

WELCOME  
TO AAES



AAES 40<sup>TH</sup>

*Annual Meeting*

APRIL 7-9 LOS ANGELES

Local Arrangements Chair: Michael Yeh, MD



# THANK YOU

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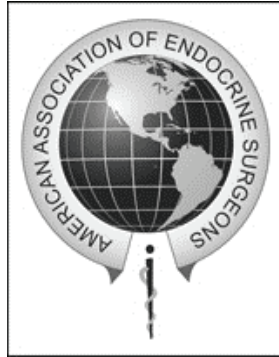
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THE AMERICAN ASSOCIATION OF  
**ENDOCRINE  
SURGEONS**

**Fortieth Annual Meeting  
APRIL 7-9, 2019**



**American Association of Endocrine Surgeons**  
201 East Main Street, Suite 1405, Lexington, KY 40507  
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# AAES FUTURE MEETINGS

April 4-6, 2020

**Birmingham, Alabama**

John Porterfield, MD

*\*The 2020 Meeting will start on Saturday  
and end on Monday*

2021

**Cleveland, Ohio**

Vikram Krishnamurthy, MD

2022

**New Orleans, Louisiana**

Emad Kandil, MD

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Maria Bates, MD  
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Patricia Cronin, MD  
(Candidate member)  
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 Melanie Goldfarb, MD  
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 Benjamin James, MD  
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 James Lim, MD  
 (Candidate member)  
 Samuel Long, MD  
 (Candidate member)  
 Amin Madani, MD  
 (Candidate member)  
 Rosebel Monteiro, MD  
 (Candidate member)  
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 Paul Park, MD  
 Mauricio Sierra-Salazar,  
 MD  
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**ATA LIAISON**  
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2016-2017	Peter Angelos	Samuel Snyder
2015-2016	Steven K. Libutti	Douglas L. Fraker
2014-2015	Gerard Doherty	William B. Inabnet, III
2013-2014	Sally E. Carty	Julie Ann Sosa
2012-2013	Miguel F. Herrera	Allan Siperstein
2011-2012	Ashok R. Shaha	Thomas J. Fahey, III
2010-2011	Douglas B. Evans	Gerard M. Doherty
2009-2010	Janice L. Pasieka	Jeffrey E. Lee
2008-2009	Michael J. Demeure	Jeffrey F. Moley
2007-2008	Geoffrey B. Thompson	Terry C. Lairmore
2006-2007	Christopher R. McHenry	John B. Hanks



2005-2006	Robert Udelsman	Collin J. Weber
2004-2005	John A. Kukora	Andrew W. Saxe
2003-2004	Paul LoGerfo	Ashok R. Shaha
2002-2003	Quan-Yang Duh	Gary B. Talpos
2001-2002	Clive S. Grant	Miguel F. Herrera
2000-2001	Barbara K. Kinder	Martha A. Zeiger
1999-2000	Jay K. Harness	John S. Kukora
1998-1999	George L. Irvin, III	Barbara K. Kinder
1997-1998	Blake Cady	E. Christopher Ellison
1996-1997	Jon A. van Heerden	George L. Irvin, III
1995-1996	Richard A. Prinz	Jeffrey A. Norton
1994-1995	John M. Monchik	Jon A. van Heerden
1993-1994	Orlo H. Clark	Glen W. Geelhoed
1992-1993	Robert C. Hickey	Patricia J. Numann
1991-1992	Stuart D. Wilson	Joseph N. Attie
1990-1991	Caldwell B. Esselstyn	Brown M. Dobyns
1989-1990	Colin G. Thomas, Jr.	Carl R. Feind
1988-1989	John R. Brooks	Melvin A. Block
1987-1988	Edward Paloyan	Caldwell B. Esselstyn
1986-1987	Oliver Beahrs	Robert C. Hickey
1985-1986	Chiu-An Wang	Edward Paloyan
1984-1985	Leonard Rosoff	John M. Monchik
1983-1984	Stanley R. Friesen	John A. Palmer
1982-1983	Edwin L. Kaplan	Blake Cady
1981-1982	Norman W. Thompson	Orlo H. Clark
1980-1981	Norman W. Thompson	Orlo H. Clark

<b>Year</b>	<b>Secretary</b> <i>(prev. Secretary-Treasurer)</i>	<b>Recorder</b>	<b>Treasurer</b>
2018-2019	James Lee	Paul Gauger	Sareh Parangi
2017-2018	Rebecca S. Sippel	Paul Gauger	Sareh Parangi
2016-2017	Rebecca S. Sippel	Cord Sturgeon	Sareh Parangi
2015-2016	Rebecca S. Sippel	Cord Sturgeon	
2014-2015	Nancy D. Perrier	Cord Sturgeon	
2013-2014	Nancy D. Perrier	Herbert Chen	
2012-2013	Nancy D. Perrier	Herbert Chen	
2011-2012	Peter Angelos	Herbert Chen	

2010-2011	Peter Angelos	Steven K. Libutti	
2009-2010	Peter Angelos	Steven K. Libutti	
2008-2009	Sally E. Carty	Steven K. Libutti	
2007-2008	Sally E. Carty	Douglas B. Evans	
2006-2007	Sally E. Carty	Douglas B. Evans	
2005-2006	Janice L. Pasieka	Douglas B. Evans	
2004-2005	Janice L. Pasieka	Geoffrey B. Thompson	
2003-2004	Janice L. Pasieka	Geoffrey B. Thompson	
2002-2003	Christopher R. McHenry	Geoffrey B. Thompson	
2001-2002	Christopher R. McHenry	Michael J. Demeure	
2000-2001	Christopher R. McHenry	Michael J. Demeure	
1999-2000	Paul LoGerfo	Michael J. Demeure	
1998-1999	Paul LoGerfo	Quan-Yang Duh	
1997-1998	Paul LoGerfo	Quan-Yang Duh	
1996-1997	Jay K. Harness	Quan-Yang Duh	
1995-1996	Jay K. Harness	George L. Irvin, III	
1994-1995	Jay K. Harness	George L. Irvin, III	
1993-1994	Blake Cady	George L. Irvin, III	
1992-1993	Blake Cady	Robert D. Croom, III	
1991-1992	Blake Cady	Robert D. Croom, III	
1990-1991	Richard A. Prinz	Robert D. Croom, III	
1989-1990	Richard A. Prinz	Jon A. van Heerden	
1988-1989	Richard A. Prinz	Jon A. van Heerden	
1987-1988	Stuart D. Wilson	Jon A. van Heerden	
1986-1987	Stuart D. Wilson		
1985-1986	Stuart D. Wilson		
1984-1985	Stuart D. Wilson		
1983-1984	John M. Monchik		
1982-1983	John M. Monchik		
1981-1982	John M. Monchik		
1980-1981	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, Norm 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.

## **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 in 1980 and 1981.

## **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 1987-1989, as our Vice-President in 1994, and as President in 1996.

## **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 in 1980 and 1981, and as President in 1993.

## **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.

**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, and as President in 1998

**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 from 1991-1992.

			
<b>Oliver Cope, MD</b>	<b>Stanley R. Friesen, MD, PhD</b>	<b>Norman W. Thompson, MD</b>	<b>Jon A. van Heerden, MD</b>
			
<b>Orlo H. Clark, MD</b>	<b>Edwin L. Kaplan, MD</b>	<b>George L. Irvin, III, MD</b>	<b>Stuart D. Wilson, MD</b>

# HONORARY MEMBERS

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

J. Aidan Carney, Pathologist

Stuart D. Flynn, Pathologist

Ian D. Hay, Endocrinologist

Virginia A. LiVolsi, Pathologist

Frank LoGerfo, Surgeon

A. G. E. "Ace" Pearce, Endocrinologist

Thomas S. Reeve, Endocrine Surgeon

F. John Service, Endocrinologist

Britt Skogseid, Endocrinologist

R. Michael Tuttle, Endocrinologist

William F. Young, Endocrinologist

# RESIDENT/FELLOW RESEARCH AWARD WINNERS & POSTER COMPETITION WINNERS

The AAES Resident/Fellow Research Award was established in 1990 to encourage interest in endocrine surgery by those training as students and residents in general surgery. Presented work may be honored in either the Clinical or Basic Research categories. The AAES Poster Competition was established in 2007.

## 1990

**Michael J. Demeure** — San Francisco, California

“Actin Architecture of Cultured Human Thyroid Cancer Cells: Predictor of Differentiation?”

**Gerard M. Doherty** — Bethesda, Maryland

“Time to Recovery of the Hypothalamic-Pituitary-Adrenal Axis After Curative Resection of Adrenal Tumors in Patients with Cushing’s Syndrome”

## 1992

**Rodney Pommier** — New York, New York

“Eleven Year Experience with Adrenocortical Carcinoma”

## 1996

**Jennifer Meko** — St. Louis, Missouri

“Evaluation of Somatostatin Receptor Scintigraphy in Detecting Neuroendocrine Tumors”

**Beth A. Ditkoff** — New York, New York

“Detection of Circulating Thyroid Cells in Peripheral Blood”

## 1997

**Herbert Chen** — Baltimore, Maryland

“Implanted Programmable Insulin Pumps: 153 Patient Years of Surgical Experience”

**K. Michael Barry** — Rochester, Minnesota

“Is Familial Hyperparathyroidism a Unique Disease”

## 1998

**Julie Ann Sosa** — Baltimore, Maryland

“Cost Implications of the Different Management Strategies for Primary Hyperparathyroidism in the US”

**David Litvak** — Galveston, Texas

“A Novel Cytotoxic Agent for Human Carcinoid”

## 1999

**Andrew Feldman** — Bethesda, Maryland

“Results of Heterotrophic Parathyroid Autotransplantation: A 13-Year Experience”

**Alan Dackiw** — Houston, Texas

“Screening for MEN1 Mutations in Patients with Atypical Multiple Endocrine Neoplasia”

# RESIDENT/FELLOW RESEARCH AWARD WINNERS & POSTER COMPETITION WINNERS

## 2000

**Electron Kebebew** — San Francisco, California  
“ID1 Proteins Expressed in Medullary Thyroid Cancer”

## 2001

**Nestor F. Esnaola** — Houston, Texas  
“Optimal Treatment Strategy in Patients with Papillary Thyroid Cancer: A Decision Analysis”

**Katherine T. Morris** — Portland, Oregon  
“High Dehydroepiandrosterone-Sulfate Predicts Breast Cancer Progression During New Aromatase Inhibitor Therapy and Stimulates Breast Cancer Cell Growth in Tissue Culture: A Renewed Role for Adrenalectomy”

## 2002

**Rasa Zarnegar** — San Francisco, California  
“Increasing the Effectiveness of Radioactive Iodine Therapy in the Treatment of Thyroid Cancer Using Trichostatin A (TSA), A Histone Deacetylase (HDAC)”

**Denise M. Carneiro** — Miami, Florida  
“Rapid Insulin Assay for Intraoperative Confirmation of Complete Resection of Insulinomas”

## 2003

**Petra Musholt** — Hanover, Germany  
“RET Rearrangements in Archival Oxyphilic Thyroid Tumors: New Insights in Tumorigenesis and Classification of Hürthle Cell Carcinoma”

**Tina W.F. Yen** — Houston, Texas  
“Medullary Thyroid Carcinoma: Results of a Standardized Surgical Approach in a Contemporary Series of 79 Consecutive Patients from The University of Texas, M. D. Anderson Cancer Center in Houston”

## 2004

**Rebecca S. Sippel** — Madison, Wisconsin  
“Does Propofol Anesthesia Affect Intra-Operative Parathyroid Hormone Levels During Parathyroidectomy? A Randomized Prospective Trial”

**David Finley** — New York, New York  
“Molecular Analysis of Hürthle Cell Neoplasms by Gene Profiling”

## 2005

**Mark Cohen** — St. Louis, Missouri  
“Long-Term Functionality of Cryopreserved Parathyroid Autografts: A 13-Year Prospective Analysis”

**Kepal N. Patel** — New York, New York  
“MUC1 Plays a Role in Tumor Maintenance in Aggressive Thyroid Carcinomas”

# RESIDENT/FELLOW RESEARCH AWARD WINNERS & POSTER COMPETITION WINNERS

## 2006

**Kyle Zano** — Chicago, Illinois

“Cost-Effectiveness Analysis of Minimally Invasive Parathyroidectomy for Asymptomatic Primary Hyperparathyroidism”

**Ashley Kappes Cayo** — Madison, Wisconsin

“Lithium Ions: A Novel Agent for the Treatment of Pheochromocytomas and Paragangliomas”

## 2007

**Tracy S. Wang** — New Haven, Connecticut “How Many Endocrine Surgeons Do We Need?”

**David Yu Greenblatt** — Madison, Wisconsin

“Valproic Acid Activates Notch1 Signaling and Inhibits Growth in Medullary Thyroid Cancer Cells”

## 2008

**Elizabeth G. Grubbs** — Houston, Texas

“Preoperative Vitamin D (VITD) Replacement Therapy in Primary Hyperparathyroidism (PHPT): Safe But Beneficial?”

**Linwah Yip** — Pittsburgh, Pennsylvania

“Loss of Heterozygosity of Selected Tumor Suppressor Genes in Parathyroid Carcinoma”

**POSTER: Pierre Leyre** — Poitiers, France

“Does the Risk of Compressive Hematoma After Thyroidectomy Authorize One-Day Surgery?”

## 2009

**Insoo Suh** — San Francisco, California

“Candidate Germline Alterations Predisposing to Familial Nonmedullary Thyroid Cancer Map to Distinct Loci on Chromosomes 1 and 6”

**Susan C. Pitt** — Madison, Wisconsin

“Tertiary Hyperparathyroidism: Is Less Than a Subtotal Resection Ever Appropriate? A Study of Long-term Outcomes”

**POSTER: Matthew Nehs** — Boston, Massachusetts

“Inhibition of B-RAFV600 Oncoprotein Prevents Cell Cycle Progression and Invasion In Vitro and Reduces Tumor Growth and Metastasis in an In Vivo Orthotopic Model of Thyroid Cancer”

**POSTER: Bian Wu** — Los Angeles, California

“Utilization of Parathyroidectomy in the Elderly: A Population-Based Study”



# RESIDENT/FELLOW RESEARCH AWARD WINNERS & POSTER COMPETITION WINNERS

## 2010

**David T. Hughes** — Ann Arbor, Michigan

“Routine Central Lymph Node Dissection For Papillary Thyroid Cancer”

**Matthew A. Nehs** — Boston, Massachusetts

“Thyroidectomy With Neoadjuvant Plx4720 Extends Survival And Decreases Tumor Burden In An Orthotopic Mouse Model Of Anaplastic Thyroid Cancer”

**POSTER: Aarti Mathur** — Bethesda, Maryland

“Adrenal Venous Sampling in Primary Hyperaldosteronism: Standardizing A Gold Standard”

## 2011

**Paxton V. Dickson** — Houston, Texas

“Achieving Eugastrinemia in MEN1 Patients: Both Duodenal Inspection and Formal Lymph Node Dissection are Important”

**Matthew Nehs** — Boston, Massachusetts

“Necroptosis is a Novel Mechanism of Radiation-Induced Cell Death in Anaplastic Thyroid Cancer and Adrenocortical Cancer”

**POSTER: Luc G.T. Moris** — New York, New York

“Rising Incidence of Second Primary Cancer in Low-Risk Patients Receiving Radioactive Iodine Therapy”

## 2012

**Ashley K. Cayo** — Milwaukee, Wisconsin

“Predicting the Need for Calcium and Calcitriol Supplementation After Total Thyroidectomy: Results of a Prospective, Randomized Study”

**Thomas J. Quinn** — Bronx, New York

“Pasireotide (Som230) Is Effective for the Treatment of Pancreatic Neuroendocrine Tumors in a Multiple Endocrine Neoplasia Type 1 Conditional Knockout Mouse Model”

**POSTER: Kevin Shepet** — Madison, Wisconsin

“Parathyroid Cryopreservation Following Parathyroidectomy: A Worthwhile Practice?”

## 2013

**Kai-Pun Wong** — Hong Kong

“A Prospective Evaluation of Surgeon-Performed Transcutaneous Laryngeal Ultrasonography in Assessing Vocal Cord Function Before and After Thyroidectomy”

**Scott K. Sherman** — Iowa City, Iowa

“Gastric Inhibitory Polypeptide Receptor: A Future Alternative to Somatostatin Type 2 Receptor Imaging and Treatment in Neuroendocrine Tumors?”

**POSTER: Sara Murray** — Madison, Wisconsin

“Timing of Symptom Improvement After Parathyroidectomy”

# RESIDENT/FELLOW RESEARCH AWARD WINNERS & POSTER COMPETITION WINNERS

## 2014

**Heather Wachtel** — Philadelphia, Pennsylvania

“Long-term Blood Pressure Control in Patients Undergoing Adrenalectomy for Primary Hyperaldosteronism”

**Jessica Maxwell** — Iowa City, Iowa

“A Practical Method to Determine the Site of Unknown Primary in Metastatic Neuroendocrine Tumors”

**POSTER: Ben James** — Chicago, Illinois

“A Novel Ultra-Rapid PTH Assay to Distinguish Parathyroid from Non-Parathyroid Tissue”

## 2015

**Diana I. Ortiz** – Medical College of Wisconsin “Cosyntropin Stimulation Testing On Postoperative Day 1 Allows for Selective Glucocorticoid Replacement Therapy in Patients Undergoing Adrenalectomy for Hypercortisolism: Results of a Novel, Multidisciplinary-Derived Institutional Protocol”

**Melanie A. McWade** – Vanderbilt University

“Fluorescence Detection of the Parathyroid Gland: Realizing the Potential for Intraoperative Guidance”

**POSTER: Idit Dotan** – McGill University Health Center

“Bio-Conjugated Nanotechnology to Target Papillary Thyroid Cancer in Vitro”

**POSTER: Uma Rajhbeharrysingh** – Oregon Health and Science University

“Ionized Calcium And The Utility Of Maxpth To Evaluate Gastric Bypass Patients and Others With Non-Renal Secondary Hyperparathyroidism”

## 2016

**Bruna Babic** – National Institute of Health, National Cancer Institute

“Pediatric Patients with Pheochromocytoma and Paragangliomas Should Have Routine Preoperative Genetic Testing for Common Susceptibility Genes and Imaging to Detect Extra-Adrenal and Metastatic Tumors”

**Peter T. White** – University of Michigan

“A Novel Heat Shock Protein 90 Inhibitor Overcomes Receptor Tyrosine Kinase Resistance in Differentiated Thyroid Cancer”

**POSTER: Selena Brouwer** – University Medical Center Utrecht

“Intratatumoral Heterogeneity of Microrna Expression is a Pervasive Feature in Papillary Thyroid Carcinoma”

**POSTER: Wouter Kluijfhout** – University of California San Francisco

“CEA Should Not Routinely be Used for Detection of a First Recurrence in Patients With MTC”

# RESIDENT/FELLOW RESEARCH AWARD WINNERS & POSTER COMPETITION WINNERS

## 2017

**Kendall J. Keck** – University of Iowa Carver College of Medicine

“Gene expression changes in small bowel neuroendocrine tumors associated with progression to metastases”

**Omair Shariq** – Mayo Clinic

“Contralateral suppression of aldosterone at adrenal venous Sampling predicts hyperkalemia following adrenalectomy for primary Aldosteronism”

**POSTER: Priya Dedhia** – University of Michigan

“Human intestinal tissue generates functional insulin producing cells”

**POSTER: Heather Wachtel** – Massachusetts General Hospital

“A multi-institutional analysis of adrenalectomy for secondary malignancy”

## 2018

**John Tierney** – Rush University Medical Center

“Expression of Programmed Death Ligand-1 and 2 in Adrenocortical Cancer Tissues: An exploratory study”

**Kristen Limbach** – Oregon Health & Science University

“Prospective Study of the Pathophysiology of Carcinoid Crisis”

**POSTER: Sarah Fisher** – MD Anderson Cancer Center

“Genetic characterization of childhood survivors of the Chernobyl accident with medullary Thyroid cancer”

**POSTER: Wessel Vorselaars** – University Medical Center Utrecht

“Clinical outcomes after unilateral adrenalectomy for primary hyperaldosteronism - a large worldwide and recently operated cohort of 435 patients”

# 2018-2019 NEW MEMBERS

## ACTIVE MEMBERS

Megan Applewhite, MD  
Naira Baregamian, MD  
Toni Beninato, MD  
Melissa Boltz, MD  
Azadeh Carr, MD  
Jovenel Cherenfant, MD  
Travis Cotton, MD  
Frederick Thurston Drake, MD  
Benzon Dy, MD  
Dawn Efenbein, MD  
Josefina Farra, MD  
Jessica Folek, MD  
Amy Fox, MD  
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Paul Graham, MD  
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Judy Jin, MD  
Anna Kundel, MD  
Victoria Lai, MD

Christine Landry, MD  
Masha Livhits, MD  
Kristin Long, MD  
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Lilah Morris-Wiseman, MD  
Patrick O'Neal, MD  
Dhaval Patel, MD  
Susan Pitt, MD  
Reese Randle, MD  
Rashmi Roy, MD  
Neil Saunders, MD  
Hyunsuk Suh, MD  
Michael Sullivan, MD  
Mark Versnick, MD  
Leslie Wu, MD  
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Justin Yozowitz, MD  
Kyle Zanocco, MD  
Nicole Zern, MD

## CORRESPONDING MEMBER

Navin Niles, MD

## CANDIDATE MEMBERS

Eyas Alkhalili, MD  
Anna Aronova, MD  
Yasmine Assadipour, MD  
Maria Bates, MD  
Cassandra Benay, MD  
Rebekah Campbell, MD  
Yufei Chen, MD  
James Davis, MD  
Neeta Erinjeri, MD  
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Jason Glenn, MD

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Denise Lee, MD  
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Alexandria McDow, MD  
Jane Mills, MD  
Janeil Mitchell, MD  
Huan Yan, MD  
Jonathan Zagzag, MD

## 2018-2019 NEW MEMBERS

### RESIDENT/FELLOW MEMBERS

Ehab Alameer, MD	Catherine McManus, MD
Wilson Alobuia, MD	Britton Mehr, MD
Ammar Asban, MD	Ankeeta Mehta, MD
Sarina Bains, MD	Marissa Mencio, MD
Michael Bortz, MD	Sarah Mitchell, MD
Taylor Brown, MD	Jon Nelson, MD
Steven Craig, MD	Kristina Nicholson, MD
Amanda Doubleday, MD	Joana Ochoa, MD
Sophie Dream, MD	Douglas Opie, MD
Oliver Fackelmayer, MD	Lauren Orr, MD
Jessica Fazendin, MD	Annette Pascual Marrero, MD
Trenton Foster, MD	Robert Rampp, MD
Rajshri Gartland, MD	Alaa Sada, MD
Claire Graves, MD	Jessica Shank, MD
Simon Holoubek, MD	Susana Vargas-Pinto, MD
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Contributions to the AAES Foundation help enrich and extend the horizons of endocrine surgery. You gift helps support operations including activities related to education and research of endocrine surgical diseases. The AAES Foundation recognizes **cumulative lifetime contributions** beginning at the Friend level of \$500 or less. Donors who have either pledged to donate or have already donated \$10,000 to the AAES Foundation will be deemed Norman Thompson Fellows. As of February 27, 2019, the following individuals and organizations have made contributions to the AAES Foundation. Donors listed with an asterisk (\*) have pledged or donated to the Celebrating AAES at 40 Campaign.

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 \*Michael Yeh  
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# PAST MEETINGS

- |      |  |      |   |
|------|--|------|---|
| 1980 | <b>Ann Arbor, Michigan</b><br>Local Arrangements Chair:<br>Norman W. Thompson      | 1991 | <b>San Jose, California</b><br>Local Arrangements Chair:<br>Maria Allo                                      |
| 1981 | <b>Washington, DC</b><br>Local Arrangements Chair:<br>Glenn Geelhoed               | 1992 | <b>Miami, Florida</b><br>Local Arrangements Chair:<br>George L. Irvin, III                                  |
| 1982 | <b>Houston, Texas</b><br>Local Arrangements Chair:<br>Robert C. Hickey             | 1993 | <b>Williamsburg, Virginia</b><br>Local Arrangements Chair: H.<br>Heber Newsome                              |
| 1983 | <b>San Francisco, California</b><br>Local Arrangements Chair:<br>Orlo Clark        | 1994 | <b>Detroit, Michigan</b><br>Local Arrangements Chair: Gary<br>B. Talpos                                     |
| 1984 | <b>Kansas City, Kansas</b><br>Local Arrangements Chair:<br>Stanley R. Friesen      | 1995 | <b>Philadelphia, Pennsylvania</b><br>Local Arrangements Chair: John<br>Kukora                               |
| 1985 | <b>Toronto, Ontario, Canada</b><br>Local Arrangements Chair:<br>Irving Rosen       | 1996 | <b>Napa, California</b><br>Local Arrangements Chair:<br>Quan-Yang Duh                                       |
| 1986 | <b>Rochester, Minnesota</b><br>Local Arrangements Chair: Jon<br>A. van Heerden     | 1997 | <b>Baltimore, Maryland</b><br>Local Arrangements Chair:<br>Robert Udelsman                                  |
| 1987 | <b>Chicago, Illinois</b><br>Local Arrangements Chair:<br>Edwin L. Kaplan           | 1998 | <b>Orlando, Florida</b><br>Local Arrangements Chair:<br>Peter J. Fabri                                      |
| 1988 | <b>Boston, Massachusetts</b><br>Local Arrangements Chair:<br>Blake Cady            | 1999 | <b>New Haven, Connecticut</b><br>Local Arrangements Chair:<br>Barbara Kinder                                |
| 1989 | <b>Chapel Hill, North Carolina</b><br>Local Arrangements Chair:<br>Robert D. Croom | 2000 | <b>Joint Meeting: London, United<br/>Kingdom/Lille, France</b><br>Local Arrangements Chair: Jack<br>Monchik |
| 1990 | <b>Cleveland, Ohio</b><br>Local Arrangements Chair:<br>Caldwell B. Esselstyn       | 2001 | <b>Atlanta, Georgia</b><br>Local Arrangements Chair:<br>Collin Weber  |

## PAST MEETINGS

- 2002 **Banff, Alberta, Canada**  
Local Arrangements Chair:  
Janice L. Pasieka
- 2003 **San Diego, California**  
Local Arrangements Chairs:  
Jay K. Harness & John  
Kukora
- 2004 **Charlottesville, Virginia**  
Local Arrangements Chair:  
John B. Hanks
- 2005 **Cancun, Mexico**  
Local Arrangements Chair:  
Miguel F. Herrera
- 2006 **New York, New York**  
Local Arrangements Chair:  
Ashok R. Shaha
- 2007 **Tucson, Arizona**  
Local Arrangements Chair:  
Michael J. Demeure
- 2008 **Monterey, California**  
Local Arrangements Chair:  
Quan-Yang Duh
- 2009 **Madison, Wisconsin**  
Local Arrangements Chair:  
Herbert Chen
- 2010 **Pittsburgh, Pennsylvania**  
Local Arrangements Chair:  
Sally E. Carty
- 2011 **Houston, Texas**  
Local Arrangements Chair:  
Nancy D. Perrier
- 2012 **Iowa City, Iowa**  
Local Arrangements Chair:  
Ronald Weigel
- 2013 **Chicago, Illinois**  
Local Arrangements Chair:  
Peter Angelos
- 2014 **Boston, Massachusetts**  
Local Arrangements Chair:  
Richard A. Hodin
- 2015 **Nashville, Tennessee**  
Local Arrangements Chair:  
Carmen Solorzano
- 2016 **Baltimore, Maryland**  
Local Arrangements Chair: John  
A. Olson, Jr.
- 2017 **Orlando, Florida**  
Local Arrangements Chair: Mira  
Milas
- 2018 **Durham, North Carolina**  
Local Arrangements Co-Chairs:  
Sanziana Roman, Julie Ann  
Sosa

# SPECIAL SESSIONS

*Attendees are welcome to attend any sessions unless specifically stated*

## **ADVANCED ENDOCRINE SURGERY COURSE**

**SATURDAY, APRIL 6, 2019 8:00 AM – 5:00 PM**

*Fairmont Miramar Hotel – Wilshire III & IV*

\*Separate registration required for this course

Back by popular demand! Take your skills to the next level and help enhance your clinical practice of endocrine surgery. This course will review current standards in management of complex endocrine diseases while engaging on a personal level with nationally recognized authorities in the field. A multi-disciplinary panel of experts will highlight the nuances of complex decision making. Panelists will be unaware of the real-life clinical scenarios presented which creates a more practical approach and lends itself well to learning objectives of practicing surgeons with a special interest in thyroid, parathyroid and adrenal disease.

## **GRAVES' DISEASE PATIENT SESSION**

**SATURDAY, APRIL 6, 2019 5:00 PM – 6:30 PM**

*Fairmont Miramar Hotel – Wilshire I & II*

This session is designed to serve our patients. The panel will discuss their intimate knowledge of Graves' disease answer patient directed questions that pertain to your specialty.

## **ALLIED PROFESSIONALS SESSION**

**SUNDAY, APRIL 7, 2019 8:30 AM – 10:00 AM**

*Fairmont Miramar Hotel – Starlight Ballroom*

This session is designed to highlight the utilization of multidisciplinary teams in endocrine surgery. The panel will discuss strategies they have employed that enable them to practice across the full scope of their training.

## **LUNCH SESSION: AAES GUIDELINES: RELEVANCE TO CLINICAL PRACTICE**

**SUNDAY, APRIL 7, 2019 12:25 PM – 1:40 PM**

*Fairmont Miramar Hotel – Starlight Ballroom*

This session will highlight the American Association of Endocrine Surgeons (AAES) Guidelines. Following a brief overview of the history of the guidelines and future directions, an expert panel will briefly review selected topics related to the management of parathyroid and thyroid disease.

## **BREAKFAST SESSION: RESEARCH FRONTIERS**

**MONDAY, APRIL 8, 2019 7:00 AM – 8:00 AM**

*Fairmont Miramar Hotel – Starlight Ballroom*

A new session in 2019! The purpose of this session is to showcase the ability to perform scientifically rigorous research that has direct applications to advancing the ways in which we care for patients. Presenters will lead an interesting discussion regarding the journey to a scientific career in addition to the practical aspects of dissemination and adoption of new knowledge in practice.

# SPECIAL SESSIONS

## **ALLIED PROFESSIONALS BREAKFAST**

**MONDAY, APRIL 8, 2019 7:00 AM – 8:00 AM**

*Fairmont Miramar Hotel – Wilshire IV*

This will be a casual breakfast for allied health professionals. AAES President Herb Chen, MD will represent the AAES Council as we discuss future topic ideas for the 2020 AAES Annual Meeting. Allied health professional membership will be discussed in addition to the recruitment of the planning committee for the 2020 meeting.

## **DIVERSITY AND INCLUSION PANEL**

**MONDAY, APRIL 8, 2019 10:30 AM – 11:30 AM**

*Fairmont Miramar Hotel – Starlight Ballroom*

This session will provide insights into the issues of diversity, equity and inclusion within surgery. Panelists will discuss how their society promotes leadership development and advocates for diversity and inclusion. A structured discussion led by AAES President, Herb Chen, MD will follow individual presentations. Audience participation is expected and encouraged.

## **LUNCH SESSION: BUSINESS OF ENDOCRINE SURGERY: THE EFFICIENT ENDOCRINE SURGICAL PRACTICE**

*Sponsorship provided by Stryker*

**MONDAY, APRIL 8, 2019 11:45 AM – 1:00 PM**

*Fairmont Miramar Hotel – Starlight Ballroom*

This session is designed to help minimize burnout in Endocrine surgery by improvements in clinical efficiency. Panelists will discuss their unique insights into practice organization and optimization. Michael Starks, MD will moderate the panel discussion. Audience participation is expected and encouraged.

## **BREAKFAST SESSION: CESQIP**

**TUESDAY, APRIL 9, 2019 7:00 AM – 8:00 AM**

*Fairmont Miramar Hotel – Starlight Ballroom*

This session is designed for programs participating in or interested in participation in the CESQIP. The session will provide an update on the Committee work on variable definitions, the validation project, an update from Arbormetrix and a review of the foundations of the program. There will be time dedicated to the discussion of programmatic strengths and weakness and the vision for future.

## **GRAVES' DISEASE & THYROID FOUNDATION BREAKFAST**

**TUESDAY, APRIL 9, 2019 7:00 AM – 8:00 AM**

*Fairmont Miramar Hotel – Wilshire I & II*

Panelists will offer expertise during a moderated session including case presentations and questions. Audience participation will be highly encouraged.

# HISTORICAL LECTURER

## “From Penguins to Plankton - the Dramatic Impacts of Climate Change on the Antarctic Peninsula”

**James McClintock, MD**

*University of Alabama at Birmingham*

**Monday, April 8, 2019 8:00 AM – 8:45 AM**

*Starlight Ballroom*



James B. McClintock is the Endowed University Professor of Polar and Marine Biology at the University of Alabama at Birmingham. He received his Bachelor of Science degree from the University of California at Santa Cruz (1978) and his doctoral degree from the University of South Florida (1984). In 1987, after completing a National Science Foundation Postdoctoral Fellowship at the University of California at Santa Cruz, he joined the faculty of the Department of Biology at the University of Alabama at Birmingham. He became a Full Professor at UAB in 1997 and has also served as Dean of the School of Natural Sciences and Mathematics (1999-2003) and as Interim Dean of the Graduate School (2003-2005). Dr. McClintock's research has been funded continuously over the past 30 years by the National Science Foundation and focuses on aspects of marine invertebrate nutrition, reproduction, and primarily, Antarctic marine chemical ecology. Over the past decade his research has also encompassed studies of the impacts of rapid climate change and ocean acidification on Antarctic marine algae and invertebrates. He has published 276 peer-reviewed scientific publications, edited and written books, is invited to make numerous scientific and popular science presentations, and his research has been featured in a variety of public media outlets including the NPR Diane Rehm Show, NPR's "On Point" with Tom Ashbrook, NPR Morning Edition with David Green, National Geographic Magazine, Smithsonian Magazine, Discover Magazine, Scientific American Magazine, CNN, the Washington Post, Wall Street Journal, Chicago Tribune, Los Angeles Times, and The Weather Channel. He has been an invited speaker for 'TEDx' (Birmingham) and 'The Moth' (Lincoln Center, New York City) and has served on workshops sponsored by the National Academy of Sciences on Climate Change and Polar Ecosystems. He recently returned from his 15th research expedition to Antarctica where over the past two decades he and his research collaborators have become among the world's authorities on Antarctic marine chemical ecology and drug discovery and have developed an award winning interactive educational outreach web site ([www.antarctica.uab.edu](http://www.antarctica.uab.edu)). His expertise on the ecological impacts of climate change and ocean acidification on marine life of the Antarctic Peninsula has garnered numerous invited lectures and he writes in the popular literature on this timely topic.

# HISTORICAL LECTURE AT RECENT MEETINGS

- 2009 **Edwin L. Kaplan, MD**  
University of Chicago  
*Radiation Induced Thyroid Cancer – A Chicago Experience*
- 2010 **Norman W. Thompson, MD**  
University of Michigan  
*The Time Was Right*
- 2011 **Jon A. van Heerden, MD**  
Medical University of South Carolina  
*Pheochromocytoma Resection: Now and Then*
- 2012 **Murray F. Brennan, MD**  
Memorial Sloan-Kettering Cancer Center  
*Re-Operative Parathyroid Surgery Circa 1975*
- 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*
- 2014 **Patricia J. Numann, MD**  
SUNY Upstate Medical University  
*Ode to an Indian Rhinoceros*
- 2015 **Robert Beazley, MD**  
Boston University School of Medicine  
*The Glands of Owen...Who Was Owen?*
- 2016 **Samuel A. Wells, Jr., MD**  
National Cancer Institute  
*The Diagnosis and Treatment of Thyroid Cancer: A Historical Perspective*
- 2017 **David L. Nahrwold, MD**  
Northwestern University  
*Surgery, Surgeons and their College*
- 2018 **John L. Cameron, MD**  
John Hopkins Hospital  
*William Stewart Halsted; Our Surgical Heritage (Also an Endocrine Surgeon!)*

# CAROL & ORLO H. CLARK DISTINGUISHED LECTURER IN ENDOCRINE SURGERY

## “Relationships and Resilience: Lessons Learned from Mentors and Heroes”

**Selwyn M. Vickers, MD, FACS**

*University of Alabama School of Medicine, University of Alabama at Birmingham (UAB)*

**SUNDAY, APRIL 7, 2019 11:30 AM – 12:15 PM**

*Starlight Ballroom*



Dr. Vickers is Senior Vice President of Medicine and Dean of the University of Alabama School of Medicine, one of the ten largest public academic medical centers and the third largest public hospital in the USA. He is a world-renowned surgeon, pancreatic cancer researcher, and pioneer in health disparities research. His major research interests include: gene therapy as an application in the treatment of pancreatobiliary tumors, the role of growth factors and receptors in the oncogenesis of pancreatic cancer, the implications of FAS expressions and Tamoxifen in the growth and treatment of cholangiocarcinoma, assessment of clinical outcomes in the surgical treatment of pancreatobiliary tumors, and the role of death receptors in the treatment of pancreatic cancer. Dr. Vickers is a member of 21 professional societies with leadership roles in many, including the National Academy of Medicine. He has served as president of the Society of Black Academic Surgeons, the Southern Surgical Association, and the Society for Surgery of the Alimentary Tract.



# PRESIDENT'S INVITED LECTURERS AT RECENT MEETINGS

- |      |   |      |  |
|------|---|------|--|
| 1991 | <b>Gregory B. Bulkley, MD</b><br>Johns Hopkins University, Baltimore, Maryland<br><i>Endothelial Xanthine Oxidase: a Radical Transducer of Signals and Injury</i>             | 1999 | <b>James Hurley, MD</b><br>Cornell University, New York, New York<br><i>Post-Operative Management of Differentiated Thyroid Cancer</i>   |
| 1992 | <b>Donald Coffey, PhD</b><br>Bethesda, Maryland<br><i>New Concepts Concerning Cancer</i>  | 2000 | <b>James Shapiro, MD</b><br>University of Alberta, Edmonton, Alberta<br><i>Pancreatic Islet Cell Transplantation</i>   |
| 1993 | <b>John L. Doppman, MD</b><br>National Institutes of Health, Bethesda, Maryland<br><i>Recent Advances in Endocrinologic Imaging</i>   | 2001 | <b>Andrew F. Stewart, MD</b><br>University of Pittsburgh, Pittsburgh, Pennsylvania<br><i>Parathyroid Hormone-Related Protein: From Hypercalcemia of Malignancy to Gene Therapy from Diabetes</i> |
| 1994 | <b>Gordon J. Strewler, MD</b><br>San Francisco, California<br><i>The Parathyroid Hormone Related Protein: Clinical and Basic Studies of a Polyfunctional Protein</i>          | 2002 | <b>William F. Young Jr., MD</b><br>Mayo Clinic, Rochester, Minnesota<br><i>Adrenal-Dependent Hypertension: Diagnostic Testing Insights</i>   |
| 1995 | <b>Ivor M.D. Jackson, MD</b><br>Providence, Rhode Island<br><i>Regulation of TSH Secretion: Implications for Disorders of the Thyroid Function</i>                            | 2003 | <b>Sissy M. Jhiang, MD</b><br>The Ohio State University, Columbus, Ohio<br><i>Lessons From Thyroid Cancer: Genetics and Gene Therapy</i>   |
| 1996 | <b>Victor E. Gould, MD</b><br>Rush-Presbyterian-Medical Center, Chicago, Illinois<br><i>The Diffuse Neuroendocrine System: Evolution of the Concept and Impact on Surgery</i> | 2004 | <b>Edward R. Laws Jr, MD</b><br>University of Virginia, Charlottesville, Virginia<br><i>The Diagnosis and Management of Cushing's Disease</i>  |
| 1997 | <b>Bertil Hamberger, MD, PhD</b><br>Karolinska Institute, Stockholm, Sweden<br><i>The Nobel Prize</i>   | 2005 | <b>David Duick, MD</b><br>Phoenix, Arizona<br><i>Thyroid Nodules and Mild Primary Hyperparathyroidism: Examples of Clinical Perplexities or Unresolvable Conundrums</i>                          |
| 1998 | <b>Susan Leeman, PhD</b><br>Boston University, Boston, Massachusetts<br><i>The NeuroPeptides: Substance P and Neurotensin</i>   |      |  |

# PRESIDENT'S INVITED LECTURERS AT RECENT MEETINGS

- |      |  |      |   |
|------|--|------|---|
| 2006 | <b>Michael Bliss, PhD</b><br>University of Toronto, Ontario, Canada<br><i>Harvey Cushing and Endo-Criminology</i>  | 2012 | <b>Atul A. Gawande, MD, MPH</b><br>Brigham and Women's Hospital<br><i>Strategies for Improving Surgical Performance</i>   |
| 2007 | <b>Virginia A. Livolsi, MD</b><br>University of Pennsylvania, Philadelphia, Pennsylvania<br><i>Thyroid Nodule FNA and Frozen Section: Partners or Adversaries</i>                              | 2013 | <b>Anders O.J. Bergenfelz, MD, PhD</b><br>Lund University Hospital<br><i>Quality Control in Clinical Practice and Postgraduate Education in Endocrine Surgery</i>                                       |
| 2008 | <b>F. John Service, MD, PhD</b><br>Mayo Clinic, Rochester, Minnesota<br><i>Hypoglycemia in Adults – 80th Anniversary of Hyperinsulinism</i>  | 2014 | <b>Yuri E. Nikiforov, MD, PhD</b><br>University of Pittsburgh School of Medicine<br><i>Progress in Genomic Markers for Thyroid Cancer: How Does it Affect Patient Management?</i>                       |
| 2009 | <b>Jeffrey M. Trent, PhD</b><br>Translation Genomics Research Institute, Phoenix, Arizona<br><i>Integrating Genetics, Genomics, and Biology Towards a More Personalized Medicine</i>           | 2015 | <b>Gary Hammer, MD, PhD</b><br>University of Michigan<br><i>Translating Adrenal Stem Cells: Implications for Adrenal Disease</i>  |
| 2010 | <b>Alexander J.B. McEwan, MB</b><br>University of Alberta, Edmonton, Alberta, Canada<br><i>The State of the Art of Radionuclide Imaging and Therapy in Patients with Neuroendocrine Tumors</i> | 2016 | <b>Steven A. Rosenberg, MD, PhD</b><br>National Cancer Institute and George Washington University<br><i>The Curative Potential of T-cell Transfer Immunotherapy for Patients with Metastatic Cancer</i> |
| 2011 | <b>Allan H. (Bud) Selig</b><br>9th Commissioner of Major League Baseball<br><i>Major League Baseball – 2011 Economic and Health Related Issues</i>   | 2017 | <b>Jack A. Gilbert, PhD</b><br>University of Chicago<br><i>Thyroid Cancer and the Microbiome</i>  |
|      |  | 2018 | <b>Julie Freischlag, MD FRCS</b><br>Wake Forest University<br><i>Breakthrough to Brave</i>  |



# CONFERENCE 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. Describe the most up to date innovations in endocrine surgical care to ensure providers are engaging in patient-centered care using the most valid, reliable and current information available to the specialty
2. Participate in discussions, and explain current developments in the science and clinical practice of endocrine surgery
3. Explain practical new approaches and solutions to relevant concepts and problems in endocrine surgical care.
4. Apply additional working knowledge to assist them with their existing and growing endocrine practice.
5. New information and recent developments as they relate to recently established guidelines and procedures
6. Explain the new designation of Noninvasive Follicular thyroid cancer with Papillary-like nuclear features (NIFTP) and what it means for the management care plan of this subtype of thyroid cancer.
7. Apply new techniques to clinical practice to improve efficiency and reduce physician and allied provider burnout

### **CONTINUING MEDICAL EDUCATION CREDIT INFORMATION**

#### **Accreditation**

This activity has been planned and implemented in accordance with the Essential Areas and Policies of the Accreditation Council for Continuing Medical Education (ACCME) through the joint providership of the American College of Surgeons and 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 27.25 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 14.00 credits meet the requirements for Self-Assessment.



**AMERICAN COLLEGE OF SURGEONS**  
Inspiring Quality:  
Highest Standards, Better Outcomes



**AMERICAN COLLEGE OF SURGEONS**  
DIVISION OF EDUCATION

# ACCREDITATION CONTINUED

## CME CERTIFICATES AND EVALUATION FORMS

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 posttests. Your final CME hours will be submitted to the ACS. Members of the 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 attendees.**

The American Board of Surgery requirement for fulfillment of MOC Part 2 is the completion of a minimum of 90 hours of AMA PRA Category 1 Credit™ over a three-year cycle. At least 60 of the 90 hours must include a self-assessment activity—a written Q&A exercise (paper or online) that assesses the surgeon's understanding of the material presented during the CME program. A score of 75% or higher must be attained on the self-assessment exercise. Multiple attempts are permitted.

<b>SATURDAY, April 6, 2019</b>	<b>CME</b>	<b>SA</b>
<b>ADVANCED ENDOCRINE SURGERY COURSE</b>		
BENIGN THYROID DISEASE & PAPILLARY THYROID CANCER	1.50	1.50
PARATHYROID DISEASE	1.50	1.50
ROUNDTABLE LUNCH	1.00	0
POORLY DIFFERENTIATED AND MEDULLARY THYROID CANCER	1.00	1.00
ADRENAL	1.50	1.50
JEOPARDY	1.50	0
<b>Daily Total</b>	<b>8.00</b>	<b>5.50</b>
<b>SUNDAY, April 7, 2019</b>		
POSTER WALK AROUND / ALLIED PROFESSIONAL SESSION	1.50	0
OPENING SESSION	1.00	0
CAROL & ORLO H. CLARK DISTINGUISHED LECTURE IN ENDOCRINE SURGERY	0.75	0
LUNCH SESSION: AAES CLINICAL PRACTICE GUIDELINES	1.25	0
SCIENTIFIC SESSION I	1.00	1.00
SCIENTIFIC SESSION II	0.75	0.75
PRESIDENTIAL ADDRESS	1.00	0
<b>Daily Total</b>	<b>7.00</b>	<b>1.75</b>
<b>MONDAY, April 8, 2019</b>		
BREAKFAST SESSION: RESEARCH FRONTIERS	1.00	0
ALLIED PROFESSIONALS BREAKFAST	1.00	0
HISTORICAL LECTURE	0.75	0
SCIENTIFIC SESSION III	1.25	1.25
PANEL ON DIVERSITY & INCLUSION	1.00	0
SCIENTIFIC SESSION IV	1.00	1.00
SCIENTIFIC SESSION V	1.75	1.75
<b>Daily Total</b>	<b>6.75</b>	<b>4.00</b>
<b>TUESDAY, April 9, 2019</b>		
BREAKFAST SESSION: CESQIP	1.00	0
INTERESTING CASES	1.50	0
SCIENTIFIC SESSION VI	1.50	1.50
SCIENTIFIC SESSION VII	1.25	1.25
<b>Daily Total</b>	<b>5.25</b>	<b>2.75</b>
<b>MEETING TOTAL</b>	<b>27.25</b>	<b>14.00</b>

# DISCLOSURE INFORMATION

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) has disclosed all relevant financial relationships with any commercial interest. For additional information, please visit the ACCME website: <http://www.accme.org/requirements/accreditation-requirements-cme-providers/policies-and-definitions/financial-relationships-and-conflicts-interest>

The ACCME also requires that ACS manage any reported conflict and eliminate the potential for bias during the session. Any conflicts noted below have been managed to our satisfaction. The disclosure information is intended to identify any commercial relationships and allow learners to form their own judgments. However, if you perceive a bias during a session, please report it on the evaluation.

In compliance 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 has disclosed all relevant financial relationships with any commercial interest. All reported conflicts are managed by a designated official to ensure a bias-free presentation. Please see the insert to this program for the complete disclosure list.

SPEAKERS / MODERATORS / DISCUSSANTS	NOTHING TO DISCLOSE	DISCLOSURE		
		COMPANY	ROLE	RECEIVED
Abha Aggarwal	X			
Eren Berber	X			
Anders Bergenfelz	X			
Pim Bongers	X			
Frederic Borel	X			
Laurent Brunaud	X			
Floryne Buishand	X			
Sitaram Chivukula	X			
Victoria Gershuni	X			
Rachael Guenter	X			
Victoria Harries	X			
Brendon Herring	X			
Simon Holoubek	X			
Qing Hu	X			
Bernice Huang	X			
David Hughes	X			
Jayani Jayasekara	X			
Bora Kahramangil	X			
Omar Koibaity	X			
Alex Lin	X			
Amin Madani	X			
Reema Mallick	X			
Jessica Maxwell	X			
Eric Mirallié	X			
John Nguyen-Lee	X			
Kristina Nicholson	X			
Norman Nicolson	X			



Lauren Orr	X			
T. K. Pandian	X			
Alaa Sada	X			
Bianka Saravana-Bawan	X			
Maheshwaran Sivarajah	X			
Timothy Ullmann	X			

PLANNING COMMITTEE	NOTHING TO DISCLOSE	DISCLOSURE		
		COMPANY	ROLE	RECEIVED
Herbert Chen	X			
Ian Ganly	X			
Paul G. Gauger		Medtronic	Consulting	Consulting Fee
Rachel Kelz	X			
Amanda Laird	X			
James Lee	X	Collectedmed Medscape Summus	Founder Scientific Advisory Board Advisory Board	No remuneration Honarium Honarium
Brenessa Lindeman	X			
Carrie Lubitz	X			
Haggi Mazeh	X			
Peter Joseph Mazzaglia	X			
Adrienne Melck	X			
John Phay		Anasys Instruments	Patient license	Received \$650 last year
Susan Pitt	X			
David Schneider	X			
Wen Shen	X			
Thomas Wang	X			

## HOTEL INFORMATION

### **FAIRMONT MIRAMAR HOTEL & BUNGALOWS (Main Hotel)**

101 Wilshire Boulevard, Santa Monica, CA 90401

T: 310-576-7777

W: [www.fairmont.com/Santa-Monica](http://www.fairmont.com/Santa-Monica)

### **HUNTLEY HOTEL (Overflow Hotel)**

1111 Second Street, Santa Monica, CA 90401

T: 310-394-5454

W: [www.thehuntleyhotel.com](http://www.thehuntleyhotel.com)

## AIRPORT INFORMATION

Both the Fairmont Miramar Hotel and the Huntley Hotel are located 12 miles from the Los Angeles International Airport (LAX) — [www.flylax.com](http://www.flylax.com).

Additional airports in the area include:

Burbank Bob Hope Airport (BUR), approximately 30 miles from the hotels

Long Beach Airport (LGB), approximately 30 miles from the hotels

Ontario Airport (ONT), approximately 55 miles from the hotels

## TRANSPORTATION FROM LAX AIRPORT

### **Airport Shuttle**

There is no complimentary shuttle service between the hotel and the airport.

### **Limousine**

Complete coordination of transportation needs is available through our Concierge at (310) 576-7777 ext. 3951.

### **Taxi Service**

Rates: Approximately \$45.00 and up one way between airport and hotel

### **Uber or Lyft**

Rates: Approximately \$15.00-\$20.00 one way between airport and hotel

## CONTACTS

**Michael W. Yeh, MD**, Local Arrangements Chair

E: [myeh@mednet.ucla.edu](mailto:myeh@mednet.ucla.edu)

### **AMERICAN ASSOCIATION OF ENDOCRINE SURGEONS**

201 East Main Street, Suite 1405, Lexington, KY 40507

T: 859-402-9810 F: 859-514-9166 E: [info@endocrinesurgery.org](mailto:info@endocrinesurgery.org)

W: [www.endocrinesurgery.org](http://www.endocrinesurgery.org)



# AGENDA

# AGENDA

## FRIDAY, APRIL 5, 2019

6:30 AM – 7:00 am *Wilshire I & II Prefunction*

### **ENDOCRINE SURGERY UNIVERSITY REGISTRATION & BREAKFAST**

7:00 am — 5:45 pm *Wilshire I, II, & III*

### **ENDOCRINE SURGERY UNIVERSITY**

An educational activity for Fellows of the AAES Comprehensive Clinical Fellowship in Endocrine Surgery

#### **COURSE DIRECTOR**

Rebecca Sippel, MD - University of Wisconsin

#### **COURSE FACULTY/PANELISTS**

- Eren Berber, MD – Cleveland Clinic
- Ashley Cayo, MD – Aurora Advanced Healthcare
- Herbert Chen, MD – University of Alabama at Birmingham
- Electron Kebebew, MD – Stanford University
- Jennifer Kuo, MD, MPH – Columbia University Medical Center
- Brenessa Lindeman, MD MA – University of Alabama at Birmingham
- Matthew Nehs, MD - Brigham & Women's Hospital
- Fiemu Nwariaku, MD – University of Texas Southwestern Medical Center
- Wen Shen, MD - University of California-San Francisco
- Carmen Solorzano, MD, MPH – Vanderbilt University Medical Center
- Robert Udelsman, MD – Miami Cancer Institute

6:30 pm — 8:30 pm *Wilshire I & II*

### **ENDOCRINE SURGERY UNIVERSITY DINNER**

# AGENDA

## SATURDAY, APRIL 6, 2019

7:00 am — 12:00 pm *Wilshire I & II*  
**ENDOCRINE SURGERY UNIVERSITY, CONTINUED**

8:00 am — 5:00 pm *Wilshire III & IV*  
**ADVANCED ENDOCRINE SURGERY COURSE**  
\*Separate registration required

### COURSE DIRECTORS

Shaghayegh Aliabadi, MD – The Oregon Clinic  
Erin Felger, MD – Washington Hospital Center

### COURSE MODERATORS

- F. Thurston Drake, MD – Boston University School of Medicine
- Allan Siperstein, MD – Cleveland Clinic
- Linwah Yip, MD – University of Pittsburgh

### COURSE PANELISTS

- Inne Borel Rinkes, MD – University Medical Center Utrecht, Netherlands
- Carolyn Garner, MD – Endocrine & Oncologic Surgical Associates, Texas
- Phillip Haigh, MD – Kaiser Permanente Los Angeles Medical Center
- Electron Kebebew, MD – Stanford University
- Mirriam Lango, MD – Fox Chase Cancer Center
- Angela Leung, MD – University of California Los Angeles
- Steven Libutti, MD – Rutgers Cancer Institute of New Jersey
- Mira Milas, MD – Banner Health University Medical Center Phoenix
- Sarah Oltmann, MD – University of Texas Southwestern Medical Center
- Juan Pablo Pantoja, MD – Instituto Nacional de Ciencias Medicas y Nutricion Salvador Zubiran
- Sareh Parangi, MD – Massachusetts General Hospital
- Janice Pasieka, MD – University of Calgary
- Richard Prinz, MD - NorthShore University HealthSystem
- Ashok Shaha, MD – Memorial Sloan-Kettering Cancer Center
- Stan Sidhu, MD – University of Sydney
- Meredith Sorensen, MD – Dartmouth-Hitchcock Medical Center
- Martin Walz, MD – Academic Hospital of the University of Duisburg-Essen

8:00 am — 12:00 pm *Reed Park Courts*  
**TENNIS TOURNAMENT**  
Additional registration fee applies

12:00 pm – 5:00 pm *Palos Verdes Golf Club*  
**GOLF TOURNAMENT**  
Additional registration fee applies

2:00 pm — 7:00 pm *Starlight Ballroom Prefunction*  
**REGISTRATION OPEN**

# AGENDA

2:00 pm — 6:00 pm *Jones Library*

## **AAES COUNCIL MEETING**

4:00 pm — 6:00 pm *Volleyball Courts #4 & 5 at Perry's Rentals (1200 Pacific Coast Highway)*

## **BEACH VOLLEYBALL**

Additional fee applies

5:00 pm — 6:30 pm *Wilshire I & II*

## **GRAVES' DISEASE PATIENT SESSION**

MODERATORS: Dawn Elfenbein, MD – University of California, Irvine

PANELISTS: Kimberly Dorris – Graves' Disease & Thyroid Foundation; Trevor Angell, MD – Brigham and Women's Hospital, Harvard Medical School; Regina Castro, MD – Mayo Clinic; Kimberly Vanderveen, MD – Denver Center for Endocrine Surgery, P.C.; and Insoo Suh, MD – University of California San Francisco

6:30 pm — 8:30 pm *The Penthouse- located at the Huntley Hotel*

## **EXECUTIVE COUNCIL DINNER**

Invitation Only

9:00 pm — 11:00 pm *Herringbone Restaurant*

## **YOUNG SURGEONS' SOCIAL**

\*This event is primarily for AAES Resident, Fellow and Candidate members. Join your fellow young surgeons for an evening of comradery at Herringbone, located less than 1 mile from the hotel, just blocks from the Santa Monica Pier. Drink tickets will be handed out as you arrive and hors d'oeuvres will be available.

# AGENDA

## SUNDAY, APRIL 7, 2019

6:30 am — 4:00 pm *Starlight Ballroom Prefunction*

### **REGISTRATION OPEN**

7:00 am — 8:30 am *Santa Monica Beach*

### **BEACH BIKE RIDE**

Pick up your bike rental outside the hotel and ride along the beautiful Santa Monica beach, just steps from the hotel.

7:30 am — 8:30 am *Wilshire Rooms*

### **FELLOWSHIP COMMITTEE MEETING**

### **FOUNDATION BOARD MEETING**

### **IT COMMITTEE MEETING**

### **CESQIP COMMITTEE MEETING**

8:30 am — 9:30 am *Wilshire Rooms*

### **RESEARCH COMMITTEE MEETING**

### **COMMUNITY BASED SURGEONS COMMITTEE MEETING**

### **FUNDRAISING TASK FORCE MEETING**

### **ENDOCRINE SURGERY IDENTITY TASK FORCE MEETING**

8:30 am — 10:00 am *Wedgewood Ballroom*

### **POSTER WALK AROUND AND POSTER JUDGING**

Poster Chair: Thomas Wang, MD

8:30 am — 10:00 am *Starlight Ballroom*

### **ALLIED PROFESSIONALS SESSION**

MODERATOR: Helina Somervell, MD – Johns Hopkins

PANELISTS: Ann Arnold, MD – University of Wisconsin; Nancy Jackson, MD – UT

Southwestern; Todd Chennell, MD – University of Rochester, Strong Memorial Hospital;

Heather Wachtel, MD – University of Pennsylvania Medical Center; and Brian Saunders,

MD – Penn State Milton S. Hershey Medical Center

10:30 am — 11:30 am *Starlight Ballroom*

### **AAES OPENING SESSION, DR. HERBERT CHEN**

11:30 am — 12:15 pm *Starlight Ballroom*

### **CAROL & ORLO H. CLARK DISTINGUISHED LECTURER IN ENDOCRINE SURGERY**

### **“Relationships and Resilience: Lessons Learned from Mentors and Heroes”**

SPEAKER: Selwyn Vickers, MD – *University of Alabama School of Medicine*

# AGENDA

12:15 pm — 1:45 pm

## **LUNCH ON YOUR OWN**

OR

12:25 pm — 1:40 pm *Starlight Ballroom*

## **LUNCH SESSION: “AAES Clinical Practice Guidelines: Relevance to Clinical Practice”**

*Additional Fee for Lunch*

MODERATORS: Sally Carty, MD – University of Pittsburgh, and Chris McHenry, MD – MetroHealth Medical Center

PANELISTS: Tracy Wang, MD, MPH – Medical College of Wisconsin; Scott Wilhelm, MD – University Hospitals/Case Medical Center; Kupal Patel, MD – NYU Langone Medical Center; Thomas Fahey, MD – New York Presbyterian-Weill Cornell Medical Center; Megan Haymart, MD – University of Michigan; and Nancy Perrier, MD - MD Anderson Cancer Center

1:45 pm — 2:45 pm *Starlight Ballroom*

## **SCIENTIFIC SESSION I: Papers 1-4**

MODERATORS: Rachel Kelz, MD - *University of Pennsylvania*, and Adrian Harvey, MD – *University of Calgary*

2:45 pm — 3:15 pm *Wedgewood Ballroom*

## **BREAK, EXHIBITS, & POSTER VIEWING**

3:15 pm — 4:00 pm *Starlight Ballroom*

## **SCIENTIFIC SESSION II: Papers 5-7**

MODERATORS: Cord Sturgeon, MD – *Northwestern Medicine*, and Masha Livhits, MD, MD – *University of California, Los Angeles*

4:00 pm — 5:00 pm *Starlight Ballroom*

## **PRESIDENTIAL ADDRESS**

**“Who Are You?”**

SPEAKER: Herb Chen, MD - *University of Alabama at Birmingham*

6:00 pm — 8:00 pm *Shutters on the Beach*

## **AAES PRESIDENT’S RECEPTION**

Join colleagues and friends for the signature kick-off reception to the AAES Annual Meeting. Shutters on the Beach is a short ½ mile (14 minute) walk from the Meeting hotels. Drink tickets and hors d’oeuvres will be provided.



# AGENDA

## MONDAY, APRIL 8, 2019

7:00 am — 5:00 pm *Starlight Ballroom Prefunction*

### **REGISTRATION OPEN**

7:00 am — 8:00 am *Wilshire Rooms*

### **EDUCATION COMMITTEE MEETING FELLOWSHIP ACCREDITATION COMMITTEE MEETING**

7:00 am — 8:00 am *Wedgewood Ballroom*

### **CONTINENTAL BREAKFAST IN EXHIBIT HALL**

7:00 am — 8:00 am *Wilshire III*

### **NEW MEMBER BREAKFAST**

Invitation Only

7:00 am — 8:00 am *Starlight Ballroom*

### **BREAKFAST SESSION: RESEARCH FRONTIERS**

MODERATORS: Carrie Lubitz, MD – Massachusetts General Hospital; and Rachel Kelz, MD – University of Pennsylvania

PANELISTS: Megan Haymart, MD – University of Michigan; and Drew Shirley, MD – The Ohio State University Wexner Medical Center

7:00 am — 8:00 am *Wilshire IV*

### **ALLIED PROFESSIONALS BREAKFAST**

PANELISTS: Kim Wall, NP – MCW; Lisa LaFay, MD – University of Pittsburgh Medical Center; and Todd Chennell, NP – University of Rochester, Strong Memorial Hospital

8:00 am — 8:45 am *Starlight Ballroom*

### **HISTORICAL LECTURER**

**“From Penguins to Plankton - the Dramatic Impacts of Climate Change on the Antarctic Peninsula”**

SPEAKER: James McClintock, MD - *University of Alabama at Birmingham*

8:45 am — 10:00 am *Starlight Ballroom*

### **SCIENTIFIC SESSION III: Papers 8-12**

MODERATORS: Jennifer Ogilvie, MD – *NYU Langone Health*, and Matthew Nehs, MD – *Brigham & Women's*

10:00 am — 10:30 am *Wedgewood Ballroom*

### **BREAKS, EXHIBITS, & POSTER VIEWING**

10:30 am — 11:30 am *Starlight Ballroom*

### **DIVERSITY, EQUITY AND INCLUSION PANEL**

MODERATORS: Herb Chen, MD – University of Alabama at Birmingham

PANELISTS: Nipun Merchant, MD – University of Miami; Malcolm Brock, MD – The Johns Hopkins University School of Medicine; Minerva Romero Arenas, MD, MPH – University of Texas Rio Grande Valley, School of Medicine; and Sareh Parangi, MD – Massachusetts General Hospital

# AGENDA

10:30 am — 11:30 am *Fig Restaurant – Fairmont Miramar Hotel*  
**AAES & OTO LEADERS LUNCH**

11:30 am — 1:30 pm  
**LUNCH ON YOUR OWN**

OR

11:45 am — 1:00 pm *Starlight Ballroom*  
**LUNCH SESSION: “Business of Endocrine Surgery: The Efficient Endocrine Surgical Practice”**

Sponsorship for this session provided by Stryker

*Additional Fee for Lunch*

MODERATORS: Michael Starks, MD – Penobscot Surgical Care, PA; and Julie McGill, MD – Emory at Decatur - Specialty Surgery

PANELISTS: David Bimston, MD - Memorial Center For Integrative Endocrine Surgery; Douglas Fraker, MD – University of Pennsylvania; Amanda Lewis, MD – Norman Regional Health System; and Michael Yeh, MD – University of California, Los Angeles

1:30 pm — 2:45 pm *Starlight Ballroom*

**SCIENTIFIC SESSION IV: Papers 13-17**

MODERATORS: Mark Sywak, MD – *University of Sydney*, and Susan Pitt, MD – *University of Wisconsin*

2:45 pm — 3:00 pm *Wedgewood Ballroom*

**BREAKS, EXHIBITS, & POSTER VIEWING**

3:00 pm — 4:30 pm *Starlight Ballroom*

**SCIENTIFIC SESSION V: Papers 18-23**

MODERATORS: Barbra Miller, MD – *University of Michigan*, and Brian Untch, MD – *Memorial Sloan Kettering*

4:30 pm — 5:30 pm *Starlight Ballroom*

**AAES BUSINESS MEETING**

*\*Only Active, Allied Specialist and Senior Members need attend*

7:00 pm — 8:00 pm *Fairmont Miramar Hotel Front Lawn – Under the Fig Tree*

**GALA RECEPTION**

8:00 pm — 10:30 pm *Starlight Ballroom*

**GALA DINNER**

*Gala Dinner included with registration; ticket required for guests*

The AAES Gala Dinner has assigned seating. Please come by the Registration Desk and sign up for your seat by Monday at 1:30 pm.

# AGENDA

## TUESDAY, APRIL 9, 2019

7:00 am — 8:00 am *Starlight Ballroom Prefunction*

### **REGISTRATION OPEN**

7:00 am — 8:00 am *Wedgewood Ballroom*

### **CONTINENTAL BREAKFAST IN EXHIBIT HALL**

7:00 am — 8:00 am *Starlight Ballroom*

### **BREAKFAST SESSION: CESQIP**

MODERATORS: David Schneider, MD – University of Wisconsin; and

Jennifer Rosen, MD – Washington Hospital Center

PANELISTS: Reese Randle, MD – University of Kentucky; Judy Jin, MD – The Cleveland Clinic; Barry Inabnet, MD – Icahn School of Medicine at Mount Sinai; and Derek Panches, MD – ArborMetrix

7:00 am — 8:00 am *Wilshire I & II*

### **BREAKFAST SESSION: GRAVES' DISEASE & THYROID FOUNDATION**

MODERATORS: Dawn Eifenbein, MD – University of California, Irvine

PANELISTS: Kimberly Dorris – Graves' Disease & Thyroid Foundation;

Julie Miller, MD – Royal Melbourne Hospital; and Richard Hodin, MD – Massachusetts General Hospital

8:00 am — 9:30 am *Starlight Ballroom*

### **INTERESTING CASES SESSION**

MODERATOR: Sonia Sugg, MD – University of Iowa Hospitals & Clinics

PANELISTS: Steven Libutti, MD – Rutgers Cancer Institute of New Jersey;

Sally Carty, MD – University of Pittsburgh; Carmen Solorzano, MD, MPH – Vanderbilt University Medical Center; and Ashok Shana, MD – Memorial Sloan-Kettering Cancer Center

9:30 am — 9:45 am *Wedgewood Ballroom*

### **BREAK, EXHIBITS, & POSTER VIEWING**

9:45 am — 11:15 am *Starlight Ballroom*

### **SCIENTIFIC SESSION VI: Papers 24-29**

MODERATORS: Allan Siperstein, MD - *Cleveland Clinic*, and Aarti Mathur, MD – *Johns Hopkins*

11:15 am — 11:45 am *Wedgewood Ballroom*

### **BREAK, EXHIBITS, & POSTER VIEWING**

11:45 am — 1:00 pm *Starlight Ballroom*

### **SCIENTIFIC SESSION VII: Papers 30-34**

MODERATORS: Amelia Grover, MD – *Virginia Commonwealth University*,

and John Porterfield, MD – *University of Alabama at Birmingham*

1:00 pm

### **MEETING ADJOURN**





# SCIENTIFIC PROGRAM

◆ Denotes Resident/Fellow Research Award Competition Paper

NOTE: Author listed in **BOLD** is the presenting author  
The Scientific Program includes all sessions that are eligible  
for CME credit.

Credit amounts for each session are listed on page 37.

# SCIENTIFIC PROGRAM

## SUNDAY, APRIL 7, 2019

8:30 am — 10:00 am *Wedgewood Ballroom*  
**POSTER WALK AROUND & POSTER JUDGING**

8:30 am — 10:00 am *Starlight Ballroom*  
**ALLIED PROFESSIONALS SESSION**

MODERATORS: Helina Somervell, MD – Johns Hopkins  
PANELISTS: Ann Arnold, MD – University of Wisconsin; Nancy Jackson, MD – UT Southwestern; Todd Chennell, MD – University of Rochester, Strong Memorial Hospital; Heather Wachtel, MD – University of Pennsylvania Medical Center; and Brian Saunders, MD – Penn State Milton S. Hershey Medical Center

10:00 am — 10:30 am *Wedgewood Ballroom*  
**BREAK, EXHIBITS, & POSTER VIEWING**

10:30 am — 11:30 am *Starlight Ballroom*  
**AAES OPENING SESSION**

**Welcome & Memoriam** – Herbert Chen, MD

**Welcome to Los Angeles** – Michael Yeh, MD

**Introduction of New Members**

**Introduction to 2018 Paul LoGerfo Award Presentations** – James Howe, MD  
Heather Wachtel, MD – University of Pennsylvania  
David Schneider, MD – University of Wisconsin

**Introduction to 2018 ThyCa: Thyroid Cancer Survivors' Association Award for Thyroid Cancer Research** – James Howe, MD

Lawrence Shirley, MD – Ohio State University Wexner Medical Center

**Announcement of 2019 Award Winners** – James Howe, MD

11:30 am — 12:15 pm *Starlight Ballroom*  
**CAROL & ORLO H. CLARK DISTINGUISHED LECTURER IN ENDOCRINE SURGERY**  
**“Relationships and Resilience: Lessons Learned from Mentors and Heroes”**  
SPEAKER: Selwyn Vickers, MD – *University of Alabama School of Medicine*

12:15 pm — 1:45 pm  
**Lunch On Your Own**

OR

12:25 pm — 1:40 pm *Starlight Ballroom*  
**LUNCH SESSION: “AAES Clinical Practice Guidelines: Relevance to Clinical Practice”**  
*Additional Fee for Lunch*  
MODERATORS: Sally Carty, MD – University of Pittsburgh, and Chris McHenry, MD – MetroHealth Medical Center

# SCIENTIFIC PROGRAM

PANELISTS: Tracy Wang, MD, MPH – Medical College of Wisconsin; Scott Wilhelm, MD – University Hospitals/Case Medical Center; Kepal Patel, MD – NYU Langone Medical Center; Thomas Fahey, MD – New York Presbyterian-Weill Cornell Medical Center; Megan Haymart, MD – University of Michigan; and Nancy Perrier, MD – MD Anderson Cancer Center

1:45 pm — 2:45 pm *Starlight Ballroom*

## **SCIENTIFIC SESSION I: Papers 1-4**

MODERATORS: Rachel Kelz, MD, MSCE, MBA – *University of Pennsylvania*, and Adrian Harvey, MD – *University of Calgary*

◆ **01. KETOGENIC DIET COMBINED WITH ANTIOXIDANT N-ACETYLCYSTEINE (NAC) INHIBITS TUMOR GROWTH IN A MOUSE MODEL OF ANAPLASTIC THYROID CANCER**

**Abha Aggarwal**<sup>1</sup>, Zuliang Yuan<sup>1</sup>, Matthew A Nehs<sup>1</sup>

<sup>1</sup>*Surgery, Brigham and Women's Hospital*

◆ **02. A COMPARISON OF LONG-TERM QUALITY OF LIFE IN LOW RISK DIFFERENTIATED THYROID CANCER PATIENTS TREATED WITH HEMITHYROIDECTOMY VERSUS TOTAL THYROIDECTOMY**

**Pim J Bongers**<sup>1,2</sup>, Caylee A Greenberg<sup>1</sup>, Menno R Vriens<sup>2</sup>, Martijn Lutke Holzik<sup>3</sup>, David Goldstein<sup>4</sup>, Karen Devon<sup>1</sup>, Lorne R Rotstein<sup>1</sup>, Anna M Sawka<sup>5</sup>, Jesse D Pasternak<sup>1</sup>

<sup>1</sup>*Department of General Surgery, University Health Network*, <sup>2</sup>*Department of Surgical Oncology and Endocrine Surgery, University Medical Center Utrecht*, <sup>3</sup>*Department of Surgery, Hospital Group Twente*, <sup>4</sup>*Department of Otolaryngology-Head Neck Surgery, University Health Network*, <sup>5</sup>*Department of Endocrinology, University Health Network*

◆ **03. IMMUNE INFILTRATE-ASSOCIATED DYSREGULATION OF DNA REPAIR MACHINERY PREDISPOSES TO PAPILLARY THYROID CARCINOGENESIS**

**Norman G Nicolson**<sup>1</sup>, Taylor C Brown<sup>1</sup>, Reju Korah<sup>1</sup>, Tobias Carling<sup>1</sup>

<sup>1</sup>*Yale Endocrine Neoplasia Lab, Department of Surgery, Yale School of Medicine*

◆ **04. SKELETAL EFFECTS OF COMBINED MEDICAL AND SURGICAL MANAGEMENT OF PRIMARY HYPERPARATHYROIDISM**

**Lauren E. Orr**<sup>1</sup>, Hui Zhou<sup>2</sup>, Catherine Y. Zhu<sup>1</sup>, Philip I. Haigh<sup>3</sup>, Annette L. Adams<sup>2</sup>, Michael W. Yeh<sup>1</sup>

<sup>1</sup>*Department of Surgery, UCLA David Geffen School of Medicine*, <sup>2</sup>*Department of Research & Evaluation, Kaiser Permanente Southern California*, <sup>3</sup>*Department of Surgery, Kaiser Permanente Los Angeles Medical Center*

2:45 pm — 3:15 pm *Wedgewood Ballroom*

## **BREAK, EXHIBITS, & POSTER VIEWING**

# SCIENTIFIC PROGRAM

3:15 pm — 4:00 pm *Starlight Ballroom*

## SCIENTIFIC SESSION II: Papers 5-7

MODERATORS: Cord Sturgeon, MD – *Northwestern Medicine*, and Masha Livhits, MD, MD – *University of California, Los Angeles*

### ◆ 05. FACTORS ASSOCIATED WITH LATE RECURRENCE AFTER PARATHYROIDECTOMY FOR PRIMARY HYPERPARATHYROIDISM

**Reema Mallick**<sup>1</sup>, Linwah Yip<sup>1</sup>, Sally E Carty<sup>1</sup>, Kelly L McCoy<sup>1</sup>

<sup>1</sup>*Department of Surgery, University of Pittsburgh*

### ◆ 06. CORONARY ARTERY DISEASE IS MORE SEVERE IN PATIENTS WITH PRIMARY HYPERPARATHYROIDISM.

Omar Koibaity<sup>1</sup>, Damien Mandry<sup>1,2</sup>, Phi-Linh Nguyen-Thi<sup>3</sup>, Claire Nomine-Criqui<sup>4</sup>, Lea Demarquet<sup>5</sup>, Valerie Croise-Laurent<sup>1,2</sup>, **Laurent Brunaud**<sup>4,6</sup>

<sup>1</sup>*Department of Radiology, Université de Lorraine, CHU Nancy (Brabois)*, <sup>2</sup>*INSERM, IADI, Université de Lorraine*, <sup>3</sup>*PARC - Pôle S2R, clinical epidemiology and evaluation, Université de Lorraine, CHU Nancy (Brabois)*, <sup>4</sup>*Department of Surgery, Université de Lorraine, CHU Nancy (Brabois)*, <sup>5</sup>*Department of Endocrinology, Université de Lorraine, CHU Nancy (Brabois)*, <sup>6</sup>*INSERM U1256, Faculty of Medicine*

### ◆ 07. NORMOCALCEMIC HYPERPARATHYROIDISM: A CESQIP ANALYSIS

**T.K. Pandian**<sup>1</sup>, Sarah H Bird<sup>1</sup>, Lindsay E Kuo<sup>1</sup>, Carrie C Lubitz<sup>1</sup>, Antonia E Stephen<sup>1</sup>

<sup>1</sup>*Harvard*

4:00 pm — 5:00 pm *Starlight Ballroom*

## PRESIDENTIAL ADDRESS

“Who Are You?”

SPEAKER: Herb Chen, MD - *University of Alabama at Birmingham*



# SCIENTIFIC PROGRAM

## MONDAY, APRIL 8, 2019

7:00 am — 8:00 am *Starlight Ballroom*

### **BREAKFAST SESSION: Research Frontiers**

MODERATORS: Carrie Lubitz, MD – Massachusetts General Hospital; Rachel Kelz, MD – University of Pennsylvania

PANELISTS: Megan Haymart, MD – University of Michigan; and Drew Shirley, MD – The Ohio State University Wexner Medical Center

7:00 am — 8:00 am *Wilshire IV*

### **BREAKFAST SESSION: Allied Professionals Breakfast**

PANELISTS: Kim Wall, NP – MCW; Lisa LaFay, MD – University of Pittsburgh Medical Center; and Todd Chennell, NP – University of Rochester, Strong Memorial Hospital

8:00 am — 8:45 am *Starlight Ballroom*

### **HISTORICAL LECTURER**

**“From Penguins to Plankton - The Dramatic Impacts of Climate Change on the Antarctic Peninsula”**

SPEAKER: James McClintock, MD – *University of Alabama at Birmingham*

8:45 am — 10:00 am *Starlight Ballroom*

### **SCIENTIFIC SESSION III: Papers 8-12**

MODERATORS: Jennifer Ogilvie, MD – *NYU Langone Health*, and Matthew Nehs, MD – *Brigham & Women's*

#### ◆ **08. DERIVATION OF A COST-SAVING SCREENING STRATEGY FOR ASYMPTOMATIC PRIMARY HYPERPARATHYROIDISM**

**John J Nguyen-Lee**<sup>1</sup>, Mario Paciuc<sup>2</sup>, Rudy Guerra<sup>2</sup>, Nestor F. Esnaola<sup>3</sup>, Kyle A. Zanicco<sup>4</sup>, Feibi Zheng<sup>5</sup>

<sup>1</sup>*General Surgery, Houston Methodist Hospital*, <sup>2</sup>*Statistical Genetics and Bioinformatics, Rice University*, <sup>3</sup>*General Surgery and Surgical Oncology, Houston Methodist Hospital*, <sup>4</sup>*Endocrine Surgery, UCLA David Geffen School of Medicine*, <sup>5</sup>*General Surgery and Endocrine Surgery, Houston Methodist Hospital*

#### ◆ **09. CURRENT MANAGEMENT OF HYPOCALCEMIA AFTER TOTAL THYROIDECTOMY: A COST-EFFECTIVENESS ANALYSIS**

**Kristina J Nicholson**<sup>1</sup>, Kenneth J Smith<sup>2</sup>, Kelly L McCoy<sup>1</sup>, Sally E Carty<sup>1</sup>, Linwah Yip<sup>1</sup>

<sup>1</sup>*Endocrine Surgery, University of Pittsburgh*, <sup>2</sup>*Medicine, University of Pittsburgh*

# SCIENTIFIC PROGRAM

◆ **10. SURGERY ALONE FOR PAPILLARY MICROCARCINOMA IS MORE COST EFFECTIVE THAN LONG TERM ACTIVE SURVEILLANCE**

**Jia Feng Lin**<sup>1</sup>, Pascal Jonker<sup>1</sup>, Stanley Sidhu<sup>2</sup>, Leigh Delbridge<sup>2</sup>, Anthony Glover<sup>2</sup>, Diana Learoyd<sup>3</sup>, Ahmad Aniss<sup>2</sup>, Schelto Kruijff<sup>1</sup>, Mark Sywak<sup>2</sup>

<sup>1</sup>*Surgical Oncology, University Medical Center Groningen*, <sup>2</sup>*Endocrine Surgical Unit, University of Sydney*, <sup>3</sup>*Department of Endocrinology, University of Sydney*

**11. ADHERENCE TO CONSENSUS GUIDELINES FOR SCREENING OF PRIMARY ALDOSTERONISM IN AN UNDERSERVED OUTPATIENT URBAN HEALTH CARE SYSTEM**

**Maheshwaran Sivarajah**<sup>1</sup>, Toni Beninato<sup>2</sup>, Thomas J Fahey III<sup>2</sup>

<sup>1</sup>*St. Barnabas Hospital, Bronx*, <sup>2</sup>*NY Presbyterian/Weill Cornell Medical Center*

◆ **12. SURGICAL RESECTION IN EARLY STAGE PANCREATIC NEUROENDOCRINE TUMORS IN THE UNITED STATES: ARE WE OVER- OR UNDERTREATING PATIENTS?**

**Sitaram V Chivukula**<sup>1</sup>, John F Tierney<sup>1</sup>, Martin Hertl<sup>1</sup>, Jennifer Poirier<sup>1</sup>, Xavier M Keutgen<sup>2</sup>

<sup>1</sup>*Surgery, Rush University Medical Center*, <sup>2</sup>*Surgery, University of Chicago*

10:00 am — 10:30 am *Wedgewood Ballroom*

**BREAKS, EXHIBITS, & POSTER VIEWING**

10:30 am — 11:30 am *Starlight Ballroom*

**DIVERSITY, EQUITY AND INCLUSION PANEL**

MODERATORS: Herb Chen, MD – University of Alabama at Birmingham

PANELISTS: Nipun Merchant, MD – University of Miami; Malcolm Brock, MD – The Johns Hopkins University School of Medicine; Minerva Romero Arenas, MD, MPH – University of Texas Rio Grande Valley, School of Medicine; and Sareh Parangi, MD – Massachusetts General Hospital

11:30 am — 1:30 pm

**LUNCH ON YOUR OWN**

1:30 pm — 2:45 pm *Starlight Ballroom*

**SCIENTIFIC SESSION IV: Papers 13-17**

MODERATORS: Mark Sywak, MD – *University of Sydney*, and Susan Pitt, MD – *University of Wisconsin*

◆ **13. MOLECULAR PROFILING DOES NOT SIGNIFICANTLY CONTRIBUTE TO THE DIAGNOSTIC ALGORITHM FOR THE PREDICTION OF MALIGNANCY IN THYROID NODULES**

**Bernice L Huang**<sup>1</sup>, John A Chabot<sup>1</sup>, James A Lee<sup>1</sup>, Jennifer H Kuo<sup>1</sup>

<sup>1</sup>*Columbia University Medical Center*

# SCIENTIFIC PROGRAM

◆ **14. AGGRESSIVE VARIANTS OF PAPILLARY THYROID MICROCARCINOMA ASSOCIATED WITH HIGH-RISK FEATURES, NOT SURVIVAL**

**Simon A Holoubek**<sup>1</sup>, Huan Yan<sup>1</sup>, Amna Khokar<sup>1</sup>, Kristine Kuchta<sup>2</sup>, David J Winchester<sup>1</sup>, Richard A Prinz<sup>1</sup>, Tricia A Moo-Young<sup>1</sup>

<sup>1</sup>*Endocrine Surgery, NorthShore University HealthSystem*, <sup>2</sup>*Biostatistics and Research Informatics, NorthShore University Health System*

◆ **15. SHOULD INCIDENTAL MULTIFOCALITY BE AN INDICATION FOR COMPLETION THYROIDECTOMY IN PAPILLARY THYROID CANCER?**

**Victoria Harries**<sup>1</sup>, Laura Y Wang<sup>1</sup>, Marlena McGill<sup>1</sup>, Ashok R Shaha<sup>1</sup>, Jatin P Shah<sup>1</sup>, Richard J Wong<sup>1</sup>, R Michael Tuttle<sup>1</sup>, Snehal G Patel<sup>1</sup>, Ian Ganly<sup>1</sup>

<sup>1</sup>*Memorial Sloan Kettering Cancer Center*

◆ **16. EARLY POST-OPERATIVE THYROGLOBULIN QUANTIFIES RISK OF RECURRENCE IN PAPILLARY THYROID CANCER.**

**Jayani Hasula Jayasekara**<sup>1</sup>, Jia Feng Lin<sup>1</sup>, Man-Shun Wong<sup>1</sup>, Ahmad Aniss<sup>1</sup>, Leigh Delbridge<sup>1</sup>, Anthony Glover<sup>1</sup>, Stan Sidhu<sup>1</sup>, Mark Sywak<sup>1</sup>

<sup>1</sup>*University of Sydney Endocrine Surgery Unit, Royal North Shore Hospital*

◆ **17. THYROGLOBULIN WASHOUT FROM CERVICAL LYMPH NODE FINE NEEDLE ASPIRATION BIOPSIES IN PATIENTS WITH DIFFERENTIATED THYROID CANCER: DEFINING AN OPTIMAL CUT-OFF**

**Bora Kahramangil**<sup>1,2</sup>, Emin Kose<sup>1</sup>, Mustafa Donmez<sup>1</sup>, Husnu Aydin<sup>1</sup>, Jordan Reynolds<sup>1</sup>, Vikram Krishnamurthy<sup>1</sup>, Judy Jin<sup>1</sup>, Joyce Shin<sup>1</sup>, Allan Siperstein<sup>1</sup>, Eren Berber<sup>1</sup>

<sup>1</sup>*Cleveland Clinic*, <sup>2</sup>*General Surgery, Cleveland Clinic Florida*

2:45 pm — 3:00 pm *Wedgewood Ballroom*

**BREAKS, EXHIBITS, & POSTER VIEWING**

3:00 pm — 4:30 pm *Starlight Ballroom*

**SCIENTIFIC SESSION V: Papers 18-23**

MODERATORS: Barbra Miller, MD – *University of Michigan*, and Brian Untch, MD – *Memorial Sloan Kettering*

◆ **18. IS THERE A METHOD TO THE MADNESS? EXAMINING THE SURGICAL APPROACH AND OUTCOMES OF LAPAROSCOPIC ADRENALECTOMY AMONG CESQIP SURGEONS**

**Annette Marie Pascual Marrero**<sup>1</sup>, Hadiza Kazaure<sup>1</sup>, Samantha Thomas<sup>2</sup>, Michael Stang<sup>1</sup>, Randall Scheri<sup>2</sup>

<sup>1</sup>*Endocrine Surgery, Duke University*, <sup>2</sup>*Duke University*

# SCIENTIFIC PROGRAM

## ◆ 19. DEFINING THE COMPETENCIES FOR LAPAROSCOPIC TRANSABDOMINAL ADRENALECTOMY: AN INVESTIGATION OF INTRA-OPERATIVE BEHAVIORS AND DECISIONS OF EXPERTS

**Amin Madani**<sup>1</sup>, Karan Grover<sup>1</sup>, Jennifer H Kuo<sup>1</sup>, Barbara Miller<sup>2</sup>, Quan-Yang Duh<sup>3</sup>, Wen Shen<sup>3</sup>, Masha Livhits<sup>4</sup>, Philip W Smith<sup>5</sup>, Toni Beninato<sup>6</sup>, Rebecca S Sippel<sup>7</sup>, Elliot J Mitmaker<sup>8</sup>, James A Lee<sup>1</sup>

<sup>1</sup>*Surgery, Columbia University*, <sup>2</sup>*Surgery, University of Michigan*, <sup>3</sup>*Surgery, University of California - San Francisco*, <sup>4</sup>*Surgery, University of California - Los Angeles*, <sup>5</sup>*Surgery, University of Virginia*, <sup>6</sup>*Surgery, Cornell University*, <sup>7</sup>*Surgery, University of Wisconsin*, <sup>8</sup>*Surgery, McGill University*

## ◆ 20. OBESITY IS ASSOCIATED WITH NON-LOCALIZING IMAGING IN PRIMARY ALDOSTERONISM

**Victoria M Gershuni**<sup>1</sup>, Daniel S Herman<sup>2</sup>, Rachel R Kelz<sup>1</sup>, Robert E Roses<sup>1</sup>, Debbie L Cohen<sup>3</sup>, Scott O Trerotola<sup>4</sup>, Douglas L Fraker<sup>1</sup>, Heather Wachtel<sup>1</sup>

<sup>1</sup>*Department of Surgery, Division of Endocrine and Oncologic Surgery, University of Pennsylvania*, <sup>2</sup>*University of Pennsylvania*, <sup>3</sup>*Department of Medicine, University of Pennsylvania*, <sup>4</sup>*Department of Interventional Radiology, University of Pennsylvania*

## ◆ 21. COMPARISON BETWEEN FUNCTIONAL AND NON-FUNCTIONAL ADRENOCORTICAL CARCINOMA

**Alaa Sada**<sup>1</sup>, Malke Asaad<sup>2</sup>, Katherine A Bews<sup>3</sup>, Geoffrey B thompson<sup>1</sup>, David R Farley<sup>1</sup>, Benzon M Dy<sup>1</sup>, Melanie L Lyden<sup>1</sup>, Elizabeth B Habermann<sup>3</sup>, Travis J Mckenzie<sup>1</sup>

<sup>1</sup>*General Surgery, Mayo Clinic*, <sup>2</sup>*Mayo Clinic*, <sup>3</sup>*Surgical Outcomes Program, Kern Center for the Science of Health Care Delivery., Mayo Clinic*

## ◆ 22. ADRENOCORTICAL TUMORS HAVE A DISTINCT LONG NON-CODING RNA EXPRESSION PROFILE AND LINC00271 IS A PROGNOSTIC MARKER IN ADRENOCORTICAL CARCINOMA

**Floryne O Buishand**<sup>1,2</sup>, Yi Liu-Chittenden<sup>2</sup>, Yu Fan<sup>2</sup>, Sudheer Gara<sup>2</sup>, Dhaval Patel<sup>2</sup>, Amit Tirosh<sup>2,3</sup>, Daoud Meerzaman<sup>2</sup>, Electron Kebebew<sup>2,4</sup>

<sup>1</sup>*University of Edinburgh*, <sup>2</sup>*National Cancer Institute*, <sup>3</sup>*Sheba Medical Center*, <sup>4</sup>*Stanford University*

## ◆ 23. A NOVEL HEAT SHOCK PROTEIN 90 INHIBITOR POTENTLY TARGETS ADRENOCORTICAL CARCINOMA TUMOR SUPPRESSION VIA ALTERATION OF LONG NON-CODING RNA EXPRESSION

**Ton Wang**<sup>1</sup>, Chitra Subramanian<sup>1</sup>, Brian Blagg<sup>2</sup>, Mark S Cohen<sup>1</sup>

<sup>1</sup>*Surgery, University of Michigan*, <sup>2</sup>*Medicinal Chemistry, University of Notre Dame*

# SCIENTIFIC PROGRAM

## TUESDAY, APRIL 9, 2019

7:00 am — 8:00 am *Starlight Ballroom*

### **BREAKFAST SESSION: CESQIP**

MODERATORS: David Schneider, MD – University of Wisconsin; Jennifer Rosen, MD – Washington Hospital Center

PANELISTS: Reese Randle, MD – University of Kentucky; Judy Jin, MD – The Cleveland Clinic; Barry Inabnet, MD – Icahn School of Medicine at Mount Sinai; and Derek Panches, MD - ArborMetrix

7:00 am — 8:00 am *Wilshire I & II*

### **BREAKFAST SESSION: Graves' Disease & Thyroid Foundation Breakfast**

MODERATORS: Dawn Eifenbein, MD – University of California, Irvine

PANELISTS: Kimberly Dorris – Graves' Disease & Thyroid Foundation; Julie Miller, MD – Royal Melbourne Hospital; and Richard Hodin, MD – Massachusetts General Hospital

8:00 am — 9:30 am *Starlight Ballroom*

### **INTERESTING CASES**

MODERATOR: Sonia Sugg, MD – University of Iowa Hospitals & Clinics

PANELISTS: Steven Libutti, MD – Rutgers Cancer Institute of New Jersey; Sally Carty, MD – University of Pittsburgh; Carmen Solorzano, MD, MPH – Vanderbilt University Medical Center; and Ashok Shana, MD – Memorial Sloan-Kettering Cancer Center

9:30 am — 9:45 am *Wedgewood Ballroom*

### **BREAK, EXHIBITS, & POSTER VIEWING**

9:45 am — 11:15 am *Starlight Ballroom*

### **SCIENTIFIC SESSION VI: Papers 24-29**

MODERATORS: Allan Siperstein, MD – *Cleveland Clinic*, and Aarti Mathur, MD – *Johns Hopkins*

#### **24. ENERGY LEVEL AND FATIGUE AFTER THYROID SURGERY FOR THYROID CANCER: A POPULATION-BASED STUDY ON PATIENT-REPORTED OUTCOMES**

**David T Hughes**<sup>1</sup>, David Reyes-Gastelum<sup>2</sup>, Kevin Kovatch<sup>3</sup>, Ann S Hamilton<sup>4</sup>, Kevin C Ward<sup>5</sup>, Megan Haymart<sup>2</sup>

<sup>1</sup>*Surgery, University of Michigan*, <sup>2</sup>*Internal Medicine, University of Michigan*, <sup>3</sup>*Otolaryngology, University of Michigan*, <sup>4</sup>*Keck School of Medicine of University of Southern California*, <sup>5</sup>*Rollins School of Public Health, Emory University*

# SCIENTIFIC PROGRAM

## 25. SELF-ASSESSMENT OF THE VOICE AFTER TOTAL THYROIDECTOMY USING VHI QUESTIONNAIRES. RESULTS OF A PROSPECTIVE STUDY

Frédéric Borel<sup>1</sup>, Christophe Tresallet<sup>2</sup>, Antoine Hamy<sup>3</sup>, Muriel Mathonnet<sup>4</sup>, Jean-Christophe Lifante<sup>5</sup>, Laurent Brunaud<sup>6</sup>, Olivier Marret<sup>7</sup>, Cécile Caillard<sup>8</sup>, Florent Espitalier<sup>9</sup>, Fabrice Menegaux<sup>2</sup>, Jean-Benoit Hardouin<sup>10</sup>, Claire Blanchard<sup>11</sup>, **Eric Mirallie**<sup>12</sup>

<sup>1</sup>*Clinique de Chirurgie Digestive et Endocrinienne, Hôtel Dieu, CHU Nantes, Place Alexis Ricordeau, 44093 Nantes CEDEX 1, France.*, <sup>2</sup>*Chirurgie Générale, Viscérale et Endocrinienne, Hôpital Pitié-Salpêtrière, AP-HP, Sorbonne Universités Pierre et Marie Curie (Paris 6)*, <sup>3</sup>*Chirurgie digestive et endocrinienne, CHU Angers*, <sup>4</sup>*Chirurgie digestive, générale et endocrinienne, CHU de Limoges*, <sup>5</sup>*Chirurgie générale, endocrinienne, digestive et thoracique, Centre Hospitalier Lyon-Sud*, <sup>6</sup>*Service de chirurgie digestive, hépato-biliaire, et endocrinienne, CHU Nancy - Hôpital de Brabois*, <sup>7</sup>*Chirurgie Vasculaire, CHD Vendée*, <sup>8</sup>*Clinique de Chirurgie Digestive et Endocrinienne, Hôtel Dieu, CHU Nantes*, <sup>9</sup>*Oto-Rhino-Laryngologie, Hôtel Dieu, CHU Nantes*, <sup>10</sup>*Plateforme de Méthodologie et de Biostatistique – DRCi, Faculté de Médecine et Pharmacie*, <sup>11</sup>*Clinique de Chirurgie Digestive et Endocrinienne, CHU Nantes*, <sup>12</sup>*Nantes University Hospital*

## ◆ 26. SAME-DAY DISCHARGE IS NOT ASSOCIATED WITH INCREASED READMISSION OR COMPLICATION RATES FOLLOWING THYROIDECTOMY

**Q Lina Hu**<sup>1,2</sup>, Masha J Livhits<sup>1</sup>, Clifford Y Ko<sup>1,2</sup>, Michael W Yeh<sup>1</sup>

<sup>1</sup>*Department of Surgery, University of California, Los Angeles*, <sup>2</sup>*American College of Surgeons*

## 27. MORBIDITY IN PATIENTS WITH PERMANENT HYPOPARATHYROIDISM AFTER TOTAL THYROIDECTOMY

**Anders OJ Bergenfelz**<sup>1</sup>, Erik Nordenström<sup>2</sup>, Martin Almqvist<sup>2</sup>

<sup>1</sup>*Surgery, Department of Clinical Sciences*, <sup>2</sup>*Surgery, Surgery*

## 28. AUTOFLUORESCENCE IMAGING OF PARATHYROID GLANDS: AN ASSESSMENT OF POTENTIAL INDICATIONS

Emin Kose<sup>1</sup>, Bora Kahramangil<sup>1</sup>, Edwina Moore<sup>1</sup>, Husnu Aydin<sup>1</sup>, Mustafa Donmez<sup>1</sup>, Vikram Krishnamurthy<sup>1</sup>, Allan Siperstein<sup>1</sup>, **Eren Berber**<sup>1</sup>

<sup>1</sup>*Cleveland Clinic*

## ◆ 29. META-ANALYSIS: ACTIVE SURVEILLANCE FOR LOW RISK PAPILLARY THYROID CARCINOMA

**Bianka Saravana-Bawan**<sup>1</sup>, Amandeep Bajwa<sup>1</sup>, Todd McMullen<sup>1</sup>

<sup>1</sup>*Department of Surgery, University of Alberta*

# SCIENTIFIC PROGRAM

11:15 am — 11:45 am *Wedgewood Ballroom*

## **BREAK, EXHIBITS, & POSTER VIEWING**

11:45 am — 1:00 pm *Starlight Ballroom*

## **SCIENTIFIC SESSION VII: Papers 30-34**

MODERATORS: Amelia Grover, MD – *Virginia Commonwealth University*, and John Porterfield, MD – *University of Alabama at Birmingham*

◆ **30.** A GROWTH MODEL OF NEUROENDOCRINE TUMOR SURROGATES AND THE EFFICACY OF A NOVEL SOMATOSTATIN-RECEPTOR GUIDED ANTIBODY-DRUG CONJUGATE: PERSPECTIVES ON CLINICAL RESPONSE?

**Brendon Herring**<sup>1</sup>, Jason Whitt<sup>1</sup>, Jianfa Ou<sup>2</sup>, Joel Berry<sup>2</sup>, Herbert Chen<sup>1</sup>, Xiaoguang Margaret Liu<sup>2</sup>, Renata Jaskula-Sztul<sup>1</sup>

<sup>1</sup>*Department of Surgery, University of Alabama at Birmingham School of Medicine*, <sup>2</sup>*Department of Biomedical Engineering, University of Alabama at Birmingham School of Engineering*

◆ **31.** OVEREXPRESSION OF SOMATOSTATIN RECEPTOR TYPE 2 (SSTR2) IN NEUROENDOCRINE TUMORS FOR IMPROVED [68GA] DOTATATE IMAGING AND TREATMENT

**Rachael E Guenter**<sup>1</sup>, Tolulope Aweda<sup>2</sup>, Alex Chang<sup>1</sup>, Jason Whitt<sup>1</sup>, X. Margaret Liu<sup>3</sup>, Herbert Chen<sup>1</sup>, Suzanne Lapi<sup>2</sup>, Renata Jaskula-Sztul<sup>1</sup>

<sup>1</sup>*Surgery, University of Alabama at Birmingham*, <sup>2</sup>*Radiology, University of Alabama at Birmingham*, <sup>3</sup>*Biomedical Engineering, University of Alabama at Birmingham*

◆ **32.** DUAL INHIBITION OF BRAF AND MEK INCREASES SODIUM IODIDE SYMPORTER EXPRESSION IN PATIENT-DERIVED PAPILLARY THYROID CANCER CELLS IN VITRO

**Timothy M. Ullmann**<sup>1</sup>, Heng Liang<sup>2</sup>, Maureen D. Moore<sup>1</sup>, Isra Al Jamed<sup>2</sup>, Katherine D. Gray<sup>1</sup>, Dessislava Stefanova<sup>1</sup>, Jessica Limberg<sup>1</sup>, Jessica L. Buicko<sup>1</sup>, Brendan Finnerty<sup>1</sup>, Toni Beninato<sup>1</sup>, Rasa Zarnegar<sup>1</sup>, Irene Min<sup>2</sup>, Thomas J. Fahey<sup>1</sup>

<sup>1</sup>*Department of Surgery, New York Presbyterian Hospital: Weill Cornell Medical Center*, <sup>2</sup>*Department of Surgery, Weill Cornell Medicine*

# SCIENTIFIC PROGRAM

◆ **33. NOVEL USE OF A CLIA-CERTIFIED CDKN2C LOSS ASSAY IN SPORADIC MEDULLARY THYROID CARCINOMA**

**Jessica E Maxwell**<sup>1</sup>, Naifa Busaidy<sup>2</sup>, Mimi Hu<sup>2</sup>, Nancy Perrier<sup>1</sup>, Jeffrey Lee<sup>1</sup>, Paul Graham<sup>1</sup>, Gilbert Cote<sup>2</sup>, Elizabeth Grubbs<sup>1</sup>

<sup>1</sup>*Surgical Oncology, MD Anderson Cancer Center*, <sup>2</sup>*Endocrine Neoplasia, MD Anderson Cancer Center*

**34. NOVEL GENE PANEL AS A PROGNOSIS MARKER FOR ACTIVE SURVEILLANCE IN \ THYROID CANCER**

**Emmanuelle ML Ruiz**<sup>1</sup>, Muthusamy Kunnimalaiyaan<sup>1</sup>, Emad Kandil<sup>1</sup>

<sup>1</sup>*Surgery and oncology department, School of Medicine of Tulane University*

1:00 pm

**MEETING ADJOURN**





# ABSTRACTS

◆ Denotes Resident/Fellow Research Award Competition Paper

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

# ABSTRACTS

## ◆ 01. KETOGENIC DIET COMBINED WITH ANTIOXIDANT N-ACETYLCYSTEINE (NAC) INHIBITS TUMOR GROWTH IN A MOUSE MODEL OF ANAPLASTIC THYROID CANCER

Abha Aggarwal<sup>1</sup>, Zuliang Yuan<sup>1</sup>, Matthew A Nehs<sup>1</sup>

<sup>1</sup>*Surgery, Brigham and Women's Hospital*

**Background:** Anaplastic thyroid cancer (ATC) is a fatal malignancy. Evolved resistance renders most chemotherapies ineffective. Many advanced cancers have deregulated cellular energy metabolism characterized by glucose dependency, aerobic glycolysis, and increased oxidative stress levels. Both glucose dependency and increased oxidative stress lead to cellular proliferation. Therefore, in this study we sought to determine if a ketogenic diet (low carbohydrate, high fat) and N-acetylcysteine/NAC (antioxidant) could inhibit tumor growth in a mouse model of ATC.

**Methods:** We used the ATC line 8505c to establish xenografts in nude mice (n=6/group). Group1 was fed standard diet (SD); group2 was given a ketogenic diet (KD); Group3 was given SD with NAC in the drinking water (40mM); and Group4 was given KD plus NAC (40mM). Tumor volumes, ketones, and glucose levels were measured. In vitro, 8505c cells were treated using media with High Glucose (HG) (25mM), Low Glucose (LG) (3mM), HG plus NAC (200uM), or LG plus NAC for 96 hours. We performed proliferation assays, Seahorse glycolysis assays, and ROS assays for oxidative stress. Hexokinase-2 copy number variation (CNV) was analyzed by Fluorescent in-situ hybridization (FISH).

**Results:** We found that Ketogenic diet plus NAC dramatically decreased tumor volume compared to SD (22.5 mm<sup>3</sup> +/- 12.4 vs. 147.3 mm<sup>3</sup> +/- 54.4, P<0.05) and also compared to SD plus NAC (P< 0.05). In vitro, proliferation was reduced in the cells cultured in LG plus NAC compared to both HG and LG alone (p<0.001 and p<0.005). NAC caused a reduction in glycolysis capacity by Seahorse analysis in both HG and LG treatments (p<0.001). LG plus NAC significantly lowered ROS compared to HG alone (p=0.014). Finally, Hexokinase-2 copy number variation was markedly lower in cells grown with LG plus NAC compared to HG and LG alone (p<0.001).

**Conclusions:** A ketogenic diet combined with the antioxidant NAC dramatically reduced tumor size in a mouse model of ATC. Glucose restriction combined with NAC reduced cell proliferation by decreasing cellular oxidative stress, glycolysis capacity, and Hexokinase-2 expression in vitro. Further studies are warranted to explore the role for these metabolic therapies in ATC treatment.

# ABSTRACTS

## ◆ 02. A COMPARISON OF LONG-TERM QUALITY OF LIFE IN LOW RISK DIFFERENTIATED THYROID CANCER PATIENTS TREATED WITH HEMITHYROIDECTOMY VERSUS TOTAL THYROIDECTOMY

**Pim J Bongers**<sup>1,2</sup>, Caylee A Greenberg<sup>1</sup>, Menno R Vriens<sup>2</sup>, Martijn Lutke Holzik<sup>3</sup>, David Goldstein<sup>4</sup>, Karen Devon<sup>1</sup>, Lorne R Rotstein<sup>1</sup>, Anna M Sawka<sup>5</sup>, Jesse D Pasternak<sup>1</sup>

<sup>1</sup>Department of General Surgery, University Health Network, <sup>2</sup>Department of Surgical Oncology and Endocrine Surgery, University Medical Center Utrecht, <sup>3</sup>Department of Surgery, Hospital Group Twente, <sup>4</sup>Department of Otolaryngology-Head Neck Surgery, University Health Network, <sup>5</sup>Department of Endocrinology, University Health Network

**Background:** Although either total thyroidectomy (TT) or hemithyroidectomy (HT) may be acceptable in managing low-risk differentiated thyroid cancers (DTC), the long-term health-related quality of life (HRQoL) implications of these options are not well-understood. We aimed to compare measures of long-term HRQoL in low-risk DTC patients treated with TT to those treated with HT.

**Methods:** We performed a self-administered survey of adults treated for low-risk DTC with tumors  $\leq 4$ cm that underwent surgery between 2005-2016 at a large university hospital. The survey included the European Organization for Research and Treatment of Cancer QLQ-C30 questionnaire, supplementary QLQ-THY34 module, Assessment of Survivor Concerns (ASC) questionnaire, and Multidimensional Fatigue Inventory (MFI-20). Primary outcome was the difference between TT and HT in the global scale of quality of life measured by the EORTC-QLQ-C30 and secondary outcomes included HRQoL functional, symptom (hair problems, restlessness, swallowing, tingling, voice concerns, cramps, joint pain), and patient worry scales (cancer and general health related). Significant patient and treatment-related confounders were included in multivariable regression analyses.

**Results:** Overall survey response rate was 51.0% (270/529). The definitive surgical intervention was TT for 211 (78.1%) and HT for 59 patients (21.9%). Time of survey after surgical treatment was longer for the TT group (median 98 vs 74 months,  $p=0.001$ ), reflecting recent trends in increasing use of HT. Recurrence rates were similar (1.8%-TT vs 3.4%-HT,  $p=0.297$ ) and HT had lower but significant rates of levothyroxine treatment (99.5%-TT vs 66.0%-HT,  $p=0.001$ ). Global quality of life score did not differ between groups (77.6-TT vs 76.9-HT,  $p=0.214$ ). Multivariable analysis showed HT to be associated with more cancer related worry, specifically fear of recurrence ( $p=0.023$ ), and overall health concern ( $p=0.032$ ). Other quality of life markers, often associated with thyroid hormone therapy, were not significantly different in adjusted multivariable models.

**Conclusions:** In this cross-sectional survey, individuals with low risk DTC treated with TT or HT had similar global scores of HRQoL. In hypothesis-generating secondary analyses, cancer-related worry appeared higher in individuals treated with HT compared to TT. While further independent validation is required, these data highlight a previously unreported impact of surgical regimen to the postoperative quality of life for low-risk DTC patients.

# ABSTRACTS

## ◆ 03. IMMUNE INFILTRATE-ASSOCIATED DYSREGULATION OF DNA REPAIR MACHINERY PREDISPOSES TO PAPILLARY THYROID CARCINOGENESIS

**Norman G Nicolson**<sup>1</sup>, Taylor C Brown<sup>1</sup>, Reju Korah<sup>1</sup>, Tobias Carling<sup>1</sup>

<sup>1</sup>*Yale Endocrine Neoplasia Lab, Department of Surgery, Yale School of Medicine*

**Background:** Autoimmune thyroiditis is a risk factor for development of papillary thyroid cancer (PTC). Additionally, many PTC specimens without a pre-operative diagnosis of thyroiditis are found to have immune infiltrates in the resection specimen. Inflammation and genotoxic reactive oxygen species contribute to thyrocyte DNA damage, which is mutagenic only if repaired incorrectly. We hypothesized that the immune milieu in the inflamed thyroid may signal thyrocytes to dysregulate DNA repair, contributing to carcinogenesis.

**Methods:** RNA-seq data was obtained for PTC (n=505) and paired normal thyroid (n=59) samples from The Cancer Genome Atlas (TCGA) and for Hashimoto's (n=15) and normal thyroids (n=264) from the Genotype-Tissue Expression (GTEx) project. Immune marker RNA expression was compared to histological estimates, and then to expression of selected DNA repair genes. To confirm the RNA-seq findings, gene expression analysis by quantitative PCR (qPCR) was performed for the error-prone DNA polymerase POLQ in fresh frozen PTC (n=23), normal thyroid adjacent to PTC (n=21), and normal thyroid adjacent to nodules and adenomas (n=11). Immunohistochemistry was performed on formalin-fixed PTC and thyroid adenoma sections to localize POLQ expression to specific cell types.

**Results:** Immune marker expression matched histological immune cell fraction for TCGA data. Immune markers such as CD4 closely correlated in the PTC samples with POLQ expression ( $r=0.50$ , Spearman's rho), but for other DNA repair genes there was no relationship (TDG,  $r=0.09$ ; POLE,  $r=0.11$ ) or an inverse relationship (PMS2,  $r=-0.32$ ). Immune infiltrate in PTC-adjacent normal thyroid closely correlated to POLQ expression in the same tissue ( $r=0.85$ ) and in the paired PTC ( $r=0.36$ ). Thyroid tissue from GTEx with Hashimoto's had at least 3-fold increased expression of POLQ ( $p<0.001$ ) and CD3E ( $p<0.0001$ ). POLQ expression by qPCR was significantly higher in PTC and PTC-adjacent normal samples than in normal thyroid adjacent to benign lesions (mean normalized log<sub>2</sub>-transformed expression, 4.2 vs 5.5 vs 0.0,  $p<0.001$ ). Immunohistochemistry confirmed that most POLQ expression was in thyrocytes rather than lymphocytes, in all tissue types studied.

**Conclusions:** This study demonstrates a close correlation between adjacent immune infiltrate and expression of error-prone DNA repair machinery in thyrocytes, likely reflecting a pathway by which autoimmune thyroid diseases predispose patients to PTC development.

# ABSTRACTS

## ◆ 04. SKELETAL EFFECTS OF COMBINED MEDICAL AND SURGICAL MANAGEMENT OF PRIMARY HYPERPARATHYROIDISM

**Lauren E. Orr**<sup>1</sup>, Hui Zhou<sup>2</sup>, Catherine Y. Zhu<sup>1</sup>, Philip I. Haigh<sup>3</sup>, Annette L. Adams<sup>2</sup>, Michael W. Yeh<sup>1</sup>

<sup>1</sup>*Department of Surgery, UCLA David Geffen School of Medicine,* <sup>2</sup>*Department of Research & Evaluation, Kaiser Permanente Southern California,* <sup>3</sup>*Department of Surgery, Kaiser Permanente Los Angeles Medical Center*

**Background:** Parathyroidectomy (PTX) increases bone mineral density (BMD) and decreases fracture risk in patients with primary hyperparathyroidism (PHPT). The aim of this study was to assess the effect of adding bisphosphonates either before or after PTX on skeletal outcomes.

**Methods:** A retrospective cohort study of bisphosphonate-naïve patients with osteoporosis and classic PHPT (calcium 10.5 and PTH >65) within a vertically integrated healthcare system was performed (1995 to 2016). Osteoporosis was defined by a baseline T-score < -2.5 at any site, or by using ICD-9/10 codes. Time-varying Cox regression was used to estimate an adjusted risk of any fracture in five comparison groups: observation, bisphosphonates alone, PTX alone, bisphosphonates followed by PTX, and PTX followed by bisphosphonates. The secondary outcome was hip BMD change within 6 years after PTX.

**Results:** The cohort comprised 1,737 patients, of which 303 underwent PTX (17%), 433 were treated with bisphosphonates only (25%), 125 were treated with bisphosphonates followed by PTX (7%), and 69 underwent PTX followed by bisphosphonate treatment (4%). We observed 278 fractures overall with a median follow up of 5.2 years. PTX was associated with a reduction in fracture risk compared to observation (HR 0.55, 95% CI 0.35-0.84). Bisphosphonate treatment followed by PTX was associated with a reduction in fracture risk similar to that observed with PTX alone (HR 0.46, 95% CI 0.25-0.83). However, PTX followed by bisphosphonate treatment did not reduce fracture risk (HR 1.09, 95% CI 0.65-1.81). The fracture risk associated with bisphosphonate therapy alone was similar to observation (HR 0.82, 95% CI 0.62-1.08). PTX alone was associated with a nonsignificantly greater increase in hip BMD (5.66%, 95% CI 3.69-7.64) compared to PTX followed by bisphosphonates (3.76%, 95% CI -0.15-7.67).

**Conclusions:** Bisphosphonate initiation after PTX may antagonize the beneficial effects of PTX on fracture risk in osteoporotic patients with PHPT. Until further research is performed, bisphosphonates should be avoided in the postoperative period.

# ABSTRACTS

## ◆ 05. FACTORS ASSOCIATED WITH LATE RECURRENCE AFTER PARATHYROIDECTOMY FOR PRIMARY HYPERPARATHYROIDISM

Reema Mallick<sup>1</sup>, Linwah Yip<sup>1</sup>, Sally E Carty<sup>1</sup>, Kelly L McCoy<sup>1</sup>

<sup>1</sup>Department of Surgery, University of Pittsburgh

**Background:** The surgical cure rate for primary hyperparathyroidism (PHP) is >95%, but in several recent studies the rate of long-term recurrence is higher than once appreciated. Our aim was to identify factors of late recurrence after seemingly curative parathyroidectomy.

**Methods:** With institutional approval, prospectively collected data were retrieved for all patients who had surgery for sporadic PHP from 11/72 to 1/15 with long-term follow-up, defined as  $\geq 3$  years. Patients who had concomitant thyroidectomy or persistent PHP were excluded. Recurrent PHP (RPHP) was defined by 6 months of postoperative eucalcemia followed by elevated calcium and high/inappropriately unsuppressed PTH levels. Patients with RPHP were compared to a contemporaneous cohort with durable cure (CPHP) defined by consistent eucalcemia through most recent follow-up (range 36-211 mo, mean 73). Statistical analysis used student's t test for continuous data and Fisher's exact test for categorical data.

**Results:** 262 patients met inclusion criteria: 29 (11%) with RPHP and 233 (89%) with CPHP. Gender ( $p=0.8$ ) and mean age ( $p=0.6$ ) were similar. Mean follow-up differed by group (RPHP 94.8 mo vs CPHP 70.4 mo,  $p<0.01$ ). Mean time to RPHP recurrence was 84 mo (range 13-179). Although 83% of RPHP patients had unilateral exploration vs 72% of CPHP ( $p=0.3$ ), all RPHP patients had a single gland resected at initial surgery vs 197/233 (85%) CPHP patients ( $p<0.01$ ) with no difference in resected gland size ( $p=0.9$ ). The mean final intraoperative PTH level was higher in the RPHP (48.04 pg/mL) compared to the CPHP group (37.5 pg/mL,  $p<0.01$ ), and the mean 6-month calcium level was slightly higher, as well (9.6 vs 9.3 mg/dL,  $p<0.001$ ). The mean 6-month PTH value did not significantly differ between groups (RPHP 67.8 vs CPHP 59.6 pg/mL,  $p=0.8$ ). Notably, at 6 months, RPHP patients were much more likely to have eucalcemic elevation in PTH than were CPHP patients (86% vs 15%,  $p<0.01$ ).

**Conclusions:** Patients followed long-term after apparent curative parathyroidectomy for PHP have a high rate of late recurrence (11%), with hypercalcemia reappearing as many as 15 years later. At 6-month follow-up, an elevated PTH is strongly associated with recurrence, a finding that may help to guide cost-effective surveillance recommendations.

# ABSTRACTS

## 06. CORONARY ARTERY DISEASE IS MORE SEVERE IN PATIENTS WITH PRIMARY HYPERPARATHYROIDISM.

Omar Koibaity<sup>1</sup>, Damien Mandry<sup>1,2</sup>, Phi-Linh Nguyen-Thi<sup>3</sup>, Claire Nomine-Criqui<sup>4</sup>, Lea Demarquet<sup>5</sup>, Valerie Croise-Laurent<sup>1,2</sup>, **Laurent Brunaud**<sup>4,6</sup>

<sup>1</sup>Department of Radiology, Université de Lorraine, CHU Nancy (Brabois), <sup>2</sup>INSERM, IADI, Université de Lorraine, <sup>3</sup>PARC - Pôle S2R, clinical epidemiology and evaluation, Université de Lorraine, CHU Nancy (Brabois), <sup>4</sup>Department of Surgery, Université de Lorraine, CHU Nancy (Brabois), <sup>5</sup>Department of Endocrinology, Université de Lorraine, CHU Nancy (Brabois), <sup>6</sup>INSERM U1256, Faculty of Medicine

**Background:** Primary hyperparathyroidism (PHPT) is associated with an increased cardiovascular mortality and mechanisms underlying this association are unclear. The coronary calcium score (CAC score) is a strong and independent risk predictor for 10-year coronary event: 22-28% when CAC > 400 (high risk), 12-16% when CAC 101-400 (intermediate risk), 2-6% when CAC 1-101 (low risk), and 1-2% when CAC = 0 (very low risk). However, available data about coronary artery disease are very limited in PHPT. The goal of this study was to evaluate CAC score in a large number of PHPT patients, to compare with control subjects, and to evaluate predictors of CAC score in PHPT.

**Methods:** Cross-sectional study of consecutive PHPT patients without history of coronary artery disease, history of diabetes, or severe chronic kidney disease (GFR < 30 mL/min/1.73 m<sup>2</sup>). CAC scores in PHPT patients were compared with population-based control subjects (n=6110) from the Multi-Ethnic Study of Atherosclerosis (MESA) with adjustments on patient's age, gender, and ethnicity.

**Results:** Mean CAC score was 120 + 344 (range 0-2587) in 130 patients with PHPT (109 females). CAC score was > 400 (high risk) in 13 patients, between 101 and 400 (intermediate risk) in 14 patients, between 1 and 100 (low risk) in 42 patients, and null in 61 patients. When compared with control subjects, the percentage of positive CAC scores (i.e. non-null) was similar in PHPT patients (53 versus 50%). However, positive CAC scores were significantly higher and at the 67th percentile of the MESA cohort (p<0.001). CAC score was positively correlated with patient's age (0.342; p<0.001), antihypertensive medications number (0.207; p=0.018), 25OH-vitD level (0.191; p=0.029), and negatively with GFR (-0.212 ; p=0.015) and 24h-urinary calcium (-0.192 ; p=0.035). In multivariate analysis, patient's age (1.135; 1.034-1.246; p=0.007) and antihypertensive medications (8.810; 2.447-31.716; p<0.001) remained independent predictors of high-intermediate risk CAC scores (CAC score > 100).

**Conclusions:** High-intermediate risk CAC scores were observed in 21% of PHPT patients (10-year coronary event > 12%). Positive CAC scores were significantly higher in PHPT patients than in population-based control subjects. Patient's age and antihypertensive medications should be taken into account in future studies.

# ABSTRACTS

## ◆ 07. NORMOCALCEMIC HYPERPARATHYROIDISM: A CESQIP ANALYSIS

**T.K. Pandian**<sup>1</sup>, Sarah H Bird<sup>1</sup>, Lindsay E Kuo<sup>1</sup>, Carrie C Lubitz<sup>1</sup>, Antonia E Stephen<sup>1</sup>

<sup>1</sup>Harvard

**Background:** Normocalcemic primary hyperparathyroidism (nPHPT) has been described as a unique clinical entity that may be more challenging to cure compared to classical primary hyperparathyroidism. Lack of consistent findings in the literature regarding the incidence of multi-gland disease and clinical outcomes may be due to single-center studies with small numbers of patients. We utilized a multi-institutional database to better characterize this condition.

**Methods:** The Collaborative Endocrine Surgery Quality Improvement Program (CESQIP) database from all 48 participating institutions during 2014-2018, was queried for patients undergoing parathyroidectomy for sporadic primary hyperparathyroidism. Those without recorded preoperative calcium levels were excluded. Patient characteristics, operative details, pathology, and outcomes data were compared between patients with nPHPT and those with elevated calcium (PHPT). Of note, calcium levels in CESQIP are reported as categorical values (low, normal, high, very high) based on each institutions' laboratory reference range.

**Results:** Among 7634 patients, 65 were excluded due to lack of preoperative calcium values. In the remaining 7569, 9.7% (733) were nPHPT. Mean age at surgery and sex were similar for nPHPT and PHPT cohorts. Preoperative parathyroid hormone (PTH) levels were not elevated in 13.2% vs 11.3% and high in 85.0% vs 87.7% for nPHPT and PHPT, respectively. In the nPHPT cohort, 47 patients (6.4%) were undergoing remedial surgery compared with 307 patients (4.5%) with PHPT ( $p < 0.05$ ). The PHPT cohort had a single parathyroid resected more frequently than the nPHPT group (73.3% vs 47.5%,  $p < 0.05$ ). Similarly, patients with nPHPT had a higher rate of subtotal (3.5 gland) resection (10.0% vs 4.7%,  $p < 0.05$ ). Pathology reported a higher frequency of multi-gland hyperplasia in the nPHPT cohort (43.1% vs 21.9,  $p < 0.05$ ). The rate of clinical concern for persistent hyperparathyroidism was similar between the two groups ( $p = 0.09$ ) but not reported in 25% overall.

**Conclusions:** Patients with nPHPT have higher rates of multi-gland disease compared with PHPT. The rate of persistent disease did not differ between the two groups but follow up was limited. More patients with nPHPT were undergoing remedial surgery, suggesting that parathyroidectomy in this cohort may have higher failure rates. These data support routine multi-gland exploration and long term follow up for nPHPT patients.



# ABSTRACTS

## ◆ 08. DERIVATION OF A COST-SAVING SCREENING STRATEGY FOR ASYMPTOMATIC PRIMARY HYPERPARATHYROIDISM

**John J Nguyen-Lee**<sup>1</sup>, Mario Paciuc<sup>2</sup>, Rudy Guerra<sup>2</sup>, Nestor F. Esnaola<sup>3</sup>, Kyle A. Zanicco<sup>4</sup>, Feibi Zheng<sup>5</sup>

<sup>1</sup>General Surgery, Houston Methodist Hospital, <sup>2</sup>Statistical Genetics and Bioinformatics, Rice University, <sup>3</sup>General Surgery and Surgical Oncology, Houston Methodist Hospital, <sup>4</sup>Endocrine Surgery, UCLA David Geffen School of Medicine, <sup>5</sup>General Surgery and Endocrine Surgery, Houston Methodist Hospital

**Background:** Primary hyperparathyroidism (PHPT) is the most common cause of hypercalcemia in the ambulatory setting. Several studies have demonstrated that PHPT is an underdiagnosed condition. Few studies have examined the utility of implementing a screening program for hypercalcemic patients in the outpatient setting. Our study seeks to find a cost-saving screening strategy for diagnosing PHPT based on peak calcium level, age and gender in a primary care population.

**Methods:** We reviewed laboratory data resulting from primary care office visits at our institution between January 2016 through December 2017 to evaluate patients that had at least one episode of hypercalcemia (serum calcium >10.4 mg/dL). We excluded patients who had a history of transplant or were on calcium elevating medications such as thiazide diuretics. For each calcium threshold, we calculated the percentage of patients who were found to have an elevated PTH level (> 65pg/mL) in our system. Using a previously published decision analysis on observation versus parathyroidectomy in asymptomatic PHPT, we determined whether net cost savings could be achieved by screening hypercalcemic patients given their probability of PHPT and expected cost savings from fracture risk reduction, given their gender and age.

**Results:** There were 459,002 primary care office visits from 155,350 unique patients in the study period. Of these patients, 2,271 had at least one hypercalcemic lab value. After exclusion of transplant patients and patients on potentially confounding medications, there were 1,326 patients, of which 28.2% had a PTH level checked. The likelihood of having biochemically classic PHPT was 27.3%, 25%, 33.3%, 38.6%, 45.2%, and 51% for threshold peak serum calcium levels of 10.5, 10.6, 10.7, and 10.8, and 10.9, and  $\geq 11$  respectively. Cost savings was established at a screening threshold of 10.5 for all patients until age 66 for men and 69 for women. For men aged 67-68, and women aged 70-71, the optimal screening threshold was 10.8. For men 69 or older and women 72 or older, there was no optimal screening threshold.

**Conclusions:** For our primary care population, cost savings can be achieved by screening hypercalcemic patients with a life expectancy exceeding 16 years, with varying thresholds based on age and gender.

# ABSTRACTS

## ◆ 09. CURRENT MANAGEMENT OF HYPOCALCEMIA AFTER TOTAL THYROIDECTOMY: A COST-EFFECTIVENESS ANALYSIS

**Kristina J Nicholson**<sup>1</sup>, Kenneth J Smith<sup>2</sup>, Kelly L McCoy<sup>1</sup>, Sally E Carty<sup>1</sup>, Linwah Yip<sup>1</sup>

<sup>1</sup>Endocrine Surgery, University of Pittsburgh, <sup>2</sup>Medicine, University of Pittsburgh

**Background:** Symptomatic hypocalcemia is a complication of total thyroidectomy (TT) that may result in hospital readmission. Strategies for management include treatment initiation when symptomatic, or prevention by routine or PTH-directed oral calcium supplementation. The cost-effectiveness of these three often-utilized strategies for management of post-TT hypocalcemia is unclear.

**Methods:** A Markov cohort model from the payer perspective was created for patients undergoing outpatient TT. Management strategies included routine supplementation with calcium alone (RS), a protocol for post-operative PTH-based selective supplementation with calcium and calcitriol (SS), and no supplementation (NS) until patients demonstrated postoperative hypocalcemic symptoms. Markov cycle length was one week and model time horizon was 6 months. Patients in each strategy could remain asymptomatic or develop symptomatic hypocalcemia, managed with outpatient oral supplementation, intravenous calcium infusion administered in an ambulatory care setting, or inpatient intravenous calcium infusion. Effectiveness was measured in quality-adjusted life years (QALYs). Costs were obtained from the CMS fee schedule and the VA Federal Supply Schedule. Quality-of-life utilities and probabilities came from the current literature. Sensitivity analyses were performed to test model parameter assumptions.

**Results:** RS was the preferred strategy, costing \$351 per patient and resulting in 0.497 QALYs. SS cost \$577 for 0.494 QALYs, while NS was most costly at \$4,953 for 0.492 QALYs. The model was robust on one-way sensitivity analysis to variations in the costs of calcium carbonate and hospital admission, probability of symptomatic hypocalcemia, and hospital length of stay. In the base case model, >90% of symptomatic patients in the RS and SS strategies are treated with outpatient oral supplementation, and the added cost of NS was due to ~45% of symptomatic patients requiring either ambulatory or inpatient intravenous infusion. However, the cost-effectiveness of NS approached that of SS or RS when >97% of symptomatic patients could be treated with oral supplementation alone. On probabilistic sensitivity analysis, RS was preferred in 82% of scenarios.

**Conclusions:** In this data-driven theoretical model, routine calcium supplementation after TT was the least costly option and resulted in the largest QALY gain. After TT, a preventative calcium supplementation strategy should be strongly considered.

## ◆ 10. SURGERY ALONE FOR PAPILLARY MICROCARCINOMA IS MORE COST EFFECTIVE THAN LONG TERM ACTIVE SURVEILLANCE

**Jia Feng Lin**<sup>1</sup>, Pascal Jonker<sup>1</sup>, Stanley Sidhu<sup>2</sup>, Leigh Delbridge<sup>2</sup>, Anthony Glover<sup>2</sup>, Diana Learoyd<sup>3</sup>, Ahmad Aniss<sup>2</sup>, Schelto Kruijff<sup>1</sup>, Mark Sywak<sup>2</sup>

<sup>1</sup>Surgical Oncology, University Medical Center Groningen, <sup>2</sup>Endocrine Surgical Unit, University of Sydney, <sup>3</sup>Department of Endocrinology, University of Sydney

**Background:** Papillary thyroid microcarcinoma (PMC), often diagnosed incidentally, is mostly an indolent type of thyroid cancer. Patients submitted to protocolled total thyroidectomy (TTx) and postoperative radioactive iodine (RAI) ablation may be overtreated. TTx comes with a risk of complication, increased patient burden and health costs. Recent data suggest that PMC maybe treated with active surveillance (AS) rather than immediate surgery and RAI. The aim of this study is to assess survival outcomes and costs of conventional treatment for an Australian PMC cohort and to compare these costs with those of an AS approach.

**Methods:** A prospectively collected surgical cohort of patients treated for papillary thyroid cancer (PTC) between 1985 and 2017 from an Australian tertiary referral center was studied. Only patients with PMC (defined as PTC < 1 cm), known treatment and follow-up data were included for analysis. The primary outcome measure was the cost of surgical treatment and hypothetical AS. Secondary outcome measures included surgical complication rates, type of surgery, disease specific survival (DSS), overall survival (OS) and recurrence free survival (RFS).

**Results:** In total 349 out of 2079 patients fulfilled inclusion criteria. Costs of surgical treatment and hypothetical AS were estimated at a one-time A\$9,041 and a biannually A\$308, respectively. We estimate that the cost of one surgical PMC treatment equals approximately 14.5 years of AS. Mean follow-up was 13.4 months. Permanent complications occurred in 2.6% of the patients; the most prevalent complication was hypocalcaemia (2.3%). The 5-year OS, DSS and RFS were 97%, 100% and 95% respectively. Disease recurrence occurred in 11 (3.2%) patients during follow-up. Around 67% of the PMC patients were treated with postoperative RAI. Postoperative RAI did not reduce recurrence rates ( $P > 0.05$ ).

**Conclusions:** Surgery may have a long term economic advantage for patients who are likely to require more than 14.5 years of follow-up in an AS scheme. Less than 3 percent of patients that undergo total or hemithyroidectomy for PMC have permanent complications. Postoperative RAI has no effect on recurrence rates and might be omitted. Therefore, surgery is a cost-effective and safe treatment option for younger Australian PMC patients.

# ABSTRACTS

## 11. ADHERENCE TO CONSENSUS GUIDELINES FOR SCREENING OF PRIMARY ALDOSTERONISM IN AN UNDERSERVED OUTPATIENT URBAN HEALTH CARE SYSTEM

**Maheshwaran Sivarajah**<sup>1</sup>, Toni Beninato<sup>2</sup>, Thomas J Fahey III<sup>2</sup>

<sup>1</sup>St. Barnabas Hospital, Bronx, <sup>2</sup>NY Presbyterian/Weill Cornell Medical Center

**Background:** Primary aldosteronism (PA) is one of the most common causes of secondary hypertension. Deleterious effects of increased oxidant stress and cardiovascular complications are more common in these patients. Surgical removal of the aldosterone-producing adenoma or medical management with mineralocorticoid receptor-blockers can prevent adverse outcomes. Current guidelines recommend detection by using the plasma aldosterone/renin ratio (ARR) to detect possible PA in specific groups described in the Endocrine Society 2016 clinical practice guidelines. Here we aimed to determine adherence to guidelines for PA screening in an urban non-profit health care system serving an indigent population.

**Methods:** We reviewed records of adult patients in the outpatient setting of an urban health care system between 2013-2017. The ICD 9 and 10 diagnosis codes were used to identify patients meeting the inclusion criteria for screening for PA according to the Endocrine Society 2016 guidelines. The corresponding aldosterone, renin activity and 24hr urine aldosterone values were identified. Multivariate logistic regression was performed on each criterion to determine predictors of screening.

**Results:** There were 129,111 patients seen in the outpatient clinics and 7,175 patients (5.5%) met criteria for PA screening. The mean age of patients meeting criteria was 61 +/- 15.4 years and 57.6% were women. African Americans were the most common ethnic group (3,501; 48.8%) and Medicare (2,803; 39%) and Medicaid (2,626; 36.6%) were the most common insurance providers. The aldosterone-renin ratio (ARR) or 24hr urine aldosterone level was checked in 86 (1.2%) patients; 22 (25.3%) had an ARR>20. Of the 77 patients with "hypertension and an adrenal mass", 14 (18.2%) had ARR checked. On multivariate logistic regression, significant positive predictors for being screened were "patients with 3 elevated blood pressure values" OR 10.13 (95%CI: 5.07-20.25) p<0.001, "hypertension and an adrenal mass" OR 11.98 (95%CI: 4.34-33.09) p<0.001, "hypertension and spontaneous hypokalemia" OR 3.09 (1.32-2.71) p=0.009 and "hypertension and diuretic-induced hypokalemia" OR 5.09 (2.22-11.70) p<0.001.

**Conclusions:** The missed opportunity to diagnose PA represents a significant health care disparity in this underserved community. It is possible that timely identification and treatment of PA in underserved health care populations could ameliorate health care disparities related to hypertension.

# ABSTRACTS

## ◆ 12. SURGICAL RESECTION IN EARLY STAGE PANCREATIC NEUROENDOCRINE TUMORS IN THE UNITED STATES: ARE WE OVER- OR UNDERTREATING PATIENTS?

**Sitaram V Chivukula**<sup>1</sup>, John F Tierney<sup>1</sup>, Martin Hertl<sup>1</sup>, Jennifer Poirier<sup>1</sup>, Xavier M Keutgen<sup>2</sup>

<sup>1</sup>*Surgery, Rush University Medical Center*, <sup>2</sup>*Surgery, University of Chicago*

**Background:** The incidence of pancreatic neuroendocrine tumors (PanNETs) is continuously rising, in part due to the incidental finding of smaller tumors on cross-sectional imaging. Current guidelines suggest that non-operative management should be considered for PanNETs < 2cm. The objective of this study was to evaluate the utilization of surgery for PanNETs < 2cm in the United States, identify factors that influence clinicians to operate, and determine variables associated with survival in early stage PanNETs.

**Methods:** Using the National Cancer Database (2004-2014), 3,243 cases of T1 (<2cm) PanNETs were identified. These cases were broken down into two groups according to size (0-1 cm and 1-2 cm) and lymph node metastases. Additional patient and tumor characteristics were examined. Multivariate models were used to identify factors that predicted failure to undergo surgery and to assess the impact of surgery on patient survival.

**Results:** 75% (753/1,003) of PanNETs measuring 0-1 cm and 80% (1,799/2,240) of PanNETs measuring 1-2cm were resected in this time period. 84 of these were functional PanNETs and 82% (69/84) of those were resected. Variables influencing primary tumor resection on multivariate analysis included presence of positive lymph nodes (OR 3.0-3.6), location of tumor in body/tail of pancreas (OR 1.5), moderately or well-differentiated tumors (OR 2.3-4.9), and surgery at academic centers (OR 1.5). Patients with PanNETs 1-2 cm were more likely to undergo resection than those 0-1 cm (p=0.05), and functional tumors were more likely to undergo resection as well (p=0.05). When looking at 5 year survival rates and controlling for other variables, patients who underwent resection for PanNETs 1-2 cm had longer survival than those who did not have surgery (median follow-up 33.6 months, HR 0.51, CI 0.34-0.75, p<0.001). However, this survival benefit was not confirmed for PanNETs 0-1cm (median follow-up 31.5 months, HR=0.63, CI 0.36-1.11, p=0.11).

**Conclusions:** Contrary to current guideline recommendations, a vast majority of patients with PanNETs < 2cm undergo surgical resection in the United States and multiple factors influence this decision. A survival benefit may be present for surgical resection of PanNETs 1-2 cm, suggesting that current recommendations should perhaps be revised.

# ABSTRACTS

## ◆ 13. MOLECULAR PROFILING DOES NOT SIGNIFICANTLY CONTRIBUTE TO THE DIAGNOSTIC ALGORITHM FOR THE PREDICTION OF MALIGNANCY IN THYROID NODULES

**Bernice L Huang<sup>1</sup>**, John A Chabot<sup>1</sup>, James A Lee<sup>1</sup>, Jennifer H Kuo<sup>1</sup>

<sup>1</sup>*Columbia University Medical Center*

**Background:** The diagnostic algorithm used to predict the malignancy risk of thyroid nodules includes clinical factors, sonographic characteristics, cytopathology findings, and molecular profiling. Altogether, the algorithm can be costly and time-consuming for patients and clinicians. The added value of each diagnostic step of the algorithm has never been fully elucidated. We aimed to evaluate the stepwise contribution of each diagnostic step toward an accurate determination of malignancy.

**Methods:** A single institution, retrospective study of 137 patients who underwent partial or total thyroidectomy was performed. Only dominant nodules with clear pathological correlates were evaluated. Demographic information included age, sex, race, family history of thyroid cancer, radiation exposure, and nodule size. The American Thyroid Association (ATA) 2015 ultrasound risk stratification for each nodule was determined based on the average rating of four experienced sonographers. Descriptive statistics were performed with Wilcoxon rank sum and chi square tests. A baseline logistic regression model for predicting malignancy was regressed on demographic information. In a stepwise fashion, the 1) ATA risk stratification 2) Bethesda classification of FNABs and 3) molecular profiling were added to the baseline model and the statistical significance of the addition of each diagnostic step was analyzed using the likelihood ratio test. Receiver operating characteristic (ROC) curves and area under the curve (AUC) were calculated for each model.

**Results:** Most patients were women (83%) with a median age of 55 years (interquartile range [IQR], 44-66). Median nodule diameter was 3.0cm (IQR, 1.8-4.0). Malignancy rate was 39%, with the majority being papillary carcinoma (85%). The additions of ATA risk stratification and Bethesda classification to preceding models were statistically significant ( $p < .001$ ). The addition of molecular profiling was not significant ( $p = .81$ ). ROC curves of the models showed similar results: AUCs for the baseline model and for models sequentially including ATA stratification, Bethesda classification, and molecular profiling were 0.76, 0.85, 0.91, and 0.91 respectively.

**Conclusions:** The diagnostic algorithm to determine malignancy risk in thyroid nodules involves many steps. Although the use of molecular profiling is increasing, our data suggests that it does not significantly add to our ability to predict malignancy in thyroid nodules.

## ◆ 14. AGGRESSIVE VARIANTS OF PAPILLARY THYROID MICROCARCINOMA ASSOCIATED WITH HIGH-RISK FEATURES, NOT SURVIVAL

**Simon A Holoubek**<sup>1</sup>, Huan Yan<sup>1</sup>, Amna Khokar<sup>1</sup>, Kristine Kuchta<sup>2</sup>, David J Winchester<sup>1</sup>, Richard A Prinz<sup>1</sup>, Tricia A Moo-Young<sup>1</sup>

<sup>1</sup>Endocrine Surgery, NorthShore University HealthSystem, <sup>2</sup>Biostatistics and Research Informatics, NorthShore University Health System

**Background:** Papillary thyroid microcarcinoma (PTMC) is generally associated with excellent survival, and non-operative management has been considered an option for patients with low-risk characteristics. However, the data on presentation and survival in aggressive variants of PTMC microcarcinomas is limited. The purpose of this study is to compare the pathologic presentation and overall survival of classic PTMC (cPTMC) versus aggressive variants of PTMC.

**Methods:** Patients treated for papillary thyroid carcinoma (PTC) between 2004 and 2015 in the National Cancer Database were identified. Inclusion criteria were: Age  $\geq 18$  years, tumor size  $\leq 1.0$ cm, and PTC of either classic variant, tall cell (TC), or diffuse sclerosing (DS) subtypes. Univariate and multivariate analyses were performed to identify associations between key variables. Overall survival was analyzed by Kaplan Meier.

**Results:** There were 82,056 patients with cPTMC, 923 with TC, and 219 with DS. Extrathyroidal extension and nodal involvement was significantly more common in TC and DS when compared to cPTMC ( $p < 0.05$ ). Patients with TC were also more likely than cPTMC to have distant metastatic disease ( $p < 0.05$ ). TC and DS patients were significantly more likely to be treated with total thyroidectomy. Only 78.6% of cPTMC received a total thyroidectomy, as compared to 87.7% for TC and 83.6% for DS ( $p < 0.05$ ). Radioactive iodine was only used as a treatment modality in 26.1% cPTMC patients compared to 48.5% for TC and 45.2% for DS ( $p < 0.05$ ). On multivariate analysis, TC (4.48, 3.99-5.48) and DS (2.81, 1.96-4.03) histology were both found to be an independent predictor of ETE. TC was an independent predictor of positive nodal metastasis (1.56, 1.29-1.90). Despite the aggressive pathologic presentations of TC and DS, there was no difference in overall survival of TC and DS patients when compared to those with cPTMC.

**Conclusions:** Tall cell and diffuse sclerosing variants are associated with more aggressive features as compared to classic papillary microcarcinoma. More aggressive treatment of these subtypes may account for the lack of difference in survival between aggressive subtypes compared to cPTMC.

# ABSTRACTS

## ◆ 15. SHOULD INCIDENTAL MULTIFOCALITY BE AN INDICATION FOR COMPLETION THYROIDECTOMY IN PAPILLARY THYROID CANCER?

**Victoria Harries**<sup>1</sup>, Laura Y Wang<sup>1</sup>, Marlina McGill<sup>1</sup>, Ashok R Shaha<sup>1</sup>, Jatin P Shah<sup>1</sup>, Richard J Wong<sup>1</sup>, R Michael Tuttle<sup>1</sup>, Snehal G Patel<sup>1</sup>, Ian Ganly<sup>1</sup>

<sup>1</sup>Memorial Sloan Kettering Cancer Center

**Background:** Multifocality in papillary thyroid carcinoma (PTC) is common. The aim of this study is to determine whether patients with multifocal disease (MFD), treated with thyroid lobectomy alone, have increased recurrence in the contralateral lobe, regional recurrence and poorer survival.

**Methods:** After IRB approval, patients with PTC treated with thyroid lobectomy from 1993 to 2015 were identified from an institutional database. Patients with surgery other than a lobectomy, T4 or unresectable disease, distant metastases at presentation, and those in whom multifocality could not be determined were excluded. Nine hundred and thirty-five patients were identified. The rates of immediate completion thyroidectomy (defined as performed within 12 month of initial surgery) were similar between groups (38 patients (5.8%) in the unifocal disease (UFD) group versus 17 (6.1%) in MFD group). After excluding patients who had an immediate completion thyroidectomy, 880 patients were included in the outcome analysis, of whom 618 patients (70.2%) had UFD and 262 patients (29.8%) had MFD. Rate of contralateral lobe recurrence, regional recurrence free survival (RRFS) and overall survival (OS) were calculated using the Kaplan-Meier method.

**Results:** With a median follow-up of 49 months, patients with MFD had similar rate of contralateral lobe recurrence to UFD (HR 1.088; 95% CI 0.281 – 4.210). The 5-year rate of contralateral lobe recurrence in the UFD and MFD groups were 0.8% and 1.3%, respectively (p=0.903). Patients with MFD were more likely to develop regional recurrence (5-year RRFS 98.7% versus 100.0% for the MFD and UFD groups, respectively (p=0.027)). Despite this, all patients were salvaged and there were no disease-related deaths in either group. The 5-year OS for the UFD group and MFD group were 96.1% and 95.9%, respectively.

**Conclusions:** Patients with MFD PTC do not appear to have an increased probability of developing contralateral lobe recurrence. In our cohort, there was a marginally increased risk of regional recurrence; despite this, there was no impact on survival. MFD should not be considered as an indication for completion thyroidectomy.



# ABSTRACTS

## ◆ 16. EARLY POST-OPERATIVE THYROGLOBULIN QUANTIFIES RISK OF RECURRENCE IN PAPILLARY THYROID CANCER.

**Jayani Hasula Jayasekara**<sup>1</sup>, Jia Feng Lin<sup>1</sup>, Man-Shun Wong<sup>1</sup>, Ahmad Aniss<sup>1</sup>, Leigh Delbridge<sup>1</sup>, Anthony Glover<sup>1</sup>, Stan Sidhu<sup>1</sup>, Mark Sywak<sup>1</sup>

<sup>1</sup>*University of Sydney Endocrine Surgery Unit, Royal North Shore Hospital*

**Background:** Post-operative follow up of papillary thyroid cancer (PTC) commonly involves serial serum thyroglobulin (Tg) levels. Prior studies have demonstrated a decreased rate of recurrence in PTC in patients with an early post-operative serum Tg<1-2ng/mL. The aim of this study was to determine whether post-operative Tg can quantify the risk of recurrence in PTC.

**Methods:** This study reviewed patients who underwent a total thyroidectomy for PTC >10mm and had complete biochemical data available in the period 2000-2016. All patients had a post-operative stimulated Tg measured within 3 months of total thyroidectomy. Thyroglobulin levels were measured using the Roche e601 assay (since 2014), minimum Tg measurable 0.1ng/mL and Immulite 2000 assay (prior to 2014), minimum Tg measurable 1ng/mL. Median follow-up was 18 months (range 1-181 months). Structural recurrence was defined as disease detected on imaging and confirmed on biopsy. Biochemical recurrence or persistence was defined as serum Tg≥1ng/mL with negative Tg antibodies and no evidence of structural disease.

**Results:** The study group included 503 patients with a mean age of 50 years and mean tumor size of 24mm, 220 (43.7%) patients had stimulated post-operative Tg<1ng/mL, 55 (10.9%) had 1ng/mL≤Tg<2ng/mL and 228 (45.3%) had Tg≥2ng/mL. The overall rate of recurrence for each group was 9%, 30.9% and 59.2% respectively (p<0.0002). For patients with stimulated post-operative Tg<2ng/mL the risk of structural recurrence was 4% compared to 30.3% for those with a Tg≥2ng/mL (p<0.0001). In patients with Tg<0.5ng/ml the total recurrence rate was 6.5%. In addition, 381 (75.7%) patients underwent radioiodine (RAI) ablation post-operatively and 122 (24.3%) had nil post-operative RAI ablation. There was no significant difference in structural recurrence (16.8% vs 13.1%) nor biochemical recurrence or persistence (17.8% vs 19.7%) between these groups.

**Conclusions:** In patients undergoing total thyroidectomy for papillary thyroid cancer, early post-operative stimulated thyroglobulin accurately quantifies the risk of disease recurrence.

# ABSTRACTS

## ◆ 17. THYROGLOBULIN WASHOUT FROM CERVICAL LYMPH NODE FINE NEEDLE ASPIRATION BIOPSIES IN PATIENTS WITH DIFFERENTIATED THYROID CANCER: DEFINING AN OPTIMAL CUT-OFF

**Bora Kahramangil**<sup>1,2</sup>, Emin Kose<sup>1</sup>, Mustafa Donmez<sup>1</sup>, Husnu Aydin<sup>1</sup>, Jordan Reynolds<sup>1</sup>, Vikram Krishnamurthy<sup>1</sup>, Judy Jin<sup>1</sup>, Joyce Shin<sup>1</sup>, Allan Siperstein<sup>1</sup>, Eren Berber<sup>1</sup>

<sup>1</sup>Cleveland Clinic, <sup>2</sup>General Surgery, Cleveland Clinic Florida

**Background:** Thyroglobulin washout (TGW) is frequently used adjunctive to cytology in patients with differentiated thyroid cancer (DTC) undergoing fine needle aspiration biopsy (FNA) of cervical lymph nodes (LN). Although recent American Thyroid Association (ATA) guidelines recommended a cut-off of 1 ng/ml, there remains a confusion about what TGW value should be considered positive. This study aims to investigate the validity of current recommendations and determine an optimal TGW cut-off in follow-up of DTC.

**Methods:** This is an IRB-approved clinical study correlating TGW values with cytology in patients with DTC who underwent FNA of cervical LNs. From an institutional database, patients who underwent LN FNA with concurrent TGW and blood thyroglobulin measurements between 2009-2018 were identified. All TGWs were performed by diluting leftover FNA aspirate in 5 cc of saline. LNs with malignant cytology were resected and metastatic involvement confirmed pathologically. LNs with benign cytology were followed up for at least 6 months with ultrasound and tumor markers to confirm benign nature. ROC curves were constructed to determine the optimal cut-offs of absolute TGW level and TGW/blood thyroglobulin ratio to diagnose LN recurrence.

**Results:** 58 patients underwent 71 FNAs of suspicious cervical LNs (21 in central, 50 in lateral neck compartments) during follow-up. 47 LNs were found to be metastatic, while 24 proved benign. One patient had a pathologically confirmed LN metastasis despite a TGW of 0. Sensitivity, specificity, positive predictive value, negative predictive value, and accuracy of the ATA cut-off of 1 ng/ml to diagnose nodal recurrence were 94%, 88%, 94%, 88%, and 92%, respectively. ROC curve revealed that 2.8 ng/ml was the optimal TGW level to diagnose LN metastasis (94% sensitive, 96% specific). Optimal cut-off for TGW/blood thyroglobulin ratio was 14.6 (85% sensitive, 100% specific). Overall, absolute TGW level proved superior to TGW/blood thyroglobulin in predicting nodal recurrence.

**Conclusions:** This study suggests that a revision of the TGW cut-off to 2.8 ng/ml from the currently recommended value of 1.0 ng/ml in LN FNAs would increase the specificity without decreasing sensitivity in detecting recurrence from differentiated thyroid cancer. Overall, absolute TGW level was more accurate than TGW/blood thyroglobulin ratio for predicting nodal recurrence.

# ABSTRACTS

## ◆ 18. IS THERE A METHOD TO THE MADNESS? EXAMINING THE SURGICAL APPROACH AND OUTCOMES OF LAPAROSCOPIC ADRENALECTOMY AMONG CESQIP SURGEONS

**Annette Marie Pascual Marrero**<sup>1</sup>, Hadiza Kazaure<sup>1</sup>, Samantha Thomas<sup>2</sup>, Michael Stang<sup>1</sup>, Randall Scheri<sup>2</sup>

<sup>1</sup>Endocrine Surgery, Duke University, <sup>2</sup>Duke University

**Background:** Laparoscopic adrenalectomy can be performed using a transabdominal (TA) or posterior retroperitoneal approach (PRA). Choosing the optimal approach can be challenging. Multi-institutional level data describing the characteristics and outcomes of patients undergoing these operative approaches are scarce.

**Methods:** Adult patients undergoing TA or PRA were selected from the Collaborative Endocrine Surgery Quality Improvement Program (CESQIP, 2014-18). Bivariate analyses were used to compare patient characteristics and outcomes for TA vs. PRA. Outcomes included conversion to open procedure, capsular disruption, and  $\geq 1$  complications. The effect of operative approach on the incidence of  $\geq 1$  complication was determined using univariate and multivariate techniques.

**Results:** Among 833 patients who underwent laparoscopic adrenalectomy, 539 (64.7%) underwent TA and 294 (35.3%) PRA. Median age was 54 years. Patients who underwent PRA were more likely to have BMI  $\leq 40$  (89.8% vs. 81.8%,  $p=0.001$ ). The most prevalent diagnoses for PRA were hyperaldosteronism, pheochromocytoma, and non-functioning nodule vs. pheochromocytoma, hyperaldosteronism, and Cushing's syndrome for TA. Patients undergoing PRA were more likely to have smaller (median 2.4 vs. 3.2cm,  $p<0.001$ ) and right-sided nodules (46.6% vs. 36.9%,  $p=0.02$ ). PRA was associated with a lower conversion to open procedure (0.7% vs. 4.1%,  $p=0.004$ ), and shorter length of stay (1 day: 73.8% vs. 49.5%,  $p<0.001$ ). However, PRA was associated with a higher rate of capsular disruption (12.6% vs 7.6%,  $p=0.02$ ); among PRA with capsular disruption, the median nodule size was 2.2cm, and 16.2% were for metastatic disease. Overall, PRA was associated with a lower complication rate (3.1% vs. 8.7%,  $p=0.002$ ). In unadjusted analysis, patients who underwent PRA were less likely to develop  $\geq 1$  complication (OR=0.42, 95% CI 0.19-0.96,  $p=0.04$ ), however after multivariate adjustment, there was no statistical difference in complication rate between both procedures (OR=0.47, 95% CI 0.20-1.12,  $p=0.09$ ).

**Conclusions:** CESQIP surgeons are selective in choosing PRA. Difference in complication risk was insignificant in adjusted analyses, however, our study revealed a higher rate for capsular disruption during PRA even for small tumors. Therefore, the decision to choose PRA, particularly for malignant tumors should be carefully weighed. Contrary to published data, our study suggests that PRA should not be generalized and should be used only in select cases.

# ABSTRACTS

## ◆ 19. DEFINING THE COMPETENCIES FOR LAPAROSCOPIC TRANSABDOMINAL ADRENALECTOMY: AN INVESTIGATION OF INTRA-OPERATIVE BEHAVIORS AND DECISIONS OF EXPERTS

**Amin Madani**<sup>1</sup>, Karan Grover<sup>1</sup>, Jennifer H Kuo<sup>1</sup>, Barbara Miller<sup>2</sup>, Quan-Yang Duh<sup>3</sup>, Wen Shen<sup>3</sup>, Masha Livhits<sup>4</sup>, Philip W Smith<sup>5</sup>, Toni Beninato<sup>6</sup>, Rebecca S Sippel<sup>7</sup>, Elliot J Mitmaker<sup>8</sup>, James A Lee<sup>1</sup>

<sup>1</sup>*Surgery, Columbia University*, <sup>2</sup>*Surgery, University of Michigan*, <sup>3</sup>*Surgery, University of California - San Francisco*, <sup>4</sup>*Surgery, University of California - Los Angeles*, <sup>5</sup>*Surgery, University of Virginia*, <sup>6</sup>*Surgery, Cornell University*, <sup>7</sup>*Surgery, University of Wisconsin*, <sup>8</sup>*Surgery, McGill University*

**Background:** Safe performance of laparoscopic transabdominal adrenalectomy (LTA) requires the application of a complex body of knowledge and skills, which are difficult to define, teach and measure. This qualitative study aims to define and characterize expert behaviors, decisions and other cognitive processes required to perform LTA.

**Methods:** Hierarchical and cognitive task analyses for right and left LTA were performed using semi-structured interviews and field observations of experts to describe the thoughts and behaviors that exemplify optimal performance. Verbal data was recorded, transcribed verbatim, supplemented with published literature, coded and thematically analyzed using a constructivist grounded-theory approach by two independent reviewers. This was iteratively elaborated until data reached saturation.

**Results:** A conceptual framework was synthesized based on 10 interviews (median 53 minutes [46-63]), 5 adrenalectomies and 9 literary sources (5 book chapters, 4 online videos). Sixty tasks (Right: 52; Left: 55), 55 cognitive behaviors and 84 potential errors were identified and categorized into 8 procedural steps and 6 fundamental principles: anticipation, establishing exposure, identifying safe planes, considering oncologic principles, tactical modification, and error recovery. Experts unanimously reported the importance of creating a 3D mental model of the anatomy/pathology (e.g. aberrant vessels, tumor location) that is consistently fine-tuned throughout the operation, with conscious awareness of danger zones (e.g. "medial arc" surrounding the adrenal/periadrenal fat). Surgeons described methods to optimize exposure and accentuate safe planes, such as using gravity and dynamic traction/counter-traction via pushing, pulling and lifting maneuvers in the axis of areolar and fibrous attachments. Despite variations in dissection techniques, experts highlighted two themes: "macrodissection" (large sweeping motions) and "microdissection" (fine dissection of thin layers), with emphasis on non-linear motions and effective transitions between the two when appropriate. Surgeons stressed the importance of tactical modification when faced with failure of progression, hemorrhage, suboptimal exposure, and loss of bearings. Teamwork and effective communication were also consistently described as essential for avoiding and managing physiologic changes, or to coordinate contingency plans when required.

**Conclusions:** This study defines behaviors and competencies that are essential to performing LTA effectively and safely. This framework may serve as the basis for educational curricula, assessment tools, self-reflection, coaching and quality-control metrics.

## ◆ 20. OBESITY IS ASSOCIATED WITH NON-LOCALIZING IMAGING IN PRIMARY ALDOSTERONISM

**Victoria M Gershuni**<sup>1</sup>, Daniel S Herman<sup>2</sup>, Rachel R Kelz<sup>1</sup>, Robert E Roses<sup>1</sup>, Debbie L Cohen<sup>3</sup>, Scott O Trerotola<sup>4</sup>, Douglas L Fraker<sup>1</sup>, Heather Wachtel<sup>1</sup>

<sup>1</sup>Department of Surgery, Division of Endocrine and Oncologic Surgery, University of Pennsylvania, <sup>2</sup>University of Pennsylvania, <sup>3</sup>Department of Medicine, University of Pennsylvania, <sup>4</sup>Department of Interventional Radiology, University of Pennsylvania

**Background:** Primary aldosteronism (PA) is the most common etiology of secondary hypertension. However, due to the high rates of concomitant hypertension in obesity, obese patients may have unrecognized PA. We hypothesize that obesity may impact the rate of diagnosis and likelihood of surgical management for patients with PA.

**Methods:** We conducted a retrospective cohort analysis of patients with PA (1997-2017) who underwent adrenal vein sampling (AVS). Patients were classified by body mass index as obese (BMI $\geq$ 35) or non-obese (BMI $<$ 35). Primary outcome was change in blood pressure measurements and anti-hypertensive medications (by WHO Defined Daily Dose). Secondary outcome was clinical resolution determined by previously published PASO criteria.

**Results:** Of 418 PA patients who underwent AVS, over 35% (n=131) were classified as obese (mean BMI 40.1 vs. 28.7 kg/m<sup>2</sup>, p $<$ 0.001). The majority of the obese group were male (67.9 vs. 56.1%, p=0.02) and presented at a younger age (51.4 vs. 54.4 years old, p=0.008). Patients with higher BMI had greater number of pre-operative anti-hypertensive medications (6.7 vs. 5.7, p=0.04). There was no difference between duration of hypertension (10 years for both, p=0.90), baseline comorbidities, or biochemical presentation (plasma aldosterone, renin, or aldosterone:renin ratio). Significantly, obese patients were less likely to have evidence of an adrenal tumor on imaging (67.9 vs. 78.1%, p=0.03), although rates of lateralizing AVS were comparable between groups (74.6 vs. 77.3%, p=0.55). Among the 285 patients who underwent adrenalectomy, the median tumor size was significantly smaller in the obese patients (1.1 vs. 1.5 cm, p=0.014). While both groups were able to eliminate medication use, the obese group trended toward higher mean arterial pressure (99.6 vs. 96.1 mm Hg, p=0.07) at long-term follow-up.

**Conclusions:** Obese patients with PA may have smaller tumors, and imaging may be less helpful for identifying an adrenal mass. AVS is essential in these patients, as it may prevent them from being falsely classified as non-surgical candidates. Although both obese and non-obese patients benefitted substantially from adrenalectomy, obese patients had persistent hypertension which may reflect underlying essential hypertension.

# ABSTRACTS

## ◆ 21. COMPARISON BETWEEN FUNCTIONAL AND NON-FUNCTIONAL ADRENO-CORTICAL CARCINOMA

**Alaa Sada**<sup>1</sup>, Malke Asaad<sup>2</sup>, Katherine A Bews<sup>3</sup>, Geoffrey B thompson<sup>1</sup>, David R Farley<sup>1</sup>, Benzon M Dy<sup>1</sup>, Melanie L Lyden<sup>1</sup>, Elizabeth B Habermann<sup>3</sup>, Travis J Mckenzie<sup>1</sup>

<sup>1</sup>General Surgery, Mayo Clinic, <sup>2</sup>Mayo Clinic, <sup>3</sup>Surgical Outcomes Program, Kern Center for the Science of Health Care Delivery., Mayo Clinic

**Background:** While roughly half of adrenocortical Carcinomas (ACC) present with manifestations of clinical or subclinical hormone hypersecretion, whether functional status impacts outcomes remains controversial. We sought to compare survival between functional and nonfunctional neoplasms.

**Methods:** All adult patients diagnosed with ACC at our institution between 1997 and 2017 were identified. Patients who underwent hormonal assessments were included. Demographics, tumor characteristics, TNM stages and outcomes were analyzed using Chi-square and Wilcoxon Rank Sum tests. Survival was assessed using Kaplan-Meier analysis and univariate and multivariable Cox proportional hazards regression.

**Results:** A total of 266 patients were identified. Patients presented with stage I (6%), stage II (33%), stage III (26%), and stage IV disease (32%); stage was unknown in 3%. Left-sided neoplasms were more common (56%). Grade was reported in 29% of patients, with 32% of tumors being grade I/II and 68% grade III/IV. Average neoplasm size was 12±6 cm. Fifty-three percent (n=140) of tumors were found to be functional. Among these, isolated cortisol secretion was the most common presentation (48%), followed by mixed hormone secretion (25%), isolated sex hormone secretion (19%), and aldosterone secretion (8%). Patients with functional ACC were younger (49±16 vs 54±14, p=0.02) and more likely to be female (69% vs 51%, p=0.002). There was no difference in laterality, neoplasm size or grade between functional and nonfunctional neoplasm (P>0.05). However, functional ACC were more likely to present with metastatic disease vs nonfunctional (41% vs 21%, p=0.001). Surgical resection was performed in 77% of patients. When comparing 30-day morbidity between functional and nonfunctional ACC, there was no significant difference in incidence or severity. The median overall survival (OS) was 35 months. Overall survival was better for nonfunctional ACC (median 66 vs 22 months, p=0.01). On multivariable analysis, functional ACC was associated with worse survival after adjusting for age, sex, grade, stage and resection HR=1.5 (95% CI, 1.04-2.14, p=0.03).

**Conclusions:** Approximately half of ACC present with either isolated or mixed hormone secretion. While short term morbidity after resection of ACC was similar between nonfunctional and functional variants, long term survival was worse for patients with functional tumors.

# ABSTRACTS

## ◆ 22. ADRENOCORTICAL TUMORS HAVE A DISTINCT LONG NON-CODING RNA EXPRESSION PROFILE AND LINC00271 IS A PROGNOSTIC MARKER IN ADRENOCORTICAL CARCINOMA

**Floryne O Buishand**<sup>1,2</sup>, Yi Liu-Chittenden<sup>2</sup>, Yu Fan<sup>2</sup>, Sudheer Gara<sup>2</sup>, Dhaval Patel<sup>2</sup>, Amit Tirosch<sup>2,3</sup>, Daoud Meerzaman<sup>2</sup>, Electron Kebebew<sup>2,4</sup>

<sup>1</sup>University of Edinburgh, <sup>2</sup>National Cancer Institute, <sup>3</sup>Sheba Medical Center, <sup>4</sup>Stanford University

**Background:** Adrenocortical carcinoma (ACC) is an aggressive malignancy with a low but variable overall survival rate. Even after complete tumor resection, over half of patients develop recurrent disease. Long noncoding RNAs (lncRNAs) have been found to be involved in cancer initiation/progression and as markers of cancer prognosis. The role of lncRNAs in ACC is poorly understood. Thus, in this study we performed lncRNA expression profiling in ACC, adrenocortical adenoma (ACA) and normal adrenal cortex (NAC).

**Methods:** Total RNA was extracted from fresh frozen tissue samples (11 ACA, nine ACC and five NAC samples) with histopathological confirmed diagnosis. ArrayStar Human lncRNA/mRNA Expression Microarray V3.0 was used for transcriptome analysis. Differentially expressed lncRNAs were validated using TaqMan real-time quantitative PCR in a validation cohort including an additional 10 ACCs. The ACC dataset from the Cancer Genome Atlas (TCGA) project was used to evaluate the prognostic utility of lncRNAs found to be differentially expressed in ACC. Survival curves were plotted by Kaplan-Meier analysis, and differences in survival rates were assessed using a log-rank test.  $P < 0.05$  was considered significant. Gene Set Enrichment Analysis (GSEA) was performed to identify lncRNA-associated biological signaling pathways.

**Results:** Unsupervised hierarchical and heat map clustering showed distinct clustering of ACC samples compared with NAC and ACA samples by lncRNA expression profiles. A total of 874 lncRNAs were differentially expressed between ACC and NAC, including known carcinogenesis-related lncRNAs such as HOTTIP, HOXA11-AS1, CRNDE, LINC00271 and TBXAS1. One thousand seventy-six lncRNAs were differentially expressed between ACC and ACA. LINC00271 was a prognostic marker, with patients with low LINC00271 expression surviving significantly shorter than patients with a high LINC00271 expression. Median survival time (MST) for the low-expression group was 1788 days, whereas the MST was not reached for the high-expression group ( $P < 0.019$ ). Importantly, low LINC00271 expression was positively associated with WNT signaling pathway, cell cycle, and regulation of chromosome organization.

**Conclusions:** ACC has a distinct lncRNA expression profile. LINC00271 is a prognostic marker in ACC and is involved in biological pathways commonly dysregulated in ACC.



# ABSTRACTS

## ◆ 23. A NOVEL HEAT SHOCK PROTEIN 90 INHIBITOR POTENTLY TARGETS ADRENOCORTICAL CARCINOMA TUMOR SUPPRESSION VIA ALTERATION OF LONG NON-CODING RNA EXPRESSION

Ton Wang<sup>1</sup>, Chitra Subramanian<sup>1</sup>, Brian Blagg<sup>2</sup>, Mark S Cohen<sup>1</sup>

<sup>1</sup>Surgery, University of Michigan, <sup>2</sup>Medicinal Chemistry, University of Notre Dame

**Background:** Adrenocortical carcinoma (ACC) is an aggressive malignancy with poor survival in advanced disease. Recent studies demonstrate that long noncoding RNAs (lncRNAs) are mutated in ACCs compared to normal adrenal cells and effect genes responsible for tumor suppression, cellular homeostasis, survival, and metastasis. We hypothesize that a novel, more potent c-terminal heat shock protein 90 (Hsp90) inhibitor (KU758) targets ACC tumor suppression more effectively via alteration of lncRNA expression.

**Methods:** Validated ACC cell lines SW13, RL251, and NCI-H295R were grown in 2D culture. Cell viability after treatment with KU758 was measured by MTS assay. NCI-H295R cells were treated with 0.5- 1.0  $\mu$ M KU758 and 1.0  $\mu$ M 17-AAG (N-terminal Hsp90 inhibitor) for 24 hours. RNA was extracted from the treated cells, normalized by NanoDrop, and converted to cDNA. lncRNA expression analysis using SYBR Green qPCR was performed. Data analysis was by Qiagen.

**Results:** KU758 potently inhibits ACC cell proliferation with IC<sub>50</sub> values as low as 0.6  $\mu$ M after 72h treatment versus 6.8  $\mu$ M for normal fibroblast cells. After treatment of NCI-H295R cells with KU758, there was a statistically significant (greater than 2 fold; p<0.01) downregulation in the oncogenic lncRNAs AFAP1-AS, BCAR4, LSINCT5, BANCR, CRNDE, and UCA, and upregulation in the tumor suppressing lncRNA TUG1 compared to control. Treatment with 17-AAG did not cause any significant change in the lncRNAs affected by KU758 treatment except CRNDE (also decreased), while treatment with 17-AAG caused a statistically significant decrease (p<0.01) in the oncogenes KRASP1, LINC00152, LINC00963, LUCAT1, and PVT1 and upregulation in the tumor suppressors TUG1 and TUSC7. Treatment with 1.0  $\mu$ M 17AAG also significantly adversely increased the oncogenes CBR3-AS1, GACAT1, SUMOIP3 and decreased the tumor suppressor PTENP1 compared to treatment with KU758.

**Conclusions:** This is the first study demonstrating that Hsp90 inhibitors are able to significantly alter lncRNA expression in ACC cells. The novel C-terminal inhibitor KU758 appears to have greater specificity for ACC compared to the N-terminal inhibitor 17-AAG and also lacks adverse upregulation of several oncogenes observed with 17AAG that could lead to tumor growth and spread. Further translational characterization with siRNA-mediated knockdowns and in vivo efficacy studies are warranted to validate this promising new therapeutic.



# ABSTRACTS

## 24. ENERGY LEVEL AND FATIGUE AFTER THYROID SURGERY FOR THYROID CANCER: A POPULATION-BASED STUDY ON PATIENT-REPORTED OUTCOMES

**David T Hughes**<sup>1</sup>, David Reyes-Gastelum<sup>2</sup>, Kevin Kovatch<sup>3</sup>, Ann S Hamilton<sup>4</sup>, Kevin C Ward<sup>5</sup>, Megan Haymart<sup>2</sup>

<sup>1</sup>*Surgery, University of Michigan*, <sup>2</sup>*Internal Medicine, University of Michigan*, <sup>3</sup>*Otolaryngology, University of Michigan*, <sup>4</sup>*Keck School of Medicine of University of Southern California*, <sup>5</sup>*Rollins School of Public Health, Emory University*

**Background:** Patients often report poor energy after thyroid surgery. The aim of this study was to quantify the incidence and factors associated with patient-reported lack of energy and fatigue following thyroid surgery for differentiated thyroid cancer(DTC).

**Methods:** Patients diagnosed with DTC from 2014-2015 included in the Georgia and Los Angeles Surveillance, Epidemiology, and End Results(SEER) cancer registries were surveyed by mail approximately 2.5 years after their initial diagnosis. Patients' survey data was linked to their SEER data. Multivariable regression analysis with odds ratio(OR) and 95% confidence interval(CI) was performed to determine patient variables predictive of change in energy level and fatigue severity after thyroid surgery.

**Results:** Of 2632 respondents (63% response rate), 2584 were included (48 excluded for not having surgery). The mean age was 50.4 years, 2005(77.6%) were female, 1780(68.9%) were AJCC-7 Stage 1, and 2407(93.2%) had papillary thyroid cancer. Surgery included total thyroidectomy with lymph node removal (1275[49.3%]), total thyroidectomy (990[38.3%]), and thyroid lobectomy (319[12.3%]). Radioiodine therapy was delivered in 1465(57.6%) and thyroid hormone suppression in 1296(51.5%). Over a third, 988(38.2%), reported much worse or somewhat worse energy level compared to before surgery and 1310(50.7%) rated their fatigue as very severe, severe, or moderate. Reports of weight gain 934(36.1%), low mood 860(33.3%), voice changes 718(27.8%) and low calcium 598(23.1%) for >3 months were also common. The following characteristics were related to a higher likelihood to report worse energy following thyroid surgery: age <45 years old, receiving radioiodine (OR 1.31[CI1.10-1.56]), thyroid hormone suppression (OR 1.48[CI1.21-1.82]), having depression before surgery (OR 1.34[CI1.07-1.67]), and reporting low calcium after surgery (OR 1.26[CI1.02-1.54]). Variables related to reporting of significant fatigue included: age <45 years old, thyroid hormone suppression (OR1.63[CI1.34-1.99]), one (OR 1.43[CI1.17-1.75]) or ≥2 (OR 2.25[CI1.71-2.97]) comorbidities, and depression prior to surgery (OR 2.34[CI1.85-2.95]). There were no significant correlations of reports of either fatigue or worse energy with extent of thyroid surgery or voice complaints.

**Conclusions:** Over a third of patients report worsening of energy levels following thyroidectomy for DTC and more than half report significant fatigue. These findings underscore the importance of informing patients of the potential impact of thyroid cancer treatment.

# ABSTRACTS

## 25. SELF-ASSESSMENT OF THE VOICE AFTER TOTAL THYROIDECTOMY USING VHI QUESTIONNAIRES. RESULTS OF A PROSPECTIVE STUDY

Frédéric Borel<sup>1</sup>, Christophe Tresallet<sup>2</sup>, Antoine Hamy<sup>3</sup>, Muriel Mathonnet<sup>4</sup>, Jean-Christophe Lifante<sup>5</sup>, Laurent Brunaud<sup>6</sup>, Olivier Marret<sup>7</sup>, Cécile Caillard<sup>8</sup>, Florent Espitalier<sup>9</sup>, Fabrice Menegaux<sup>2</sup>, Jean-Benoit Hardouin<sup>10</sup>, Claire Blanchard<sup>11</sup>, **Eric Mirallie**<sup>12</sup>

<sup>1</sup>*Clinique de Chirurgie Digestive et Endocrinienne, Hôtel Dieu, CHU Nantes, Place Alexis Ricordeau, 44093 Nantes CEDEX 1, France.*, <sup>2</sup>*Chirurgie Générale, Viscérale et Endocrinienne, Hôpital Pitié-Salpêtrière, AP-HP, Sorbonne Universités Pierre et Marie Curie (Paris 6)*, <sup>3</sup>*Chirurgie digestive et endocrinienne, CHU Angers*, <sup>4</sup>*Chirurgie digestive, générale et endocrinienne, CHU de Limoges*, <sup>5</sup>*Chirurgie générale, endocrinienne, digestive et thoracique, Centre Hospitalier Lyon-Sud*, <sup>6</sup>*Service de chirurgie digestive, hépato-biliaire, et endocrinienne, CHU Nancy - Hôpital de Brabois*, <sup>7</sup>*Chirurgie Vasculaire, CHD Vendée*, <sup>8</sup>*Clinique de Chirurgie Digestive et Endocrinienne, Hôtel Dieu, CHU Nantes*, <sup>9</sup>*Oto-Rhino-Laryngologie, Hôtel Dieu, CHU Nantes*, <sup>10</sup>*Plateforme de Méthodologie et de Biostatistique – DRCi, Faculté de Médecine et Pharmacie*, <sup>11</sup>*Clinique de Chirurgie Digestive et Endocrinienne, CHU Nantes*, <sup>12</sup>*Nantes University Hospital*

**Background:** Post thyroidectomy voice disorders are probably the most frequent complication after thyroidectomy. We report the long-term voice quality outcomes after total thyroidectomy using a simple self-assessment tool; the voice handicap index (VHI) self-questionnaire.

**Methods:** This observational prospective multicenter study (ClinicalTrial NCT02167529) included 800 patients, who underwent total thyroidectomy between 2014 and 2017 in 7 Hospitals. Exclusion criteria included confirmed extended malignant disease, age <18 years, and preoperative voice disorders with confirmed vocal cord palsy (VCP). All patients filled in pre- and postoperative VHI questionnaires (month-2 and month-6). The VHI questionnaire includes 30 items, scored on a 5-point scale. The higher the score (maximum 120 points), the more impaired the voice quality is. A difference  $\geq 18$  points is considered as clinically significant.

**Results:** Eight hundred patients were analyzed. Mean VHI scores were  $7.0 \pm 11.9$  preoperatively,  $13.6 \pm 19.8$  at month-2,  $8.6 \pm 14.5$  at month-6. All differences were statistically significant;  $p < .0001$  for pre versus month-2,  $p = .004$  for pre versus month-6,  $p < .0001$  for month-2 versus month-6. Thirty-six patients (4.5%) presented with a postoperative VCP. VHI score was significantly impaired in patients with VCP compared to those without VCP at month-2 ( $24.8 \pm 29.2$  versus  $13.0 \pm 19.0$ ;  $p < .0001$ ) and postoperative month-6 ( $13.5 \pm 22.6$  versus  $8.3 \pm 13.8$ ;  $p = .044$ ). In patients with no VCP, VHI scores were  $7.0 \pm 11.2$  preoperatively,  $13.0 \pm 19.0$  at month-2, and  $8.3 \pm 13.8$  at month-6. All differences were statistically significant;  $p < .0001$  for pre versus month-2, for pre versus month-6 and for month-2 versus month-6. Among patients without postoperative VCP, 18.8% and 8.5% still described clinically relevant voice impairment ( $\geq 18$  points) on postoperative month-2 and month-6. There was no difference between month-2 VHI score in patients without VCP and month-6 VHI score in patients with VCP ( $p = .879$ ). VCP ( $p = .02$ ) and thyroid weight ( $p = .008$ ) only were associated with increased risk of postoperative voice impairment.

**Conclusions:** Postoperative VCP significantly impairs patients' voice quality perception after thyroidectomy. Even without VCP, patients described an impaired voice. Evaluation of the voice was similar in non-VCP patients at 6 months and in VCP patients at 2 months. One out five patients with no postoperative VCP still experienced post thyroidectomy voice disorders at month-2.

# ABSTRACTS

## ◆ 26. SAME-DAY DISCHARGE IS NOT ASSOCIATED WITH INCREASED READMISSION OR COMPLICATION RATES FOLLOWING THYROIDECTOMY

Q Lina Hu<sup>1,2</sup>, Masha J Livhits<sup>1</sup>, Clifford Y Ko<sup>1,2</sup>, Michael W Yeh<sup>1</sup>

<sup>1</sup>Department of Surgery, University of California, Los Angeles, <sup>2</sup>American College of Surgeons

**Background:** Overnight hospitalization following thyroidectomy has been a widely adopted practice due to concern for complications such as hypocalcemia and hematoma. The objective of this study was to examine the safety of same-day discharge after thyroidectomy using a national, clinically validated registry containing thyroidectomy-specific outcome measures.

**Methods:** The American College of Surgeons National Surgical Quality Improvement Project (ACS NSQIP) Targeted Thyroidectomy database was used to identify patients who underwent thyroidectomy from January 1, 2016 to December 31, 2017. Patients who underwent radical neck dissection or whose length of stay was greater than 3 days were excluded. A 1:1 propensity score match was used to match patients who were discharged on postoperative day (POD) 0 and those discharged on POD 1 or 2. The primary outcome was 30-day readmission and secondary outcomes included thyroidectomy-specific complications (hypocalcemia, neck hematoma, and recurrent laryngeal nerve [RLN] injury). Multivariable logistic regression models were constructed to assess the association between discharge timing and postoperative outcomes.

**Results:** Of the 10,502 patients, 2776 (26.4%) were discharged on POD 0 and 7726 (73.6%) were discharged on POD 1 or 2. Patient characteristics predictive of same-day discharge included younger age, white race, lower ASA class, independent functional status, and lack of comorbidities. Operative characteristics predictive of same-day discharge included lobectomy, benign indication, central neck dissection, vessel sealant device use, intraoperative RLN monitoring, and lack of postoperative drain use. Following propensity score matching, 1976 matched pairs were created. In this matched cohort, the rates of readmission were similar when comparing patients discharged on POD 0 to those discharged on POD 1 or 2 (adjusted odds ratio [aOR] 1.29, 95% confidence interval [CI] 0.83-2.03). Likewise, no statistically significant differences were found in the rates of surgical site infection (aOR 0.78, 95% CI 0.34-1.73), clinically severe hypocalcemia (aOR 0.99, 95% CI 0.56-1.75), neck hematoma (aOR 1.08, 95% CI 0.57-2.06), or RLN injury (aOR 0.74, 95% CI 0.54-1.01).

**Conclusions:** In a national cohort of patients undergoing thyroidectomy, same-day discharge was not associated with higher readmission or complication rates when compared with discharge 1 or 2 days after surgery.

# ABSTRACTS

## 27. MORBIDITY IN PATIENTS WITH PERMANENT HYPOPARATHYROIDISM AFTER TOTAL THYROIDECTOMY

**Anders OJ Bergenfelz**<sup>1</sup>, Erik Nordenström<sup>2</sup>, Martin Almqvist<sup>2</sup>

<sup>1</sup>*Department of Clinical Sciences, Lund University,* <sup>2</sup>*Department of Surgery, Skåne University Hospital*

**Background:** Permanent hypoparathyroidism is common after thyroidectomy. The present study evaluated the risk for morbidity in patients operated with total thyroidectomy for benign disease with and without permanent hypoparathyroidism.

**Methods:** Data was retrieved from the Scandinavian Quality Register for Thyroid, Parathyroid and Adrenal Surgery and cross-linked with the Swedish National Prescription Registry for Pharmaceuticals, the National Data Inpatient Registry, and Causes of Death Registry. Patients with benign thyroid disease were included. Permanent hypoparathyroidism was defined as treatment with active Vitamin D for more than 6 months after thyroidectomy. Analyzed morbidity was evaluated by multivariable Cox's regression analysis and presented as Hazard ratio (HR) and 95 % confidence interval.

**Results:** There were 4828 patients. The mean (s.d.) follow up was 4.5 (2.4) years. Some 239 (5.0 %) patients medicated for permanent hypoparathyroidism. Patients with permanent hypoparathyroidism had an increased risk for renal insufficiency, HR 4.88 (2.00-11.95), and an increased risk for any malignancy, HR 2.15 (1.08-4.27). Patients with permanent hypoparathyroidism with known cardiovascular disease at the time of thyroidectomy, had an increased risk for cardiovascular events during follow-up, HR 1.88 (1.02-3.47).

**Conclusions:** Patients with permanent hypoparathyroidism after total thyroidectomy have an increased risk of long-term morbidity. These results are a cause of great concern.

# ABSTRACTS

## 28. AUTOFLUORESCENCE IMAGING OF PARATHYROID GLANDS: AN ASSESSMENT OF POTENTIAL INDICATIONS

Emin Kose<sup>1</sup>, Bora Kahramangil<sup>1</sup>, Edwina Moore<sup>1</sup>, Husnu Aydin<sup>1</sup>, Mustafa Donmez<sup>1</sup>, Vikram Krishnamurthy<sup>1</sup>, Allan Siperstein<sup>1</sup>, **Eren Berber<sup>1</sup>**

<sup>1</sup>*Cleveland Clinic*

**Background:** Although autofluorescence (AF) imaging of parathyroid glands (PG) has been described, there are concerns about its reliability and ideal applications. Furthermore, studies have reported a subjective assessment without a pathologic confirmation of all PGs assessed. The aim of this study is to determine the accuracy of AF to detect PGs and potential indications in thyroid and parathyroid surgery by doing an AF –pathologic correlation.

**Methods:** This is an IRB-approved prospective study of patients undergoing thyroidectomy and parathyroidectomy with AF imaging. Initially, AF characteristics of PGs versus thyroid and other central neck soft tissues were quantified. Based on this distinction, each specimen that was sent to pathology was inspected with this imaging and predicted to be parathyroid versus non-parathyroid tissue. This prediction was correlated with pathology. Ability to detect PGs before surgical dissection and on thyroidectomy specimens incidentally was also assessed. Normalized autofluorescence intensities (PG AF / measured background intensity) were compared using paired-samples t-test. ROC curve was constructed.

**Results:** 310 patients underwent parathyroidectomy (n=137), total thyroidectomy (n=139) and thyroid lobectomy (n=34). Autofluorescence was demonstrated in 947 (98%) of 971 PGs, with 228 (23%) identified with AF before dissection. Mean AF intensities of parathyroid, thyroid, and other central neck tissues (soft tissue, thymus, muscle, lymph node) were 1.73, 1.38, and 1.43, respectively (p=0.003). There were 550 specimens that were imaged with AF first and then sent to pathology. For these samples, sensitivity, specificity, positive predictive and negative predictive values to predict parathyroid tissue were 93.9%, 97.1%, 94.9% and 96.6%, respectively. False positive and false negative rates were 2% each. In 7% (n=12/173) of thyroidectomy specimens, incidentally resected, visually not suspected PGs were identified with AF, leading to implantation. In patients with parathyroid disease and negative preoperative localization, 30% of glands were recognized with AF before dissection.

**Conclusions:** In this large prospective evaluation with pathologic confirmation, the accuracy of AF to identify PGs was high. Potential utilities seems to be in (1) prediction of PG location before dissection, (2) facilitation of PG identification in patients with parathyroid disease and negative localization and (3) assessment of thyroidectomy specimens for incidental parathyroidectomy.

# ABSTRACTS

## ◆ 29. META-ANALYSIS: ACTIVE SURVEILLANCE FOR LOW RISK PAPILLARY THYROID CARCINOMA

**Bianka Saravana-Bawan**<sup>1</sup>, Amandeep Bajwa<sup>1</sup>, Todd McMullen<sup>1</sup>

<sup>1</sup>*Department of Surgery, University of Alberta*

of active surveillance criteria to include tumors up to 1.5cm.

**Background:** The incidence of thyroid cancer has been increasing, particularly papillary thyroid carcinomas (PTC) of size < 2cm. The majority of this increase is thought to be due to incidental findings on imaging. Because of the relatively indolent nature of PTC, active surveillance (AS) has been proposed rather than traditional surgical management for patients with low risk PTC. This meta-analysis assessed the available literature regarding the efficacy of active surveillance of PTC.

**Methods:** A systematic search was conducted of EMBASE, MEDLINE and PubMed with keywords “active surveillance,” “thyroid microcarcinoma” and “thyroid carcinoma.” Inclusion criteria were active surveillance of low risk PTC, defined as T1a or T1b, N0, M0 disease. Main outcomes of interest were tumor growth, defined as growth in maximum diameter by ≥ 3mm, metastatic spread to cervical lymph nodes or extra nodal disease, thyroid cancer-related mortality, incidence of delayed thyroid surgery (DTS), and disease recurrence after delayed thyroid surgery. Secondary outcomes included indication for DTS, decrease in primary tumor, defined as decrease in maximum diameter by ≥ 3mm, and overall mortality. A meta-analysis was performed obtaining pooled proportions.

**Results:** A total of 9 studies met inclusion criteria for final analysis. Across the 9 studies, there were a total of 4253 patients with a mean follow-up time of 51.7 months. Pooled analysis revealed during AS 4.4% (95%CI 3.1-5.8%) of patients demonstrated tumor growth by maximum diameter. A total of 1% (95%CI 0.6-1.5%) of patients developed cervical lymph node metastasis, 0.04% (95%CI 0.002-0.2%) developed extra nodal disease, and overall mortality rate was 0.03% (95%CI 0.0005-0.2%). Delayed thyroid surgery was performed in 9.7% (95%CI 6.0-14.1%) of patients. The main indication for surgery was patient preference at 51.9% (95%CI 44.9-58.9%) in comparison to only 29.1% (95% 23.1-35.6%) of patients receiving DTS for tumor growth. Analysis was restricted to studies of AS for PTMC a total of 7 studies with a total of 3905 patients with results demonstrating no significant difference in primary or secondary outcomes.

**Conclusions:** Active surveillance is an appropriate management strategy for low risk PTMC and further consideration should be given to extension

# ABSTRACTS

## ◆ 30. A GROWTH MODEL OF NEUROENDOCRINE TUMOR SURROGATES AND THE EFFICACY OF A NOVEL SOMATOSTATIN-RECEPTOR GUIDED ANTIBODY-DRUG CONJUGATE: PERSPECTIVES ON CLINICAL RESPONSE?

**Brendon Herring**<sup>1</sup>, Jason Whitt<sup>1</sup>, Jianfa Ou<sup>2</sup>, Joel Berry<sup>2</sup>, Herbert Chen<sup>1</sup>, Xiaoguang Margaret Liu<sup>2</sup>, Renata Jaskula-Sztul<sup>1</sup>

<sup>1</sup>*Department of Surgery, University of Alabama at Birmingham School of Medicine,* <sup>2</sup>*Department of Biomedical Engineering, University of Alabama at Birmingham School of Engineering*

**Background:** Patient-derived xenografts (PDXs) are invaluable tools for testing personalized therapeutics on tumors prior to their administration to patients. However, as PDX models for neuroendocrine tumors (NETs) are largely lacking, we have developed a three-dimensional (3D) flow-perfusion polydimethylsiloxane (PDMS) bioreactor model for the purpose of culturing tumor surrogates from patient-derived NET samples. This work evaluates the length of time that surrogates were successfully cultured *ex vivo*, and the response of surrogates to a novel antibody-drug conjugate (ADC).

**Methods:** 18 Patient-derived NET samples (G1 n=7, G2 n=7, GX n=4) were implanted into bioreactors, and cultured. Surrogates were incubated with the fluorescent dye IR-783 before fluorescence imaging with an In Vivo Imaging System (IVIS). Growth was defined as increased radiant efficiency on imaging. Further, a G2 pancreatic NET sample was implanted into four bioreactors. Two surrogates were treated with ADC comprised of a potent anti-mitotic Monomethyl auristatin E, linked to an antibody to somatostatin receptor 2 (SSTR2), a NET-specific target on the cell membrane. Growth rate/viability and response to ADC treatment were assessed by incubating surrogates with IR-783 and the RealTime-Glo™ AnnexinV Apoptosis and Necrosis Assay (Promega) respectively, prior to daily IVIS imaging over six days. Histologic sections of the original sample were stained to assess SSTR2 expression. Surrogates derived from a NET xenograft (BON-1 cells) were likewise evaluated.

**Results:** The mean duration of surrogate growth was 33.5 days. No statistically significant difference existed in surrogate growth for primary gastroenteropancreatic NETs vs. metastases ( $t = -0.12$ ,  $df = 14$ ,  $p = 0.906$ ). Patient-derived NET bioreactors treated with ADC exhibited much higher degrees of apoptosis (13-fold, 9-fold) and necrosis (2.5-fold, 1.6-fold). Similarly, treated BON-1 surrogates exhibited less proliferation (1.2-fold, 1.9-fold) and higher apoptosis (1.5-fold, 1.1-fold) than controls. In all cases, response to ADC treatment correlated with SSTR2 positivity.

**Conclusions:** Patient-derived NET surrogates can be reliably cultured within the bioreactor system for up to 33 days, regardless of metastatic status. The bioreactor model can be used to evaluate the efficacy of antibody-guided molecular chemotherapy *ex vivo* and may be particularly useful for predicting clinical responses in patients not eligible for clinical trials due to deteriorating health.



# ABSTRACTS

## ◆ 31. OVEREXPRESSION OF SOMATOSTATIN RECEPTOR TYPE 2 (SSTR2) IN NEUROENDOCRINE TUMORS FOR IMPROVED [68GA] DOTATATE IMAGING AND TREATMENT

**Rachael E Guenter**<sup>1</sup>, Tolulope Aweda<sup>2</sup>, Alex Chang<sup>1</sup>, Jason Whitt<sup>1</sup>, X. Margaret Liu<sup>3</sup>, Herbert Chen<sup>1</sup>, Suzanne Lapi<sup>2</sup>, Renata Jaskula-Sztul<sup>1</sup>

<sup>1</sup>*Surgery, University of Alabama at Birmingham*, <sup>2</sup>*Radiology, University of Alabama at Birmingham*, <sup>3</sup>*Biomedical Engineering, University of Alabama at Birmingham*

**Background:** Neuroendocrine tumors (NETs) can be found in various sites throughout the body. These tumors are often slow growing with low metabolic activity, making them particularly difficult to image with the current imaging standards. However, a new technique for NET imaging using PET/CT with radiolabeled somatostatin analogs is becoming more common, as many NETs overexpress somatostatin receptor subtype 2 (SSTR2). Unfortunately, patients with high-grade NETs often have a diminished level of SSTR2 and are not eligible for this imaging. We have found that the histone deacetylase inhibitors (HDACi) thalidomide (TDP-A) and valproic acid (VPA) can upregulate the expression of SSTR2 in NET cells and xenografts for improved detection and treatment.

**Methods:** To evaluate the effect of HDACi's on SSTR2 expression at the mRNA and protein level in NET cell lines, qPCR and western blotting was performed. The effect of TDP-A on SSTR2-based imaging was investigated by both an image stream and flow cytometry analysis on NET cells pre-treated with TDP-A, followed by the detection of octreotide (OCT, somatostatin analog with high binding affinity to SSTR2). Changes in SSTR2 expression in NET xenografts before and after TDP-A treatment were imaged using [68Ga]DOTATATE small animal PET/CT. Conclusively, IHC staining was used to further confirm increased SSTR2 incidence in xenografts.

**Results:** The functional upregulation of somatostatin receptor subtype 2 (SSTR2) in NETs after HDACi (TDP-A or VPA) treatment was confirmed through in vitro experiments and small animal PET/CT imaging using [68Ga]DOTATATE. The HDAC inhibitors TDP-A and VPA increased SSTR2 transcription and protein expression in various NET cell lines. Image stream analysis showed improved binding of OCT-Cy5 in NET cells treated with TDP-A for 12 hours and flow cytometry confirmed a 2-fold increase in SSTR2 prevalence on the cell surface after TDP-A treatment. Furthermore, IHC staining performed on NET xenografts showed increased density of SSTR2 after TDP-A treatment. PET/CT imaging with [68Ga] DOTATATE confirmed the ability to enhance radiopeptide uptake in NET xenografts after treatment with TDP-A.

**Conclusions:** This study demonstrates a new method to improve high-grade NET imaging and potential treatments through SSTR2 targeting, which can help more accurately diagnose and treat NET patients.



# ABSTRACTS

## ◆ 32. DUAL INHIBITION OF BRAF AND MEK INCREASES SODIUM IODIDE SYMPORTER EXPRESSION IN PATIENT-DERIVED PAPILLARY THYROID CANCER CELLS IN VITRO

**Timothy M. Ullmann**<sup>1</sup>, Heng Liang<sup>2</sup>, Maureen D. Moore<sup>1</sup>, Isra Al Jamed<sup>2</sup>, Katherine D. Gray<sup>1</sup>, Dessislava Stefanova<sup>1</sup>, Jessica Limberg<sup>1</sup>, Jessica L. Buicko<sup>1</sup>, Brendan Finnerty<sup>1</sup>, Toni Beninato<sup>1</sup>, Rasa Zarnegar<sup>1</sup>, Irene Min<sup>2</sup>, Thomas J. Fahey<sup>1</sup>

<sup>1</sup>*Department of Surgery, New York Presbyterian Hospital: Weill Cornell Medical Center,* <sup>2</sup>*Department of Surgery, Weill Cornell Medicine*

**Background:** The majority of papillary thyroid cancers (PTC) are driven by acquired mutations, typically in the BRAF or RAS genes, that aberrantly activate the mitogen activated protein kinase (MAPK) pathway. This leads to malignant transformation, de-differentiation, and decrease of sodium-iodide symporter (NIS) expression, resulting in resistance to radioactive iodine therapy. We sought to determine whether inhibition of aberrant MAPK-signaling can restore NIS expression.

**Methods:** We identified an optimal dosing regimen of dabrafenib (BRAF inhibitor) and trametinib (MEK inhibitor) using BCPAP cells, a BRAFV600E-mutant human PTC cell line. Next, we prospectively developed primary cultures of PTCs and benign adenomas derived from operative specimens and applied drug treatment from 24-48 hours. Samples were genotyped to identify BRAF, HRAS, NRAS and KRAS mutations. We performed Western blotting to measure MAPK activity via p-ERK levels and RT-qPCR to measure NIS expression after treatment.

**Results:** Pilot experiments in BCPAP cells demonstrated optimal upregulation in NIS levels by qPCR with doses of dabrafenib at 0.5uM or 1.0uM and trametinib at 0.25uM, but the combination was about twice as effective as the best single treatment, trametinib at 0.25uM (fold-change  $6.1 \pm 1.7$  vs.  $2.6 \pm 0.2$ , respectively). Dabrafenib alone resulted in only mild decreases in p-ERK levels, whereas trametinib treatment alone or in combination abolished p-ERK signaling. In the primary culture experiments, 23 patient specimens were included: 19 PTCs and 4 adenomas. BRAFV600E mutations were identified in 14/19 (73.6%) PTCs; the remainder were BRAF and RAS wildtype. In human PTC-derived primary cultures, dual treatment with dabrafenib and trametinib increased NIS expression (fold-change  $3.7 \pm 0.8$ ), while single treatment with dabrafenib did not (fold-change  $1.2 \pm 0.3$ ). This effect was unique to PTC cells; benign adenomas treated with dabrafenib and trametinib showed no increase in NIS expression (FC  $1.1 \pm 0.3$ ).

**Conclusions:** BRAF inhibition with dabrafenib neither eliminated aberrant MAPK signaling nor increased NIS expression in patient-derived PTC cells. Dual treatment with BRAF and MEK inhibitors significantly upregulated NIS expression, suggesting that BRAF inhibition alone may be insufficient to induce NIS upregulation in PTC. This effect was cancer-specific; adenomas did not show similar NIS upregulation.

# ABSTRACTS

## ◆ 33. NOVEL USE OF A CLIA-CERTIFIED CDKN2C LOSS ASSAY IN SPORADIC MEDULLARY THYROID CARCINOMA

**Jessica E Maxwell**<sup>1</sup>, Naifa Busaidy<sup>2</sup>, Mimi Hu<sup>2</sup>, Nancy Perrier<sup>1</sup>, Jeffrey Lee<sup>1</sup>, Paul Graham<sup>1</sup>, Gilbert Cote<sup>2</sup>, Elizabeth Grubbs<sup>1</sup>

<sup>1</sup>*Surgical Oncology, MD Anderson Cancer Center,* <sup>2</sup>*Endocrine Neoplasia, MD Anderson Cancer Center*

**Background:** The cyclin-dependent-kinase inhibitors (CDKN)/retinoblastoma pathway has been implicated in sporadic medullary thyroid carcinoma (sMTC) tumorigenesis. Somatic CDKN2C loss has been retrospectively associated with decreased overall survival in MTC patients, independent of RET status. In this study, we evaluated CDKN2C loss in a prospective clinical environment using a novel CLIA-certified assay to confirm its association with aggressive disease and interrogate response to targeted therapy.

**Methods:** Patients with advanced sMTC underwent tumor genotyping for the purpose of management of targeted therapy, including evaluation of CDKN2C loss using a FISH-based CLIA-certified assay.

**Results:** Tumors from fifty-eight patients with advanced sMTC were evaluated for CDKN2C loss from 5/2017 to 10/2018. Twenty-eight patients had haploid loss (1n) (48.2%), 27 (46.6%) were diploid wildtype (2n), and the test was indeterminate in 3 cases (5.2%). Eleven (19%) patients presented with M1 disease and 40 (69%) developed distant metastasis. Patients with CDKN2C loss had a shorter time to development of distant metastasis compared to those with wildtype CDKN2C (21 versus 71 months,  $p=.04$ ). Of the 28 patients treated with targeted therapies, median time from diagnosis to initiating therapy was 52 months in those with CDKN2C loss vs. 103 months in wildtype patients ( $p=0.14$ ). No association was seen in CDKN2C status and radiographic response to first targeted agent ( $p=1$ ), duration of therapy ( $p=1$ ), or likelihood of transition to a second targeted agent ( $p=1$ ). Among patients treated with targeted therapy, patients with CDKN2C loss had a median PFS of 31 months, compared to 56 months in those wildtype patients ( $p=.40$ ).

**Conclusions:** This study represents the first evaluation in the clinical setting of CDKN2C loss in MTC. In a cohort of patients with advanced disease, this alteration is frequent with half of the tumors harboring a loss. CDKN2C loss may be associated with decreased time to distant metastasis and decreased time to requiring therapy, both measures of disease aggressiveness, with a trend towards shorter PFS for patients on targeted therapy. A larger cohort and longer follow-up will be required to assess the impact of CDKN2C loss on response to treatment and if patients might receive additional benefit from the inclusion of a CDK inhibitor.

# ABSTRACTS

## 34. NOVEL GENE PANEL AS A PROGNOSIS MARKER FOR ACTIVE SURVEILLANCE IN THYROID CANCER

**Emmanuelle ML Ruiz<sup>1</sup>**, Muthusamy Kunnimalaiyaan<sup>1</sup>, Emad Kandil<sup>1</sup>

*<sup>1</sup>Surgery and oncology department, School of Medicine of Tulane University*

**Background:** Treatment for the low risk papillary thyroid cancer (PTC) may lead to unnecessary consequences as a surgery and unnecessary cost. Thus, an active surveillance strategy was recently proposed as an option for managing patients with low-risk PTCs. The aim of this study was to identify a gene panel to predict the lymph node metastasis to help with the decision making for active surveillance.

**Methods:** The Cancer Genome Atlas database containing patients with PTC from 19 medical centers provided 495 samples were analyzed. To define a gene signature correlated with the lymph node stage (N0 or N1), a learning machine model was used. A Receptive Operative Curve (ROC) analysis was used to estimate the strength of the prediction through the calculation of the Area Under Curve (AUC). To define the correlation of the genes' signature with clinical parameters, Kruskal-Wallis test was performed. Finally, a survival analysis using the survival R package was done.

**Results:** We identified a panel of 25 genes with an AUC of 0.83 for the A score, which can differentiate the N0 and N1 PTC samples with a p-value inferior to  $2 \times 10^{-16}$ . The gene panel is significantly correlated with all other aggressive features. Interestingly, the panel was more powerful in predicting metastasis in patients with T1 tumors ( $p=4.75E-4$ ). The panel also stratified specimens according to extrathyroidal extension ( $p= 2.41E-13$ ). The panel significantly predicts the DFS of samples with no lymph node metastasis ( $p=0.026283$ ).

**Conclusions:** This novel 25-gene panel is a potential prognostic marker for selection of patients for active surveillance. The panel can accurately predict lymph node metastasis and recurrence in patients with low risk PTC.





# POSTER DISPLAYS

◆ Denotes Resident/Fellow Research Award Competition Poster

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

# POSTER DISPLAYS

## ◆ 01. OUTCOMES OF BILATERAL ADRENALECTOMY FOR CUSHING'S DISEASE AND ECTOPIC ACTH-PRODUCING TUMORS

**Thomas Szabo Yamashita**<sup>1</sup>, Alaa Sada<sup>1</sup>, Irina Bancos<sup>2</sup>, Megan G Berger<sup>3</sup>, William F Young<sup>2</sup>, Benzon M Dy<sup>3</sup>, David R Farley<sup>1</sup>, Melanie L Lyden<sup>3</sup>, Geoffrey B Thompson<sup>3</sup>, Travis J McKenzie<sup>3</sup>

<sup>1</sup>General Surgery, Mayo Clinic, <sup>2</sup>Endocrinology, Mayo Clinic, <sup>3</sup>Endocrine Surgery, Mayo Clinic

## ◆ 02. SAME-DAY DISCHARGE FOLLOWING MINIMALLY INVASIVE ADRENALECTOMY IS SAFE AND FEASIBLE IN SELECTED PATIENTS

**Omair A Shariq**<sup>1</sup>, Katherine A Bews<sup>2</sup>, Benzon M Dy<sup>1</sup>, Melanie L Lyden<sup>1</sup>, David R Farley<sup>1</sup>, Geoffrey B Thompson<sup>1</sup>, Elizabeth B Habermann<sup>2</sup>, Travis J McKenzie<sup>1</sup>

<sup>1</sup>Department of Surgery, Mayo Clinic, <sup>2</sup>Robert D and Patricia E Kern Center for the Science of Healthcare Delivery, Mayo Clinic

## 03. ADRENALECTOMY FOR NON-NEUROBLASTIC PATHOLOGY IN CHILDREN

**Michael D Traynor**<sup>1,2</sup>, Alaa Sada<sup>1</sup>, Geoffrey B Thompson<sup>1</sup>, Christopher R Moir<sup>2</sup>, Irina Bancos<sup>3</sup>, David R Farley<sup>1</sup>, Benzon M Dy<sup>1</sup>, Melanie L Lyden<sup>1</sup>, Elizabeth B Habermann<sup>4</sup>, Travis J McKenzie<sup>1</sup>

<sup>1</sup>General and GI Surgery, Mayo Clinic, <sup>2</sup>Pediatric Surgery, Mayo Clinic, <sup>3</sup>Endocrinology, Mayo Clinic, <sup>4</sup>Kern Center for the Science of Health Care Delivery, Mayo Clinic

## ◆ 04. PET FOR INDETERMINATE ADRENAL MASSES - A RETROSPECTIVE REVIEW

**Scott Assen**<sup>1</sup>, Denise Chan<sup>1</sup>, Stephanie Nguyen<sup>1</sup>, Sanjay Bansal<sup>1</sup>, Janice Pasiaka<sup>2</sup>

<sup>1</sup>University of Calgary, <sup>2</sup>Department of Surgery, University of Calgary

## ◆ 05. GEOGRAPHIC VALIDATION OF THE ALDOSTERONOMA RESOLUTION SCORE

**Wessel MCM Vorselaars**<sup>1</sup>, Dirk van Beek<sup>1</sup>, Emily L Postma<sup>1,2</sup>, Rasa Zarnegar<sup>2</sup>, Frederick T Drake<sup>3,4</sup>, Quan Y Duh<sup>3</sup>, Stephanie D Talutis<sup>4</sup>, David B McAneny<sup>4</sup>, Catherine McManus<sup>5</sup>, James A Lee<sup>5</sup>, Scott B Grant<sup>6</sup>, Raymon H Grogan<sup>7</sup>, Minerva A Romero Arenas<sup>8</sup>, Nancy D Perrier<sup>8</sup>, Benjamin J Peipert<sup>9</sup>, Michael Mongelli<sup>9</sup>, Tanya Castelino<sup>10</sup>, Elliot J Mitmaker<sup>10</sup>, Mark Sywak<sup>11</sup>, David N Parente<sup>12</sup>, Jesse D Pasternak<sup>12</sup>, Gerardo D'Amato<sup>13</sup>, Marco Raffaelli<sup>13</sup>, Valerie Schuermans<sup>14</sup>, Nicole D Bouvy<sup>14</sup>, Hasan H Eker<sup>15</sup>, Jaap H Bonjer<sup>15</sup>, Anton F Engelsman<sup>16</sup>, Els JM Nieveen van Dijkum<sup>16</sup>, Madelon JH Metman<sup>17</sup>, Schelto Kruijff<sup>17</sup>, Wilco Spiering<sup>1</sup>, Inne HM Borel Rinkes<sup>1</sup>, Gerlof D Valk<sup>1</sup>, Menno R Vriens<sup>1</sup>

<sup>1</sup>University Medical Center Utrecht, <sup>2</sup>Weill Cornell Medical College, <sup>3</sup>University of California San Francisco, <sup>4</sup>Boston University School of Medicine and Department of Graduate Medical Sciences, <sup>5</sup>New York Presbyterian Columbia University, <sup>6</sup>University of Chicago Medi-

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cal Center, <sup>7</sup>Baylor St. Luke's Medical Center, <sup>8</sup>University of Texas MD Anderson Cancer Center, <sup>9</sup>Northwestern University Feinberg School of Medicine, <sup>10</sup>McGill University Health Centre, <sup>11</sup>Royal North Shore Hospital, <sup>12</sup>University Health Network Toronto General Hospital, <sup>13</sup>Policlinico Universitario "A Gemelli" Università Cattolica Del Sacro Cuore, <sup>14</sup>Maastricht University Medical Center+, <sup>15</sup>VU Medical Center, <sup>16</sup>Amsterdam Medical Center, <sup>17</sup>University Medical Center Groninge

## 06. QUANTITATIVE ANALYSES OF FIVE-YEAR TRENDS IN THE RECENT WORK-FORCE FOR ENDOCRINE OPERATIONS.

**Vikram D Krishnamurthy**<sup>1</sup>, Robert Naples<sup>1</sup>, Sam Zolins<sup>1</sup>, Judy Jin<sup>1</sup>, Eren Berber<sup>1</sup>, Allan Siperstein<sup>1</sup>, Joyce J Shin<sup>1</sup>

<sup>1</sup>Endocrine Surgery, The Cleveland Clinic

## ◆ 07. NFAT5 AMPLIFIED EXPRESSION IS ASSOCIATED WITH ENDOCRINE-INACTIVE ADRENOCORTICAL CARCINOMAS

**Taylor C Brown**<sup>1</sup>, Jianliang Man<sup>1</sup>, Norman G Nicolson<sup>1</sup>, Reju Korah<sup>1</sup>, Tobias Carling<sup>1</sup>

<sup>1</sup>Department of Surgery, Yale University

## ◆ 08. THE RECURRENCE RATE OF SPORADIC PHEOCHROMOCYTOMAS AFTER CURATIVE ADRENALECTOMY – A SYSTEMATIC REVIEW AND META-ANALYSIS.

**Isabelle Holscher**<sup>1</sup>, Anton F. Engelsman<sup>1</sup>, Els J.M. Nieveen van Dijkum<sup>1</sup>

<sup>1</sup>Surgery, Amsterdam UMC

## 09. THE UPS AND DOWNS OF GENERAL SURGERY RESIDENT EXPERIENCE IN ENDOCRINE SURGERY: ANALYSIS OF 28 YEARS OF ACGME GRADUATE CASE LOGS

**Philip W Smith**<sup>1</sup>, Adriana Ramirez<sup>1</sup>, Anna Fashandi<sup>1</sup>, John B Hanks<sup>1</sup>, John R Potts<sup>2</sup>

<sup>1</sup>Surgery, University of Virginia Medical Center, <sup>2</sup>Accreditation Council for Graduate Medical Education

## ◆ 10. AN ANALYSIS OF RESEARCH PRODUCTIVITY OF FEMALE ENDOCRINE SURGEONS

Kareem M Ibraheem<sup>1</sup>, **Marcus Allan Hoof**<sup>2</sup>, Lena A Hummel<sup>2</sup>, Hania Adib<sup>2</sup>, Mohamed I Abdelgawad<sup>1</sup>, Thomas M Yusin<sup>2</sup>, Therese M Nguyen<sup>2</sup>, Mary I Killackey<sup>1</sup>, Emad A Kandil<sup>1</sup>

<sup>1</sup>General Surgery, Tulane School of Medicine, <sup>2</sup>Tulane School of Medicine

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## ◆ 11. EFFICACY OF A FORMAL DIAGNOSTIC AND INTERVENTIONAL THYROID ULTRASOUND COURSE IN A GENERAL SURGERY RESIDENCY

**Amna Khokar**<sup>1</sup>, Kristine Kutcha<sup>1</sup>, Winchester David<sup>1</sup>, Richard Prinz<sup>1</sup>, Stephen Haggarty<sup>1</sup>, Tricia Moo-Young<sup>1</sup>

<sup>1</sup>*NorthShore University*

## 12. THE ADDED VALUE OF TECHNETIUM-99M SESTAMIBI SCAN IN PATIENTS WITH PRIMARY HYPERPARATHYROIDISM AND POSITIVE ULTRASOUND

**Tal Yalon**<sup>1</sup>, Asher Rottenberg<sup>2</sup>, MARIYA NEYMARK<sup>3</sup>, Liat Appelbaum<sup>4</sup>, Yoram Kluger<sup>3,5</sup>, Haggi Mazeh<sup>6</sup>, Michal Mekelel<sup>3,5</sup>

<sup>1</sup>*Chaim Sheba Medical Center*, <sup>2</sup>*Hadassah-Hebrew University*, <sup>3</sup>*Rambam-Health Care Campus*, <sup>4</sup>*Hadassah-Hebrew University Medical Center, Ein Kerem*, <sup>5</sup>*Technion-Israel Institute of Technology*, <sup>6</sup>*Hadassah-Hebrew University Medical Center, Mount Scopus*

## ◆ 13. THE ROLE OF TUMOR FUNCTIONALITY ON SURVIVAL IN MEN1-RELATED PANCREATIC NEUROENDOCRINE TUMORS: NON-FUNCTIONING PANCREATIC NEUROENDOCRINE TUMORS VERSUS INSULINOMAS.

**Dirk-Jan van Beek**<sup>1</sup>, Sjoerd Nell<sup>1</sup>, Pierre Goudet, on behalf of the GTE<sup>2</sup>, Detlef K. Bartsch<sup>3</sup>, Nancy D. Perrier<sup>4</sup>, Maria Luisa Brandi<sup>5</sup>, Naris Nilubol<sup>6</sup>, Laurent Brunaud<sup>7</sup>, Jesse D. Pasternak<sup>8</sup>, Cord Sturgeon<sup>9</sup>, Inne H.M. Borel Rinkes<sup>1</sup>, Gerlof D. Valk, on behalf of the DutchMEN study group (DMSG)<sup>10</sup>, Menno R. Vriens<sup>1</sup>

<sup>1</sup>*Department of Endocrine Surgical Oncology, University Medical Center Utrecht*, <sup>2</sup>*Department of Digestive and Endocrine Surgery, Centre Hospitalier Universitaire de Dijon*, <sup>3</sup>*Department of Visceral, Thoracic and Vascular Surgery, Philipps University Marburg*, <sup>4</sup>*Department of Surgical Oncology, MD Anderson Cancer Center*, <sup>5</sup>*Department of Surgery and Translational Medicine, University of Florence*, <sup>6</sup>*Endocrine Oncology Branch, National Cancer Institute, National Institutes of Health*, <sup>7</sup>*Department of Digestive, Hepatobiliary and Endocrine Surgery, Université de Lorraine, CHU Nancy-Brabois*, <sup>8</sup>*Department of Surgery, University Health Network*, <sup>9</sup>*Department of Surgery, Northwestern University*, <sup>10</sup>*Department of Endocrine Oncology, University Medical Center Utrecht*

## ◆ 14. PROGNOSTIC FACTORS AND SURVIVAL IN MEN1 PATIENTS WITH GAS-TRINOMAS: RESULTS FROM A POPULATION-BASED COHORT

**Dirk-Jan van Beek**<sup>1</sup>, Sjoerd Nell<sup>1</sup>, Carolina R.C. Pieterman<sup>2</sup>, Wouter W. de Herder<sup>3</sup>, Annienke C. van de Ven<sup>4</sup>, Olaf M. Dekkers<sup>5</sup>, Anouk N. van der Horst-Schrivers<sup>6</sup>, Madeleine L. Drent<sup>7</sup>, Peter H. Bisschop<sup>8</sup>, Bas Havekes<sup>9</sup>, Inne H.M. Borel Rinkes<sup>1</sup>, Menno R. Vriens<sup>1</sup>, Gerlof D. Valk<sup>2</sup>

<sup>1</sup>*Department of Endocrine Surgical Oncology, University Medical Center Utrecht*, <sup>2</sup>*Department of Endocrine Oncology, University Medical Center Utrecht*, <sup>3</sup>*Department of Internal Medicine, Erasmus Medical Center Rotterdam*, <sup>4</sup>*Department of Endocrinology, Radboud*



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*University Medical Center, <sup>5</sup>Departments of Endocrinology and Metabolism and Clinical Epidemiology, Leiden University Medical Center, <sup>6</sup>Department of Endocrinology, University Medical Center Groningen, <sup>7</sup>Department of Internal Medicine, Section of Endocrinology, Amsterdam UMC location VU University Medical Center, <sup>8</sup>Department of Endocrinology and Metabolism, Amsterdam UMC location Academic Medical Center, <sup>9</sup>Department of Internal Medicine, Division of Endocrinology, Maastricht University Medical Center*

## **15. USE OF LOBECTOMY FOR PATIENTS WITH LOW-RISK PAPILLARY THYROID CANCER BY LOW AND HIGH-VOLUME SURGEONS: A NATIONAL SURVEY**

**Alexandria MdDow<sup>1</sup>, Megan Sauke<sup>1</sup>, Susan C Pitt<sup>2</sup>**

*<sup>1</sup>University of Wisconsin, <sup>2</sup>Department of Surgery, University of Wisconsin*

## **◆ 16. AN EFFECTIVE TOLERANCE APPROACH FOR PORCINE ISLET XENOTRANSPLANTATION IN HUMANIZED MICE**

**Frances T. Lee<sup>1</sup>, Anil Dangi<sup>2</sup>, Melanie Burnette<sup>2</sup>, Xunrong Luo<sup>1,3</sup>**

*<sup>1</sup>Northwestern University, <sup>2</sup>Nephrology, Duke University, <sup>3</sup>Duke University*

## **17. CREATION AND VALIDATION OF A PARATHYROID CANCER PROGNOSTIC SCORE: A MULTICENTER STUDY**

**Angelica M Silva Figueroa<sup>1</sup>, Kenneth R Hess<sup>2</sup>, Si-Yuan Wu<sup>3</sup>, Dhaval T Patel<sup>4</sup>, Naris Nilubol<sup>4</sup>, Sa T Nguyen<sup>3</sup>, Kelly L McCoy<sup>5</sup>, Sally E Carty<sup>5</sup>, Sarah B Fisher<sup>3</sup>, Michelle Williams<sup>6</sup>, Elizabeth G Grubbs<sup>3</sup>, Paul H Graham<sup>3</sup>, Jeffrey E Lee<sup>3</sup>, MacKenzie Shindorf<sup>4</sup>, William F Simonds<sup>7</sup>, Jenny E Blau<sup>7</sup>, Naifa L Busaidy<sup>8</sup>, Nancy D Perrier<sup>3</sup>**

*<sup>1</sup>Department of Head and Neck Surgery, Universidad Finis Terrae & Hospital Barros Luco Trudeau, <sup>2</sup>Department of Biostatistics, MD Anderson Cancer Center, <sup>3</sup>Department of Surgical Oncology, MD Anderson Cancer Center, <sup>4</sup>Department of Surgical Oncology, Center for Cancer Research National Cancer Institute, <sup>5</sup>Department of Surgery, University of Pittsburgh Medical Center, <sup>6</sup>Department of Pathology, MD Anderson Cancer Center, <sup>7</sup>Metabolic Diseases Branch, National Institute of Diabetes and Digestive and Kidney Diseases, National Cancer Institute, NIH, <sup>8</sup>Department of Endocrine Neoplasia & Hormonal Disorders, MD Anderson Cancer Center*

## **◆ 18. DOES PARATHYROIDECTOMY MODIFY RENAL FUNCTION IN PATIENTS WITH PRIMARY HYPERPARATHYROIDISM?**

**Brian C Ruhle<sup>1</sup>, Scott Grant<sup>2</sup>, Salman Alsafran<sup>1</sup>, Tanaz Vaghaiwalla<sup>1</sup>, Edwin Kaplan<sup>1</sup>, Peter Angelos<sup>1</sup>, Raymon Grogan<sup>3</sup>**

*<sup>1</sup>University of Chicago, <sup>2</sup>CareMount Medical, <sup>3</sup>Baylor College of Medicine*

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## ◆ 19. SINGLE ADENOMAS AND ECTOPIC GLANDS ARE COMMON CAUSES OF PRIMARY HYPERPARATHYROIDISM IN CHILDREN AND ADOLESCENTS

**Robert D. Rampp**<sup>1</sup>, Edna E. Mancilla<sup>2</sup>, N. Scott Adzick<sup>3</sup>, Micheal A. Levine<sup>2</sup>, Rachel R. Kelz<sup>4</sup>, Douglas L. Fraker<sup>4</sup>, Pallavi Iyer<sup>5</sup>, Brenessa M. Lindeman<sup>6</sup>, Herbert Chen<sup>6</sup>, Heather Wachtel<sup>4</sup>

<sup>1</sup>*Surgery, University of Tennessee College of Medicine- Chattanooga*, <sup>2</sup>*Endocrinology, Childrens Hospital of Philadelphia*, <sup>3</sup>*Surgery, Childrens Hospital of Philadelphia*, <sup>4</sup>*Surgery, Hospital of the University of Pennsylvania*, <sup>5</sup>*Pediatric Endocrinology, University of Alabama, Birmingham*, <sup>6</sup>*Surgery, University of Alabama, Birmingham*

## 20. RECOVERY AFTER THYROID AND PARATHYROID SURGERY – HOW DO OUR PATIENTS REALLY FEEL?

**Yufei Chen**<sup>1</sup>, Carolyn Seib<sup>2</sup>, Jessica Gosnell<sup>2</sup>, Wen Shen<sup>2</sup>, Quan-Yang Duh<sup>2</sup>, Insoo Suh<sup>2</sup>

<sup>1</sup>*Cedars-Sinai Medical Center*, <sup>2</sup>*Surgery, University of California San Francisco*

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**Dessislava Stefanova**<sup>1</sup>, Timothy M. Ullmann<sup>2</sup>, Jessica N. Limberg<sup>2</sup>, Jessica L. Buicko<sup>2</sup>, Toni Beninato<sup>3</sup>, Rasa Zarnegar<sup>2</sup>, Thomas J. Fahey III<sup>2</sup>, Brendan M. Finnerty<sup>2</sup>

<sup>1</sup>*Surgery, Weill Cornell Medical Center*, <sup>2</sup>*Weill Cornell Medical Center*, <sup>3</sup>*NewYork-Presbyterian Brooklyn Methodist Hospital*

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<sup>1</sup>*Temple University*, <sup>2</sup>*Massachusetts General Hospital*

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**Shravan Leonard-Murali**<sup>1</sup>, Tommy Ivanics<sup>1</sup>, Xiaoxia Han<sup>2</sup>, Christopher P Steffes<sup>3</sup>, David S Kwon<sup>3</sup>, Rupen Shah<sup>3</sup>

<sup>1</sup>*Department of Surgery, Henry Ford Hospital*, <sup>2</sup>*Department of Public Health Sciences, Henry Ford Health System*, <sup>3</sup>*Department of Surgery, Division of Surgical Oncology, Henry Ford Hospital*

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<sup>1</sup>Endocrine Surgery, University of California San Francisco, <sup>2</sup>Radiology, University of California San Francisco, <sup>3</sup>University of Utrecht

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**Luigi De Napoli**<sup>1</sup>, Antonio Matrone<sup>1</sup>, Karin Favilla<sup>1</sup>, David Galleri<sup>1</sup>, Carlo Enrico Ambrosini<sup>1</sup>, Alexander Aghababyan<sup>1</sup>, Piermarco Papini<sup>1</sup>, Liborio Torregrossa<sup>1</sup>, Clara Ugolini<sup>1</sup>, Agnese Proietti<sup>1</sup>, Paolo Vitti<sup>1</sup>, Rossella Elisei<sup>1</sup>, **Gabriele Materazzi**<sup>1</sup>

<sup>1</sup>University of Pisa

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**Sophie Dream**<sup>1</sup>, Herbert Chen<sup>2</sup>, Brenessa Lindeman<sup>2</sup>

<sup>1</sup>The University of Alabama at Birmingham, <sup>2</sup>Surgical Oncology, The University of Alabama at Birmingham

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**Emmanuelle ML Ruiz**<sup>1</sup>, Tianhua Niu<sup>2</sup>, Emad Kandil<sup>3</sup>

<sup>1</sup>Surgery and oncology department, Medical School of Tulane University, <sup>2</sup>Department of Biochemistry, School of Medicine of Tulane University, <sup>3</sup>Surgery and oncology department, School of Medicine of Tulane University

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**Catherine Denkler**<sup>1</sup>, Chang Liu<sup>1</sup>, Erica Emery<sup>1</sup>, Devon Collins<sup>1</sup>, Anthony Visioni<sup>1</sup>

<sup>1</sup>Surgery, Inova Fairfax Medical Campus

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**Steven Craig**<sup>1</sup>, Andrew Bysice<sup>2</sup>, Shamir Chandarana<sup>3</sup>, Janice Pasieka<sup>4</sup>

<sup>1</sup>University of Calgary, <sup>2</sup>Surgery, University of Calgary, <sup>3</sup>Head and Neck Surgery, University of Calgary, <sup>4</sup>Endocrine Surgery, University of Calgary

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**Deepak Abraham**<sup>1</sup>, Swarna Azaria<sup>1</sup>, Anish Cherian<sup>1</sup>, Paul Jacob<sup>1</sup>, Pranay Gaikwad<sup>1</sup>

<sup>1</sup>Christian Medical College, Vellore, India

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<sup>1</sup>Surgery, University of Alabama at Birmingham School of Medicine, <sup>2</sup>Surgery, University of Alabama at Birmingham School of Medicine, <sup>3</sup>Chemistry, University of South Florida

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**Matilda Annebäck**<sup>1</sup>, Jakob Hedberg<sup>1</sup>, Peter Stålberg<sup>1</sup>, Olov Norlén<sup>1</sup>

<sup>1</sup>Department of Surgical Sciences, Uppsala University, Uppsala, Sweden

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<sup>1</sup>NYP-Weill Cornell Medical Center, <sup>2</sup>NYP-Brooklyn Methodist Hospital

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<sup>1</sup>Mount Sinai Hospital, <sup>2</sup>Mount Sinai Beth Israel, <sup>3</sup>Mount Sinai West

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<sup>1</sup>Emory University, <sup>2</sup>DROPC, American College of Surgeons

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<sup>1</sup>Fondazione Policlinico Universitario A. Gemelli IRCCS, <sup>2</sup>Division of Endocrine and Metabolic Surgery, Fondazione Policlinico Universitario A. Gemelli IRCCS, Università Cattolica del Sacro Cuore

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<sup>1</sup>General Surgery, Mayo Clinic Arizona, <sup>2</sup>Transplant Surgery, Mayo Clinic Arizona, <sup>3</sup>Endocrinology, Mayo Clinic Arizona

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<sup>1</sup>Surgery, Gachon University College of Medicine, <sup>2</sup>Internal Medicine, Seoul National University Boramae Medical Center, <sup>3</sup>Surgery, Seoul National University Boramae Medical Center

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<sup>1</sup>New York Presbyterian Hospital: Weill Cornell Medical Center, <sup>2</sup>Department of Surgery, Weill Cornell Medicine, <sup>3</sup>Weill Cornell Medicine, <sup>4</sup>Boyce Thompson Institute Mass Spectrometry Center, Cornell University

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<sup>1</sup>MetroHealth Medical Center, <sup>2</sup>Department of General Surgery, MetroHealth Medical Center

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<sup>1</sup>Surgery, University of Wisconsin

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<sup>1</sup>Surgery, University of Wisconsin

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Kara K Rossfeld<sup>1</sup>, Sahana Rao<sup>1</sup>, Pamela Brock<sup>1</sup>, Lawrence A Shirley<sup>1</sup>, John E Phay<sup>1</sup>

<sup>1</sup>The Ohio State University Wexner Medical Center

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<sup>1</sup>Department of Surgery, University of California, San Francisco, <sup>2</sup>Department of Biostatistics, University of California, Berkeley, <sup>3</sup>University of California, San Francisco

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Fnu Shashpal<sup>1</sup>, Denise Carneiro-Pla<sup>2</sup>, Timothy Lyons<sup>1</sup>, Louis Luttrell<sup>1</sup>, Mahsa Javid<sup>2</sup>

<sup>1</sup>Endocrinology, Medical University of South Carolina, <sup>2</sup>Surgery, Medical University of South Carolina



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Thompson, Geoffrey

Bruce

Young, William F.

### **St. Paul**

Fox, Amy Catherine

Sneider, Mark S.

### **St. Michael**

Glenn, Jason

## **MISSOURI**

### **Columbia**

Koivunen, Debra G.

## **Saint Louis**

Brunt, L. Michael

Gillanders, William E.

Hall, Bruce L.

Shieber, William

## **MISSISSIPPI**

### **Jackson**

Parent, Andrew D.

### **Tupelo**

Bowlin, John W.

## **NORTH CAROLINA**

### **Apex**

Leight, George S.

### **Asheville**

Humble, Ted H.

Mazotas, Ioanna

### **Chapel Hill**

Croom, Robert D.

Kim, Lawrence T.

Yeh, Jen Jen

### **Charlotte**

Kercher, Kent W.

Wagner, Kristin Elizabeth

### **Durham**

Scheri, Randall P

### **Greenville**

Pofahl, Walter E.

Pories, Walter J.

### **Pittsboro**

Starling, James R.

### **Raleigh**

Faust, Kirk B.

Gallagher, Scott F

Park, Paul Beomsoo

### **Wilmington**

Versnick, Mark Anthony

### **Winston-Salem**

Albertson, David A.

Cannon, Jennifer

## **NORTH DAKOTA**

### **Fargo**

Traynor, Michael

Donovan

## **NEBRASKA**

### **Omaha**

Fingeret, Abbey

## **NEW HAMPSHIRE**

### **Lebanon**

Sorensen Meredith J.

## **NEW JERSEY**

### **Livingston**

Bains, Sarina

### **Morristown**

Whitman, Eric D.

### **Neptune**

Shifrin, Alexander L.

Sullivan, Michael Corey

### **New Brunswick**

Laird, Amanda Michelle

Libutti, Steven K.

Trooskin, Stanley

Zachary

### **Plainsboro**

Kahn, Steven P.

### **Ridgewood**

Kundel, Anna

### **Vineland**

Kushnir Leon

## **NEW MEXICO**

### **Albuquerque**

Nockel, Pavel John

### **Hobbs**

Konstantinidis,

Agathoklis

### **Rio Rancho**

Miscall, Brian G.

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## **NEW YORK**

### **Albany**

Abraham, Christa Rose  
Applewhite, Megan K

### **Bronx**

Kim, Ki Won  
Sivarajah, Maheshwaran  
Smith, Jonathan Cope

### **Brooklyn**

Beninato, Toni

### **Carmel**

Grant, Scott Bryan

### **Chappaqua**

Aronova, Anna

### **Fayetteville**

Albert, Scott Paul  
Dhir, Mashaal  
Kort-Glowaki, Kara C.

### **Forest Hills**

Babic, Bruna

### **Ithaca**

Lee, Denise

### **Lake Success**

Dubner, Sanford  
Yozawitz, Justin Mark

### **Mineola**

Allendorf, John D.

### **New York City**

Brennan, Murray F.  
Buicko, Jessica Lynn  
Chabot, John A.  
Fahey III, Thomas J  
Fernandez Ranvier,  
Gustavo G  
Finnerty, Brendan M  
Ganly, Ian  
Givi, Babak  
Heller, Keith Stuart  
Inabnet, William B.

Kraus, Dennis H.

Kuo, Jennifer Hong

Lee, James

Madani, Amin

Marti, Jennifer Lynn

Ogilvie, Jennifer B.

Patel, Kepal N.

Shah, Jatin P.

Shaha, Ashok R.

Strong, Vivian E.

Suh, Hyunsuk

Suman, Paritosh

Taye, Aida

Tuttle, Robert M.

Wilson, Melissa

Wu, James X

Zarnegar, Rasa

### **Rochester**

Chennell, Todd

Moalem, Jacob

### **Syracuse**

Gutnick, Jesse

Numann, Patricia J.

## **OHIO**

### **Akron**

Horattas, Mark C.  
van Fossen, Victoria L.

### **Beachwood**

Chagpar, Ryaz

### **Cincinnati**

Steward, David Leland

### **Cleveland**

Esselstyn, Caldwell B.  
Jin, Judy  
Mansour, Edward G.  
McHenry, Christopher R.  
Shin, Joyce J  
Siperstein, Allan  
Wilhelm, Scott Michael

## **Columbus**

Ellison, Christopher

Lee, Grace

Shirley, Lawrence A.

### **Toledo**

Brunicardi, Francis  
Charles  
Wharry, Laura I.

## **OKLAHOMA**

### **Norman**

Connally, Tom Shi

## **OREGON**

### **Lake Oswego**

Lim, James Young Hoon

### **Portland**

Aliabadi, Shaghayegh  
Jamison, Richard  
Lindsay  
Limbach, Kristen  
Pommier, Rodney F.  
Raaf, John H.  
Sheppard, Brett C.  
Yu, Kelvin Chiu

### **Springfield**

Folek, Jessica

## **PENNSYLVANIA**

### **Allentown**

Hartzell, George W.

### **Bryn Mawr**

Carter, Bradford

### **Danville**

Mallick, Reema  
Strodel, William E.

### **Greensburg**

Treter, Sarah D.

### **Hershey**

Boltz, Melissa Marie  
Kauffman, Gordon L.  
Saunders, Brian D.

# GEOGRAPHICAL MEMBERSHIP DIRECTORY

## **Meadowbrook**

Kukora, John S.

## **Oil City**

El Lakis, Mustapha

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Fraker, Douglas L.

Kairys, John C.

Kelz, Rachel

Kuo, Lindsay Evert

Yunxiu

Lango, Miriam

LiVolsi, Virginia

Mao, Melissa

Ridge, John A.

Wachtel, Heather

Yeo, Charles J.

## **Pittsburgh**

Bartlett, David Lawrence

Carty, Sally E

McCoy, Kelly Lynn

Nicholson, Kristina Joy

Yip, Linwah

## **Saxonburg**

Stremple, John F.

## **Sayre**

Trostle, Doug

## **RHODE ISLAND**

### **Providence**

Cotton, Travis Mcfarlane

Monchik, Jack Morton

## **SOUTH CAROLINA**

### **Boiling Springs**

Whitfield, Bryan Watkins

### **Charleston**

Carneiro-Pla, Denise

Javid, Mahsa

### **Columbia**

Brown, J. Jeffrey

## **Greenville**

Lokey, Jonathan S

## **Rock Hill**

Dhiman, Shamly V

## **Seabrook Island**

van Heerden, Jon

Anthony

## **SOUTH DAKOTA**

### **Sioux Falls**

Murphy Emily EK

## **TENNESSEE**

### **Chattanooga**

Roe, Michael

### **Knoxville**

Beasley, Mariah

Alexander

Harrell, David Joel

Mancini, Matthew

Lawrence

Nelson, Henry Sperry

Zirkle, Kevin

### **Memphis**

King Jr., William Scott

Rocheffort, Holly

### **Nashville**

Abumrad, Naji N.

Baregamian, Naira

Broome, James Thomas

Mims, Michele Hall

Prasertvit, Sirinya

Solorzano, Carmen

Cecilia

### **Tazewell**

Wilmoth, Robert J.

## **TEXAS**

### **Austin**

Brady, Bridget Marie

Kroeker, Teresa R

Lirov, Roy

## **Belton**

Lairmore, Terry C.

## **Dallas**

Balentine, Courtney

Dackiw, Alan P.B.

Holt, Shelby Anne

Islam, Ana Kashfia

Landry, Christine S.

Oltmann, Sarah

Catherine

Rabaglia, Jennifer

Lauren

Steckler, Robert M.

Wang, Yi Zarn

## **Denton**

Garner, Carolyn Nance

## **Edinburg**

Reinhart, Henry Alfred

Romero Arenas, Minerva

Angelica

## **El Paso**

Alkhalili, Eyas

## **Galveston**

Tyler, Douglas S.

## **Harlington**

Snyder, Samuel K.

## **Houston**

Fisher, Sarah

Graham, Paul Hardin

Grubbs, Elizabeth

Gardner

Jackson, Gilchrist L.

Lee, Jeffrey E.

Makris, Konstantinos

Perrier, Nancy D.

Suliburk, James W.

Zagzag, Jonathan

Zheng, Feibi

## **San Antonio**

Duperier, Frank

Dauterive

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Kitano, Mio

Santillan, Alfredo A.

## **Temple**

Campbell, Rebekah

Milan, Stacey

## **Wichita Falls**

Sutton, Beth H.

## **VIRGINIA**

### **Arlington**

Broughan, Thomas A.

Lai, Victoria

### **Charlottesville**

Hanks, John B.

Smith, Philip William

Zeiger, Martha Allen

### **Fairfax**

Assadipour, Yasmine

### **Norfolk**

Hughes, Marybeth

### **Portsmouth**

Johnston, Michael

Gwynne

### **Richmond**

Grover, Amelia C.

Khokar, Amna

Merrell, Ronald Clifton

Newsome, Heber H.

Phan, Giao Q.

Shah, Syed

## **VERMONT**

### **Burlington**

Wrenn, Sean Michael

## **WASHINGTON**

### **Centralia**

Yan, Huan

### **Kirkland**

Hakkarainen, Timo

William

## **Seattle**

Reimel, Beth Ann

Zern, Nicole Kansier

## **Veradale**

Sinha, Renu

## **WISCONSIN**

### **Appleton**

Mitchell, Janeil M

### **Madison**

Bates, Maria

Long, Kristin Leigh

Mack, Eberhard A.

Matzke, Greg M.

Pasupuleti, Latha

Venkata

Pitt, Susan Clare

Schaefer, Sarah

Catherine

Schneider, David F.

Sippel, Rebecca S

Wenger, Ronald David

### **Milwaukee**

Campbell, Bruce H

Cayo, Ashley Kappes

Evans, Douglas B.

Krzywda, Elizabeth Ann

Misustin, Sarah

Patel, Dhaval Thakor

Wang, Tracy S.

Wilson, Stuart D.

Yen, Tina Wei-Fang

## **WEST VIRGINIA**

### **Charleston**

Richmond, Bryan K.

### **Morgantown**

LoPinto, Melissa

## **Australia**

### **Beecroft**

Reeve, Thomas S.

### **Footscray**

Chin-Lenn, Laura

### **Liverpool**

Niles, Navin

### **Melbourne**

Miller, Julie Ann

Serpell, Jonathan

William

Yeung, Meei J.

### **North Hobart**

Mills, Jane Kathleen

### **Sydney**

Delbridge, Leigh W.

Sidhu, Stan

### **Warroona**

Edis, Anthony J.

## **Austria**

### **Vienna**

Niederle, Bruno

## **Belgium**

### **Aalst**

Van Slycke, Sam

## **China**

### **Hong Kong**

Lo, Chung-Yau

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### **Clermont-Ferrand**

Kauffmann, Philippe R.

### **Lille Cedex**

Carnaille, Bruno Marie

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## **Marseilles**

Sebag, Frederic N.

## **Strasbourg**

Mutter, Didier

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Brunaud, Laurent

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### **Duisburg**

Simon, Dietmar

### **Dusseldorf**

Roeher, Hans-Dietrich

### **Essen**

Walz, Martin K.

### **Mainz**

Musholt, Thomas J.

Weber, Theresia

### **Rostock**

Klar, Ernst

## **Greece**

### **Athens**

Linos, Dimitrios A.

Moraitis, Dimitrios G.

### **Thessaloniki**

Koutelidakis, Ioannis

## **India**

### **Lucknow**

Agarwal, Amit

Agarwal, Gaurav

Mishra, Saroj K.

## **Israel**

### **Hadera**

Krausz, Michael M.

### **Haifa**

Mekel, Michal

### **Herzliya**

Schachter, Pinhas P.

### **Jerusalem**

Mazeh, Haggi

## **Italy**

### **Bari**

Testini, Mario

### **Genoa**

Minuto, Michele N.

### **Padova**

Iacobone, Maurizio

### **Padua**

Favia, Gennaro

### **Pisa**

Miccoli, Paolo

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De Crea, Carmela

Raffaelli, Marco

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Imamura, Masayuki

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Imai, Tsuneo

## **Oita**

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## **Tokyo**

Obara, Takao

Sugitani, Iwao

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### **Putrajaya**

Mahamad, Sadhana

## **Netherlands**

### **Amsterdam**

Engelsman, Anton

### **Groningen**

Kruijff, Schelto

### **Utrecht**

Borel Rinkes, Inne H.M.

Vriens, Menno

Reginaldus

## **New Zealand**

### **AUCKLAND**

#### **Whangarei**

Patel, Rajeshbhai

Kantibhai

## **Norway**

### **Bergen**

Varhaug, Jan E.

## **Poland**

### **Krakow**

Barczynski, Marcin



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## **Saudi Arabia**

### **Riyadh**

Al Sobhi, Saif Sulaiman  
Alhefdhi, Amal Yahya

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### **Belgrade**

Paunovic, Ivan

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Lee, Kyu Eun

## **Spain**

### **Barcelona**

Moreno Llorente, Pablo

### **Madrid**

Duran Poveda, Manuel

## **Sweden**

### **Linköping**

Gimm, Oliver

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Hamberger, Bertil

Kouvaraki, Maria

### **Uppsala**

Skogseid, Britt M.

## **Switzerland**

### **Geneva**

Sadowski, Samira  
Mercedes

## **Taiwan**

### **Taipei**

Lee, Chen-Hsen

## **Turkey**

### **Istanbul**

Duren, Mete

Tezelman, Serdar Tevfik

## **Ukraine**

### **Kiev**

Kvachenyuk, Andrey

## **United Kingdom**

### **APO**

Young, Christopher

### **Exeter**

Pearse, A.G.E.

### **London**

Christakis, Ioannis

Apostolos

Frilling, Andrea

### **Oxford**

Dudley, Nicholas E.



























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41<sup>ST</sup> ANNUAL MEETING

2020  
APRIL 4 - 6

Birmingham, Alabama

Local Arrangements Chair: John Porterfield, MD

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T: 859-402-9810 | F: 859-514-9166

E: [INFO@ENDOCRINESURGERY.ORG](mailto:INFO@ENDOCRINESURGERY.ORG)

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