

JUNE 2018

Diabetes Care®

# In This Issue of *Diabetes Care*

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## Insulin Affordability: ADA Working Group Conclusions and Recommendations

An ADA Working Group assigned to investigate insulin affordability in the U.S. reports its conclusions and recommendations this month in *Diabetes Care* (p. 1299). It comes as list prices for insulin have been increasing by ~10–20% per year over the last 10 years and at a time when inflation has been ~2% and spending on prescription drugs has only increased by ~3% year on year. Using public information sources and meetings/interviews with key stakeholders, the Insulin Access and Affordability Working Group describes a complex insulin supply chain, including opaque pricing mechanisms and a myriad of different health insurance policies, that has contributed to the steep rising price for insulin over the previous decade. In particular the Working Group notes that there may be numerous incentives within a system that it says cannot be beneficial to the health of patients with diabetes. Detailing the many complexities in the system, the group points out that while list prices (the price for insulin set by the manufacturer) appeared to triple between 2002 and 2012, the net price reflecting what the manufacturer receives is much less. However, the article singles out the system of rebates as a major issue when accounting for the apparent difference between list price and net price. The article also notes that a lack of transparency means it is very difficult to understand where the money flows. Those rebates often do not make it to the point of sale for the patient. While highlighting a number of other issues, the Working Group goes on to make a series of conclusions and recommendations in relation to insulin affordability and access, expressing concern about the complexity and opaqueness of the system that ultimately appears to be driving prices higher and higher. Commenting more widely on the ADA statement, the chair of the Working Group William T. Cefalu said: “The Working Group was convened to provide high-level direction in the implementation of insulin access and affordability initiatives. After discussions with over 20 stakeholders in the insulin supply chain, we remain concerned with the complexity of the system. It was the consensus of the Working Group that the incentives throughout the insulin supply chain, which facilitate high list prices, need to be addressed.”

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Cefalu et al. Insulin Access and Affordability Working Group: conclusions and recommendations. *Diabetes Care* 2018;41:1299–1311

## Poorer Surgery Outcomes for Patients With Diabetes

Diabetes and higher HbA<sub>1c</sub> are independently associated with higher risk of adverse outcomes following surgery, according to Yong et al. (p. 1172). As a result, they suggest that patients with diabetes and elevated HbA<sub>1c</sub> levels prior to surgery should follow pathways of care dedicated to higher-risk patients. They also suggest that their findings provide a basis for future intervention studies to examine a role for pre- and postoperative glycemia management in patients with diabetes. The study focuses on surgery inpatients age ≥54 years in the period May 2013 to January 2016 and whether or not they had preexisting diabetes or were diagnosed with diabetes (HbA<sub>1c</sub> ≥6.5%) or prediabetes (HbA<sub>1c</sub> 5.7–6.4%) at the beginning of the study. Patients with HbA<sub>1c</sub> <5.7% were then classed as having normoglycemia. Baseline and clinical data were obtained, and patients were followed for 6 months with the primary outcome being incidence of mortality at 6 months. The authors write that of the 7,565 included surgery patients, 30% had diabetes and a further 37% had prediabetes. The balance was then classed as having normoglycemia. They used modeling and found that in comparison to normoglycemia, diabetes was associated with increased mortality at 6 months following surgery. They also found that diabetes was associated with higher risk of a range of secondary outcomes, including major complications, intensive care unit admission, and increased lengths of stay in the hospital. A further classification and regression tree analysis confirmed the higher risk of 6-month mortality with diabetes. Prediabetes conferred no increased risk following surgery. According to author Elif I. Ekinci: “Diagnosis of diabetes identifies those at higher risk of morbidity and mortality after surgery in general and not just following cardiac surgery. Now that we have a much deeper understanding of the adverse surgical outcomes in people with diabetes, we can begin to think about the interventions that we need to plan in order to prevent these outcomes.”

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Yong et al. The presence of diabetes and higher HbA<sub>1c</sub> are independently associated with adverse outcomes after surgery. *Diabetes Care* 2018;41:1172–1179

### HbA<sub>1c</sub> Variations in Type 1 Diabetes Across and Within Eight High-Income Countries

Variations in glycemic control (HbA<sub>1c</sub>) achieved by children with type 1 diabetes across eight high-income countries are explored by Charalampopoulos et al. (p. 1180). They suggest that while average HbA<sub>1c</sub> levels between countries do vary (a bit), within-country variation might have more of an influence on individual outcomes. Using data from just under 65,000 children with type 1 diabetes, the authors used a modeling approach to explore variations in HbA<sub>1c</sub> across 528 diabetes centers in seven European countries and the U.S. in the period 2013–2014. They report that Sweden had the lowest mean HbA<sub>1c</sub> at 7.6% and, along with Norway and Denmark, Sweden had the lowest between-center variations with most children achieving good glycemic control regardless of the clinic they attended. Germany and Austria had the next lowest mean HbA<sub>1c</sub> levels at 7.7–7.8% but crucially had the largest between-center variations. In England, Wales, and the U.S., HbA<sub>1c</sub> levels were markedly higher but had low-to-moderate between-center variation. In addition, they found that children attending centers with much more variable overall HbA<sub>1c</sub> levels also tended to have higher HbA<sub>1c</sub> levels across all countries. The authors go on to discuss some of the reasons for the variability, highlighting the collaborative efforts made in Nordic countries to improve care quality and a relative lack of transparency towards quality improvements that might explain the wider variations and relatively high mean HbA<sub>1c</sub> levels seen in other countries. Author Dimitrios Charalampopoulos told *Diabetes Care*: “To the best of our knowledge, this is the largest number of patients included in a comparison study of glycemic control in the pediatric age. Our results challenge the traditional emphasis of type 1 diabetes benchmarking studies on whole-country averages which, as we showed, can conceal important within-country variations. By making such variations visible, we can help national registries target their resources more efficiently in order to improve outcomes.”

Charalampopoulos et al. Exploring variation in glycemic control across and within eight high-income countries: a cross-sectional analysis of 64,666 children and adolescents with type 1 diabetes. *Diabetes Care* 2018;41:1180–1187

### Multicomponent Care Improves Diabetes Outcomes: Meta-analysis

Integrated multicomponent care is likely to improve patient outcomes in type 2 diabetes according to Lim et al. (p. 1312). They suggest that team-based care with improved information flow should improve patient outcomes and self-management. This was particularly the case in younger patients and in patients with poorer overall control and in settings with lower resources. Using a systematic search and meta-analysis, the authors identified 181 unique trials that investigated the effectiveness of integrated care where at least two quality improvements were implemented in relation to aspects of the care system. Other criteria included intervention periods of 12 months or more, at least one clinical outcome, and comparison against usual care (as the control). Overall, they found that implementation of such programs resulted in improvements in HbA<sub>1c</sub>, systolic and diastolic blood pressure, and LDL cholesterol but that the effect sizes were small in general. Individual components of care systems that had the greatest effects on health outcomes included changes to team structures, improved communications, and implementation of patient self-management and education. According to the authors, a particular strength of the study is that they have included more patients than previous reports and more complex interventions and together the results demonstrate sustained effects. However, they do acknowledge a series of limitations including a lack of access to patient-level data, the possibility of confounding effects, and that some aspects of quality improvements might already be included in usual care. Commenting on the research, Juliana C.N. Chan said: “Every person with diabetes has a unique profile. The silent and progressive nature of diabetes calls for a structured approach based on evidence and teamwork in order to define, manage, and monitor the multiple needs of an individual throughout his/her life journey with diabetes. By educating and engaging the patients through information exchange, we would improve the patient-provider relationship and facilitate shared decision making in order to personalize diabetes care.”

Lim et al. Aspects of multicomponent integrated care promote sustained improvement in surrogate clinical outcomes: a systematic review and meta-analysis. *Diabetes Care* 2018;41:1312–1320

<https://doi.org/10.2337/dc18-ti06>