



**International
Diabetes Federation
Europe**



INSULIN AT
100

**IMAGINING THE
NEXT 100 YEARS
OF DIABETES**

**IDF EUROPE
WEBINAR
22 JANUARY 2021**

INTRODUCTION

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Insulin was discovered one hundred years ago by Sir Frederick G. Banting. Insulin has since saved millions of lives and is considered to be one of the greatest medical achievements of all time. Without insulin, people living with Type 1 diabetes will die and people with Type 2 diabetes on insulin therapy will develop life-threatening complications.

Banting sold the patent of insulin for one Canadian dollar to the University of Toronto; he wanted it to be accessible for free to everyone. Today, we still believe that insulin should be accessible to everybody, but the reality is quite different: one hundred years after its discovery, access to insulin and associated supplies and technologies, as well as access to many other diabetes medicines and tools, still remains inaccessible to some, and great inequalities persist across the world and within individual countries.

We need to make sure that insulin and other diabetes medicines are available for everyone who needs them. This is why the centenary of the discovery of insulin is an important milestone: it does not just represent a chance to celebrate past medical achievements, but most importantly, it is a reminder that we all have to join forces to ensure that each person living with diabetes receives the treatment and medications that s/he needs.

To raise awareness of this Centenary and of the rights of all people with diabetes to live a long and healthy life, IDF Europe hosted a webinar, “Imagining the next 100 years of diabetes” to celebrate the progress made over the past 100 years, look at possible future solutions for the next 100 years, and call on governments across Europe to promote better access to diabetes care and support further research and innovation. This marks the beginning of a three-year campaign which will seek to improve access to all required medicines, technologies, supplies and tools for all people living with diabetes.

OPENING REMARKS

After a brief introduction, Bastian Hauck, the webinar’s moderator, gave the floor to Prof. [Andrew Boulton](#), International Diabetes Federation President. In his opening remarks, Prof Boulton gave a brief overview of the role played by European scientists leading to the discovery of insulin, such as Claude Bernard (who first brought up the hypothesis that pancreatectomy would lead to diabetes), Oskar Minkowski (who successfully demonstrated that pancreatectomy leads to diabetes) and Nicolae Paulescu (who developed pancreine, a pancreatic extract containing insulin). A special mention went to RD Lawrence, International Diabetes Federation’s first President, who was one of the first people to receive insulin in England and lived a long life thanks to this landmark discovery.

Most importantly, Prof Boulton underlined that the centenary of insulin is a unique opportunity to promote access to insulin and diabetes care across Europe. A fundamental part of IDF and IDF Europe’s advocacy programmes is to ensure that every person living with diabetes has access not only to insulin, but also to all the equipment needed to achieve optimal health outcomes and quality of life.

Dr [Niti Pall](#), IDF Europe Chair, added that access to innovation is not equitable, and that many regions of Europe still do not get access to medicines and new technologies.

As an umbrella organisation of 70 Member Associations across Europe, IDF Europe aims to represent the voice of people living with diabetes. Dr Pall explained that the most exciting development over the last few years has been the engagement of people with diabetes in driving their own care and being at the forefront of innovation in treatments and care. “Collaborating with people living with diabetes is going to be key in delivering care, access, advocacy, new treatments and new therapies in the future”, she said.

VIDEO TESTIMONIALS FROM PEOPLE LIVING WITH DIABETES ACROSS EUROPE:

The webinar kicked off with video testimonials from people living with diabetes across Europe who shared their experiences, hopes, and dreams for the future. Click on the boxes to watch the videos!

[Alexandra Costa](#), from Portugal, talked about how technology helped her prepare for her pregnancy and the importance of technological advances in diabetes treatment.

[Alojz Rudolf](#), from Slovenia, explained how access to new glucose monitoring systems made his diabetes easier to deal with and his life more enjoyable.

[Zarina Bikmullina](#), from Russia, explained the challenges people living with diabetes have to face every day, such as economic difficulties, unemployment and exclusion from social activities.

[Maartje Roskams](#), from Belgium, stated that it is possible to live with diabetes and engage into high intensity sports.

[Maria Tsarikova](#), from Russia, called on society and politicians to guarantee better access to diabetes care in her country.

[Ken Tait](#), from the UK, talked about the stigma that surrounds people with Type 2 and asked for more inclusivity in the diabetes world.

THE DISCOVERY OF INSULIN: THE FIRST STEP ON A JOURNEY OF INNOVATIONS

Dr [Konstantinos Makrilakis](#), IDF Europe Board Member from Greece, presented the steps that led to the discovery of insulin from ancient Egypt, 3,500 years ago, when diabetes was treated with a mixture of “water from the bird pond,” elderberry, fibers from the asit plant, milk, beer, cucumber flower, and green dates, through to the extraction of the secretion of the pancreas from dogs, and the first successful injection of insulin into a human being in January 1922.

Over the last few years, many new medicines were launched, which greatly decreased the burden of diabetes. Technology has also improved tremendously, leading to much better and easier management of diabetes. In his conclusion, Dr Makrilakis shared his hope that “we will not need another 100 years for the ultimate prevention and the definitive treatment of diabetes”.

WHAT THE FUTURE HOLDS - 100 YEARS FROM NOW

Bastian Hauck introduced five speakers who touched upon promising innovations in diabetes care.

[Markku Saraheimo](#), from the Helsinki City Hospital, University of Helsinki, focused on the various approaches to prevent Type 1 diabetes or halt the progression of the destruction of insulin-producing cells. He presented some projects/trials from [INNODIA](#) (Meld-ATG; Ver-A-T1D; IMPACT; Iscalimab) which are paving the way to discover options to prevent diabetes or to reverse the process so that insulin is not needed anymore.

[Eelco de Koning](#), Professor of diabetology at Leiden University Medical Centre in the Netherlands, focused on beta cell replacement, which he considers to be the only treatment that can completely normalise glucose levels in the blood without any risk of hypoglycaemia. He presented the three key issues to protect the beta cells, which he called “The Three Musketeers for beta-cell health”: prevention, protection, and regeneration or replacement once many beta cells are destroyed. According to Professor de Koning, cell replacement therapy is the only real solution for people with islet failure.

Similarly, [Henrik Semb](#), from the University of Copenhagen, Denmark, talked about pluripotent stem cells, which have the capacity to differentiate into all our different cell types in our body, including insulin-producing beta cells. He showed how stem cell-based therapy could help in managing Type 1 diabetes, but he also highlighted some key challenges, including immunogenicity, the potential for tumours to develop and the efficacy and functionality of the cell product. Dr Semb said that in 10 years we could demonstrate that we can do with pluripotent stem cells exactly the same thing as we do with islet transplantation.

[Tadej Battelino](#), Professor at University Children’s Hospital, Slovenia, focused on the digital side of diabetes care. He talked about sensors and long term implantable devices, some “futuristic” ways of insulin delivery (transdermal and oral insulin) and artificial intelligence. About long-term implantable devices, he explained that these are chromatography devices that are miniaturised on a chip and can transmit data and measure multiple things at the same time, like ketone bodies and glucose. He then described some ongoing clinical studies focused on new ways of delivering insulin - transdermally or orally. More than a year ago, the Lancet published the results of a clinical trial demonstrating that oral insulin can be effective; there are, however, several caveats at the moment that precludes it from being commercialised. Talking about artificial intelligence, Professor Battelino highlighted similarities between diabetologists and computers, and how artificial intelligence will help reduce the burden of the condition for people living with diabetes.

[Sufyan Hussain](#), from St. Thomas Hospital, King’s College, UK, focused on specific diabetes technologies and addressed the conditions required to promote access and the active engagement of people living with diabetes.

He talked about future developments in the artificial pancreas, including dual hormone systems, and about the importance of promoting access and digital literacy about smartpens, non-invasive glucose monitoring options and phone-based dosing advisors. Dr Hussain also pointed out that “diabetes is an example of driving care through communities that are built up online”; they can provide people living in different parts of the world with new, savvy ways of managing their condition. The driver for this recent development has been the need to improve their knowledge about diabetes and for peer support, and the necessity to empower more individuals to self manage. Similarly to what Dr Pall mentioned in her welcoming remarks, Dr Hussain emphasised the role of people living with diabetes in developing new therapies: communities (especially online) can make the difference in improving the delivery of care.

QUESTIONS & ANSWERS

Cajsa Lindberg, former President of the Swedish Diabetes Association and Mentor of the IDF Europe’s Youth Group, YOURAH, moderated the Questions & Answers part of the webinar. Cajsa asked the scientists/panellists to give their perspective on a series of questions on innovations and technologies, that were collated prior to the webinar through social media groups and live during the webinar.

Will there ever be a time where diabetes is not a 24/7 burden? Not cure-wise, but rather having specific treatment that would require the patient's input for only a few minutes per week?

Professor Battelino gave a short and honest reply: no. He does not believe there will be a “system” that would enable a person living with diabetes to only have a couple of minutes a week of burden. “I believe in a very gradual development of these automated systems, with a lot of caution. Probably in five years, we will again see a major step forward, perhaps not to the extent that you want”, he said.

Can't we have within the near future a treatment to retrain the immune system not to attack the insulin-producing cells, instead of insulin-producing islets?

Dr Saraheimo replied that in perhaps 10, 15 years, some of the approaches or trials which are currently going on, combined with antibody studies, may come to fruition.

Is there a possibility in the future of having an app that checks our blood sugar, takes a picture of the food, and helps us decide how much insulin to take?

Professor Battelino answered that some companies are already looking into this.

What are the implications of diabetes on the alpha cells? Are alpha cells an area of research for the treatment of diabetes?

Professor de Koning explained that diabetes is not only characterised by a deficiency (either in an absolute or in a relative terms) of insulin, but there is also too much glucagon (secreted by alpha cells). The beta cells do not suppress glucagon; glucagon plays a major role in glycaemic disease regulation, and there are still a lot of unanswered questions about this. Professor de Koning also pointed out: “During this webinar, we talked about beta cell replacement therapy. But, you know, shouldn't it be islet replacement therapy? What cells should be replaced? There are still many unanswered questions”.

Is there any progress on knowing better why type one diabetes starts?

Professor Battelino is not sure that this will happen within the very near future. He explained that it is not something easy to achieve since the human immune system is a very complex system of cells that communicate and teach each other. While many trials on animals were successful, the beta cell biology interventions on humans are extremely difficult and burdensome to people with diabetes. “My admiration to all those that participate continuously in these trials”, said Professor Battelino.

The empowerment and education of people with diabetes are major pillars in the treatment of diabetes. Can you mention some innovative ways of empowering people who are living with diabetes that you are expecting over the next few years?

In Dr Hussain's opinion, looking at the next five years, diabetes education will be online-community driven. "Hopefully, in the next few years, we'll get a better understanding about which platforms to use in order to reach out to ethnic minority groups", he said. Dr Saraheimo added that "we need more advocacy and the conjoined effort of politicians, governments, national diabetes associations and diabetes parliamentary groups in order to get resources for diabetes research".

If you were to mention one thing, what do you think is needed to help foster innovation within diabetes?

Professor Semb replied that he would love to have a device to put the cells in; a device that would protect the cells from autoimmunity and from rejection.

CLOSING REMARKS

Prof. [Nebojsa Lalic](#), IDF Europe Chair-Elect, thanked the moderator and the expert speakers who joined the webinar. In his closing remarks, Professor Lalic applauded the many sophisticated ways of treating diabetes that are currently being developed, as well as the enthusiasm invested in diabetes research: "I do hope that we will keep up with this enthusiasm for the next 100 years". He then underlined again that unfortunately innovation is not accessible to the majority of people living with diabetes, and that our focus should be on ensuring access. From now on and for the next 100 years, we should work to create an environment in which innovative tools, medicines and technologies can be accessible to everyone who needs them.