



## Proceedings

# Scientific summary of the 6th World Congress on Prevention of Diabetes and its Complications (WCPD 2010)

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Between the 8<sup>th</sup> and 11<sup>th</sup> of April in 2010 the 6<sup>th</sup> World Congress on Prevention of Diabetes and its Complications (WCPD 2010) took place in Dresden, Germany. This was the 6<sup>th</sup> congress in the line focusing especially on diabetes prevention. The major theme of this congress was "Prevention in Practice". Approximately 1000 scientists, researchers, and people interested in diabetes prevention practice, coming from 67 different countries, attended the congress. The scientific and practical aspects of how to implement diabetes prevention into clinical practice were discussed in 43 different sessions and workshops. As a summary of this congress a state of the art practice guideline [1] accompanied by an evidence based guideline for the prevention of type 2 diabetes was issued [2]. Nevertheless more than 45 different programs for diabetes prevention world wide were introduced and discussed [3]. It was a great success to have such a small congress dedicated to this important topic in an environment where the people can meet, discuss and develop plans. The WCPD 2010 was the state of the art congress for diabetes prevention in practice. Herewith we provide a short summary of the scientific and practical sessions.

## Gestational diabetes as topic at the WCPD 2010

The congress was focused mostly onto the prevention of type 2 diabetes. Women with previous gestational diabetes (GDM) *per se* have an increased life long diabetes risk. From this point, GDM was discussed in several sessions as one of the most prominent factors defining increased metabolic risks or risk in getting type 2 diabetes. In some of the sessions summarized below, GDM was discussed in its pathophysiology. Boyd Metzger from the United States

talked about the prevention of GDM. Michael Kruse from Germany discussed pathophysiological aspects in GDM and Frederick Muylle from Belgium introduced a disease management program for women with GDM. Parallel to this specific presentations GDM was part of other discussions. The International Diabetes Federation has made a statement that there is relevance for a global diabetes risk assessment including GDM. Furthermore, successful permanent changes in life style may require different strategies in women with previous GDM. As one of the highlights at the WCPD 2010 a practice guideline for the prevention of type 2 diabetes was released, which clearly also addresses the needs of women with previous GDM.

The WCPD 2010 was a congress under the umbrella of prevention and practice. Eighty percent of the sessions were focused on how we can translate prevention science into prevention practice. Therefore GDM is one of the most practical indicators to identify persons with increased risk in a very early stage of her life. Therefore the prevention of type 2 diabetes has to focus also onto those with GDM.

### ***GDM as target for diabetes prevention Boyd Metzger, USA***

Boyd Metzger from the USA answered the question why GDM should be prevented: It is a common event during pregnancy and its incidence is increasing. Women with GDM are at a high risk of progression to type 2 diabetes mellitus. The potential benefit of the prevention of GDM is great, not only for the women but also for their offspring. The offspring has an increased risk of obesity, metabolic disturbances, and hypertension. Moreover, they suffer from advanced beta cell decompensation when being exposed to the intrauterine environment of GDM.

### ***Abstract 154: A High fat diet during pregnancy causes alterations in cardiac metabolism in male offspring Michael Kruse, USA***

Dr. Michael Kruse from the German Institute of Human Nutrition Potsdam, Rehbruecke presented results of a study about effects of high fat diet during pregnancy. The alterations in cardiac metabolism were the main focus of attention. A wild type of female mice and a genetic heterozygous deletion of GLUT4 (G4+/-) female mice were fed a

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control breeding chow or a high fat diet for 2 weeks prior to mating and during gestation and lactation. Male pups were weaned onto a standard low fat rodent chow until sacrifice at 24 weeks. Heart weight of the pups of both types of mice exposed to high fat diet was increased. Key genes involved in cardiac fatty acid oxidation were reduced only in G4+/- on high fat diet and their fetuses had higher glucose levels. The findings illustrate the synergistic effect of altered genes and environment in programming adult disease suggesting dietary recommendations during pregnancy for prevention.

**Abstract 330: Zoet Zwanger project: Registration and follow-up for women with gestational diabetes in the region of Flanders, Belgium**  
**Frederik Muylle, Belgium**

Frederik Muylle from the Vlaamse Diabetes Vereniging presented “Zoet Zwanger” (“Sweet & Pregnant”), a diabetes prevention project in the region of Flanders, Belgium. It aims to promote long term metabolic follow-up and a healthy lifestyle among women with previous GDM. The first part is an awareness campaign addressing women with GDM and their healthcare providers using a dedicated web site, information folders, and posters. Secondly, a voluntary registration system has been set up. Registered women receive a first letter (by E-mail and regular mail) at 3 months postpartum and are subsequently reminded annually to see their general practitioner for a check-up. 50% of women with GDM develop diabetes within 10 years after delivery. Therefore, this promising initiative offers a special opportunity for diabetes prevention and yields hope to improve long-term outcomes for these women.

**How to identify those at risk globally?**

This topic was addressed from the International Diabetes Federation at a special workshop. The workshop aim was to develop a global strategy for risk assessments for those with type 2 diabetes risk. Prof. Jaakko Tuomilehto and Prof. Steven Colagiuri initiated this proposal and nearly all known researchers, who are working from a public health and epidemiological perspective to develop risk assessment concepts, took part. It was intensively discussed how to use laboratory markers or self assessment risk factors for a global strategy. The FINDRISK questionnaire was seen as one of the good examples evaluated already in more the 35 countries for a public health strategy. People defending more opportunistic screening or medical assessments were driven by using routine laboratory markers for risk assessment. Both strategies are relevant and the International Diabetes Federation is starting a 2 years project to develop this global risk assessment strategy for type 2 diabetes risk. The results will be presented at the World Diabetes Congress in Dubai in 2011.

**EZ Scan as new technology for none invasive diabetes risk detection**

Thinking about the prevention of diabetes in practice, we always face the challenge of how to find the people with increased risk. Several tools are available, the oral glucose tolerance test as gold standard, fasting glucose measure-



Figure 1. **The IMAGE Project.** One of the highlights of the WCPD was the presentation of the results of the IMAGE project. IMAGE is a large European initiative funded by the European commission to develop a practice guideline for the prevention of type 2 diabetes together with an evidence based guideline [4].

ment and also a high number of questionnaires to identify those with increased risk. All of those tools have advantages and disadvantages. One very interesting new technical achievement to identify those with increased diabetes risk is the EZ Scan. EZ Scan is a new diagnostic device developed by IMPETO Medical and is using the sweat glands to detect risk for insulin resistance and diabetes. The basic pathophysiology behind is the reverse iontophoresis which showed in a fast growing number of well performed clinical studies world wide a very tight association to insulin resistance and diabetes risk as well as cardiovascular complications. EZ Scan was presented with its scientific evaluation data which showed strong evidence because the evaluation in Caucasian and Asian population, showed a nearly identical association with metabolic risk. This indicates that there is a new technical method, easy to perform, non invasive, which is reliable in identifying those with increased metabolic risk. Having this, would be a dream in performing standardized intervention and risk assessment programs world wide. The advantage is a three minute non invasive easy to handle diagnostic tool which can be implemented in a medical but also paramedical setting. The physician can use the EZ Scan to monitor insulin resistance based treatment, the pharmacist, prevention manager, or health care educator can use it to diagnose increased diabetes risk. We all are looking forward to the application of EZ Scan in clinical practice like performed currently in China, the Netherlands and Germany.

The major output of this project is a practical toolkit for diabetes prevention, which can be used by anyone, who is interested in implementing a diabetes prevention program. A group of about 100 European experts in this field have worked for 2.5 years on this toolkit and expertise and experiences were condensed into 18 pages, which contain the very essence in diabetes prevention. For effective diabetes prevention, the IMAGE partners believe that an education for the trainer is necessary. Therefore they developed a curriculum for the training of prevention managers which also was released at the WCPD in Dresden. Several pilot projects in Europe showed that it is feasible to train preven-

tion trainers while using the practical toolkit to successfully perform diabetes prevention in practice. It was a milestone for diabetes prevention in practice to have the IMAGE project. Diabetes prevention is getting into a mature stage - what used to be a challenge in diabetes prevention in practice is now being addressed by the IMAGE toolkit.

For more information, please visit: [www.image-project.eu](http://www.image-project.eu). The Toolkit refers to the latest evidence in the science of diabetes prevention and allows translating this knowledge into practice. It contains practical examples and worksheets. These worksheets facilitate the implementation of a prevention program and can be taken directly from the Toolkit.

The IMAGE Toolkit for diabetes prevention provides practical information for anyone involved in healthcare and prevention activities for adults at risk of developing diabetes. This includes those working in primary and specialized healthcare services, physicians, physical activity experts, dieticians, nurses, and also others planning or already involved in diabetes prevention interventions (e.g. teachers, business partners). The IMAGE Toolkit also contains useful information for local and national politicians and health policy makers interested in creating an environment which facilitates healthy ageing and the implementation of the WHO recommendation that “we must make the healthy choice the easy choice.”

The Toolkit addresses the need for change, how to budget and finance a prevention program, and how to identify people at risk. The core of the toolkit describes elements of an effective lifestyle intervention program. A process model for supporting lifestyle behavior change is presented and described in its phases (motivation, action and maintenance). Physical activity is a key factor in diabetes prevention. The Toolkit describes why to increase physical activity and how to encourage the clients to increase physical activity. A balanced, nutritious, enjoyable diet is essential for health. This section describes the goals for food intake and goals for long-term nutrient intake. Other behaviors to consider in diabetes prevention are, e.g., smoking, stress/depression, and sleeping patterns. The Toolkit finishes with an overview on how to evaluate intervention programs and how to establish quality assurance [5].

If we work together using the strong evidence base we can halt, or at the very least delay, the progression of diabetes and positively impact the quality of life of the millions of people who are at high risk of diabetes. The toolkit can be downloaded from the IMAGE website: [www.image-project.eu](http://www.image-project.eu) (button IMAGE Final Results).

The conclusion: If you want to start a diabetes prevention program, use this toolkit, retrieve what is helpful for you and start building up your program.

## Diabetes prevention in practice

The best example to learn how to build up a prevention program is to learn from others who already have done. This was the major part of the WCPD 2010 and several programs worldwide from Europe, South America, Asia, Australia and northern America were presented. It was very

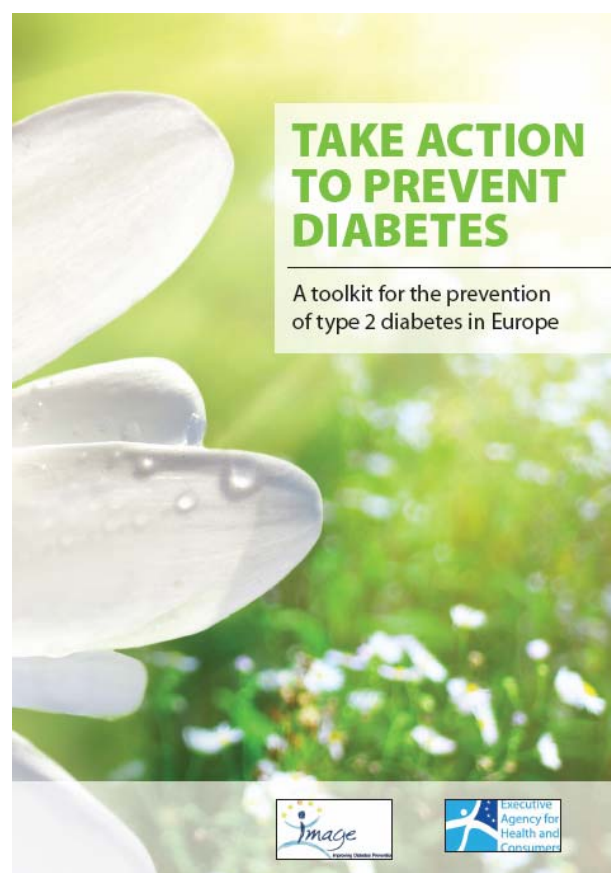


Figure 2. The IMAGE Toolkit “Take Action to Prevent Diabetes” - A Toolkit for the prevention of type 2 diabetes in Europe. One of the highlights was the presentation of a practice guideline for the prevention of type 2 diabetes called “Toolkit for the prevention of type-2 diabetes” [1]. The IMAGE Toolkit for the prevention of diabetes is a practice guideline for diabetes prevention and is one of the products developed by the European study group of the IMAGE project. It is based on the IMAGE Evidence-based Guidelines and the IMAGE Training Curriculum.

interesting that all those programs follow the same idea to prevent type-2 diabetes in those at risk, but all of the programs were different. The target population, the screening strategy, the intensity of the intervention and the duration of intervention varied a lot. Many programs presented their results and evaluation data indicating that internationally the barriers to implement a diabetes prevention program are the same. To communicate these results and experiences further while the congress a state of the art book “Prevention in Practice” was issued and given to all the congress attendees and will be distributed to politicians, stakeholders and international organizations. The prevention in practice book summarizes 20 very different examples for primary diabetes prevention programs world wide. With this the book provides a technical overview about programs in different settings, different target population, different

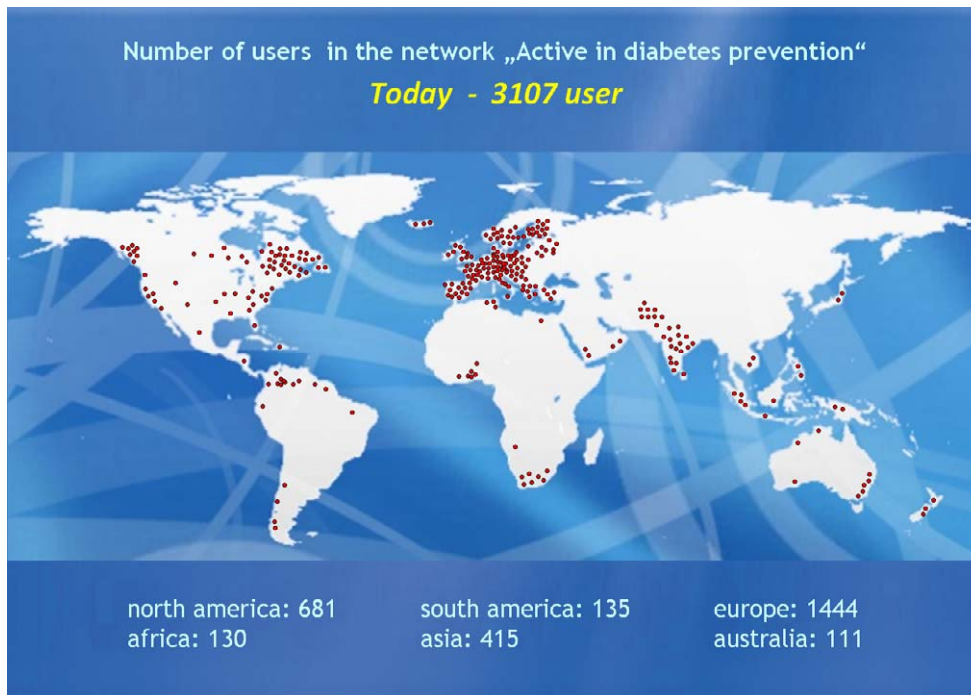


Figure 3. Current status of The Network demonstrating the distribution of 3107 users throughout the world.

social and ethnic groups as well as completely different structural environments and as this it is an interesting state of the art book to learn from the experiences of others. The book also provides a very good overview about difficulties, challenges and barriers to the implementation of a prevention program.

If you are interested use [www.acitveindiabetesprevention.com](http://www.acitveindiabetesprevention.com) and get access to a copy of this book.

**Network “Who are active in diabetes prevention” – [www.acitveindiabetesprevention.com](http://www.acitveindiabetesprevention.com)**

The highest chance to successfully implement diabetes prevention is given in global network structures. After the 5th World Congress on Prevention of Diabetes the idea arose to build up such a global network of experts in diabetes prevention. It started 9 months before the WCPD 2010 and an overwhelming number of people indicating themselves as active in diabetes prevention joined the network. 3.100 people from more than 130 countries joined and exchanged ideas, contact details and program material. This global network is a huge success and will help to increase quality of diabetes prevention in practice world wide. At the congress the further strategies of the network were discussed and the attendees encouraged the organizers of the network a lot to develop a virtual prevention centre hosting practical information as well as the drafts of intervention material from the programs world wide to have one place with easy access to download material from others for own use. This was clearly increasing the ability to implement a diabetes prevention program in practice world

wide. If you are interested please register at [www.acitveindiabetesprevention.com](http://www.acitveindiabetesprevention.com) and join this world wide community.

This Network is completely free for registration, membership and use, but the success of this project depends on the members of the network. Together we may start a dynamic discussion and finally making the prevention of diabetes a realistic commitment within our communities. As more people are registered the more powerful and useful the network can be. Please also help us to forward this invitation to the people you know which are interested in the field.

**Behavior and lifestyle change**

About 20% of the sessions at the congress were pointed out to behavioral aspects in lifestyle changes at people with risk for chronic diseases. At the congress a new behavior change model was introduced based on a meta-analysis of what is known from behavioral science and behavioral practice to initiate a lifestyle change. This new behavioral change model includes 3 stages of behavioral change, motivation, action and maintenance, but several different levels of action to achieve these stages. This is unique and new, because here an ideal combination of science and practice is established. In several sessions this model was discussed and applied to different kind of intervention strategies with high and low intensity and short and long-term intervention duration. This behavioral change model will be the basis for the development of future intervention programs for persons with chronic disease risk.

## Drugs in diabetes prevention

This was another hot topic. What is the right strategy - lifestyle or pharmacy prevention? Who is the right patient for this? At the WCPD 2010 a controversy around this topic took place. Most of the people were clearly interested in lifestyle intervention programs due to the pleiotropic effect addressing also other risk factors. But there is also a need for drugs in the field of diabetes prevention. Some of the drugs like Metformin or Acarbose are already licensed for the treatment of IGT or the prevention of diabetes in some European countries, but especially in South America and Asia. For example in China a large trial is done with Acarbose in the field of diabetes prevention. Metformin is a drug which is licensed in nearly 60 countries world wide for diabetes prevention. Who is the right patient for using a drug or is the drug always only an addition to lifestyle intervention? There was no clear answer in the discussion at this meeting. The people voted that 70% of the intervention in high risk persons should be lifestyle and the rest lifestyle plus intervention and for some people already the drug at the beginning. The use of Metformin for example in patients with previous gestational diabetes or obese candidates could be used as well as anti-obesity drugs for people who failed several times with lifestyle intervention. This could be an alternative to start with an intervention to be successful. These questions need further elaboration, but there will be a different need for using drugs for the prevention of diabetes for different ethnic clientele and different risk stratification clusters.

## Summarizing the experiences of the WCPD 2010

We had a very active and interesting congress. The attendees pointed out several times that it was very interesting to have this scientific and practice program, but they also enjoyed it a lot to have the chance to meet each other several times during the congress days. They exchanged ideas, discussed experiences and developed own new projects. Parallel to the congress several project working groups met and discussed joined collaboration and European and national projects. The attendees pointed out, that what they have learned was to gain knowledge and experiences how to implement diabetes prevention into practice. The take home message of this congress is - the prevention of type 2 diabetes is becoming in its mature stage and this maturity has to address the practical implementation of programs for the primary prevention of type 2 diabetes.

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