

Diabetes Care®

THE JOURNAL OF CLINICAL AND APPLIED RESEARCH AND EDUCATION

January 2020 Volume 43, Number 1

In This Issue

- 1 In This Issue of *Diabetes Care*

Editor's Commentary

- 3 *Diabetes Care* in 2020: Following and Leading the Stories of Diabetes
M.C. Riddle

Perspectives in Care

- 5 Introducing the Endotype Concept to Address the Challenge of Disease Heterogeneity in Type 1 Diabetes
M. Battaglia, S. Ahmed, M.S. Anderson, M.A. Atkinson, D. Becker, P.J. Bingley, E. Bosi, T.M. Brusko, L.A. DiMeglio, C. Evans-Molina, S.E. Gitelman, C.J. Greenbaum, P.A. Gottlieb, K.C. Herold, M.J. Hessner, M. Knip, L. Jacobsen, J.P. Krischer, S.A. Long, M. Lundgren, E.F. McKinney, N.G. Morgan, R.A. Oram, T. Pastinen, M.C. Peters, A. Petrelli, X. Qian, M.J. Redondo, B.O. Roep, D. Schatz, D. Skibinski, and M. Peakman

Commentaries

- 13 Insulin Dosing for Fat and Protein: Is it Time?
C.E.M. Smart, B.R. King, and P.E. Lopez
- 16 Genetics of Type 1 Diabetes Comes of Age
M.J. Redondo and P. Concannon

Continuous Glucose Monitoring For Type 1 Diabetes

- 19 Putting Continuous Glucose Monitoring to Work for People With Type 1 Diabetes
K.K. Hood, L.A. DiMeglio, and M.C. Riddle
- e1 Longitudinal Changes in Continuous Glucose Monitoring Use Among Individuals With Type 1 Diabetes: International Comparison in the German and Austrian DPV and U.S. T1D Exchange Registries
K.M. Miller, J. Hermann, N. Foster, S.E. Hofer, M.R. Rickels, T. Danne, M.A. Clements, E. Lilienthal, D.M. Maahs, and R.W. Holl, for the T1D Exchange and DPV Registries
- e3 CGM Initiation Soon After Type 1 Diabetes Diagnosis Results in Sustained CGM Use and Wear Time
P. Prahalad, A. Addala, D. Scheinker, K.K. Hood, and D.M. Maahs
- 22 Distinct Patterns of Daily Glucose Variability by Pubertal Status in Youth With Type 1 Diabetes
J. Zhu, L.K. Volkening, and L.M. Laffel
- 29 Faster Compared With Standard Insulin Aspart During Day-and-Night Fully Closed-Loop Insulin Therapy in Type 1 Diabetes: A Double-Blind Randomized Crossover Trial
K. Dovc, C. Piona, G. Yeşiltepe Mutlu, N. Bratina, B. Jenko Bizjan, D. Lepej, R. Nimri, E. Atlas, I. Muller, O. Kordonouri, T. Biester, T. Danne, M. Phillip, and T. Battelino
- 37 Glycemic Outcomes in Adults With T1D Are Impacted More by Continuous Glucose Monitoring Than by Insulin Delivery Method: 3 Years of Follow-Up From the COMISAIR Study
J. Šoupal, L. Petruželková, G. Grunberger, A. Hásková, M. Flekač, M. Matoulek, O. Mikeš, T. Pelcl, J. Škrha Jr., E. Horová, J. Škrha, C.G. Parkin, Š. Svačina, and M. Prázný

44

- Predictors of Recurrent Severe Hypoglycemia in Adults With Type 1 Diabetes and Impaired Awareness of Hypoglycemia During the HypoCOMPASS Study
A.J.S. Flatt, S.A. Little, J. Speight, L. Leelarathna, E. Walkinshaw, H.K. Tan, A. Bowes, A. Lubina-Solomon, E. Holmes-Truscott, T.J. Chadwick, R. Wood, T.J. McDonald, D. Kerr, D. Flanagan, A. Brooks, S.R. Heller, M.L. Evans, and J.A.M. Shaw

→ 53

- Continuous Glucose Monitoring in People With Type 1 Diabetes on Multiple-Dose Injection Therapy: The Relationship Between Glycemic Control and Hypoglycemia
N. Oliver, M. Gimenez, P. Calhoun, N. Cohen, V. Moscardo, N. Hermanns, G. Freckmann, M. Reddy, and L. Heinemann

Clinical Care/Education/Nutrition/Psychosocial Research

→ 59

- Amount and Type of Dietary Fat, Postprandial Glycemia, and Insulin Requirements in Type 1 Diabetes: A Randomized Within-Subject Trial
K.J. Bell, C.Z. Fio, S. Twigg, S.-A. Duke, G. Fulcher, K. Alexander, M. McGill, J. Wong, J. Brand-Miller, and G.M. Steil

67

- Urinary and Serum Angiogenic Markers in Women With Preexisting Diabetes During Pregnancy and Their Role in Preeclampsia Prediction
M. Zen, S. Padmanabhan, K. Zhang, A. Kirby, N.W. Cheung, V.W. Lee, and T.I. Alahakoon

74

- Excessive Weight Gain Before and During Gestational Diabetes Mellitus Management: What Is the Impact?
R.A. Barnes, T. Wong, G.P. Ross, M.M. Griffiths, C.E. Smart, C.E. Collins, L. MacDonald-Wicks, and J.R. Flack

→ 82



- Absence of Islet Autoantibodies and Modestly Raised Glucose Values at Diabetes Diagnosis Should Lead to Testing for MODY: Lessons From a 5-Year Pediatric Swedish National Cohort Study
A. Carlsson, M. Shepherd, S. Ellard, M. Weedon, Å. Lernmark, G. Forsander, K. Colclough, Q. Brahimi, C. Valtonen-Andre, S.A. Ivarsson, H. Elding Larsson, U. Samuelsson, E. Örtqvist, L. Groop, J. Ludvigsson, C. Marcus, and A.T. Hattersley

Epidemiology/Health Services Research

90

- Use of Sodium–Glucose Cotransporter 2 Inhibitors in Patients With Type 1 Diabetes and Rates of Diabetic Ketoacidosis
C. Hampp, R.S. Swain, C. Horgan, E. Dee, Y. Qiang, S.K. Dutcher, A. Petrone, R. Chen Tilney, J.C. Maro, and C.A. Panizzo

98

- Maternal Gestational Diabetes Mellitus and Newborn DNA Methylation: Findings From the Pregnancy and Childhood Epigenetics Consortium
C.G. Howe, B. Cox, R. Fore, J. Jungius, T. Kvist, S. Lent, H.E. Miles, L.A. Salas, S. Rifas-Shiman, A.P. Starling, P. Yousefi, C. Ladd-Acosta, A. Baccarelli, E.B. Binder, V.L. Chatzi, D. Czamara, D. Dabelea, D.L. DeMeo, A. Ghantous, Z. Herceg, E. Kajantie, J.M.T. Lahti, D.A. Lawlor, A. Litonjua, T.S. Nawrot, E.A. Nohr, E. Oken, C. Pizzi, M. Plusquin, K. Räikkönen, C.L. Relton, G.C. Sharp, T.I.A. Sørensen, J. Sunyer, M. Vrijheid, W. Zhang, M.-F. Hivert, and C.V. Breton

106

- Trends in Rates of Infections Requiring Hospitalization Among Adults With Versus Without Diabetes in the U.S., 2000–2015
J.L. Harding, S.R. Benoit, E.W. Gregg, M.E. Pavkov, and L. Perreault

Keep up with the latest information for *Diabetes Care* and other ADA titles via Facebook (/ADAJournals) and Twitter (@ADA_Journals).

All articles in *Diabetes Care* are available online at diabetes.org/diabetescare. Cover articles (➡) and select content are available free of charge. Other articles are available free to print subscribers or can be purchased as e-prints or reprints.

ADA's *Diabetes Care Update* podcasts are available at diabetesjournals.org and through iTunes.

Icons shown below appear on the first page of an article if more information is available online.



Free Article



Video



Podcast



Supplementary Data



Companion Article

- 117** Diabetic Ketoacidosis at Diagnosis of Type 1 Diabetes in Colorado Children, 2010–2017
G.T. Alonso, A. Coakley, L. Pyle, K. Manseau, S. Thomas, and A. Rewers

- 122** Risk of Rapid Kidney Function Decline, All-Cause Mortality, and Major Cardiovascular Events in Nonalbuminuric Chronic Kidney Disease in Type 2 Diabetes
O. Buyadaa, D.J. Magliano, A. Salim, D.N. Koye, and J.E. Shaw

- 130** Oxidatively Damaged DNA/RNA and 8-Iso prostane Levels Are Associated With the Development of Type 2 Diabetes at Older Age: Results From a Large Cohort Study
B. Schöttker, Y. Xuan, X. Gao, A. Anusri, and H. Brenner

- 137** Vertebral Fractures in Individuals With Type 2 Diabetes: More Than Skeletal Complications Alone
F. Koromani, L. Oei, E. Shevraja, K. Trajanoska, J. Schoufour, T. Muka, O.H. Franco, M.A. Ikram, M.C. Zillikens, A.G. Uitterlinden, G.P. Krestin, T. Anastassiades, R. Josse, S.M. Kaiser, D. Goltzman, B.C. Lentle, J.C. Prior, W.D. Leslie, E. McCloskey, O. Lamy, D. Hans, E.H. Oei, and F. Rivadeneira

- 145** Childhood Pancreatitis and Risk for Incident Diabetes in Adulthood
C.D. Bendor, A. Bardugo, I. Zucker, T. Cukierman-Yaffe, M. Lutski, E. Derazne, T. Shohat, O. Moserzon, D. Tzur, A. Sapir, O. Pinhas-Hamiel, R.G. Kibbey, I. Raz, A. Afek, H.C. Gerstein, A. Tirosh, and G. Twig

- 152** Early Outcomes From the English National Health Service Diabetes Prevention Programme
J. Valabhji, E. Barron, D. Bradley, C. Bakhai, J. Fagg, S. O'Neill, B. Young, N. Wareham, K. Khunti, S. Jebb, and J. Smith

Emerging Therapies: Drugs and Regimens

- 161** Efficacy and Safety of the Glucagon Receptor Antagonist RVT-1502 in Type 2 Diabetes Uncontrolled on Metformin Monotherapy: A 12-Week Dose-Ranging Study
J.H. Pettus, D. D'Alessio, J.P. Frias, E.G. Vajda, J.D. Pipkin, J. Rosenstock, G. Williamson, M.A. Zangmeister, L. Zhi, and K.B. Marschke

Pathophysiology/Complications

- 169** Genetic Variants Predisposing Most Strongly to Type 1 Diabetes Diagnosed Under Age 7 Years Lie Near Candidate Genes That Function in the Immune System and in Pancreatic β-Cells
J.R.J. Inshaw, A.J. Cutler, D.J.M. Crouch, L.S. Wicker, and J.A. Todd

- 178** High Concentration of Medium-Sized HDL Particles and Enrichment in HDL Paraoxonase 1 Associate With Protection From Vascular Complications in People With Long-standing Type 1 Diabetes
T. Vaisar, J.E. Kanter, J. Wimberger, A.D. Irwin, J. Gauthier, E. Wolfson, V. Bahnam, I-H. Wu, H. Shah, H.A. Keenan, C.J. Greenbaum, G.L. King, J.W. Heinecke, and K.E. Bornfeldt

- 187** Effect of Surgical Versus Medical Therapy on Diabetic Kidney Disease Over 5 Years in Severely Obese Adolescents With Type 2 Diabetes
P. Bjornstad, K. Hughan, M.M. Kelsey, A.S. Shah, J. Lynch, E. Nehus, M. Mitsnefes, T. Jenkins, P. Xu, C. Xie, T. Inge, and K. Nadeau

Cardiovascular and Metabolic Risk

- 196** Appropriate Shocks and Mortality in Patients With Versus Without Diabetes With Prophylactic Implantable Cardioverter Defibrillators
M.J. Juntila, A. Pelli, T.V. Kenttä, T. Friede, R. Willems, L. Bergau, M. Malik, B. Vandenbergk, M.A. Vos, G. Schmidt, B. Merkely, A. Lubinski, M. Svetlosak, F. Braunschweig, M. Harden, M. Zabel, H.V. Huikuri, and C. Sticherling, for the EU-CERT-ICD Investigators

- 201** White Matter Connectivity Abnormalities in Prediabetes and Type 2 Diabetes: The Maastricht Study
L.W. Vergoossen, M.T. Schram, J.J. de Jong, C.D. Stehouwer, N.C. Schaper, R.M. Henry, C.J. van der Kallen, P.C. Dagnelie, M.P. van Boxtel, S.J. Eussen, W.H. Backes, and J.F. Jansen

- 209** Muscle Oxygen Supply and Use in Type 1 Diabetes, From Ambient Air to the Mitochondrial Respiratory Chain: Is There a Limiting Step?
E. Heyman, F. Daussin, V. Wieczorek, R. Caiazzo, R. Matran, P. Berthon, J. Aucouturier, S. Berthoin, A. Descatoire, E. Leclair, G. Marais, A. Combes, P. Fontaine, and S. Tagougui

- 219** Prognostic Importance of Resistant Hypertension in Patients With Type 2 Diabetes: The Rio de Janeiro Type 2 Diabetes Cohort Study
C.R.L. Cardoso, N.C. Leite, G. Bacan, D.S. Ataíde, L.K.C. Gorgonio, and G.F. Salles

- 228** Insulin Sensitivity and Renal Hemodynamic Function in Metformin-Treated Adults With Type 2 Diabetes and Preserved Renal Function
E.J.M. van Bommel, D. Ruiter, M.H.A. Muskiet, M.J.B. van Baar, M.H.H. Kramer, M. Nieuwdorp, J.A. Joles, P. Bjornstad, and D.H. van Raalte

- 235** Sleep and HbA_{1c} in Patients With Type 2 Diabetes: Which Sleep Characteristics Matter Most?
A. Brouwer, D.H. van Raalte, F. Rutters, P.J.M. Elders, F.J. Snoek, A.T.F. Beekman, and M.A. Bremmer

Novel Communications in Diabetes

- 244** Reports of Lactic Acidosis Attributed to Metformin, 2015–2018
J.H. Flory, S. Hennessy, C.J. Bailey, and S.E. Inzuchi

- 247** Cannabis Use Is Associated With Increased Risk for Diabetic Ketoacidosis in Adults With Type 1 Diabetes: Findings From the T1D Exchange Clinic Registry
G.L. Kinney, H.K. Akturk, D.D. Taylor, N.C. Foster, and V.N. Shah

Consensus Report

- 250** Diabetes Digital App Technology: Benefits, Challenges, and Recommendations. A Consensus Report by the European Association for the Study of Diabetes (EASD) and the American Diabetes Association (ADA) Diabetes Technology Working Group
G.A. Fleming, J.R. Petrie, R.M. Bergenstal, R.W. Holl, A.L. Peters, and L. Heinemann

Issues and Events

- 261** Issues and Events

e-Letters – Observations

- e5** Dietary Patterns of Insulin Pump and Multiple Daily Injection Users During Type 1 Diabetes Pregnancy
S.L. Neoh, J.M. Yamamoto, D.S. Feig, and H.R. Murphy, on behalf of the CONCEPTT Collaborative Group

e-Letters – Comments and Responses

- e8** Comment on Norhammar et al. Undetected Dysglycemia Is an Important Risk Factor for Two Common Diseases, Myocardial Infarction and Periodontitis: A Report From the PAROKRANK Study. *Diabetes Care* 2019;42:1504–1511
H. Li, S. Tian, and L.-q. Kong
- e9** Response to Comment on Norhammar et al. Undetected Dysglycemia Is an Important Risk Factor for Two Common Diseases, Myocardial Infarction and Periodontitis: A Report From the PAROKRANK Study. *Diabetes Care* 2019;42:1504–1511
A. Norhammar, B. Kjellström, N. Habib, A. Gustafsson, B. Klinge, Å. Nygren, P. Näsmann, E. Svenungsson, and L. Rydén
- e10** Comment on Trinh et al. Successful Treatment of Immune Checkpoint Inhibitor–Induced Diabetes With Infliximab. *Diabetes Care* 2019;42:e153–e154
A. Galligan, B. Krishnamurthy, and T.W. Kay
- e11** Response to Comment on Trinh et al. Successful Treatment of Immune Checkpoint Inhibitor–Induced Diabetes With Infliximab. *Diabetes Care* 2019;42:e153–e154
B. Trinh, M.Y. Donath, and H. Läubli
- e12** Comment on Jakubowicz et al. Reduction in Glycated Hemoglobin and Daily Insulin Dose Alongside Circadian Clock Upregulation in Patients With Type 2 Diabetes Consuming a Three-Meal Diet: A Randomized Clinical Trial. *Diabetes Care* 2019;42:2171–2180
I.E. Saraiva
- e13** Response to Comment on Jakubowicz et al. Reduction in Glycated Hemoglobin and Daily Insulin Dose Alongside Circadian Clock Upregulation in Patients With Type 2 Diabetes Consuming a Three-Meal Diet: A Randomized Clinical Trial. *Diabetes Care* 2019;42:2171–2180
O. Froy