

Improve outcomes, optimize utilization and reduce costs with digital phenotyping



“Digital phenotyping is real personalization, not a generic solution. It’s technology that sees your employees or members as individuals and creates care pathways that fit each of them correctly. Onduo is committed to solutions that recognize and honor the dignity of each individual and address their specific health and wellbeing.” **Dr. Vindell Washington, Onduo CEO**



What is digital phenotyping?

Digital phenotyping uses data to observe individual genetic, physical, experiential and environmental influences that impact our health and allow healthcare providers to tailor care specifically to our needs and lifestyles.

“It is a process of collecting, organizing and activating data—from electronic health records to smart devices such as phones and medical wearables—to manage people's health,” explains Yugang Jia, data sciences manager for Onduo. “The additional data from smart devices can fill the gap between clinical visits, so healthcare providers can learn more about individual needs and deliver precise interventions at the moments that matter.”

2

Why is it useful?

It's still very difficult for consumers with chronic conditions to stay healthy and engaged. To achieve life-changing outcomes, people need sustained behavior change. One effective and efficient way to begin thinking and acting differently is to personalize care recommendations and plans to the precise needs of each person. And digital phenotyping makes that possible.

This data allows us to understand more about large groups of patients, such as people living with diabetes, hypertension or mental health challenges. But we need to look at more than one condition at a time, and we need to factor in other aspects such as medication adherence, access to healthcare, social determinants of health, etc. One way to achieve this is with personalization at scale, and that's where digital phenotyping comes in.

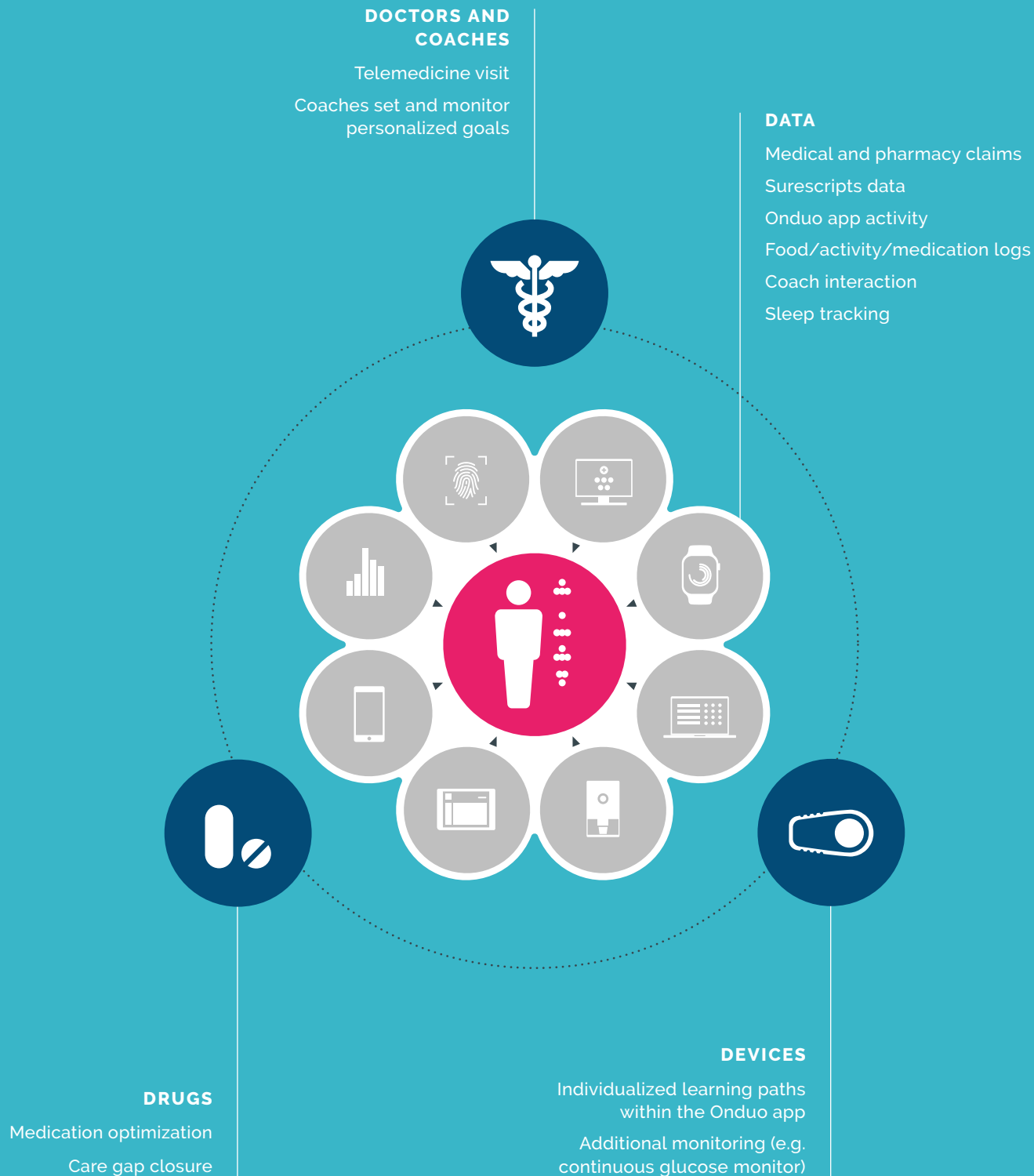
Population health management is the first step in providing better care. With digital phenotyping, we go deeper into your member or employee population, going beyond traditional segmentation to constructing gathered profiles. By analyzing a continuous flow of data available through contracted relationships and member-level user agreements, we are able to identify important sub-groups that may be at increased risk or face obstacles to care and understand the barriers to good health facing individuals in the group.

"The smaller population you define, the more precise you can be," Jia says.

We then drill down to patient-level data that enables us to develop a clear picture—a phenotype—of each person in the group.

"We can deliver truly individualized interventions that improve the health and wellbeing of each person in that group. Here's why that's important: Two people might have similar clinical risk, but their trajectory towards that could be totally different. We won't be able to see that without precision insights. Using that personalized information, we can apply different interventions at different times to lower their risk. Providers can reach out with coaching or text messages in real time and make it easier for patients to follow-through on treatments and recommendations." **Yugang Jia, Onduo Data Sciences Manager**

Onduo sources data from external systems, devices and the information members share with the app and coaches



3

How does digital phenotyping benefit payers?

Payers want ways to improve outcomes, optimize utilization and reduce costs. Digital phenotyping achieves those goals through personalized, scalable care.

"You get patient and population insights beyond what you can mine from traditional sources like claims and clinical data," Jia explains. "This enables you to stratify the population into smaller cohorts using insights from smart devices to fill the gaps so you can manage the clinical and financial risk of patients."

This is especially valuable in program assessment. Without digital phenotyping, the evaluation cycle is quite long, in some cases a year or more, in part because patient outreach and data-gathering occur infrequently. That's a long time to wait to understand if a program is working.

"With digital phenotyping, insurers can assess programs on a near real-time basis with higher accuracy, so evaluation and iteration happens more quickly," Jia continues. "When you shorten the cycle of improvement, you can influence the provider side to provide interventions more effectively."

"We've built an incredible data infrastructure that understands and stratifies populations, and ensures that each person is on the right path. We can create advanced real-time cohorts, where members are clustered into groups and receive messages based on their needs. As we learn more about each cohort, we can evolve the clusters, phenotypes, prioritizations, and recommendations. By ensuring data integrity you can succeed at this level of personalization." Dr. Vindell Washington, Onduo CEO

4

Why do employers care about digital phenotyping?

Preventable chronic conditions have a tangible impact on an organization's bottom line, leading to increased health insurance premiums, more employee medical claims and lost productivity.

Data from the CDC¹ show that five chronic diseases or risk factors—high blood pressure, diabetes, smoking, physical inactivity, and obesity—cost American employers \$36.4 billion a year because of missed work days alone.

Supporting employees' wellbeing boosts engagement, reduces absenteeism and improves performance. It also benefits retention, recruitment and overall organization productivity.

How? Offering a whole-person care approach that drives good outcomes positions your organization as a champion of and collaborator in employees' career, social, physical, financial and community wellbeing.

Employer example: workforce wellness

Onduo helps your employees stay healthier, reducing absenteeism and downtime for your business. Let's consider one common disease that impacts a significant percentage of your workforce: diabetes.

The CDC's National Diabetes Statistics Report, 2020 found that 34.1 million adults aged 18 years or older—or 13.0% of all U.S. adults—have diabetes and 88 million American adults—approximately 1 in 3—have prediabetes. Helping your employees manage the disease or take steps to avoid developing it has a major impact on attendance, performance and organizational productivity.²

Digital phenotyping informs a care model and can produce measurable results. In Onduo's type 2 diabetes population, participants not at the American Diabetes Association treatment target see a 0.9% decrease in their A1C³ and high-risk participants experience an average 2.3% reduction.⁴

Other life-impacting changes include:

- A 9-pound average weight loss⁵
- A 40% increase in daily step-count activity⁶
- Clinically relevant improvements in distress scores that impact daily living, self-care and disease management⁷



How does digital phenotyping work?

Onduo's digital phenotyping is based on the advanced real-time cohort (ARC) concept. The model calculates opportunities to impact targeted outcomes with medication optimizations and other interventions.

SORT

The ARC uses data to sort your population into groups based on similar characteristics (digital phenotyping). Each cohort or cluster receives targeted marketing to drive enrollment.

PERSONALIZE

Those who sign up get a personalized program that's based on their individual clinical and engagement.

PROVIDE

Those with the highest need or at the highest risk may be given devices and assigned to a virtual care team.

CONNECT

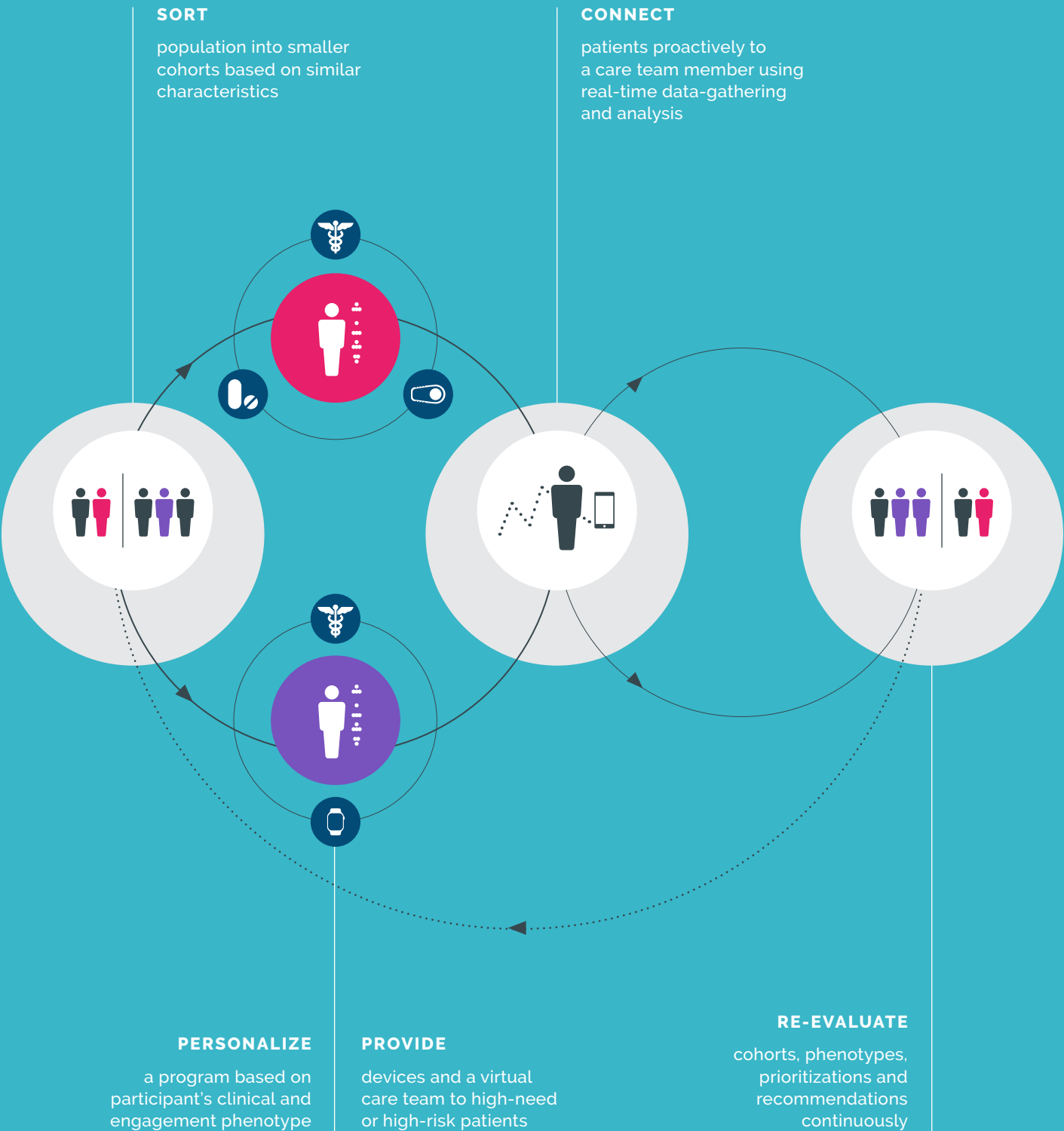
Based on the real-time data-gathering and analysis, ARC routes patients to the appropriate care team member, prioritizing needs and suggesting the next best action.

RE-EVALUATE

Machine learning allows the ARC to continually develop a deeper understanding of clusters, phenotypes, prioritizations and recommendations.

In practice, the ARC incorporates real-time data inputs and continuously re-evaluates your population so Onduo can deliver the personalized experience most likely to drive individual results.

Onduo creates a personalized path to better outcomes and through systematic analysis, we can understand patient health with digital phenotyping



Medication optimization

Digital phenotyping identifies the levers that change outcomes. You receive information about high-risk members and see how you can impact risk in specific ways and at specific times that meet individuals where they are. For example, the Onduo medication optimization workflow, a key component of the ARC Opportunity Engine, uses claims and prescription-fill data to:

- Invite prioritized members to telemedicine visits with Onduo physicians so medications are brought in line with clinical practice guidelines.
- Easily identify any member with care gaps to address inadequate therapy, unnecessary medications, incorrect dosage, adverse events, medication safety concerns, and contraindications.
- Improve medication adherence, optimize medication regimens, and manage chronic diseases to provide better care, promote better health, and lower unnecessary costs.
- Prioritize members who are more likely to dial into a telemedicine appointment for medication optimization based on their identified digital phenotype profile.
- Increase bandwidth for delivering optimizations with a streamlined process that creates more time for members to work with coaches and physicians.
- Calculate overall opportunities to impact targeted outcomes through medication optimizations and other interventions.

6

Why is now the time to lean into digital phenotyping?

Connected care and telehealth were on the rise before the global COVID-19 pandemic. With its advent, organizations were forced to accelerate adoption of digital care solutions and technology. There is growing evidence that these innovations are incredibly complementary to traditional care, giving providers an additional tool for caring. Digital healthcare is here to stay.

Integrating digital phenotyping into your member programs or employee benefits and wellness initiatives helps enable you to:

- Identify the right program for your team, your business and your members/employees
- Deliver personalized care to keep your employees and members healthy, engaged and adherent.
- Focus on meaningful outcomes that impact overall wellbeing and quality of life
- Reduce risk and cost
- Improve population health—the only way we can drive real change in healthcare

"Few solutions in healthcare are truly patient-centered, and fewer still enable us to intervene before problems become severe," Washington concludes. "Digital phenotyping—and Onduo—do both. We are no longer restricted to looking at 35 to 40 attributes available from the clinical perspective or claims data. We can now recognize that our employees and members are individuals who live in neighborhoods, engage in different activities, eat different food, and operate in different social structures. That knowledge empowers employers and payers to bring more care to more people."



How Onduo protects member data

As a healthcare company, Onduo is particularly sensitive to members' data security and privacy. We operate in accordance with all applicable privacy and data protection laws and employ physical, technical and administrative controls to protect personal information. We do not sell or share member data with advertisers or marketers. Some of our controls include:

Leadership and management

Our security team is led by a dedicated Information Security Officer and works closely with executive management. All employees and contractors undergo standard background checks and are required to participate in annual information security and compliance training.

Certifications

Onduo dedicates technical and administrative resources to ensure the security, confidentiality, integrity and availability of our customer data. We hold ISO 27001:2013 and HITRUST certifications. Verily, which provides product research and development for the Onduo solution, is SOC 2 Type 2 certified. All partners and providers must be ISO 27001:2013, HITRUST and SOC 2 Type 2 certified.

Access controls

In addition to cameras and entry and exit controls at our physical locations, workers are only authorized to access data that they reasonably must handle to fulfill their current job responsibilities. When sub-service organizations need access to data, we secure agreements that require them to adhere to the confidentiality commitments we make to you. Onduo monitors each sub-service organization's safeguards via annual reviews of their controls.

Detection and response

Onduo has established policies and procedures for responding to potential security incidents, which are managed by our Detection and Response Team. Affected clients will be informed via email from our Account Services team. These procedures are tested and updated at least annually.

Onduo delivers meaningful outcomes and raises the quality bar

Our evidence-based quality programs support employees and members in ways that work by:

- Alerting employees or members who need an appointment and scheduling it quickly
- Employing proven instructional techniques to educate on preventive care and disease management
- Validating each member's/employee's understanding of health conditions
- Screening to identify lifestyle habits that impact health or exacerbate conditions
- Ensuring providers answer any questions about newly prescribed medications
- Motivational interviewing to develop and meet goals, such as increasing physical activity levels

Onduo's origins deliver meaningful outcomes

With support from its parent company Verily, Onduo is uniquely positioned to succeed with our data analytics capabilities, behavioral science and user experience capabilities, and investment in novel devices. These capabilities provide employers and health plans the ability to transform how they digitally engage their staff and members—a necessity with the growing demand for virtual care. Our mission is to make the world's health data useful so people enjoy healthier lives.

Onduo offers certain care management and coordinated clinical care programs for eligible individuals, as further described within our website. Onduo LLC and a network of affiliated professional entities (collectively, "Onduo") collaborate to offer the services. Onduo services are meant to be used in conjunction with regular in-person clinical services and not intended to replace routine primary care.

About Verily

Launched in 2015, Verily is a subsidiary of Alphabet focused on life sciences and healthcare. The mission is to make the world's health data useful so that people enjoy healthier lives. Verily develops tools and devices to collect, organize and activate health data, and creates interventions to prevent and manage disease. The organization partners with leading life sciences, medical device and government organizations, using deep hardware, software, scientific, and healthcare expertise to enable faster development, meaningful advances, and deployment at scale.

References

- 1 Centers for Disease Control and Prevention. *Workplace Health Promotion: How CDC Supports a Healthy, Competitive Workforce*. <https://www.cdc.gov/chronicdisease/resources/publications/factsheets/workplace-health.htm>. January 22, 2021.
- 2 Centers for Disease Control and Prevention. *National Diabetes Statistics Report, 2020*. Atlanta, GA: Centers for Disease Control and Prevention, U.S. Dept of Health and Human Services; 2020.
- 3 Data on file, Oct 2020.
- 4 Dixon RF et al. *J Diabetes Sci Technol*. 2020;14(5):908-911
- 5 Majithia AR et al. *J Med Internet Res* 2020;22(8):e21778
- 6 Data on file, Sept 2020.
- 7 Polonsky WH et al. *Clinical Diabetes* 2020 Oct;38(4): 357-362

