDI (range: 0-1), which incorporates education, employment, insurance status, housing, and income. AL was calculated using established biomarkers across cardiovascular, metabolic, renal, and immune systems, with a total possible score of 10. Self-reported racial differences in iSDI and AL were compared using Mann-Whitney U and Chi-square tests. Spearman correlations were used to evaluate associations between AL and overall iSDI, and between AL and individual iSDI components.

Results: A total of 167 patients were included; their mean age was 64.8 ± 14.2 years, 54% were female, 68% identified as White, and 11% as Black. Median AL score was 4 (IQR 4-5) and median iSDI was 0.34 (IQR 0.23-0.45). Black patients had higher median iSDI (0.58) than White patients (0.36, $p < 0.01$), but median AL did not differ. Among the ten AL biomarkers, albumin (71.4%), heart rate (63.3%), and leukocyte count (62.8%) were the most frequently deranged. AL was analyzed in relation to individual iSDI components. AL was associated with lower education ($\rho = 0.22$, $p < 0.01$), unemployment ($\rho = 0.17$, $p < 0.01$), lack of insurance ($\rho = 0.04$, $p < 0.05$), and lower income ($\rho = 0.04$, $p < 0.05$). The correlation with housing stability was not statistically significant ($\rho = 0.03$, $p > 0.05$).

Conclusions: Higher AL is associated with higher individually reported social deprivation metrics among PNET patients. Albumin, heart rate, and leukocyte count were the most commonly deranged biomarkers, suggesting that these parameters contribute most to AL. AL may represent a biologic mechanism driving disparities.

♦13. SDHB Immunostaining remains an indispensible frontline tool to characterize pathogenic germline mutation in pheochromocytoma and paraganglioma

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Background: Succinate dehydrogenase (SDH) complex mutations are among the most frequent germline mutations in pheochromocytoma (PCC) and paraganglioma (PGL), with important diagnostic and prognostic implications.
SDHB immunohistochemistry (IHC) provides a cost-effective and accessible method to functionally assess SDH status and guide interpretation of variants of uncertain significance (VUS).
This study evaluated the accuracy of SDHB IHC as an initial screening tool for germline SDH pathogenic variants in a large, single-center PPGL cohort.

Methods: A combined prospective and retrospective analysis was performed on 106 PPGL patients (1997–2025). Clinical, biochemical, imaging, genetic, and pathological data were collected.
SDHB IHC was performed on resected tumor specimens using a rabbit monoclonal antibody (dilution 1:1000) and graded as negative, weak, or strong.
Germline testing was performed with targeted next-generation sequencing (Twist Core Human Exome/Illumina NextSeq/NovaSeq). Concordance between SDHB IHC and germline analysis was assessed.

Results: Among 108 tumors, 68 (63%) were paragangliomas and 40 (37%) pheochromocytomas. Pathogenic SDH germline mutations were identified in 32 cases (29.6%): SDHB (n=19), SDHD (n=10), and SDHA (n=3). Additional mutations included FH (n=1), MEN2A (n=1), NF1 (n=3), RET (n=1), and VHL (n=3).

Negative SDHB staining showed 92.6% concordance with pathogenic SDH variants (excluding VUS).
Strong staining was retained in all FH, MEN2A, RET, NF1, and most VHL cases. Of 53 tumours with negative genetic panels, 94% retained strong SDHB staining. Four false negatives (13%) occurred in those strongly staining positive on SDHB IHC. Among 14 VUS tumours, SDHB IHC was positive in nine, weak for one and negative in four tumours.

Conclusions: SDHB IHC is a practical and cost-efficient first-line screening tool to characterize PPGLs. Strong SDHB immunostaining demonstrates high correlation with SDH-competent and sporadic PPGLs, with a low false negative rate.
Negative SDHB staining demonstrates excellent concordance with pathogenic SDH mutations and assists in the triage of patients for germline genetic testing, particularly for patients who do not satisfy the current institutional criteria for germline testing and in risk stratification of patients with VUS. In this subgroup, negative staining may indicate SDH deficiency, warranting closer imaging surveillance, cascade screening and consideration for reclassification with evolving genetic data.

14. Comparing the efficacy of using radiofrequency ablation versus microwave ablation for the retreatment of benign solid thyroid nodules

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Background: Retreatment of benign thyroid nodules with radiofrequency ablation (RFA) within 6 months led to greater volume reduction rate (VRR) than a single treatment. The efficacy of a repeat thermal ablation (retreatment) spaced more than 12-months apart, and the comparative efficacy of RFA versus microwave ablation (MWA) for retreatment remains less known. This study compared the 12-month VRR of using RFA versus MWA as a retreatment, spaced at least 12-months from the last thermal ablation, for benign, predominantly solid thyroid nodules.

Methods: Consecutive patients undergoing RFA or MWA as a retreatment were considered. The inclusion criteria were 1)cytologically benign, predominantly solid (≥80%) thyroid nodules; 2) received previous thermal ablation; 3) retreatment spaced at least 1 year from the last thermal ablation; 4) completed 12-month follow-up after retreatment. Patients receiving further thermal ablation, surgery or radioiodine within 12-months from retreatment were excluded. The primary outcome was 12-month VRR after retreatment = Volume before retreatment – 12-month volume/Volume before retreatment x 100%. Complications, compressive and cosmetic symptoms were compared.

Results: From 2022 to 2024, 46 nodules (RFA:23, MWA:23) from 46 patients were eligible for analysis. Baseline characteristics including nodule volumes prior to any thermal ablation (RFA 33.6mL (20.6 – 50.7mL) vs MWA 32.6mL (17.7 – 46.8mL),p=0.489), and prior to retreatment (RFA 17.0[12.7 – 26.8mL] vs MWA 20.3mL[12.8–27.5mL], p=0.750) were comparable. The median interval to retreatment was 23 months (17-39). The overall 12-month VRR following retreatment was 75.5% (53.6–82.3%), with no significant difference between RFA and MWA (69.4% [50.1–85.1%] vs. 77.3% [60.7–81.2%], p=0.798). The total VRR achieved from baseline prior to any thermal ablation was 86.8% (61.9–92.0%), and comparable between groups (RFA: 85.9% [58.7 – 93.4%] vs MWA: 88.0% [75.1 – 89.7%], p=0.784). No vocal cord palsy or hematoma occurred. Smaller volume before retreatment was the only factor associated with 12-month VRR≥80%. (p=0.046, OR 0.927 (0.860 – 0.999)). Overall cosmetic symptoms improved after retreatment (p=0.005).

Conclusions: In this cohort of large benign solid thyroid nodules previously treated with thermal ablation, a retreatment at more than 12-months later led to further nodule shrinkage. Retreatment with RFA or MWA at this time interval were comparably effective and safe.

♦15. Nano-second Pulsed Field Ablation for Benign Symptomatic Thyroid Nodules: a Novel Non-Thermal Modality

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Background: Nano-second pulsed field ablation (nsPFA) is a non-thermal ablative procedure FDA approved in March 2024. Given its relative novelty as a therapy for symptomatic, benign thyroid nodules, there have been no published studies in the United States evaluating the outcomes of this new treatment modality. The aims of this study are to utilize our clinical experience to estimate short-term volume reduction following nsPFA and to describe the related patient-reported experiences.

Methods: We performed a retrospective study of adult patients who underwent nsPFA for a symptomatic, benign thyroid nodule at a single, high-volume academic center between March 2024 and August 2025. Volume reduction ratio (VRR) at 30 days post-procedure was calculated. Patient experiences were reported using the CellFX nsPFA Percutaneous Electrode Procedure Patient Surveys at Day 0 and Day 30.

Results: Thirteen patients underwent nsPFA for a benign thyroid nodule. Median pre-procedural nodule volume was 9.77cm3. Indications for nsPFA included compressive symptoms (61.5%), cosmetic concerns (15.4%) and toxic adenoma (15.4%). At 30 days post-procedure, median nodule volume in the PFA group was 4.58cm3, with a median decrease in volume of 5.19cm3, representing a 52.0% volume reduction ratio at 30 days post-procedure. This was comparable to our historical RFA cohort, which had a median 90-day nodule volume reduction ratio of 51.7%. There were no clinician or patient reported complications. The procedure was well tolerated, with 75% of patients reporting “mild” or “no pain” during the procedure. Patient satisfaction with nsPFA was high at 30 days post-procedure; 66.6% reported “some” or “much” improvement in the cosmetic appearance of the nodule, 66.6% reported “some” or “much” improvement in their compressive symptoms, and 100% of patients reported feeling “satisfied” or “very satisfied” with their procedure.

Conclusions: nsPFA is a well-tolerated, non-thermal ablative modality for benign thyroid nodules demonstrating radiographic and symptomatic improvement in nodule size and symptoms within 30 days of procedure, with a strong safety profile. Longer term follow up is underway to determine durability of results, long term safety profile, and comparison with thermal ablative techniques.

♦16. Barriers and Facilitators to Primary Aldosteronism Screening in Primary Care: A Qualitative Study

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Background: Primary aldosteronism (PA) is the leading cause of secondary hypertension, yet only 1 –2% of eligible patients undergo appropriate screening. Because screening is typically initiated in the primary care setting, it depends on clinicians’ ability to identify at-risk patients and correctly order and interpret testing. This study aimed to explore how primary care providers (PCPs) approach PA screening, identify perceived barriers to screening, and elicit potential strategies to improve screening uptake.

Methods: This qualitative study involved one-on-one, semi-structured, virtual interviews with PCPs. Interviews explored participants’ approaches to hypertension management, experiences with screening for secondary causes of hypertension, and specific PA screening practices. Recordings were transcribed verbatim and thematic analysis was performed to identify key themes related to PA screening practices, barriers, and potential interventions. Data were managed and coded using NVivo 15 software.

Results: A total of 9 interviews were conducted. PCPs had been in practice for a median of 13 years. Although providers reported that at least half of their patient panel carried a diagnosis of hypertension, exposure to PA varied widely. Common triggers for PA screening included resistant hypertension and hypokalemia. Thematic analysis identified multi-level barriers to screening. At the provider level, participants often did not consider PA screening, citing competing health priorities during visits, limited knowledge of guidelines, discomfort with testing logistics, and lack of confidence in result interpretation. Patient-level barriers included inconsistent adherence to medications and follow-up, and competing social and health priorities. System-level barriers included fragmented referral processes, lack of care coordination, and time constraints. Electronic medical record (EMR) based strategies were uniformly and independently introduced by interviewers, emerging as both facilitators of screening and sources of frustration. Providers found thoughtfully designed EMR-integrated clinical pathways and automated order sets helpful but described poorly integrated alerts as disruptive and contributing to alert fatigue. Additional facilitators included external specialist support.

Conclusions: PCPs recognized the importance of identifying secondary causes of hypertension but face significant barriers to screening for PA. Multifaceted interventions combining targeted provider education, streamlined workflows, and intelligently designed EMR tools may improve screening completion and timely diagnosis.

♦17. Assessing Resident Confidence and Knowledge Gaps in Adrenal Surgery: A Mixed-Methods Study

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Background: Adrenalectomy volume in the United States continues to rise, yet general surgery residents rarely achieve operative proficiency in this technically demanding procedure. Most training interventions have been designed by faculty consensus with limited incorporation of resident perspectives. This study evaluated resident competence and autonomy in adrenalectomy using a national survey-based dataset and explored resident-identified barriers and training gaps using qualitative resident feedback.

Methods: We conducted a mixed-methods analysis of Society for Improving Medical and Professional Learning (SIMPL) national case evaluations (2015–2023) and semi-structured interviews with PGY-3 to PGY-5 residents at a high-volume academic adrenal center. SIMPL data included faculty- and resident-reported assessments of performance, autonomy, and case complexity for laparoscopic and open adrenalectomies. Competent performance and meaningful autonomy were dichotomized on the basis of faculty surgeon responses. Logistic regression modeled predictors of competent performance and meaningful autonomy. Interview transcripts were coded using content analysis to identify themes related to perioperative knowledge and skill gaps.

Results: A total of 322 adrenalectomy cases (272 laparoscopic, 50 open) involving 221 residents were analyzed. Competent performance was observed in 39.5% of laparoscopic and 31.8% of open cases, while meaningful autonomy occurred in 37.9% and 16.0%, respectively. Among PGY-5 residents, predicted probability of competent performance and autonomy were 50.3 and 39.5%. Agreement between resident and faculty ratings occurred in 41.5% of competency and 57.1% of autonomy assessments, with residents underestimating their performance in nearly half of cases. Fourteen interviews of PGY 3-5 residents revealed limited exposure to adrenal surgery, variability in intraoperative autonomy, and persistent knowledge gaps in postoperative management, perioperative medication management and long-term surveillance.

Conclusions: General surgery residents infrequently achieve competence or autonomy in adrenalectomy by graduation and often underestimate their abilities relative to faculty assessments. Resident-reported data highlight insufficient longitudinal exposure and perioperative management knowledge gaps. These findings underscore the need for resident-informed training interventions and support the role of fellowship training for surgeons intending to perform adrenal surgery independently.

♦18. Molecular Testing of Thyroid Nodules Is Associated with Decreased Healthcare Costs within Metropolitan Statistical Areas

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Background: Molecular testing (MT) may lower overall costs of thyroid nodule care by reducing rates of unnecessary surgery. We evaluated whether MT use correlates with reduced thyroidectomy rates and the effect on total cost of thyroid nodule care.

Methods: Using the Merative™ MarketScan® Research Database, we identified adults who underwent fine-needle aspiration (FNA) for thyroid nodules between 2014 and 2023. Metropolitan statistical areas (MSAs) were stratified based on annual MT utilization rates: rare (0-2%), infrequent (>2-4%), frequent (>4-10%), and routine use (>10%). Patients not assigned to an MSA or assigned to multiple MSAs were excluded from this analysis. Total cost of care included inpatient, outpatient, laboratory, and radiology services associated with thyroid nodule diagnosis codes, normalized per 2 years of enrollment. Kruskal-Wallis and chi-squared tests were used to compare cost and thyroidectomy rates across quartiles.

Results: In total, 370,732 patients underwent thyroid FNA, of which 19,482 (5.3%) received MT. Overall MT utilization increased from 1% in 2014 to 14.6% in 2023. Ultimately, 294,580 (79%) patients were included in the MSA analysis. There were 26,551 (9%) patients in the MSAs categorizes as rare use, 70,484 (24%) in infrequent use MSAs, 188,379 (64%) in frequent use MSAs, and 9,166 (3%) in the routine use MSAs. Patients treated in a routine use MSA had slightly lower thyroidectomy rates (10.8% overall: 7.1% thyroid lobectomy, 3.7% total thyroidectomy) compared to those in the rare user category (13.2% overall: 7.7% thyroid lobectomy, 5.5% total thyroidectomy) ($p<0.001$). Average normalized total cost of thyroid nodule care was lower in the routine use MSAs ($67,631/patient) compared to the rare use MSAs ($105,805/patient) ($p<0.001$). There was no significant decrease in thyroidectomy rates in any of the MT use strata over time.

Conclusions: Routine molecular testing was associated with a small (2%) decrease in thyroidectomy rates and substantially lower per-patient costs, likely reflecting broader institutional factors beyond avoidance of unnecessary surgery.

19. Assessment of Health Literacy Across Types of Hyperparathyroidism

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Background: Health literacy (HL) is the ability to obtain, process, and understand basic health information necessary to make informed decisions. Low HL has been linked to delays in diagnosis and treatment, reduced adherence to therapy, and worse clinical outcomes. This study aimed to assess HL among individuals with hyperparathyroidism (HPT).

Methods: The NIH All of Us Research database was used to evaluate HL in adults diagnosed with primary, renal secondary, non-renal secondary, and tertiary HPT. HL was assessed using 3 questions from the Overall Health survey, adapted from the Brief Health Literacy Screening Tool (BRIEF-3). Total score ranged from 3 to 15, with scores >9 indicating adequate HL and ≤9 indicating inadequate HL. Chi-square test was used to compare HL across HPT groups and among different demographic domains, and a p-value < 0.05 was considered significant.

Results: Of the 6566 participants, 84% demonstrated adequate HL, while 16% had inadequate HL. Females were more likely to have adequate HL compared to males (86% vs. 80 %, p < 0.001). Inadequate HL was prevalent in Black participants in comparison to White participants (20% vs 8%, p < 0.001). Employment was associated with having adequate HL compared to unemployment (93% vs 81%, p < 0.001). Those with a college degree had a 96% rate of adequate HL compared to 50% among those with less than a high school education (p < 0.001). Similarly, higher income was linked to better HL, with 97% adequacy among patients earning ≥$100,000 and 77% among those earning <$25,000 (p < 0.001). Diagnosis type also influenced HL, with inadequate HL being most common among patients with renal secondary HPT (20%), followed by tertiary HPT (14.5%), non-renal secondary HPT (12%), and primary HPT (10%) (p < 0.001).

Conclusions: While majority of patients demonstrated adequate HL, inadequate HL was more prevalent among participants identifying as Black, participants with lower educational attainment, and those with renal secondary HPT. These findings highlight the need for targeted educational interventions and tailored communication strategies to optimize care among vulnerable HPT populations.

♦20. Unilateral Adrenalectomy Reduces Autonomous Cortisol Secretion in Bilateral Macronodular Adrenal Hyperplasia (BMAH)

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Background: While unilateral adrenalectomy is commonly used to treat unilateral adrenal cortisol excess, the role for unilateral adrenalectomy in cases of bilateral cortisol excess associated with BMAH is not well-defined. The goal of this study is to determine the impact of unilateral adrenalectomy on the degree of mild autonomous cortisol secretion (MACS) in patients with BMAH.

Methods: We conducted a single center retrospective cohort study (1/1/2020-9/1/2025) of adults undergoing unilateral adrenalectomy for management of BMAH associated MACS. Patients were assessed for adrenal insufficiency (AI) on postoperative day #1 using AM cortisol level and/or cosyntropin stimulation testing (CST). AI was defined as a morning cortisol level < 10 mcg/dL, or by stimulated cortisol level < 18 mcg/dL after cosyntropin administration. Outcomes included postoperative AI and assessment of MACS.

Results: A total of 59 patients met inclusion criteria. Median age was 62 years (42-84), median BMI 32.6 (19.9-51.1), and 44 (75%) were female. 55 (93%) patients had preoperative 1mg dexamethasone cortisol testing (DST), median baseline DST cortisol was 3.1 (1.5-19). Postoperative adrenal insufficiency was diagnosed in 34 (58%) patients. 30 (88%) had resolution of AI during follow-up after median duration 2.9 (0.4-16.5) months. 4 (12%) remained on steroid therapy at the end of the study. Baseline DST cortisol, ACTH, DHEAS, or dominant adrenal nodule size were not associated with development of postoperative AI (all p>0.05). Asymmetry of at least double the size of the dominant nodule between the resected gland versus the remaining gland was associated with post-op AI (p = 0.01). 28 patients were assessed with postoperative DST during follow-up at a median of 3.3 (0.8-24.4) months. Delta post DST (baseline-postoperative) cortisol reduction was 1.5 (0.7-14.3). 22 (79%) of patients evaluated had normalization of postoperative 1mg DST cortisol to ≤ 1.8 mcg/dL.

Conclusions: Unilateral adrenalectomy significantly improves postoperative cortisol parameters in patients with BMAH associated cortisol excess.

♦21. Post-Thyroidectomy Fatigue in Thyroid Cancer: An Analysis of Incidence, Healthcare Utilization, and Out-of-Pocket Costs

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Background: Fatigue is a frequent patient-reported outcome following thyroidectomy for thyroid cancer that affects patients' quality of life. However, little is known about its incidence or impact on subsequent healthcare utilization and costs. This study aimed to (1) identify factors associated with new-onset fatigue and (2) evaluate the association between new-onset fatigue and subsequent healthcare utilization and out-of-pocket costs post-thyroidectomy for thyroid cancer.

Methods: This retrospective cohort study included adults who underwent thyroidectomy for thyroid cancer (ICD-C73) with continuous enrollment for 1-year pre- and post-thyroidectomy in MarketScan (2009-2022). Patients with pre-existing fatigue, hyper/hypothyroidism, autoimmune thyroid disease, and concurrent parathyroidectomy were excluded. New-onset fatigue was defined as >2 ICD-coded claims within the year post-operatively. Multivariable logistic regression assessed risk factors for fatigue. Entropy balancing was performed to obtain a weighted comparison between new-onset and no fatigue groups. Independent sample t-tests compared healthcare utilization and total out-of-pocket costs between the groups.

Results: Of 9,926 patients (mean age 48.9±13.3 years and 71.0% female), new-onset fatigue occurred in 14.4% (n=1,426). Rates of new-onset fatigue were similar following lobectomy and total thyroidectomy (13.9% vs. 14.7%, respectively, p=0.49). Significant factors (p<0.05) associated with new-onset fatigue included younger age (OR=0.99), female sex (OR=1.29), higher comorbidity index (OR=1.02), fatigue-related comorbidities (anemia OR=1.71, anxiety/depression OR=1.59, autoimmune disorders OR=1.41, sleep disorders OR=1.68), and tracheostomy (OR=4.22).

In the three-months post-thyroidectomy, patients with new-onset fatigue had significantly more healthcare visits than those without (20.9±12.2 vs. 16.2±7.4 total visits per patient, respectively, p<0.001). Increased healthcare utilization persisted at one-year post-thyroidectomy for patients with new-onset fatigue (49.3±28.0 vs. 44.9±25.2 total visits per patient, p<0.001). Median out-of-pocket costs were also higher for patients with new-onset fatigue compared to those without at three-months ($341 vs. $346, p<0.001) and one-year post-thyroidectomy ($1321 vs. 1301, p<0.001).

Conclusions: New-onset fatigue appears to affect 1 in 7 patients who undergo thyroidectomy for thyroid cancer, contributing to significantly increased healthcare utilization and incrementally higher out-of-pocket costs. Younger women and those with more co-morbidities are at greater risk. Preoperative counseling should address the potential for post-thyroidectomy fatigue and resulting sequelae. Further research is needed to assess the burden of fatigue on time toxicity and employment disruption.

♦22. Do Bilateral Superficial Cervical Plexus Blocks Decrease Postoperative Pain After Thyroid Surgery?: A Randomized Clinical Trial

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Background: Thyroid surgery is a common outpatient procedure that is associated with mild to moderate pain. Pre-incisional anesthetic with local wound infiltration (LWI) is thought to decrease postoperative pain. Bilateral superficial cervical plexus blocks (BSCPB) are a popular regional anesthesia technique, but implementation varies across hospitals, and its utility requires further investigation in a contemporary setting where non-narcotic medications are the mainstay of pain management. We aimed to evaluate the efficacy of LWI+BSCPB in decreasing postoperative pain and enhancing quality of recovery.

Methods: We performed a single center, prospective, double-blinded randomized controlled trial. Thyroidectomy patients received LWI at the planned incision site with 10ml 0.25% bupivacaine and bilateral injections at Erb's point with 10ml of either 0.25% bupivacaine or saline (placebo). Exclusion criteria included previous neck surgery and chronic use of prescription pain medications. Patients were surveyed 3-4 hours after surgery and reported their pain and nausea/vomiting on a 1-10 scale. The externally validated "Quality of Recovery-15" (QoR-15) questionnaire was also administered at preoperative baseline, postoperative day 2 (POD2), and postoperative week 2 (POW2). Statistical analysis with Mann-Whitney U test was performed using R and Python software.

Results: 80 clinical trial patients were included: 66 (82.5%) female, 14 (17.5%) male, mean age 51±16 years. 60 (75%) patients underwent total thyroidectomy and 20 (25%) patients underwent lobectomy. 3-4 hours after surgery, the treatment and control groups had similar self-reported scores for postoperative pain (median [interquartile range]: 3.0 [1.0-4.0] vs 3.5 [2.0-5.0], p=0.103) and nausea/vomiting (0.0 [0.0-4.0] vs 3.5 [2.0-5.0], p=0.683). The QoR-15 sum score at preoperative baseline was similar between the treatment and control groups (137.54 [126.50-143.75] vs 134.50 [125.50-143.25], p=0.414). On POD2, the QoR-15 sum score was also similar between the treatment and control groups (135.50 [128.25-142.00] vs 134 [114.50-141.50], p=0.472). On POW2, the treatment group QoR-15 sum score was significantly higher than the control group (145 [135.50-150.00] vs 140 [134.00-146.00], p=0.037). However, the difference between the QoR-15 sum scores was less than the previously established minimal clinical difference value of 8.

Conclusions: LWI+BSCPB is equivocal to LWI alone with regards to postoperative pain, nausea/vomiting, and overall quality of recovery after undergoing thyroid surgery.

♦23. Safety of Pancreatic Neuroendocrine Tumor Enucleation Beyond Traditional Criteria: A 26-Year Single-Institution Experience

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Background: Although there are no formal guidelines defining which pancreatic neuroendocrine tumors (PNETs) should undergo enucleation versus pancreatectomy, selection is typically based on tumor size, grade, and distance from the main pancreatic duct (PD). Traditionally, enucleation is reserved for small, low-grade lesions distant from the PD. Data on outcomes beyond these criteria remains limited. This study aims to address that gap.

Methods: A retrospective review identified all patients who underwent PNET enucleation at a single academic institution from 1999-2025. Patients were categorized into traditional criteria (TC) (tumor ≤2 cm and ≥4 mm from the PD) and expanded criteria (EC) (tumor >2 cm or <4 mm from the PD) groups. Outcomes were compared between groups, and multivariable logistic regression adjusted for age, sex, BMI, comorbidities, surgical approach, tumor location, and PNET type.

Results: Forty-six patients were identified with 20 (43.5%) meeting EC and 26 (56.5%) meeting TC. In EC, 8 (40.0%) were insulinomas, 2 (10.0%) gastrinomas, and 10 (50.0%) nonfunctional tumors, compared with 14 (56.0%) insulinomas, 2 (8.0%) gastrinomas, and 9 (36.0%) nonfunctional tumors in TC. Median tumor size was 2.2 cm for EC vs 1.4 cm for TC (p=0.065); median distance from PD was 2 mm EC vs 9 mm TC (p=0.007). While the EC group had higher rates of clinically relevant POPF (40.0% vs 30.8% TC, p=0.548), Clavien–Dindo ≥IIIa complications (50.0% vs 30.8% TC, p=0.231), readmissions (35.0% vs 26.9% TC, p=0.748), and postoperative interventions (55.0% vs 30.8% TC, p=0.135), these differences were not statistically significant (Table). LOS was comparable between groups (5 days EC vs 6 days TC, p=0.460). One EC patient required subsequent pancreatectomy (p=0.435), and there were no postoperative mortalities. Multivariable regression confirmed no significant association between EC and adverse outcomes.

Conclusions: Although higher complication rates occurred with EC, these differences were not statistically significant and may reflect sample size limitations. Based on the results of this study, enucleation of PNETs meeting EC may be considered in select patients, particularly when a more morbid resection such as pancreatoduodenectomy would otherwise be required, though it may also be associated with a greater likelihood of requiring postoperative interventions.

♦24. The Modern Endocrine Surgery Job Market (2005–2025): Analysis of Hiring Pathways, Practice Composition, and Predictors of Success

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Background: Twenty years into its dedicated fellowship, endocrine surgery has matured into a distinct subspecialty. As the field evolves, data-driven insight is needed to guide graduates navigating an increasingly diverse job market. This study defines contemporary employment trends and determinants of early career success among American Association of Endocrine Surgeons (AAES) fellowship graduates.

Methods: National survey of AAES fellowship graduates (n=87) captured demographics, job timing, practice type, recruitment resources, and perceived success factors. Descriptive statistics and regression models assessed temporal trends and predictors of early success.

Results: Among respondents (57.5% female), academic positions declined from 90%→45% over two decades (-2.4%/yr, R^2=0.74, p=0.016). Early hiring increased modestly (26%→38%, p=0.31), suggesting more structured recruitment. Pure endocrine-only (20–30%) and mixed practices (70-80%) remained stable, while endocrine-heavy practices (≥50% endocrine volume) rose from 39%→70% (+1.8 %/yr, p=0.14), driven by non-academic surgeons (+4.6%/yr, p=0.013).

Top hiring resources were trainee faculty (64%), peer colleagues (41%), and the AAES job board (40%). Valued skills included high-volume fellowship experience (82%), minimally invasive adrenal surgery (38%), and research productivity (33%). Key success factors were high clinical volume (88%), mentorship/senior partner access (67%), proficiency in office-based procedures (43%) and intraoperative adjunct familiarity (43%).

Digital recruitment expanded markedly: AAES job board awareness increased from 64%→91% (p=0.007), online search use from 21%→47% (p=0.046), and hybrid/remote interviews from 14%→56% (p=0.001), while recruiter reliance declined (22%→6%). Only 6% found Endocrine Surgery University (ESU) helpful in job acquisition.

Multivariable analysis linked academic placement with research productivity (OR 4.5, p<0.05). Community placement correlated with later graduation (OR 21.4 p=0.0003), financial package/benefits (OR 6.8, p=0.010) and mixed-practice flexibility (OR 3.2, p=0.038). Early hiring was associated with mentorship and faculty involvement (OR 4.8, p=0.025). Early career success correlated with mentorship/senior partner access (OR 5.2, p=0.001) and high-volume training (OR 3.0, p=0.018).

Conclusions: The modern endocrine surgery job market is structured, digital, and mentorship-driven. Academic positions have declined, while endocrine-dominant practices thrive across community settings. Mentorship/senior access and operative volume remain the strongest predictors of success regardless of practice setting. Modernizing AAES and ESU resources around mentorship, career development, and digital readiness will better prepare fellows for today's evolving workforce.

25. WITHDRAWN

♦26. WITHDRAWN

♦27. The Missed Millions: Underdiagnosis, Undertreatment, and Disparities in Primary Hyperparathyroidism

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Background: Primary hyperparathyroidism (PHPT) remains underdiagnosed and undertreated, with well-documented racial disparities. Prior studies have utilized limited datasets, including institutional databases, Medicare and the VA. We sought to evaluate rates of PHPT diagnosis and treatment, and disparities associated with race and socioeconomic status, within a large representative national database.

Methods: Using Epic Cosmos, a database representing 300 million patients, we identified patients with hypercalcemia (serum calcium >10.5 mg/dL) from 2017-2022. We assessed rates of screening with parathyroid hormone (PTH), identifying those with likely PHPT through abnormal PTH. Of these patients, we identified comorbid conditions and treatment with parathyroidectomy. Socioeconomic status was assessed using an area deprivation index (ADI) where higher ADI reflects greater socioeconomic disadvantage.

Results: 2,786,820 patients were found to have hypercalcemia. Of those, 832,034 (29.9%) had a PTH level measured, and 485,396 were found to be abnormal (58.3%) (presumed classic PHPT) (Figure 1a). This cohort was 67.0% female, 66.4% white, 22.9% black, and 7.9% Hispanic. Only 13.7% of these patients underwent parathyroidectomy. Per capita rates of screening and parathyroidectomy differed geographically (Figure 1b, c). Parathyroidectomy was performed in 14.9% of white patients, 10.3% of black patients and in 13.0% of Hispanic patients ($p<0.001$). Of patients in the least deprived ADI quintile (median ADI 19), 15.8% underwent parathyroidectomy, compared to only 11.5% in the most deprived ADI quintile (median ADI 90) ($p<0.001$). Parathyroidectomy was performed in 20.1% of PHPT patients with kidney stones, 10.4% with fractures, 17.8% with osteoporosis, 6.7% with CKD3 or higher, 16.5% age ≤50, and 13.8% with serum calcium >11.5 mg/dL.

Conclusions: The majority of screened cases of hypercalcemia were likely attributable to PHPT, with an estimated U.S. population prevalence of at least 0.5%. In the largest assessment to date, PHPT remains substantially underdiagnosed and surgically undertreated, with geographic variation suggesting differential strengths and weaknesses across states. Treatment disparities persist, by both race and ADI. Education, screening initiatives, and expansion of the endocrine surgery workforce are needed to address these gaps in diagnosis, treatment, and access to PHPT care.

♦28. Listening for Cushing's: A Narrative Medicine Approach to Earlier Detection of Hypercortisolism

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Background: Despite substantial indicators, patients with cortisol-producing adrenal tumors experience diagnostic delays, potentially due to overlooked or misinterpreted symptomatology. Our objective was to analyze patient narratives using narrative medicine-based interviews to identify patient descriptors of hypercortisolism symptoms and explore how these might contribute to diagnostic delays.

Methods: Postoperative patients with cortisol-producing adrenal adenoma (AA) or adrenal cortical carcinoma (ACC) were recruited via snowball-sampling for semi-structured narrative medicine-based interviews exploring interpretive gaps between patient symptom descriptors and the clinical language of hypercortisolism. Interviews were transcribed and subsequently analyzed in NVivo using thematic and cluster analysis until thematic saturation was reached.

Results: Out of 19 U.S. participants, 73.7% were female, and 57.9% had ACC. Mean time to diagnosis was 5.7yrs for AA (1-180mos), 3.3yrs for ACC (4-72mos), and 4.5yrs (1-180mos) overall ($p=0.48$). Most patients (73.7%) self-attributed symptoms to non-modifiable factors: aging (42.8%), stress (28.6%), and menopause (21.4%). Most (84.2%) described symptoms metaphorically, evoking leaking and breaking imagery to communicate loss of bodily control and integrity (Table 1). Cluster analysis revealed considerable overlap across neuropsychological, cushingoid, and inflammatory domains, suggesting that patients often experienced blended rather than distinct illness patterns. AA patients often described early onset fatigue (77.8%), weight gain (66.7%), hypertension (44.4%), and neuropsychological changes (22.2%), whereas ACC patients reported early fatigue (66.7%), hypertension (44.4%), back or abdominal pain (44.4%), and androgenic symptoms (22.2%). In the clinical setting, patients frequently perceived physician dismissal (89.5%) or symptom misattribution to more common explanations: lack of dieting or exercise (37.5%) and stress (25.0%). During diagnostic workup, patients frequently reported delays due to fragmented care from multiple referrals (57.9%), missed or ignored imaging findings (36.8%), diagnostic anchoring without further workup (42.1%), and limited clinician expertise with diagnostic workup (31.6%). Nearly one in three females (30.8%) attributed delays to perceived gender bias from providers.

Conclusions: Delays in diagnosing hypercortisolism arise from multiple interpretive gaps. Patients describe overlapping symptoms metaphorically, normalizing them as aging or stress, while clinicians may not recognize how patient narratives reflect underlying endocrine dysfunction. By integrating symptom frequency data, clinical findings, and patient language, we believe a novel approach to interpreting patient narratives may promote earlier endocrine evaluation.

♦29. Evaluating the Feasibility of a Randomized Trial Comparing Surgery and Neoadjuvant Multikinase Inhibitor in High-Risk Well-Differentiated Thyroid Cancer: A Discrete Choice Experiment of Patient Preferences

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Background: High-risk well-differentiated thyroid cancer has a low biochemical complete response rate (25-45%) after surgery and adjuvant radioactive iodine therapy. In other solid tumors, neoadjuvant therapy has improved tumor control and surgical outcomes. Recently, pretreatment with multikinase inhibitors (MKIs) has shown promise in unresectable thyroid cancers by targeting both angiogenic and oncogenic pathways. Administering MKIs preoperatively may enhance complete biochemical response rates and disease control in high-risk DTC. Given that patient perspectives are central to the thyroid cancer care journey, this study aimed to evaluate patient preferences between a neoadjuvant MKI (Lenvatinib) and standard upfront surgery within the context of a clinical trial.

Methods: An online Discrete Choice Experiment (DCE) was conducted, with participants recruited through the Prolific platform. Respondents were presented with a hypothetical diagnosis of high-risk thyroid cancer, defined as tumors with aggressive features including local invasion and bulky lymph node metastasis. Participants chose between two treatment options: (1) standard surgery with associated risks and recurrence rates, or (2) three months of neoadjuvant Lenvatinib followed by surgery, including potential benefits and side effects. Additional questionnaires assessed quality of life, decision-making influences, and demographics. Data were analyzed to identify factors associated with treatment preference.

Results: A total of 1,025 participants completed the DCE. Initially, 68.2% (n=699) preferred upfront surgery, while 31.8% (n=326) chose neoadjuvant therapy. When tumor shrinkage and possible improved outcomes were highlighted, preferences shifted modestly; 51.9% (n=533) chose surgery and 48.1% (n=493) selected neoadjuvant Lenvatinib. The most influential decision factors were avoiding side effects (68.9%) and perceived personal benefit (61.9%). On multivariable logistic regression, males (OR=0.69, p=0.009) and those with a personal history of thyroid cancer (OR=0.21, p=0.045) were more likely to prefer upfront surgery.

Conclusions: Although most participants favored upfront surgery, nearly half were open to neoadjuvant Lenvatinib when potential benefits were emphasized. These findings suggest hesitancy toward altering current standards of care, emphasizing the importance of patient education and communication. Addressing concerns about toxicity and uncertainty will be critical to enhance future trial enrollment and facilitate adoption of neoadjuvant strategies in high-risk thyroid cancer.

♦30. Prognostic factors for structural recurrence free-survival after (prophylactic) total thyroidectomy for MEN2-related medullary thyroid carcinoma: towards individualized follow-up

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Background: Multiple Endocrine Neoplasia type 2 (MEN2) is a rare hereditary syndrome with a penetrance of >90% for medullary thyroid carcinoma (MTC). American Thyroid Association (ATA) guidelines currently recommend (prophylactic) total thyroidectomy (TTx) for all patients. However, these guidelines also recommend an intensive postoperative follow-up that is applied uniformly to all patients. This study aims to evaluate long-term oncological outcomes after TTx in patients with MEN2 and subsequently aims to assess factors associated with structural recurrence-free survival (SRFS) to enable individualized follow-up.

Methods: Patients with MEN2 who underwent TTx between 1973 and 2023 were included. The primary outcome was structural recurrence free survival (SFRS) in MEN2-related MTC. Time-to-event analysis was performed using Kaplan-Meier method with log-rank test, and univariable Cox regression analyses were conducted to identify prognostic factors.

Results: Ninety-six patients underwent TTx at a median age of 13 years (range 0-71). MTC was present in 65 patients (69%). Median follow-up time was 17 years (range 1-48). Five- and 15-year follow up SRFS rates were 95% and 88%, respectively. Fifty-two patients (54%) who either underwent prophylactic surgery according to guidelines, had no MTC in resection specimen or had undetectable first postoperative calcitonin, did not experience structural recurrence. Prognostic factors for structural recurrence were an 'above reference range' first postoperative calcitonin (Hazard ratio (HR) 33.0; [6.1-178.3]), age at time of surgery (HR 1.04; [1.0-1.1]) and lymph node metastases (HR 11.8; [3.2-42.9]). Eleven patients underwent a total of 18 reoperations.

Conclusions: In patients who underwent a prophylactic TTx in accordance with contemporary ATA guidelines, without MTC in resection specimen, or with an undetectable first postoperative calcitonin value, follow-up can be safely discontinued. For the remaining patients, follow-up can be individualized according to prognostic factors.

♦31. Significance and Predictors of Lymph Node Metastasis in Oncocytic Thyroid Carcinoma

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Background: In 2017, the World Health Organization reclassified Oncocytic Thyroid Carcinoma (OTC) as a distinct thyroid malignancy. Although nodal status is a central element of thyroid cancer staging, at present, the prevalence, significance, and factors associated with nodal metastasis in OTC are poorly understood.
Methods: Using the National Cancer Database (2004-2020), OTC cases were abstracted. Cases without pathologic confirmation, surgery, lymph node data, or complete TNM staging were excluded. Baseline characteristics were summarized. Overall survival was analyzed by Kaplan–Meier and log-rank tests. Logistic regression identified factors associated with nodal metastasis, and a preliminary nomogram was developed.

Results: Among 1,766 patients with OTC who underwent surgery, 267 (15.1%) had nodal metastasis on final pathology, but only 56.2% of those (n=150/267) were clinically detected (cN1) before surgery; ~7.0% were upstaged (cN0 to pN1). Node-positive patients were older (median age 64 vs 57 years, p<0.001), more often male (50.6% vs 32.4%, p<0.001), and had larger tumors (median 4.0 cm vs 3.1 cm, p<0.001); Hispanic patients with OTC had the highest nodal metastasis rate (22.6%). The likelihood of nodal metastasis increased with clinical T-stage (T1: 10.3%, T2: 10.8%, T3: 16.9%, T4: 57.3%; p<0.001) and was associated with a higher occurrence of distant metastasis (19.1% vs. 2% for node-positive vs. node-negative patients, p<0.001). Five-year survival was significantly lower in patients with nodal metastasis (59.3% vs 94.4%, p<0.001). Male sex (OR 1.67, p=0.007), Hispanic ethnicity (vs. non-Hispanic White OR 2.77, p<0.001), and multifocal disease (OR 2.37, p<0.001) were among factors associated with nodal metastasis. A preliminary nomogram demonstrated excellent discrimination and good calibration (AUC 0.868; concordance 0.851).

Conclusions: In patients with OTC, nodal metastasis appears common but often missed. Our study demonstrates high associated rates of distant metastasis and significantly worse 5-year survival for patients with nodal metastasis. These results underscore the need for careful nodal evaluation when OTC is suspected or diagnosed, particularly when the tumor size is ≥4cm. The high rate of nodal metastasis in Hispanic patients necessitates further investigation. Although preliminary, a nomogram may aid in early identification of patients with likely nodal metastasis.

♦32. Can Afirma GRID Invasion and Lymph Node Metastasis mRNA Signatures Help Predict ATA 2025 Thyroid Nodule Risk Recurrence?

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Background: Afirma's Genomics Resource for Intelligent Discovery (GRID) provides mRNA expression-based signatures to predict thyroid tumors with a low risk of clinically significant invasion and metastases. Our study aims to evaluate the performance analysis Afirma GRID Invasion (INV) and Lymph Node Metastasis (LNM) signatures in the context of updated American Thyroid Association (ATA) 2025 risk of recurrence stratification.

Methods: A retrospective study was performed on all surgically-treated patients with Bethesda III-VI nodules for whom Afirma GRID data was available between 3/5/20-4/1/25. Patient demographics, clinical characteristics, molecular test results, and surgical pathology were evaluated. Patients were stratified by risk level according to the 2025 ATA Guidelines. Performance characteristics (sensitivity, specificity, PPV, NPV) were analyzed.

Results: Molecular testing was performed on 73 nodules (median age 56.7 years, 72.6% female,). Median nodule size was 2.2 cm (IQR 1.4-3.8 cm). Final histology revealed 41 malignant nodules (56.1%; 27 papillary, 6 follicular, 1 Hurthle cell, 1 anaplastic, 1 poorly-differentiated). Among malignant cases, ATA risk was low in 20/41 (48.8%), low-intermediate in 4/41 (9.8%), intermediate-high in 8/41 (19.5%), and high in 9/41 (22.0%). There was no difference in demographic or preoperative characteristics between benign, low/low-intermediate, and intermediate-high/high ATA risk levels. The GRID INV signature demonstrated high sensitivity of 100% in detecting ATA high-risk disease, with specificity 34%, PPV 18%, and NPV 100% (Table 1). The LNM signature showed sensitivity 89%, specificity 33%, PPV 16%, and NPV 95%. Both INV and LNM signatures demonstrated modestly decreased sensitivity (INV 76%, LNM 71%) and NPV (INV 82%, LNM 77%) when ATA intermediate-high and high-risk categories were combined.

Conclusions: The high NPV of the Invasion and Lymph Node Metastasis signatures supports their potential utility in ruling out ATA intermediate-high and high-risk disease, potentially favoring less surgery. The limited PPV reduces their reliability for identifying aggressive tumors, underscoring the need for integration with clinical, radiographic, and cytologic findings.

♦33. Long Term Outcomes of the Afirma Genomic Sequencing Classifier: A Single-Center Validation Study of 2,473 Indeterminate Thyroid Nodules Over an 8-Year Period

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Background: Molecular testing with the Afirma Genomic Sequencing Classifier (GSC) has improved the diagnostic accuracy of cytologically indeterminate thyroid nodules. Although real world post-validation studies have confirmed the test's utility in predicting cancer, the interpretation of "benign" molecular results remain inconsistent due to differing "true negative" criteria and limited correlation with surgical pathology. We thus aimed to evaluate the performance of Afirma GSC at our institution.

Methods: This is a retrospective analysis of patients who underwent Afirma GSC testing for Bethesda III/IV thyroid nodules from July 2017 to September 2024. Nodules were classified as GSC-Benign or GSC-Suspicious and correlated with surgical pathology of that nodule. GSC performance was evaluated. Factors associated with malignancy and indications for operative GSC-Benign nodules were assessed with chi-square, Mann-Whitney U tests and multivariable regression.

Results: 2,473 nodules were included: 725 (29%) GSC-Suspicious, 1,748 (71%) GSC-Benign (Figure 1). 593 (82%) of GSC-Suspicious nodules were resected at our institution with a malignancy rate of 87%. The addition of a mutation (seen in 31% of nodules) increased cancer risk to 96% compared to 82% of nodules without mutations (p<.001). Sex, nodule size, and Bethesda class did not affect malignancy rate (p=NS). 177 (10%) of GSC-Benign nodules underwent operation; this subgroup differed from non-operated patients by age (56 vs 63, p<.001), nodule size (3.5 vs 2.2 cm, p<.001), and Bethesda IV class (27% vs 13%, p<.001). In the operated GSC-Benign group, overall risk of malignancy was 20%. Cancer rates were higher in Bethesda IV nodules (38% vs 14% with Bethesda III, p<.001) and nodules with clinically suspicious preoperative features (82% vs 16%, p<.001) including suspicious imaging or interval nodule growth. Age, sex, nodule size, and multinodularity did not affect malignancy rate (p=NS).

Conclusions: To our knowledge, this is the largest series to assess Afirma molecular testing. A suspicious GSC showed a high risk of malignancy, with the presence of a distinct mutation further increasing risk. The selected group of patients with GSC-Benign results that underwent resection had a higher-than-expected malignancy rate, which we suspect was due to selection bias. Our findings suggest that non-operated GSC-Benign nodules may warrant longer-term surveillance.

♦34. Circulating Tumor DNA (ctDNA) and Circulating Tumor Cells (CTC) as Prognostic Biomarkers in Parathyroid Carcinoma

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Background: Parathyroid carcinoma (PC) is a rare endocrine malignancy, and 40% of patients progress. Deciding which patients should start adjuvant therapy is difficult. This study evaluated ctDNA and CTCs as prognostic indicators for disease progression and survival.

Methods: Retrospective review of a prospectively maintained database of adults with PC. Serial blood draws were obtained from (12/2020-7/2024). Patients with ≥1 serial blood draw were included. CTCs were enumerated using CellSearch with ≥1 considered positive. ctDNA was isolated using a 52-gene Oncomine assay. Progression was defined as any increase in tumor burden following the first blood draw. Statistical analysis was performed using fisher exact tests, and Kaplan Meier (KM) curves. Overall survival (OS) and progression-free survival (PFS) were estimated using KM methods from the date of the first blood draw.

Results: Thirty-five patients with established PC were enrolled; 8 excluded due to having <1 blood draws. 27 patients underwent CTC analysis, and 17 patients underwent ctDNA analysis. 63% were male, median age at first blood draw was 60 (IQR 51-70.5). At first blood draw (19/27) 70% had no evidence of disease (NED), (6/27) 22% distant metastasis (DM), 8% (2/27) locoregional-recurrence (LRR). Median follow up was 38.5 months (IQR 18.4-46.8) in the CTC cohort, and 42.3 months (IQR 32-45.5) in the ctDNA cohort.

At last follow-up, 4/27(15%) developed DM, 2/27 (7%) LRR, and 16/27 (59%) remained NED. 5/27 (19%) are deceased, all but one ctDNA/CTC-positive, with a nonsignificant trend toward shorter OS (p=0.78, p=0.63). Six patients (22%) progressed, all with positive ctDNA/CTCs, showing a similar nonsignificant trend toward shorter PFS (p=0.13, p=0.08).

ctDNA mutations were detected in 12/17 (70%) of patients, most commonly TP53 8/12 (67%.) TP53-positive ctDNA was associated with higher progression/death (85% vs 15%; OR 7.2, 95% CI 0.35-546, p=0.22). Four patients underwent tumor sequencing including TP53, showing 2/4 (50%) concordant TP53 mutations.

Conclusions: There is a trend, although not statistically significant, between +CTC/ctDNA with PFS and OS. ctDNA mutation TP53 was common and showed a pattern of higher rates of disease progression and death. Molecular characterization of ctDNA/CTCs may provide prognostic information, to guide adjuvant therapy and warrants larger prospective studies.

♦35. Prior Neck Surgery Type Influences Reoperative Parathyroid Outcomes

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Background: Historically, reoperative parathyroid exploration after prior neck surgery portends elevated risk. However, there are limited data comparing outcomes after different types of previous neck procedures. Our aim was to discern whether reoperative parathyroid exploration after prior non-parathyroid operations is associated with different risks and outcomes than reoperation for recurrent hyperparathyroidism.

Methods: The outcomes of parathyroid reoperations for sporadic primary hyperparathyroidism using IOPTH monitoring from 1/10/2000-11/26/2024 from a single institution, prospectively maintained clinical database were reviewed. Reoperative indications and preoperative testing followed AAES Parathyroidectomy Guidelines. Patients with reoperation for recurrent/persistent HPT (RP) were compared to those having parathyroid exploration after prior thyroid surgery (Tx) or other central neck operations (OCN e.g. ACDF, CEA, tracheostomy, etc). Patients without adequate follow up to define cure (normocalcemia ≥6 months postop) were excluded. Complications were considered permanent at 6 months.

Results: 474 patients were included; 233 RP, 130 Tx (51% lobectomy), and 111 OCN. Mean length of follow up was 71 months (6-301). OR time was longer for RP vs Tx and OCN patients (84.5 min vs 77.85 and 65.6 min, p<0.05). Post operative complications included laryngeal nerve injury (temporary 3%, permanent 1.3%), hypocalcemia (temporary 3.2%, permanent 0.6%), and hematoma requiring reoperation (0.4%). Overall, 40/474 (8.4%) had a postoperative complication and rates were similar among the 3 groups (RP 7.7% vs OCNS 7.2% vs Tx 10.7%, P>0.05). Permanent hypocalcemia was seen only in RP patients.

In total, durable biochemical cure was achieved for 92% with similar rates between Tx and OCN patients (93.1% vs 96.4%, p=0.39) and between RP and Tx patients (89.3% vs 93.1%, p=0.26). However, RP patients were less likely to have durable cure than OCN patients (p<0.05). All OCN patients with failed reoperations had prior ACDF.

Conclusions: Complication rates after parathyroid reoperation are similar regardless of type of prior procedure, and reoperation led to durable biochemical cure in the majority of patients. However, when reoperation is performed for persistent/recurrent primary hyperparathyroidism after initial parathyroid exploration, failure to achieve cure is ~3-fold more likely than when reoperation is performed after other central neck procedures and patients should be counseled accordingly.

♦36. Effect of a Total Intravenous Anesthesia (TIVA) Protocol on Perioperative Efficiency and Pain Outcomes in Thyroid and Parathyroid Surgery

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Background: General anesthesia with inhalational agents and without neuromuscular blockade is common in thyroid and parathyroid surgery. Because the trachea is manipulated during these operations, higher gas concentrations may be required to maintain anesthesia, potentially prolonging emergence and recovery. To improve workflow and reduce variability, we implemented a total intravenous anesthesia (TIVA) protocol using remifentanil and propofol to enhance both operative and recovery efficiency. This study evaluated the impact of this protocol on perioperative timing, workflow efficiency, and postoperative pain control.

Methods: A retrospective cohort study was performed at a single high-volume endocrine surgery center, including adult thyroidectomy and parathyroidectomy cases between January–July 2024 (pre-protocol) and January–July 2025 (post-protocol). The pre-protocol group received inhalational anesthesia, and the post-protocol group received continuous remifentanil infusion with propofol and minimal gas. Outcomes included total anesthesia time, operative time, time from surgery end to extubation, PACU duration, and postoperative pain scores. Multivariable regression controlled for anesthesia provider, age, ASA status, sex, race, and ethnicity. Continuous variables were compared using Welch's t-tests with significance at $p < 0.05$.

Results: A total of 313 cases met inclusion (162 pre, 151 post). Baseline demographics were similar (age 54.7 ± 15.3 vs 55.8 ± 15.1 years; 76.5% vs 78.8% female; ASA 2.46 vs 2.45). Racial and ethnic distributions were comparable, with a majority White (61% vs 71%). The TIVA group had shorter total anesthesia time (105.97 vs 119.16 min, $p < 0.001$), PACU duration (88.97 vs 119.42 min, $p < 0.001$), and operative time (54.95 vs 61.87 min, $p = 0.013$). Time from surgery end to extubation did not differ (8.38 vs 8.11 min, $p = 0.70$). Pain scores trended lower (1.8 vs 2.1, $p = 0.12$). Overall, this represented a 20% reduction—approximately 48 minutes saved per case from induction to PACU discharge.

Conclusions: Implementation of TIVA improved surgical, anesthesia, and recovery times without worsening postoperative pain. Extrapolating the 48-minute reduction, this corresponds to roughly $130,000 saved per 100 cases and over $750,000 annually in a high-volume program, underscoring both the clinical and economic advantages of TIVA for rapid emergence in endocrine neck surgery.

♦37. The Research Arms Race: Trends in Research Productivity Among Endocrine Surgery Fellows

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Background: Research productivity by applicants can be an important metric used in the recruitment process for surgical residency and fellowship. Over time, fellowship applicants may be focusing more on sheer number of publications to bolster their application, instead of on conducting high-quality research. Therefore, we aimed to compare the research productivity and quality of current endocrine surgery fellows to those who graduated in 2020.

Methods: We conducted a bibliometric analysis of American Association of Endocrine Surgeons (AAES) endocrine surgery fellows. Fellows who matriculated in 2020 and 2025 were identified through the AAES website. SCOPUS was used to identify peer-reviewed, full-length indexed publication and citation data from the 5 years before and after fellowship matriculation year. Fellow research productivity (i.e., number of publications) and quality (i.e., number of citations, proportion of first author publications) prior to matriculation was compared in 2020 versus 2025 and before/after matriculation in 2020.

Results: We identified 52 endocrine surgery fellows – 28 matriculating in 2025 and 24 in 2020. Prior to matriculation, 2025 fellows had significantly more publications than 2020 fellows (median publications: 2025=8, IQR=[3.8,11.9]; 2020=3.5, IQR=[1.0,8.3]; p=0.04). There was no significant difference in proportion of first author publications prior to matriculation between 2025 and 2020 fellows. Of fellows that matriculated in 2020, 52% published fewer articles in the 5 years after fellowship graduation than the 5 years before, however the work that was published after fellowship had higher average citations than work published prior to fellowship (median citations: pre-fellowship=3.0, IQR=[2.0,4.0]; post-fellowship=10.0, IQR=[6.4,15.4]; p=0002).

Conclusions: We demonstrate an increase in research productivity amongst matriculants to endocrine surgery fellowship over time, potentially reflecting a growing pressure to produce a higher volume of publications to be considered competitive for fellowship. Further, the decrease in publications noted after graduation in over half of fellows from 2020 may indicate a shift toward research quantity to be competitive for fellowship interviews over an interest in sustained career-long scholarship. These results provide an argument for re-evaluating how fellowship applications are assessed by programs.

♦38. Predictive Factors for Surgical Difficulty in Transoral Robotic Thyroidectomy (TORT): A Prospective Cohort Analysis

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Background: Transoral robotic thyroidectomy (TORT) is increasingly adopted but can be technically demanding, particularly early in a surgeon's experience. We sought to identify preoperative factors that predict operative difficulty to aid patient selection and planning.

Methods: We prospectively maintained a single-surgeon cohort of consecutive TORT lobectomies (Jan–Aug 2025). Difficulty was graded for four predefined steps - (1) flap formation/isthmusectomy, (2) superior pole ligation, (3) RLN identification, and (4) thyroid dissection - using a 3-point subjective scale; overall "routine" vs "difficult" cases were defined by composite grade. Operative duration (overall and by step) provided an objective correlate. Patient anthropometrics (BMI, neck length, mouth width, chin angle, tracheal depth), clinicopathologic features, and outcomes were recorded and compared.

Results: Sixty TORT lobectomies were analyzed (48 female; mean age 41 years; mean BMI 24.0). Subjective difficulty correlated with longer operative time for each step and overall (all p≤0.01). One third of cases were "difficult" (20/60, 33.3%) and had longer mean total time by 20.1 minutes (91.8 vs 71.7 minutes, p<0.001). Predictors of overall difficulty were male sex (40.0% vs 10.0%, p=0.014), higher BMI (25.5 vs 23.3 kg/m², p=0.024), and greater tracheal depth (24.3 vs 22.1 mm, p=0.002). Step-specific associations included higher BMI with more difficult flap creation and superior pole ligation, and male sex plus deeper trachea with more difficult RLN identification. No clinicopathologic variables (nodule size, thyroiditis, thyroid volume, laterality) predicted difficulty. There were no conversions or reoperations for bleeding; one transient RLN palsy occurred.

Conclusions: Male sex, elevated BMI, and increased tracheal depth independently predict a more difficult TORT and map to specific steps (flap/superior pole vs RLN identification). These factors can inform case selection, setup, and teaching strategies for surgeons adopting the transoral approach.

39. NTRK-Fusion Positive versus BRAF V600E Thyroid Carcinomas: A Propensity Score–Matched Comparison

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Background: NTRK-fusion positive thyroid carcinoma is uncommon, representing around 2.3-3.4% of thyroid cancers. Similar to the BRAF V600E mutation, NTRK-fusions are classified as intermediate molecular risk, yet the clinicopathologic outcomes are not well defined. We aimed to define the prognostic significance of NTRK-fusion positive thyroid nodules to better inform extent of initial surgical management, and potential targeted therapy.

Methods: Consecutive thyroid nodules that underwent fine-needle aspiration (FNA) with NTRK fusions on molecular testing at an academic healthcare system were retrospectively reviewed (2018-2025). Primary outcomes included histopathology and disease persistence/recurrence. A propensity score–matched analysis compared contemporaneous patients with thyroid nodules >1cm harboring isolated BRAF V600E mutations on preoperative FNA (Bethesda III–V).

Results: 31 nodules harbored NTRK-mutations (median age 41 years, 67.7% female, 87% Bethesda III/IV). Eight types of NTRK fusions were found, the most common being ETV6/NTRK3 (n=18), EML4/NTRK3 (n=3), andTPM3/NTRK1 (n=3). Surgical details were available in 24 patients (77.4%). Median tumor size was 1.9cm and 95.8% were PTC, 50% of which demonstrated follicular growth. One patient with ETV6/NTRK3 had high-grade differentiated thyroid cancer. At 24 months, disease persistence/recurrence occurred in 2 patients (8.3%). One patient experienced distant metastasis (DM) to the lungs, ultimately responsive to RAI. All recurrences/DM arose in ETV6/NTRK3 fusion-positive cancers. Additionally, aggressive histopathologic features were more likely in patients with ETV6/NTRK3, including positive margins (35.7% vs. 0%, p=0.05) and ATA intermediate/high-risk classification (78.6% vs. 40%, p=0.09). Compared to a matched cohort of 48 isolated BRAF V600E positive nodules (43.8% Bethesda III/IV, all PTC, 2.1% recurrence), NTRK cases demonstrated higher rates of ATA intermediate/high-risk disease (62.5% vs. 38.3%, p=0.09) and compromised recurrence-free survival (RFS) at 24 months (Figure). However, similar RFS was observed at 3 and 5 years (p=0.2).

Conclusions: NTRK fusion–positive thyroid carcinomas, particularly those with ETV6/NTRK3, demonstrate more aggressive histopathology and higher ATA risk compared to BRAF V600E–mutant tumors, with inferior short-term RFS. These findings support considering total thyroidectomy as the initial surgical approach for this subgroup.

♦40. A novel approach to target metastatic invasion of follicular thyroid cancer by repurposing fingolimod.

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Background: Up to 23% of patients with follicular thyroid cancer (FTC) develop distant metastasis, most frequently to the lungs. Recent analyses of FTC lipid metabolism indicate that alterations in sphingolipid metabolism, specifically sphingosine-1-phosphate (S1P1) in the tumor microenvironment(TME), facilitate migration, invasion, and metastatic spread. As such, we hypothesized that fingolimod, an FDA-approved drug targeting S1P1, can be repurposed as a novel approach to target FTC metastatic invasion.

Methods: FTC specific data from the TCGA database was analyzed to investigate sphingosine kinase 1(SPHK1) expression, which regulates S1P1, related to its impact on survival. Genetically validated FTC cells, including FTC-133 and WRO, were cultured in an appropriate medium and cell viability in response to fingolimod treatment was assessed by CellTiter-Glo assay, while oxidative stress was measured by CMH2DCFDA. Western blotting and RT-PCR examined S1P1 expression and targeted pathways for apoptosis and migration. Trans-well migration assays employing decellularized extracellular matrices(ECM) prepared from porcine lung and differentiated THP-1 macrophages evaluated invasion in metastatic niches and the effects on the TME. Finally, mass-spectrometry profiled metabolomic changes in energy/amino acid metabolism following fingolimod treatment.

Results: Analysis of FTCs from the TCGA database revealed significantly higher SPHK1 expression levels in patients with nodal spread vs. early-stage cancers($p=2.35E-12$). Higher SPHK1 expression was also linked to poorer relapse-free survival(hazard ratio=5.688($p<0.00995$). Cell viability after 24 hours fingolimod treatment showed an IC50=5.86±0.35μM(FTC-133) and 8.32±0.99μM(WRO, both>100-fold more sensitive vs. normal cells). Fingolimod-treated FTC cells induced oxidative stress (3.6-5.2-fold), dose-dependent cleavage of PARP, and downregulation of p-P65 and p-ERK, compared to unchanged total P65 and ERK($p<0.01$). RT-PCR showed downregulation of the migration-promoting genes VEGF,IL6,TNFα,PLA2GA,and glycolysis genes Hk1,Hk2,GLUT3,PKM1,and LDH by 50%, 81.4%, 29.5%, 25%, and 80%, 80%, 45%, 50%, and 70% respectively($p<0.001$). In the lung microenvironment, fingolimod treatment reduced FTC migration/invasion and M1-macrophage invasion rate by>90%($p<0.001$), even at doses< IC50 levels. Metabolomic analysis showed inhibition of energy/amino acid metabolism.

Conclusions: Fingolimod treatment of FTC cells inhibits migration, metastasis, and angiogenesis by targeting the NF-kB/MEK pathway and energy metabolism in vitro. This is a promising early finding to support future in vivo validation studies evaluating its role as a novel repurposed therapeutic approach for metastatic FTC.

♦41. Developing a Clinical Risk Score for Hypocalcemia after Total Thyroidectomy

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Background: The most common complication of total thyroidectomy is hypocalcemia. Several clinical factors have been thought to be associated with hypocalcemia, but accurate prediction remains challenging. We sought to develop a clinical risk score to predict hypocalcemia after total thyroidectomy to guide patient counseling and peri-operative management.

Methods: We performed a retrospective cohort study of patients who underwent total thyroidectomy at a single institution. The primary outcome was hypocalcemia after surgery defined as serum calcium level <8.6 mg/dl. All patients received routine oral calcium supplementation. Clinical data including demographics, diagnostic codes, preoperative lab values, and pathology was abstracted from the electronic medical record. LASSO (Least Absolute Shrinkage and Selection Operator) regression evaluated the relationship between covariates and postoperative hypocalcemia. Covariates significantly associated with hypocalcemia were incorporated into a weighted risk score with continuous variables converted to binary variables using Youden's index as a cut point. Performance characteristics for the risk score were assessed.

Results: Of 842 patients included, 333 patients (39.5%) experienced early hypocalcemia. The median patient age was 53 years (interquartile range [IQR]: 41-64), and the majority of patients were female (73.6%) and White (68.2%). On final multivariable logistic regression, age < 54 years (odds ratio [OR]: 1.53, p=0.005), female sex (OR: 1.58, p=0.008), BMI < 24.2 kg/m2 (OR 1.61, p=0.003), pre-operative serum calcium < 9.3 mg/dl (2.07, p<0.001), and surgical duration > 209 minutes (1.54, p=0.008) were significantly associated with early hypocalcemia. These factors were incorporated into a weighted risk score based on their β-coefficients. Rates of hypocalcemia increased with increasing risk score as follows: 0-1 points: 25%, 2-3 points: 45%, 4-5 points: 59% (Figure). A point value of >2 was associated with a sensitivity of 75.7% and a negative predictive value of 74.9%.

Conclusions: We developed a risk score to predict hypocalcemia that relies on easily obtained clinical data. This score may be used to counsel patients pre-operatively and guide decision-making regarding intensity and duration of peri-operative calcium supplementation. In particular, patients with longer surgical duration may benefit from enhanced calcium supplementation.

♦42. A novel, multivariable model using the Afirma Genomic Resource for Intelligent Discovery (GRID) database can improve initial risk stratification in Bethesda III-VI nodules

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Background: The Afirma GRID is a research-use-only database derived from results of the Afirma Genomic Sequence Classifier (GSC) molecular test, and its utility in preoperative identification of high-risk thyroid lesions is not well characterized. We sought to investigate whether gene expression signatures obtained from Afirma GRID could improve preoperative risk stratification in Bethesda III-VI nodules and be used to identify malignancies at high risk of recurrence.

Methods: We performed Receiver Operating Characteristic (ROC) analyses to identify gene expression signatures from Afirma GRID as candidates for inclusion in a multivariate model, based on an Area Under Curve (AUC)>70% in univariate analyses. We then created a multivariate model estimating the probability of ATA-high risk that incorporated the candidate GRID signatures. We calculated the AUC and identified optimal cutpoints to maximize the model's specificity/positive predictive value (PPV) and sensitivity/negative predictive value (NPV), respectively.

Results: Among 73 patients from a single institution between 3/2020—4/2025, 41 lesions (56.1%) were malignant and nine (12.3%) were classified as ATA-high risk. Of nine ATA high-risk lesions, five patients were initially recommended for lobectomy based on preoperative assessment; four patients required intraoperative conversion to total thyroidectomy and one patient underwent completion thyroidectomy.

Seven gene expression signatures from Afirma GRID (Apical_junction_hallmark, Epithelial_mesenchymal_transition_hallmark, Estrogen_response_late_hallmark, TP53_pathway_hallmark, Cancer associated fibroblast, Invasion signature score, Lymph node metastasis signature score) had AUC>70% on univariate analyses. The multivariate logistic regression model incorporating these signatures improved performance to an AUC of 0.939 (95% CI: 0.87–0.98). At a cutpoint maximizing specificity/PPV (0.482, or 48.2% estimated probability of ATA-high risk classification), the model achieved 55.6% sensitivity, 98.4% specificity, 94.0% NPV, and 83.3% PPV, ruling in ATA-high risk classification in six (8.2%) patients in the sample. At a cutpoint maximizing sensitivity/NPV (0.063 or 6.3% estimated probability of ATA-high risk), the model achieved 100% sensitivity, 82.8% specificity, 100% NPV, and 45.0% PPV, ruling out 53 patients (72.6%) in the sample.

Conclusions: This exploratory study describes a novel, multivariable model incorporating gene expression signatures from Afirma GRID that can enhance preoperative risk stratification, potentially changing initial management recommendations. Further studies using multi-institutional or independent datasets are needed to validate this proposed model and the suggested cutpoints.

♦43. Disparities in Radioactive Iodine Use Among Patients with Differentiated Thyroid Carcinomas

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Background: Papillary, Follicular, and Oncocytic (Hürthle cell) thyroid carcinomas (PTC, FTC, OTC) represent the major subtypes of differentiated thyroid cancer (DTC). American Thyroid Association guidelines recommend radioactive iodine (RAI) treatment for patients with these cancers with extrathyroidal extension or lymphatic or distant metastases. Prior studies have shown racial and socioeconomic disparities in thyroid cancer care. We hypothesized that these disparities may differ by cancer subtype.

Methods: We identified patients aged ≥18 years with PTC, FTC, or OTC from the National Cancer Database (2004–2020). Patients with other malignancies or unknown mortality status were excluded. Multivariable logistic regression was used to identify socioeconomic and clinicopathologic factors associated with receiving RAI therapy. Kaplan-Meier curves were used to measure overall survival.

Results: RAI was given to 45.5% of PTC, 50.0% of FTC, and 53.5% of OTC patients. In multivariable regression, older age (OR 0.92, p<0.001) and higher income (OR 0.80, p<0.001) were associated with lower odds of receiving RAI. Conversely, patients in rural regions (OR 1.18, p=0.001), with higher education (≤5% without high school; OR 1.42, p<0.001), with private insurance (OR 1.39, p<0.001), and treated outside of community centers (OR 1.42-1.59, p<0.001) were more likely to receive RAI. Tumor aggressiveness also strongly correlated with receiving RAI; patients with larger tumors (≥4 cm; OR 3.39, p<0.001), nodal involvement (N1; OR 1.87, p<0.001), or microscopic extrathyroidal extension (OR 1.61, p<0.001) were significantly more likely to receive RAI. Tumor histology was not a significant predictor of RAI. Overall survival was higher for patients treated with RAI across all three tumor types, log-rank p<0.001 for PTC and FTC, p=0.003 for OTC).

Conclusions: Disparities persist in the use of RAI therapy among patients with DTCs, even in those with aggressive tumors who are recommended to receive adjuvant treatment. Socioeconomic factors continue to influence treatment access independent of tumor histology and aggressiveness. Considering RAI use is associated with improved survival across all three histologies, disparities may adversely affect cancer outcomes. These findings show the need for policy-level interventions to ensure equitable RAI therapy, especially as new guidelines narrow its indications.

44. Impact of Prior Neck Surgery on Thyroidectomy Complications: A Real-World Analysis of >50,000 Cases in the ACS NSQIP Database

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Background: Thyroidectomy following prior neck surgery is traditionally considered to carry higher complication risk compared to primary surgery. However, real-world contemporary data are lacking. We aimed to evaluate the impact of prior neck surgery on thyroidectomy morbidity using a large national cohort.

Methods: We conducted a retrospective cohort study of patients who underwent thyroidectomy using the ACS-NSQIP Procedure-Targeted Thyroidectomy Database (2016-2023). In this dataset, prior neck surgery is not restricted to thyroid/parathyroid, and is categorized as prior ipsilateral, contralateral, bilateral, midline, or other procedure. Data on the interval between operations are unavailable. Outcomes included hypocalcemia-related events, laryngeal nerve injury, and neck hematoma. Complication rates were compared between patients with and without prior neck operations using χ^2 tests or Monte-Carlo simulation, with p-values adjusted for multiple comparisons.

Results: Among 54,535 thyroidectomy patients, 5,569 (10.2%) had prior neck surgery. These patients had lower frequency of multinodular goiter (19.7% vs 29.2%) and solitary nodule (30.6% vs 42.0%), but higher frequency of known differentiated malignancy (37.9% vs 13.3%, p<0.001). Nearly half had undergone a contralateral procedure (2,712, 48.7%). Overall, reoperation was associated with higher frequency of calcium/vitamin D supplementation (56.4% vs 62.8%, p<0.001). Similar results were observed in the subgroups of ipsilateral, contralateral, bilateral and other prior procedures. Laryngeal nerve injury was more frequent only among those with “other” prior procedures (8.5% vs 5.9%, p<0.001); conversely, it was lower after prior contralateral neck surgery (4.7% vs 5.9%, p=0.007). The rate of neck hematoma was not different in any subgroup. Among patients undergoing thyroidectomy for known malignancy or completion for malignancy, prior surgery was associated with lower rates of hypocalcemia; notably, prior contralateral surgery was associated with lower rates of laryngeal nerve injury (9.0% vs 4.1%, p<0.001).

Conclusions: Prior neck surgery was not uniformly associated with increased thyroidectomy morbidity. Complication profiles varied by laterality of previous procedure and thyroidectomy indication, with specific reoperation subgroups demonstrating lower rates of nerve injury. This may reflect extensive preoperative evaluation, referral to specialized centers, or selection bias in this surgical cohort. Despite inherent dataset limitations, these findings suggest that reoperative thyroidectomy, when appropriately selected, can be performed with safety comparable to primary surgery.

45. Does Size Matter for Minimally Invasive Follicular Thyroid Cancer?

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Background: Minimally invasive follicular thyroid cancer (miFTC) is a subtype of differentiated thyroid cancer (DTC). It is characterized by limited capsular and vascular invasion, and is confirmed histologically after surgical resection. Like other DTCs, the extent of treatment depends on tumor size. Previous studies suggest that miFTC may be indolent, and patients may not require extensive surgery and adjuvant treatment even for large tumors. This study compares survival outcomes in miFTC patients by surgical procedure and use of radioactive iodine therapy (RAI).

Methods: Patients with miFTC were identified in the National Cancer Database (2004-2022) and categorized into 4 treatment groups – hemithyroidectomy without RAI (HT/-RAI), hemithyroidectomy with RAI (HT/+RAI), total thyroidectomy without RAI (TT/-RAI), and total thyroidectomy with RAI (TT/+RAI) – and analyzed by tumor size (<4cm versus ≥4cm). Categorical variables were compared using chi-square analysis, continuous variables with Wilcoxon rank-sum tests, and survival among groups with Cox proportional hazards regression.

Results: Among 7,669 miFTC patients, most were female (72.8%), White (79.5%), non-Hispanic (88.0%), privately insured (64.4%), treated at non-community institutions (95.9%), and an average age of 50.7 years. Median tumor size was 3.0cm (IQR 2.0-4.5). Most patients (63%) received total thyroidectomy. Receipt of hemithyroidectomy versus total thyroidectomy differed significantly by sex (p=0.009), race (p=0.009), facility type (p=0.004), and lymphovascular invasion (p<0.001). For tumors <4cm, survival did not differ significantly among treatment groups. For tumors ≥4cm, patients receiving HT/-RAI had significantly worse survival (HR:1.64, p=0.003) than patients receiving TT/+RAI, while patients receiving TT/-RAI or HT/+RAI did not differ significantly from patients receiving TT/+RAI (HR:1.32, p=0.10 and HR:1.21, p=0.38 respectively).

Conclusions: Patients with miFTC tumors ≥4cm who underwent hemithyroidectomy without RAI had worse survival than those receiving total thyroidectomy with RAI. Further analysis is needed to determine if a miFTC tumor size threshold exists where total thyroidectomy is optimal.

♦46. PC-4D-CT: A novel imaging modality for recurrent primary hyperparathyroidism

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Background: Recurrent primary hyperparathyroidism (PHPT) poses significant challenges for re-operative decision-making due to increased risks of surgery and difficulty of parathyroid localization with conventional imaging studies. A photon-counting computed tomography scan is a novel imaging modality that can offer high resolution images of parathyroid anatomy. We aimed to examine if photon-counting 4D-CT scans (PC-4D-CT) improved visualization of parathyroid disease in patients with recurrent PHPT.

Methods: We performed a single-center retrospective cohort study of nine patients with recurrent primary hyperparathyroidism who underwent PC-4D-CT imaging. Descriptive statics examined patient demographics and disease characteristics. We compared preoperative results from standard imaging (ultrasound, Sestamibi, and 4D-CT scans) versus PC-4D-CT results. For patients who underwent re-operative parathyroidectomy, PC-4D-CT results were compared to intra-operative findings.

Results: The cohort had two (22.2%) patients with parathyroid carcinoma and seven (77.8%) with recurrent PHPT, four of whom had a diagnosis of Multiple Endocrine Neoplasia Type 1. Median patient age was 65 years (range 31-85 years), and patients had a median of two prior parathyroid surgeries (range 1-3 surgeries). Four (44.4%) patients had non-localizing disease on standard imaging, and use of PC-4D-CT localized disease for all of these patients. Of the other five patients with localizing disease on standard imaging, PC-4D-CT results were concordant in three cases (60%). For one patient with non-concordant imaging, PC-4D-CT suggested contralateral disease, and intra-operative findings were consistent with PC-4D-CT results. For the other patient, PC-4D-CT results suggested bilateral disease. Overall, five (55.6%) patients underwent surgery - three targeted parathyroidectomies, one completion subtotal parathyroidectomy, and one en bloc resection of residual parathyroid tissue with thyroid lobectomy – all with abnormal parathyroid tissue identified based on PC-4D-CT results.

Conclusions: The novel imaging modality PC-4D-CT may offer improved localization of parathyroid targets in the setting of recurrent PHPT. While further work is needed to classify diagnostic accuracy and understand correlations with disease recurrence, PC-4D-CT has the potential to improve operative planning for challenging cases of primary hyperparathyroidism.

♦47. Determining Malignancy Rates and Clinical Behavior of RAS-Positive Thyroid Neoplasms Diagnosed on Molecular Testing

Patricia G Lu[1], Joseph Tobias[2], Nicole Cipriani[3], Tatjana Antic[3], Brian Kim[4], David Sarne[4], Ronald Cohen[4], Paul Chang[5], Peter Angelos[1], Megan Applewhite[1], Xavier Keutgen[1]

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Background: Molecular testing of indeterminate thyroid nodules (ITN) provides additional information to stratify the risk of malignancy and the necessity and extent of surgery. Although RAS mutations are frequently found, there is limited data on their pathologic features or clinical behavior. Herein, we sought to examine the malignancy rates and overall behavior of RAS-mutant ITNs with the aim to inform clinician's treatment decisions.

Methods: A single-center, retrospective review of all ITNs with NRAS, HRAS, or KRAS identified on genetic testing from 2016-2025 was performed. Clinical and pathologic data were collected, as well as recurrence rates. High risk features were defined as extrathyroidal extension, angioinvasion, and/or poor differentiation.

Results: Of 97 RAS-mutant nodules, 82 were ITNs (89% Bethesda III, 11% Bethesda IV). Five RAS-mutant ITNs had an additional TERT mutation and were significantly more likely to be malignant (60% vs. 21%, p=0.05) and require RAI (60% vs. 4%, p<0.01). Of the 77 ITNs with only RAS mutations, 41 (53%) had NRAS, 24 (31%) had HRAS, and 12 (16%) had KRAS mutations. Eighty two percent were treated with thyroid lobectomy and 18% with total thyroidectomy. The overall malignancy rate for RAS-only ITNs was 21% and included 13 (81%) FTC, 2 (13%) oncocytic thyroid carcinomas, and 1 (6%) PTC. On univariate analysis, RAS subtype was not associated with malignancy (NRAS 22% vs. HRAS 21% vs. KRAS 17%, p=0.66). In multivariable modeling adjusting for age, sex, Bethesda score, combined TIRADS/ATA score, and nodule size, RAS subtype remained non-significant. TERT co-mutation was significantly associated with malignancy (p=0.02), as was younger age (p=0.009). Of the 16 RAS-only malignant nodules, 11 (69%) were minimally invasive, 12 (75%) were unifocal, and only 2 (12%) had high risk features. There was 1 neck recurrence, 8 months after surgery in a lateral lymph node. Median follow up was 25 months.

48. Association Between Neck Hematoma and Postoperative Hypocalcemia: Analysis of 53,091 Thyroidectomies from the ACS NSQIP Database

Anastasios Karneris[1], Mason V. Forchetti[2], Pinar J. Smith[3], Sean M. Wrenn[2], Vinod Narra[1], Theodoros Michelakos[2]

[1]*Department of Surgery, Massachusetts General Hospital, Harvard Medical School,* [2]*Division of Surgical Oncology, Department of Surgery, Rush University Medical Center,* [3]*Division of Endocrinology, Department of Internal Medicine, Rush University Medical Center*

Background: Neck hematoma and hypocalcemia are among the most significant complications after thyroidectomy. Whether these complications are related remains unclear. We hypothesized that post-thyroidectomy neck hematoma is associated with an increased risk of postoperative hypocalcemia. We aimed to test this hypothesis using a large national cohort.

Methods: We performed a retrospective cohort analysis of patients who underwent thyroidectomy using the ACS NSQIP Procedure Targeted Thyroidectomy Database (2016-2023). Patients with missing or unknown hematoma or hypocalcemia status were excluded. The primary exposure was postoperative neck hematoma. Outcomes included hypocalcemia before discharge, hypocalcemia within 30 postoperative days, need for calcium/vitamin D supplementation, and severe hypocalcemia events (e.g. readmission, administration of intravenous calcium). Associations were evaluated using χ^2 tests and multivariable logistic regression adjusting for demographic, pathologic and operative factors.

Results: Among 53,091 thyroidectomies, most were performed for a single nodule (20,895; 39.4%), one third for multinodular goiter (17,523; 33.0%), 8,875 (16.7%) for a known malignancy, 3,480 (6.6%) for Graves' disease, and the remainder for other indications. Postoperative neck hematoma occurred in 897 (1.7%) cases. Patients with hematoma had higher rates of hypocalcemia before discharge (6.6% vs 3.7%, p<0.001), hypocalcemia within 30 days (7.9% vs 5.4%, p=0.001), calcium/vitamin D supplementation (63.4% vs 57.0%, p<0.001), and severe hypocalcemia events (5.4% vs 3.3%, p=0.001). In the restricted cohort of non-reoperative open thyroidectomies without neck dissection (n=21,977), similar results were observed: hypocalcemia before discharge (6.1% vs 2.8%, p<0.001), hypocalcemia within 30 days (8.9% vs 4.5%, p<0.001), calcium/vitamin D supplementation (61.6% vs 54.0%, p<0.001), severe hypocalcemia event (6.5% vs 2.8%, p<0.001), and administration of intravenous calcium (6.0% vs 2.4%). These associations persisted even for hematomas managed non-operatively. On multivariable analysis, hematoma remained independently associated with all hypocalcemia outcomes (e.g. hypocalcemia within 30 days: OR=1.79, p=0.002).

Conclusions: Post-thyroidectomy neck hematoma, even when managed non-operatively, is associated with an increased risk of hypocalcemia-related complications. This suggests a possible physiologic mechanism such as hematoma-induced parathyroid ischemia or venous congestion. These findings highlight the importance of proactive calcium monitoring and supplementation protocols in patients who develop postoperative hematoma. Further studies are warranted to elucidate the underlying pathophysiology.

IN MEMORIAM

IN MEMORIAM
Benzon Munoz Dy
April 28, 1982 — January 24, 2026

Ben passed unexpectedly on January 24 in Rochester, MN, losing his battle with depression. A very private person, he kept his many achievements and successes to himself, but he lived a life of note to those who knew him.

Ben excelled as a surgeon, teacher, and researcher. He trained at Mayo Clinic as a surgical resident, receiving multiple teaching and research awards. After a prestigious year-long fellowship in endocrine surgery and oncology at Memorial Sloan Kettering, he returned to Mayo in 2017. Through his dedication, he rose to the academic rank of Professor and the Fellowship Director of the Comprehensive Endocrine Surgery Program.

While he was an accomplished surgeon, more than anything Ben was a teacher. He took great pride in training residents and fellows, and his rotations were ones people genuinely looked forward to. His operating room was calm and respectful, a place where trainees could think, operate, and learn comfortably. He led with humility, humor, and kindness. His professional legacy endures in the countless lives still being lived because of the care, skill, and compassion he brought to his work and the knowledge that he shared.

Ben also led a rich life outside of his work and career. At the end of a long day, and after taking his beloved nap, he would frequently venture out for dinner or drinks with friends. Never one to pass up a good deal, he always had the best happy hour specials researched or a great coupon at the ready.

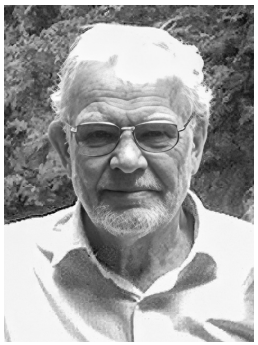
Ben loved to travel and see the world. Every summer, Ben would join his mom, aunts, and uncles on a trip to Europe, lately on a river boat cruise. He shared his love for Paris on trips with his family and partner. His travel selfies, shared widely, always featured a famous landmark in the background and Ben smiling in the foreground, making a peace sign.

His life was heavily influenced by the experiences that led him to his position at Mayo. He grew up in a loving immigrant family with a humble upbringing in Jersey City, New Jersey, to achievements that put him at the top of his medical specialty. While he liked good food and nice things, he always remained down to earth and loved the simple joys of his 100-strong graphic t-shirt collection, his flower garden, or enjoying the warmth of his fireplace, a cozy blanket, and a book or a scroll through Instagram.

Everyone that knew and loved Ben has a story to share about his wry sense of humor and his thoughtfulness. The family encourages friends and colleagues to share their memories of Ben in the Guestbook section below.

Ben was born on April 28, 1982, in Manila, Philippines. He was a loving son to his mother, Grace Dy, a caring sibling to Constantine Dy and Katrina Dy, an affectionate nephew to Maria Munoz, and a devoted partner to Christopher Goeken.

IN MEMORIAM
Göran Åkerström



Goran was a thoughtful surgeon, dedicated researcher, a trusted mentor and dear friend to so many of us in the IAES. However, I would venture to guess, many of the membership today never had the privileged or opportunity to meet this great man, yet the legacy of his work lives on and is very much ingrained in the hands and skills of today's surgeons.

Professor Åkerström's impact on endocrine surgery started with his seminal work on parathyroids; documenting their histology, physiology and the anatomical distribution of the glands. Throughout the 1980's, Goran studied the parenchyma cell mass of both diseased and normal parathyroid glands, was involved in the early studies of ultrasound location and recognized, then documented the vague cognitive symptoms impacting HPT patients. In the 1990's, he championed the surgical management of midgut neuroendocrine tumours, teaching us how to assess resectability and safely resect extensive mesenteric disease, improving the QoL for hundreds of patients. In the next two decades of his career, Professor Åkerström took on leadership roles in the IAES that were fundamental in helping this organization grow and become the society we are today. He was Secretary Treasurer from 1997-2003 and lead our organization as President from 2007-2009. In 2011, following in the footsteps of Theodor Kocher, Professor Åkerström became President of the International Society of Surgery.

On a personal note, Goran was a delightful gentleman who was genuinely interested in the young surgeons of the IAES. I remember fondly meeting him for the first time; his kindness and generosity with his time truly defined him. He was instrumental in promoting the next generation of researchers, mentoring hundreds of surgical investigators world-wide. He was a wonderful teacher, and I was blessed to have had the opportunity to work with him at several IAES Post-Graduate Courses. It was on those trips that I got to witness his wonderful sense of humour, inquisitive mind and an intense curiosity of the world around him.

He will be missed. Yet the impact he had in endocrine surgery will live on for generations to come in his scientific work, through the surgical skills he taught his mentees and by the legacy he leaves imprinted in the IAES. Our thoughts are with his family, as they mourn his loss. Take comfort knowing that his soul now rests in peace.

In the words of Lord Alfred Tennyson "God's finger touched him, and he slept."

47TH ANNUAL MEETING

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