



# touchREVIEWS in Endocrinology

VOLUME 18 • ISSUE 1 • 2022

EDITOR-IN-CHIEF: JOHN DOUPIS

**Tirzepatide: a novel once-weekly dual GIP and GLP-1 receptor for the treatment of T2DM**

Shizuka Kaneko

**Semaglutide: A Once Weekly Injection for Weight Management in Obesity**

Ides M Colin and Anne-Catherine Gérard

**Thyroid Functions During and After COVID-19 Infection: A Review**

Sabri Artun Çabuk, Ayşe Zeynep Cevher and Yaşar Küçükardalı

**Anterior pituitary hormones in blood and CSF of neurocritical care patients**

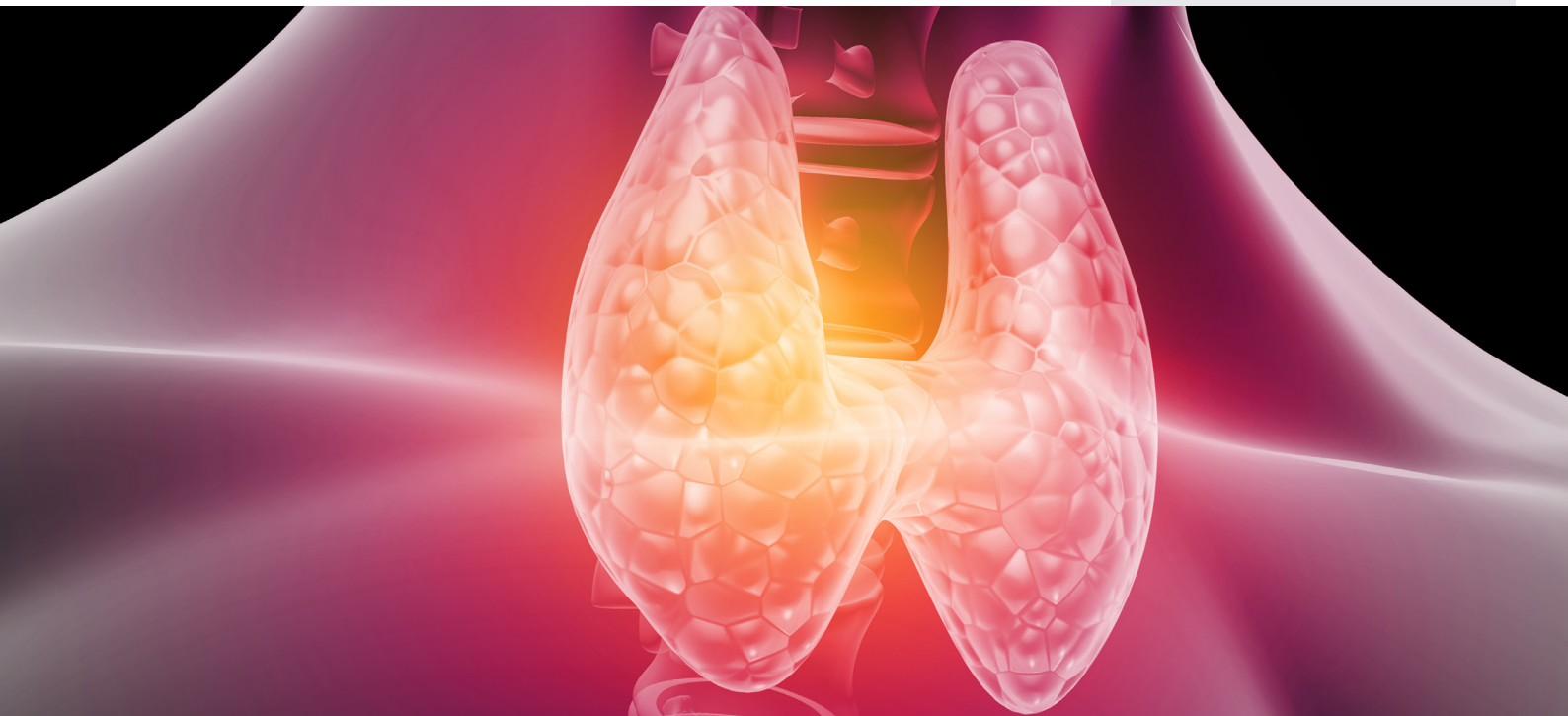
Henriette Beyer, Nicole Lange, Armin H Podtschaske et al.

[www.touchENDOCRINOLOGY.com](http://www.touchENDOCRINOLOGY.com)

# touchREVIEWS in Endocrinology

Volume 18 • Issue 1

Cover image: Human thyroid anatomy, 3d illustration.  
By Rasi © shutterstock.com



touchREVIEWS in Endocrinology wishes to thank the organisations below for their assistance. This does not constitute any official endorsement.



#### Editorial Directors

Gina Furnival  
Sophie Nickelson  
Katey Gabrysch

#### Commissioning Editors

Victoria Jones

#### Editorial Workforce

Lisa Glass  
Heather Hall

#### Editorial Assistants

Shanice Allen  
Marianna Mignani  
Danielle Crosby

#### Design Manager

Julie Stevenson

#### Group Head Medical & Editorial

Nicola Cartridge  
E: nicola.cartridge@touchmedicalmedia.com  
T: +44 (0)20 7193 3186

#### CEO & Managing Director

Barney Kent  
E: barney.kent@touchmedicalmedia.com  
T: +44 (0)20 7193 3009

#### Head of Strategic Partnerships

Caroline Markham  
E: caroline.markham@touchmedicalmedia.com  
T: +44 (0)20 7193 3704

All information obtained by Touch Medical Media and each of the contributors from various sources is as current and accurate as possible. However, due to human or mechanical errors, Touch Medical Media and the contributors cannot guarantee the accuracy, adequacy or completeness of any information, and cannot be held responsible for any errors or omissions, or for the results obtained from the use thereof. Where opinion is expressed, it is that of the authors and does not necessarily coincide with the editorial views of Touch Medical Media. Statistical and financial data in this publication have been compiled on the basis of factual information and do not constitute any investment advertisement or investment advice. For the avoidance of doubt, the information contained in this publication is intended for use by licensed medical professionals. The content should not be considered medical advice, diagnosis or treatment recommendations.

© 2022 Touch Medical Media Group Holdings Ltd, is a private limited company registered in England and Wales at Lancashire Gate, 21 Tiviot Dale, Stockport, Cheshire, SK1 1TD, UK, with registered number 08197142. All rights reserved.

ISSN: 2752-5457



www.touchmedicalmedia.com



# touchREVIEWS

## in Endocrinology

### Editor-in-Chief

**John Doupis**

Director, Diabetes Division, Iatriko Palaiou Falirou Medical Center and Internal Medicine and Diabetes Department, NS Naval Hospital, Athens, Greece

### Section Editors

**George P Chrousos**

Professor and Chairman, First Department of Paediatrics, University of Athens Medical School, Athens, Greece

**Neil Gittoes**

Head, Centre for Endocrinology, Diabetes and Metabolism, University Hospitals Birmingham and University of Birmingham, Birmingham, UK

**Ashley Grossman**

Professor of Endocrinology, Oxford Centre for Diabetes, Endocrinology and Metabolism, University of Oxford, Oxford, UK

**Chantal Mathieu**

Professor of Medicine, Catholic University of Leuven, Leuven, Belgium

**Alex Miras**

Senior Clinical Lecturer in Endocrinology, Imperial College London, London, UK

### Editorial Board

**S Faisal Ahmed**

Samson Gemmill Chair of Child Health, Consultant in Paediatric Endocrinology, School of Medicine, University of Glasgow, Glasgow, UK

**Sarah Ali**

Consultant, Endocrinology, Diabetes and General Medicine, Royal Free London NHS Foundation Trust, London, UK

**Philippe Bouchard**

Professor and Chairman, Department of Endocrinology, Hospital Saint Antoine and University Pierre and Marie Curie, Paris, France

**Francesco Chiarelli**

Professor of Paediatrics, D'Annunzio University of Chieti-Pescara, Chieti, Italy

**Annamaria Colao**

Full Professor, University of Naples Federico II, Naples, Italy

**Thomas Danne**

Professor of Paediatrics, Children's Hospital 'Auf der Bult', Hannover, Germany

**Deep Dutta**

Senior Endocrinologist, Department of Endocrinology, CEDAR Super-specialty Clinics, New Delhi, India

**Ulla Feldt-Rasmussen**

Professor, Department of Endocrinology, Centre of Cancer and Organ Diseases, University of Copenhagen, Copenhagen, Denmark

**Anne-Marie Felton**

President, Federation of European Nurses in Diabetes (FEND), Newcastle On Tyne, UK

**Angus Forbes**

Professor of Diabetes Nursing and Chair, Foundation of European Nurses in Diabetes (FEND), King's College London, London, UK

**Baptist Gallwitz**

Professor of Medicine, Eberhard Karls University of Tübingen, Tübingen, Germany

**Andrea R Genazzani**

Professor and Director, Department of Reproductive Medicine and Child Development, University of Pisa, Pisa, Italy

**Ezio Ghigo**

Professor, Division of Endocrinology and Metabolism, University of Turin, Turin, Italy

**Burkhard Göke**

Medical Director and CEO, University Medical Center Hamburg-Eppendorf, Hamburg, Germany

**Anthony M Heagerty**

Professor, University of Manchester, Manchester, UK

**Jens Juul Holst**

Professor of Medical Physiology, University of Copenhagen, Copenhagen, Denmark

**Ilpo Huhtaniemi**

Emeritus Professor of Reproductive Endocrinology, Faculty of Medicine, Department of Surgery & Cancer, Imperial College London, London, UK

**Anna-Lena Hulting**

Professor, Endocrinology, Metabolism and Diabetology, Karolinska University Hospital, Solna, Sweden

**Sanjay Kalra**

Executive Editor, JoSH Diabetes, Bharti Hospital, Karnal, India

**Robert Knutzen**

President and CEO, Pituitary Network Association (PNA), Thousand Oaks, CA, USA

**Andrea Lenzi**

Full Professor of Endocrinology, 'La Sapienza' University of Rome, Rome, Italy

**Rayaz A Malik**

Professor of Medicine at Weill Cornell Medical College, Doha, Qatar & New York City, New York, NY, USA

**Jean Claude Mbanya**

Professor of Medicine and Endocrinology, University of Yaoundé, Cameroon, Africa

**Neely Mozawala**

Diabetes Specialist Podiatrist, London, UK

**Furio Pacini**

Professor of Endocrinology, University of Siena, Siena, Italy

**Enrico Papini**

Professor of Endocrinology, 'La Sapienza' University of Rome Medical School, Rome, Italy

**Ralf Paschke**

Professor of Internal Medicine and Endocrinology, Leipzig University, Leipzig, Germany

**Vera Popovic-Brkic**

Professor of Medicine, University of Belgrade School of Medicine, Belgrade, Serbia

**Michael B Ranke**

Professor, University Children's Hospital, Eberhard Karls University, Tübingen, Germany

**João Filipe Raposo**

Assistant Professor of Public Health, Medical Faculty of New University of Lisbon; Clinical Director, Protective Association of Diabetics of Portugal, Lisbon, Portugal

**Martin Silink**

Professor of Paediatric Endocrinology, University of Sydney; Children's Hospital, Westmead, Sydney, Australia

**Johannes WA Smit**

Professor and Chairman, Department of Endocrinology, Leiden University Medical Centre, Leiden, Netherlands

**Solomon Tesfaye**

Consultant Physician and Honorary Professor of Diabetic Medicine, University of Sheffield, Sheffield, UK

**Tommaso Simoncini**

Professor of Obstetrics and Gynaecology, Department of Clinical and Experimental Medicine, University of Pisa, Pisa, Italy

**Peter Trainer**

Professor of Endocrinology, University of Manchester, Manchester, UK

**Graham R Williams**

Professor of Endocrinology, Imperial College London, London, UK

# touchREVIEWS in Endocrinology

Established: December 2005 Frequency: Bi-annual  
Current edition: Volume 18 Issue 1, 2022

## Aims and Scope

- *touchREVIEWS in Endocrinology* enables time-pressured physicians to stay abreast of major advances and opinion in endocrine practice in Europe.
- *touchREVIEWS in Endocrinology* comprises balanced and comprehensive articles, addressing the most important and salient developments in the endocrinology field.
- *touchREVIEWS in Endocrinology* endeavours to support physicians, clinicians and related healthcare professionals in continuously developing their knowledge, effectiveness and productivity. The editorial policy has been designed to encourage discussion among this peer group.
- Comprehensive bibliographies for each article mean that *touchREVIEWS in Endocrinology* is an informative and valuable reference tool for use throughout the year.
- All articles are subject to peer review, and must adhere to the ICMJE, GPP-3, and COPE guidelines.

## Structure and Format

- *touchREVIEWS in Endocrinology* is a peer-reviewed, free-to-access, bi-annual journal comprising expert interviews, review articles, case reports, editorials, special reports and original research.
- The structure of each edition of the publication comprises section categories determined by the Managing Editor. The degree of coverage assigned to each category is the decision of the Managing Editor, and in part reflects the views of the Editorial Board.
- All articles disclose any author disclosures along with any funding, financial support, and medical writing assistance.
- Each edition of *touchREVIEWS in Endocrinology* is published in full online at [www.touchENDOCRINOLOGY.com](http://www.touchENDOCRINOLOGY.com)

## Editorial Expertise

*touchREVIEWS in Endocrinology* is supported by various levels of expertise:

- Guidance from an Editorial Board consisting of leading authorities from a variety of endocrine disciplines.
- Invited contributors who are recognised authorities from their respective fields.
- Peer review – conducted by experts appointed for their experience and knowledge of a specific topic.
- An experienced team of editors and technical editors.

## Peer Review

- On submission, all articles are assessed by the Managing Editor to determine their suitability for inclusion and appropriateness for peer review.
- The Managing Editor identifies at least two appropriate reviewers, who are selected on the basis of their specialist knowledge in the relevant area, following consultation with a member of the Editorial Board where necessary.
- We aim to have the final peer review decision within 4 weeks.
- Following review, papers are either accepted without modification, returned to the author(s) to incorporate required changes or not accepted for publication.
- The Managing Editor reserves the right to accept or reject any proposed amendments on the advice of the Editorial Board and reviewers.

## Submissions and Instructions for Authors

- The Managing Editor commissions articles with guidance from the Editorial Board and unsolicited articles are welcomed.
- The Managing Editor is always keen to hear from authors wishing to discuss potential submissions, and will give due consideration to any proposals. Please contact the Managing Editor for further details.
- The 'Instructions for Authors' information is available for download at [www.touchENDOCRINOLOGY.com](http://www.touchENDOCRINOLOGY.com)

## Distribution and Readership

*touchREVIEWS in Endocrinology* is distributed bi-annually through controlled circulation to healthcare and pharmaceutical professionals in the field in Europe.

## Abstracting and Indexing

*touchREVIEWS in Endocrinology* is abstracted, indexed and listed in PubMed Central, Embase, Genamics JournalSeek, Google Scholar, IndexCopernicus and Summon by Serial Solutions.

## Free-to-access

All articles are free-to-access, which allows everyone in the endocrinology field to download published articles for free.


## Online

[www.touchmedicalmedia.com](http://www.touchmedicalmedia.com) provides clinicians and other industry professionals with a free resource of articles from over nine titles, spanning seven therapy areas including cardiology, endocrinology, immunology, neurology, oncology, ophthalmology and respiratory. Also available online at [www.touchENDOCRINOLOGY.com](http://www.touchENDOCRINOLOGY.com) is *touchREVIEWS in Endocrinology's* sister publication, *US Endocrinology*.

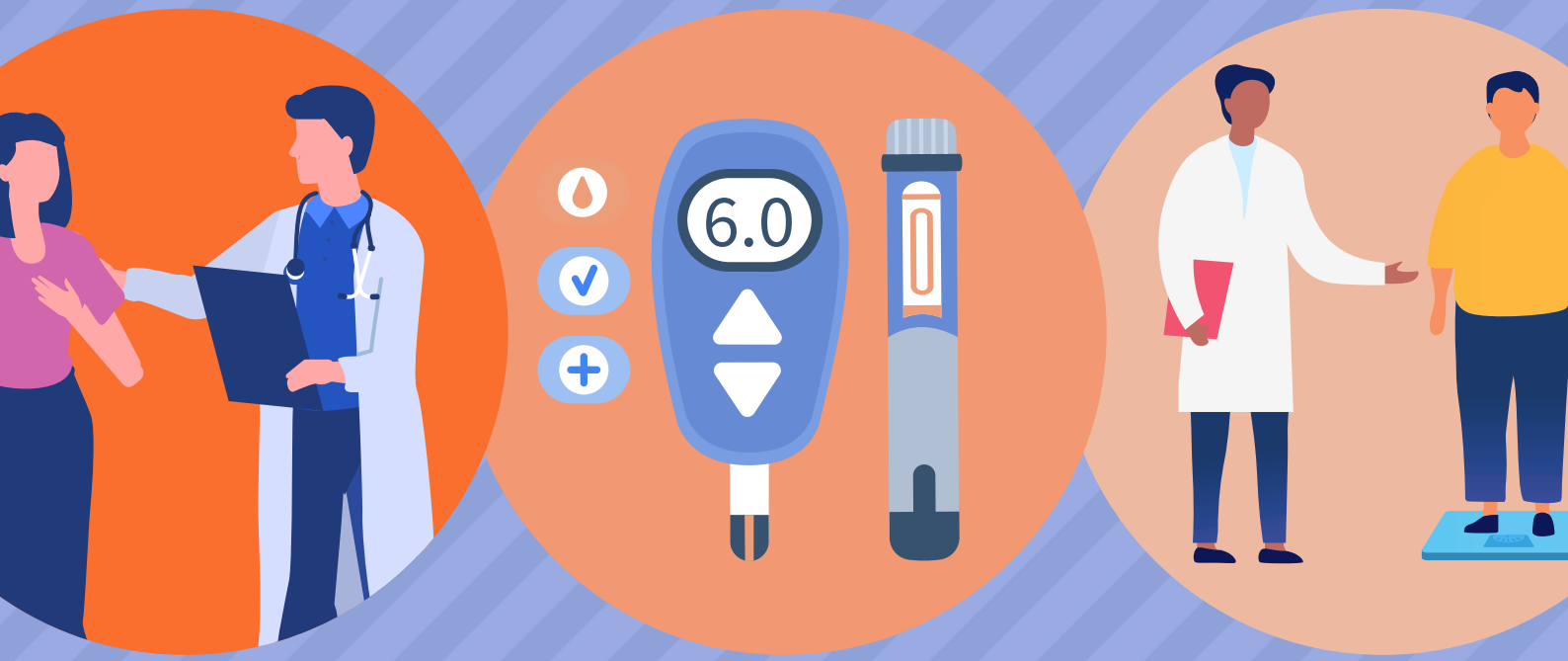
## Society Partners

[touchENDOCRINOLOGY.com](http://touchENDOCRINOLOGY.com) has developed very valuable society partnerships with the most respected not-for-profit medical societies both in Europe and the USA. These partnerships are key as [touchENDOCRINOLOGY.com](http://touchENDOCRINOLOGY.com) helps to promote awareness of these medical societies while also providing free-to-access, peer-reviewed articles and multimedia content to the society members, which ensures that the community is kept up-to-date with the latest cutting-edge content and opinion from world-renowned doctors.

## About Touch Medical Media

Touch Medical Media publishes a rich and diverse portfolio of free-to-access, peer-reviewed journals across the clinical and pharmaceutical arenas. Touch Medical Media aims to assist in the education and practice of healthcare and pharmaceutical professionals. 



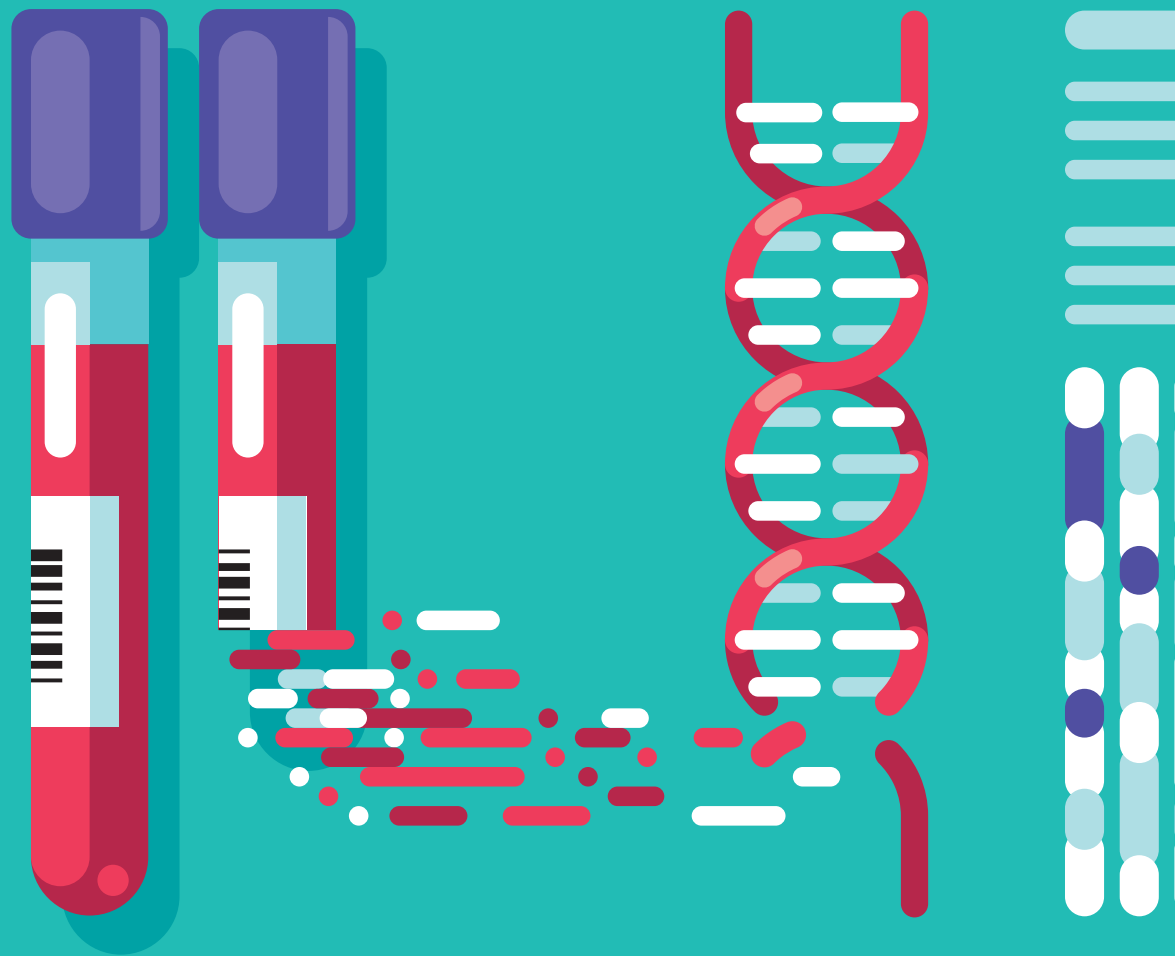


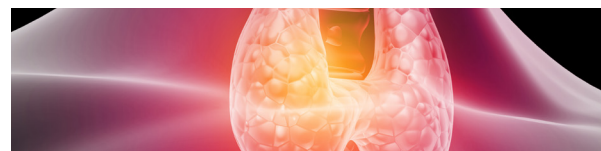
# Integrating GLP-1 RAs into T2D management: A unified approach, from PCP to patient

# Future perspectives in T2D and obesity: From dual-agonist therapy to patient education



# Personalized treatment of RET-altered thyroid cancers: What is the value of biomarker testing and targeted therapies?





## Foreword

### 1 Foreword

**John Doupis**

*Department of Internal Medicine and Diabetes, Salamis Naval and Veterans Hospital, Salamis Naval Base, Attiki, Greece*

## Systematic Review

### Diabetes

### 2 Diagnostic Test Accuracy of Urine C-peptide Creatinine Ratio for the Correct Identification of the Type of Diabetes: A Systematic Review

**Joseph M Pappachan,<sup>1,2,3</sup> Bhuvana Sunil,<sup>4</sup> Cornelius J Fernandez,<sup>5</sup> Ian M Lahart<sup>6</sup> and Ambika P Ashraf<sup>7</sup>**

*1. Department of Endocrinology & Metabolism, Lancashire Teaching Hospitals NHS Trust, Preston, UK; 2. Faculty of Science, Manchester Metropolitan University, Manchester, UK; 3. Faculty of Biology, Medicine and Health, The University of Manchester, Manchester, UK; 4. Division of Pediatric Endocrinology & Diabetes, Mary Bridge Children's Hospital, Tacoma, WA, USA; 5. Department of Endocrinology & Metabolism, Pilgrim Hospital, Boston, UK; 6. Faculty of Education, Health and Wellbeing, University of Wolverhampton, Walsall, UK; 7. Division of Pediatric Endocrinology & Diabetes, University of Alabama at Birmingham, AL USA*

## Reviews

### Diabetes

### 10 Tirzepatide: A Novel, Once-weekly Dual GIP and GLP-1 Receptor Agonist for the Treatment of Type 2 Diabetes

**Shizuka Kaneko**

*Division of Diabetes/Endocrinology/Lifestyle-Related Disease, Takatsuki Red Cross Hospital, Takatsuki, Japan*

### 20 Utilizing the New Glucometrics: A Practical Guide to Ambulatory Glucose Profile Interpretation

**John Doupis<sup>1,2</sup> and Edward S Horton<sup>3</sup>**

*1. Department of Internal Medicine and Diabetes, Salamis Naval and Veterans Hospital, Salamis, Attiki, Greece; 2. Iatriko Paleou Falirou Medical Center, Diabetes Clinic, Athens, Greece; 3. Harvard Medical School, Boston, MA, USA*

### 27 Review of Automated Insulin Delivery Systems for Type 1 Diabetes and Associated Time in Range Outcomes

**Armaan Nallicheri,<sup>1</sup> Katherine M Mahoney,<sup>1</sup> Hanna A Gutow,<sup>1</sup> Natalie Bellini<sup>2</sup> and Diana Isaacs<sup>3</sup>**

*1. Close Concerns, San Francisco, CA, USA; 2. R&B Medical Group, Williamsville, NY, USA; 3. Cleveland Clinic, Cleveland, OH, USA*

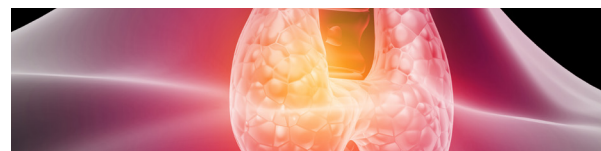
### Obesity

### 35 Once-weekly 2.4 mg Semaglutide for Weight Management in Obesity: A Game Changer?

**Ides M Colin<sup>1</sup> and Anne-Catherine Gérard<sup>1,2</sup>**

*1. Endocrino-Diabetology Research Unit, Department of Internal Medicine, Centre Hospitalier Régional (CHR) Mons-Hainaut/ Groupe Jolimont, Mons, Belgium; 2. Group of Animal Molecular and Cellular Biology, Louvain Institute of Biomolecular Science and Technology (LIBST), Université catholique de Louvain (UCLouvain), Louvain-La-Neuve, Belgium*





## Reviews

### Obesity

#### 43 **Glucagon-like Peptide-1 Receptor Analogues for the Treatment of Obesity**

David M Williams,<sup>1</sup> Matthew Staff,<sup>1</sup> Stephen C Bain<sup>1,2</sup> and Thinzar Min<sup>1-3</sup>

1. Department of Diabetes and Endocrinology, Singleton Hospital, Swansea Bay University Health Board, Swansea, UK; 2. Diabetes Research Group, Swansea University Medical School, Swansea University, Swansea, UK; 3. Department of Diabetes and Endocrinology, Neath Port Talbot Hospital, Swansea Bay University Health Board, Swansea, UK

### Paediatric Endocrinology

#### 49 **Novel Insights Into the Genetic Causes of Short Stature in Children**

Concetta Mastromauro and Francesco Chiarelli

Department of Paediatrics, University of Chieti, Chieti, Italy

### Thyroid Disorders

#### 58 **Thyroid Function During and After COVID-19 Infection: A Review**

Sabri Artun Çabuk, Ayşe Zeynep Cevher and Yaşar Küçükardalı

Yeditepe University Hospital, Istanbul, Turkey

## Original Research

### Diabetes

#### 63 **Indian Phenotype Characteristics Among Patients with Type 2 Diabetes Mellitus: Insights from a Non-interventional Nationwide Registry in India**

Sanjay Kalra,<sup>1</sup> Ambrish Mithal,<sup>2</sup> Abdul Hamid Zargar,<sup>3</sup> Bipin Sethi,<sup>4</sup> Mala Dharmalingam,<sup>5</sup> Sujoy Ghosh<sup>6</sup> and Ranjini Sen<sup>7</sup>

1. Department of Endocrinology, Bharti Hospital, Karnal, India; 2. Department of Endocrinology, Max Healthcare, Saket, India; 3. Centre for Diabetes and Endocrine Care, Gulshan Nagar, Srinagar, India; 4. Department of Endocrinology, CARE Super Specialty Hospital & Transplant Centre, Hyderabad, India; 5. Department of Endocrinology, Ramaiah Medical College, Bengaluru, India; 6. Department of Endocrinology, Institute of Post-Graduate Medical Education and Research and Seth Sukhlal Karnani Memorial Hospital, Kolkata, India; 7. AstraZeneca Pharma India Ltd, Bengaluru, India

### Pituitary Disorders

#### 71 **Anterior Pituitary Hormones in Blood and Cerebrospinal Fluid of Patients in Neurocritical Care**

Henriette Beyer,<sup>1</sup> Nicole Lange,<sup>1</sup> Armin H Podtschaske,<sup>2</sup> Jan Martin,<sup>2</sup> Lucia Albers,<sup>3</sup> Alexaner von Werder,<sup>4</sup> Jürgen Ruland,<sup>5</sup> Gerhard Schneider,<sup>2</sup> Bernhard Meyer,<sup>1</sup> Simone M Kagerbauer<sup>2</sup> and Jens Gempt<sup>1</sup>

1. Department of Neurosurgery, Technical University Munich, School of Medicine, Klinikum rechts der Isar, Munich, Germany; 2. Department of Anesthesiology, Technical University Munich, School of Medicine, Klinikum rechts der Isar, Munich, Germany; 3. Department of Medical Informatics, Statistics and Epidemiology, Technical University Munich, School of Medicine, Klinikum rechts der Isar Munich, Germany; 4. Department of Neuroendocrinology, Technical University Munich, School of Medicine, Klinikum rechts der Isar, Munich, Germany; 5. Department of Clinical Chemistry, Technical University Munich, School of Medicine, Klinikum rechts der Isar, Munich, Germany