Short Summary of the Scientific Sessions

of the 6th World Congress on
Prevention of Diabetes and its Complications
April 8th to 11th in Dresden, Germany
Dear all interested in the prevention of diabetes,

With this material you have in your hand you received a summary of the scientific sessions at the 6th World Congress on Prevention of Diabetes and its Complications held in April 8th to 11th in Dresden, Germany. It was our idea, for everyone who attended and all those who are interested in the field, to provide a summary of all those presentations in the scientific program including all oral abstracts. For someone who is attending a scientific meeting it’s always difficult to get an overview about all news and new aspects presented, because often tracks are running in parallel. This was the rationale to decide to provide you a written summary about the sessions. People who are experienced in the field were sitting in the session and tried to summarize the highlights from the presentations and the discussion at those sessions. This will give you the chance to get an overview about those sessions where you were not be able to attend and for those who couldn’t have the chance to come to the WCPD 2010 to get a summary about what were the congress about. We hope that we were able to provide an added value with this summary to you and are open for every criticism and response. I thank all of those who attended the WCPD. I think we have had a great meeting and we are looking forward to the next scientific session of the World Congress on Prevention of Diabetes and its Complications 2012 in Bilbao, Spain.

Sincerely yours

Peter Schwarz,
The Summary Team

Our team is composed of dedicated individuals from different fields, who all worked together for diabetes prevention and care. We showed our support to WCPD 2010 by sitting in scientific sessions and summarizing the presentations. We relied mostly on the oral presentations of the speakers together with their visual slides. Our aim is to provide you with a concise summary of what was presented and discussed at the WCPD 2010. We hope that this summary adds value to your work in implementing diabetes prevention programs in your community. It brings great joy to know that a high number of actions are being carried out all over the world to help in diabetes prevention. May our little contribution be of great help to your own efforts.

Luitgard Schnoor, Stefanie Cruzschwitz, Antje Löffler, Antje Lindner, Marika Schlimpert, Christina Ruch, Elizabeth Soliday- Naui, Claudius Richter, Jörg Olschewski, Jaqueline Schwarz
Highlights at the WCPD2010

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. 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 prevention 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.

www.image-project.eu
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 measurement 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 the 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 tide association to insulin resistance and diabetes risk. 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.
Greetings from the President of the IDF; Jean Claude Mbanya, Cameroon

The President of the International Diabetes Federation Jean Claude Mbanya from Cameroon opened the WCPD 2010 with bringing the sun to Dresden, and the message that there is a big increase in diabetes in the developing countries: "The sleeping tiger, it seems, is waking up – with a bad-tempered growl...". The greatest increases in the diabetes population over the next generation will occur in the African Region (98%), the Middle East and North Africa, and South-East Asia. As populations become more urbanized, changes in behavior in terms of nutrition and physical activity are resulting in rising levels of overweight and obesity – principal risk factors for type 2 diabetes, and other chronic non-communicable diseases. In low- and middle-income countries, NCD’s like diabetes are compounding the burden of infectious diseases, such as malaria, TB and HIV/AIDS. Diabetes does not spare rural populations or poorer people in developing countries. Policies to make environments conducive to physical activity and reduction of the availability of high-calorie processed foods must be explored. The needs of developing countries in addressing NCD’s are technical assistance to develop and implement proven national policies and plans to prevent premature deaths. IDF always combines its regional council meetings and General Council meeting of its entire membership with the congress, hopefully followed by a World Economic Forum meeting focusing on NCD’s and then a UN General Assembly Special Session in the first half of 2011. The aim is to add a new one-day political event called the Global Diabetes Forum at the next WCPD in Dubai in 2011, to bring ministers, CEOs from industry, and NGOs together, to discuss what needs to be done next to turn around the global diabetes epidemic.

Introductory remarks; Pesach Segal - Israel

Pesach Segal from Israel first answered the question ‘Why we are here at this World Congress of Diabetes Prevention?’ and the answer is “Because there is a strong belief that if T2D is prevented, its complications will also be prevented”. He also reiterated that, this is only partly true and there is still no trial evidence for prevention of CVD, CHF and mortality. Nevertheless, clinical trials showed that prevention of T2D by lifestyle changes and/or drugs or treatments like bariatric surgery is possible. He spoke about the need to intervene earlier, at an early stage where it is still possible to save B-cell function. Furthermore, he mentioned the different methods of diagnosis: HbA1c- and blood glucose measurement. He thinks that this leads to big confusion and problems because the HbA1c-measurement is more expensive and only possible in rich populations. So it may separate the world into 2 parts. He encouraged us – as health professionals – to be the advocates fighting the disease. Doing this, we should also influence politicians, urban planners, and advertisers. We should prepare ourselves to make sure we implement what we know. He also echoed the idea of Paul Zimmet, who said that health professionals must create the climate to force politicians to act.
**Diabetes as a worldwide burden; Paul Zimmet, Australia**

From Australia, Paul Zimmet spoke about the history of diabetes as one of the greatest epidemics. An interesting fact was that Mauritius is like a barometer for the global diabetes epidemic. Its population consists of 3 ethnic groups which constitute 66% of the world’s population. So studies performed in Mauritius predicted the diabetes prevalence in other countries like China.

The prevalence of diabetes is rising exponentially. Today, in 2010, there are 285 million diabetics worldwide – 2030 there will be 438 million. One of the diabetes hot-spots is in the Middle East. Paul Zimmet mentioned that the prevalence rates of T2D change by changing from blood glucose diagnosis to HbA1c-measurement. Therefore, we should be careful looking at the numbers. Moreover, he emphasized the problem of T2D in indigenous communities. 4 of 5 diabetics are in developing countries, not in the “Western” world. Ageing, lifestyle change and urbanization may not be the main causes of T2D in developing countries. He emphasized that T2D is not only influenced by genetics but also by epigenetics. Epigenetic knowledge may shed light on more effective strategies to halt this global tsunami, maybe especially in indigenous communities.

**Closing remarks; Helmut Mehnert - Germany**

Helmut Mehnert from Germany, emphasized that diabetics are patients, not only persons, because they have a higher risk for CVD. In his opinion, there are 2 important points to consider: 1) early detection of T2D at an early stage, and 2) prevention of diabetes. He expressed his hope that this congress will improve the situation for diabetes patients worldwide.

**Network „Who are Active in Diabetes Prevention“; Peter Schwarz, Germany**

Prof. Peter Schwarz from Dresden spoke about the role of the network “Active in Diabetes Prevention”. This web-based platform serves as a venue to bring people together who are interested or active in the prevention of diabetes. The network also aims to: increase the understanding for difficulties and barriers in the implementation of prevention programs, increase the ability for the development of successful programs for diabetes prevention in public health and to enable the primary prevention of diabetes in practice. It may also be possible that the network would be the basis for global action. A few months after launching the network, there were already 3107 registered users, from 20 different countries. Prof. Schwarz emphasized that diabetes prevention is not only a medical action, it is more a public health action, and different disciplines were asked to working together. The actors of the network “Active in Diabetes Prevention” provided 34 newsletters up to now and presented different prevention programs running world wide. In the process, people learned a lot from differences in the prevention of diabetes. The network on the other hand was able to established the book “Diabetes Prevention in Practice”, reviewed the IMAGE practical toolkit, established contacts and won the MD Honours price.
The necessity of early intervention; Peter Schwarz, Germany
The congress president and organizer Prof. Peter Schwarz from Germany presented his view about the treatment along the early hyperglycaemic continuum. He states that prevention of T2DM is effective and needs management- not only when the blood glucose level has already increased. The intervention should start much earlier when the need for insulin has risen. A few important questions arise: How would you reach the person in an early state of diabetes? How would you implement intervention? How would you tell the person what the benefit might be? One possible answer could be: Go global! Seek the assistance of all concerned individuals, organizations and government agencies around the world.

How to identify the prediabetic patient?; Jaakko Tuomilehto, Finland
Jaakko Tuomilehto presented a simple, inexpensive and reliable instrument to identify people in an early state of risk of T2DM. The FINDRISC based on a real prospective data and it can predict the future concerning the appearance of a type 2 diabetes. In Finland the Diabetes incidence has a high correlation to the risk score. But are there population-specific differences in risk factors for T2DM? To answer this question Tuomilehto examined other risks in different countries. The parameters included in various models and scores are more or less the same, but the cut-points and score weights are different. A universal diabetes risk is may be not possible, but it is possible to implement diabetes risk scores in all populations. The FINDRISC identifies not only diabetes risk, besides it can predict different dysfunctions like fatty liver or CVD. There is good evidence that people at high risk identified by risk score benefit from healthy lifestyle advice.

Which intervention is appropriate at what stage?; Naoko Tajima, Japan
Naoko Tajima from Japan presented the results of the DECODA-Study in 2008. It shows the differences in manifestation of Type 2 Diabetes especially in the Asian population. In particular a high isolated IGT was observed. The different kinds of treatment with drugs in combination with lifestyle modification are resulted on these outcomes. They tested the participants by OGTT and other procedures after a meal. Summarizing the review evinced that drugs effetically can reduce the risk of T2DM and can also decrease the risk of CVD. For an optimal management for using such drugs more discussion is necessary.
Why do we need a diabetes prevention guideline? **Chairmen**

Prof. Peter Schwarz from Dresden, introduced the IMAGE project, which started 3 years ago. The aim of the IMAGE project was to develop a European practice-orientated guidelines for the primary prevention of T2D, a European curriculum for the training of prevention managers, European standards for quality control and a European e-health training portal for prevention managers. As he said, the IMAGE project is about putting the evidence into practice.

**An evidence based guideline for the prevention of diabetes; Michael Roden, Germany**

Michael Roden from Germany highlighted the scientific value of the guidelines which is the very core of the IMAGE project. He described how the target population of the project was identified and according to which criteria they were rated into different priority groups. Lifestyle modifications in high-risk individuals are very cost effective and more effective than pharmacons. Therefore the future goals he declares are the dissemination and implementation of the results of the IMAGE project.

**A curriculum for the training of prevention managers; Peter Kronsbein, Germany**

Peter Kronsbein spoke about the European curriculum for training the prevention managers (PM) – the people who will later train the people at risk. In short, it is a curriculum to train the trainer. The tasks of the PM’s were specified: management of a prevention program and counselling/training of persons at risk. Eight training modules are specifically designed to prepare the PM’s for these tasks. A pilot study of acceptance and practicability already started. So far the curriculum was very successful. Peter Kronsbein regretted that there are only few physical activity experts involved in the training – he would like to encourage more physical activity experts to get involved. Furthermore, the support of decision makers and politicians should be increased. He also emphasized the important role of the IMAGE toolkit in the implementation of diabetes prevention program. It is designed in a way that you can be adapted to fit a specific cultural/environmental needs.

**IMAGE e-learning; Martin Fischer, Germany**

Prof. Martin Fischer introduced the e-learning portal. This was conceptualized as a basis for an international platform where healthcare professionals can interact with each other as well as share, test and improve their knowledge. As a co-production of Austria, Germany and Poland, it is already available in English, Polish and German but other countries are more than welcome and everyone is asked to add their own ideas and to adapt it according to their culture.

**Quality management in diabetes prevention, Markku Peltonen, Finland**

Prof. Markku Peltonen presented the instruments they used to better introduce quality management systems into clinical health care, for it is known as a common problem in quality management. The IMAGE project serves three levels of health care operators- the individuals, health care providers and as a macrolevel the health system itself. To keep a high level of quality they defined 22 quality indicators to be Europe-wide accepted and applicable for quality control as well as 20 scientific evaluation indicators for a Trans-European measurement of the outcomes. Furthermore, they intended the dissemination of convenient and cost-effective instruments for continuous quality control. All these tools should help to keep an international high level of quality.
Underlying theories of behavioral change and relevant barriers in diabetes prevention;  
**Prasuna Reddy, Australia**

Prasuna Reddy from the GGT UDRH Flinder University & Denkin University in Australia established a program for Diabetes prevention. This survey showed improvement in all physical parameters of the patients. But there were a significant high rate of dropouts. Thereon, she and her team invented a new program called “Life!” which was prevalent based on a lifestyle modification and aimed to keep the participant in the program (76% completed the program). It shows that a significant high number of these dropouts had a depression. Beside this, other factors like low education, smoking and gender (being a man) were also important barriers for the participants to stay in the program till the end. A still unattended problem is that a depression increases complications in treating of diseases. Theoretical models do not pay attention to the mental health of the patients even though it pictures a relevant barrier in Diabetes prevention.

Changing behavior and overcoming barriers in diabetes prevention;  
**Colin Greaves, UK**

An interesting presentation was given by Colin Greaves from UK. His presentation focuses on the summaries of the evidence from systematic reviews and meta-analyses on intervention components which are associated with a) increased physical activity and b) dietary change in populations at risk of T2DM. It shows that the weight loss is effective in action stage but not in maintenance stage. The problem is, that only information and brief advice do not work. After classification in evidence and evaluation of the articles, some advices results for long-term behavior change. Using established behavior change techniques, social support, a greater frequency or number of meetings and changes in diet and physical activity at the same time are effective to change behavior. The process of behavior change has three stages: motivation, action and maintenance. However, there are still unexplained variation and other factors in play.

The perceived need for lifestyle guidance in diabetes prevention;  
**Sanna Salmela, Finland**

Sanna Salmela from Finland presented her own study about the need of lifestyle guidance that was associated with FIN-D2D project. Participants of the study were asked: “Do you wish to get lifestyle guidance?” It is commonly expected that individual lifestyle guidance is privileged of the participants and is also connected with higher success rates. But which factors are really important that people desire lifestyle guidance? The results showed, that only 36% of men and 51% of women used the offered guidance. Besides other factors it was determining, if the lifestyle guidance was wanted more or less. In conclusion, Ms. Salmela outlined that not everybody likes to receive lifestyle guidance. This fact does not mean that they don’t want to change their behavior. It is imperative that before starting a prevention program the desire for lifestyle guidance should be clarified.
Raising Awareness and Treating Prediabetes with in a Healthcare Setting; Debora Greenwood, USA; Kimberly Buss, USA
An interesting project about implementing a diabetes primary prevention program and increasing awareness of prediabetes screening, diagnosis and treatment options for clinicians was presented by Deborah Greenwood and Kimberly Buss from California. They implemented a pilot prediabetes program in one care centre in Sutter Medical Foundation, Sacramento. Healthcare providers were educated on the algorithm and current guidelines for care. Providers were encouraged to refer patients diagnosed with prediabetes to a pilot primary prevention program consisting of a prediabetes education class and a twelve week weight loss program. Until now over 300 healthcare providers has been educated and a pilot primary prevention program for 20 patients with prediabetes has been implemented. They told, the project was successful in raising awareness of prediabetes screening, diagnosis and treatment option. During 2010 education classes and Group Lifestyle Balance™ curriculum by University of Pittsburgh will be implemented in seven care centres. 800 participants will be enrolled per year.
Diabetes Prevention in Practice

*Diabetes prevention in practice* – this book was released at the WCPD 2010 in Dresden, Germany. This book represents 20 different programs for the primary prevention of type 2 diabetes in practice and is summarizing experiences and future plans in the prevention of diabetes over the world. With this the book provides a technical overview about programs in different settings, different target population, different social and ethnic groups as well as completely different structural environments.

The book also provides a very good overview about difficulties, challenges and barriers to the implementation of a prevention program. Therefore diabetes prevention in practice provides an ideal added value for all those who plan to establish a prevention program for chronic disease in practice, because here they can learn from positive examples how to act, but also from the discussion about difficulties how to avoid mistakes and barriers. If you are interested you can order the book at [www.activeindiabetesprevention.com](http://www.activeindiabetesprevention.com) and support with this to build up this international network.
Regenerative Therapies and Cell therapy in Diabetes - New approaches to prevent diabetes complications; *Medicine: Mathias Brendel, Germany*

Prof. Dr. Brendel from Dresden, University of Technology overviewed new approaches to prevent diabetes complications by regenerative therapies and cell therapy. In his talk he announced that biological replacement is a promising way to gain normoglycemia without severe hypoglycemic events. Either pancreas transplantation or islet transplantation aim on normalization of metabolism and insulin independence.

So far, pancreatic islets are transplanted by single intraportal infusion. Prof. Dr. Brendel showed further attempts, e.g. an oxygenated biocompatible capsule in which islets could be loaded in future. He also discussed a possible role of haemapoetic and mesenchymal stem cells for diabetes showing a broad field for future research.

The Dresden Transplantation Program - an Interdisciplinary Approach for Best Care Standards - Pancreas-/Kidney Transplantation; Islet Transplantation; Surgery: S. Kersting, Germany; Urology: S. Leike, Germany; Medicine: B. Ludwig, Germany

Dr. Kersting and Dr. Ludwig from Dresden, University of Technology explained the procedure of pancreas transplantation and islet transplantation, respectively. In their presentation they underlined the enormous importance of a good infrastructure for diabetes research as it has been set up in Dresden. Both therapy options promote the main goals which are glycemic control, prevention or stability of diabetes associated complications, improvement of quality of life and reduction of mortality.

Dr. Ludwig discussed an interesting case report, introducing a patient with type 1 diabetes suffering severe hypoglycemic episodes under common insulin treatment. Islet transplantation yielded metabolic stability including corrected HbA1C levels as well as absence of hypoglycemic episodes.

Trends in Immunosuppressive Regimen in Pancreas-/Kidney Transplantation; *Medicine: Ch. Hugo, Germany*

The rejection of a transplanted organ by the receiver is a considerable problem, completely erasing the beneficial effects for the patient. Therefore, Prof. Dr. Hugo from Dresden, University of Technology focused on trends in immunosuppressive regimen in simultaneous pancreas-/kidney transplantation (SPK). He introduced four main strategies. Almost 90% of the SPK patients get an induction therapy. A second approach is treatment with Tacolimus/MMF. Minimization of nephrotoxic immunosuppressives and avoidance of b-cell toxic steroids are the last two attempts he presented.
From randomised control trial to implementation in the real world – the Australian experience; James Dunbar, Australia

James Dunbar from Australia explained the way which the real life-prevention for the Australia experiment was gone. First randomised control trial took place in Finland: the Diabetes Prevention study. Based to this experience the GOAL Project in Finland and the Greater Green Triangle Diabetes Prevention Project in Australia was developed. Success factors in the GOAL were transferred to the GGT DDP, like the HAPA model and theories makes for transportable fidelity, Finnish-Australian interpersonal network and tacit knowledge and it was adapted for local GGT context (Australian guidelines and materials, input from local health professionals, HADS added). Success factors in the GGT DPP were taken over to Life!, e.g. the favourable political environment, HAPA model and theories makes for transportable fidelity, Researchers and policy makers had face to face meetings agreeing on strictly defined intervention, highly developed training, continuous quality improvement. LIFE! means “Taking action on diabetes” and based on Greater Green Triangle DPP. It is run by Diabetes Australia Victoria for 25,000 Victorians over 4 years. The training, development and evaluation were provided by Greater Green Triangle UDRH. Some of intervention-details were lost (e.g. individual session before six group sessions, repeat blood tests and feedback). The vary of facilitators and an unbalanced ratio of recruited participants to facilitators was also different to GGT.

Systematic approaches to intervention development, Prasuna Reddy, Australia

Prasuna Reddy from Australia spoke about the systematic approach to develop the intervention. The way was gone from the Diabetes Prevention study to the GOAL- project in Finland. At this basis in Australia the GGT Diabetes Prevention Project took place. The next step in the intervention implementation in Australia was the LIFE! project with 40 000 participants. This intervention was standardises, defined, continuous, data-based and worked with relationship management. Very important was to train trainers facilities. The Trainers had to do same things as the participant and went through the whole material, before they could start working. Another important detail was the focus of the mental health of the participants.

From theorie to praxis, experiences on real life-prevention, Sirkka Keinänen-Kiukaanniemi, Finland

Sirkka Keinänen-Kiukaanniemi presented the FI D2D. It was published between 2003 and 2010. Goals are to implement a program for prevention in primary health care and occupational health care. It includes arrangements of the screening to detect those in high risk. Implementation of this program is a compact system. Elements of the successful implementation are: ownership, multifactional interventions, local coordinators (regional and local networks), support from leader coworkers, overcome of barriers. In Finland the specialised care and primary health care are regulated and controlled by separate laws. The ownership and administration of Fin D2D was given to specialised hospital districts. In this project, many primary health care oriented primary workers were recruited in all organisational levels of the project. The project leaders and coordinators succeed to convince both the municipal politicians and primary health care leaders about that the project was primary health care projects, and the task of secondary care was to support and
coordinate the project. The participation rate of health care unites in project areas was very high, even though the participation within the hospital districts was voluntary.

Role of pharmacies in primary and secondary prevention of diabetes 
Sipra Peura, Finland
Sipra Peura showed that the pharmacies can take a very important place in prevention of diabetes. A finish Public Health Program for Pharmacies to prevent diabetes exists since 2001. People get information about healthy diet and diabetes by trained so called ‘contact persons’ in a pharmacy. Now in 2010 all the biggest pharmacies in Finland have their own diabetes expert. The contact persons are pharmacist or pharmacist assistant with high educational background (M. Sc., B.Sc.)
But the most important role for the prevention part in the diabetes-field plays the early identification of high-risk persons by the Find Risk which people can fill out in the pharmacies.

Session 4: Sustainability in the prevention of diabetes;
Chair 1: Jaime Davidson, USA; Chair 2: Markolf Hanefeld, Germany

The U.S. Experience in Building a National Diabetes Prevention Program;
Ann Albright, USA
Ann Albright, PhD, presented the United States’ Diabetes Prevention Program (DPP), and how they were able to create an efficient and effective campaign. Experts in the field of Public health focused their efforts on high-risk individuals, encourage them to do prevention and determine the factors that make the target population take action. One of their strategies was to set-up a center for diabetes education that serves as a “hub” to train diabetes educators. To date, it is not only the government sector that supports prevention programs but also private institutions, which makes the diabetes prevention more exciting in this part of the world.

Panel Discussion: new insights in sustainability, Trials vs. real life
Matti Uusitupa, Finland
Dr. Matti Uusitupa discussed about the sustainability in the prevention of diabetes in his country. A program was launched called DEHKO 2000-2010 with the aim of developing primary prevention of Type 2 diabetes, developing diabetes care and its quality and supporting self care of persons with the disease. An action plan was also published online in 2005, which gives guidelines and strategies for action to prevent CVD.

David Marrero, USA
David Marrero, PhD, from the United States talked about lessons from the Diabetes prevention program in the US. Principal findings from the DPP state that lifestyle intervention can reduce the development of diabetes by almost 50%. Lifestyle intervention is also an effective tool to employ because it cuts across age, gender, SES and race groups. Some of the challenge though is the proper allocation of the limited resources. To address this, a new
approach is planned to test the feasibility and effectiveness of training YMCA employees to deliver a group based version of the DPP lifestyle intervention in YCMA group facilities.

**Li Guangwei, China**

Prof. Li Guangwei presented a Chinese study with the topic of “sustainability in lifestyle interventions to prevent diabetes”. Over six years 530 subjects were asked to follow a certain lifestyle: some of them had to follow a standardized Chinese diet, others had to do more physical exercise, a third group had to fulfill both criteria and the last ones just received standard general health advice. After 6 years they were requested to continue with usual medical care. 14 years later statistics show that among the first three groups the diagnosis of diabetes was 13 % less and the CVD mortality 17 % less than in the control group.

**Jaime Davidson, USA**

From the United States of America, Dr. Jaime Davidson talked about the burden of diabetes and how the disease can overwhelm the US health care system. He vividly presented how diabetes is a growing in a pandemic proportion directly hitting health expenditure costs. To avoid further damage, diabetes must be prevented and he presented a road map in the prevention of Type 2 diabetes, which includes early identification, lifestyle modification, pharmacological intervention and constant monitoring of glucose and risk reduction measures.

**Prediction and surrogate markers of type 1 diabetes development; Nowotny,Bettina, Germany**

The first topic was presented by Dr. Bettina Nowotny from the University of Düsseldorf, she discussed the pathogenesis of T1D. Points of interest were to find a possibility to predict or to estimate the risk of a development of T1D, to find a way to monitor the progressing/therapy and at last to understand the pathogenesis of type 1 diabetes. Therefore Dr. Nowotny spoke about Islet antibodies. They could play a role for risk prediction, the more antibodies you have the higher is the risk and the sooner T1D manifests. Although the diagnosis of T1D still will be a clinical one. But Dr. Nowotny recommended to measure islet antibodies in adults. She also spoke about the T-lymphocytes, which have a main part. Studies showed that they are able to transfer diabetes. So that would be a point to set therapy, such as antigen-directed-cell-therapy or Immun-T-cell-therapy. But there are still a lot of problems in measurement of T-lymphocytes: the huge amount of essays on the market would be needed to standardize and a lot of fresh blood would be needed. But the value of T-cells could be monitoring the progress or therapy. Even though islet reactive T-lymphocytes are detectable in healthy subjects, but in that circumstances Th2/Th3, protective Insulitis ones, than in the T1D case, Th1, destructive Insulitis.
Insulin granule turnover and diabetes; Michele Solimena, Germany

Next presentation was held by Michele Solimena, with the main topic of Insulin granule turnovers. He made the statement that insulin granule components are the preferred targets of autoimmunity in T1D, biogenesis and turnover of insulin granules is the key process in beta-cells. At the opposite, in T2D the first phase of insulin secretion is missing, in T2D islets the insulin turnover is impaired. Another point in his presentation was that beta cells have fewer insulin granules than were estimated previously. The size and appearance of insulin granules depends on kind of fixation (high pressure fixation vs. chemical fixation) and species. Main part of his presentation he spent on discussing how it is possible to get more beta-cells to increase the secretion of insulin in T1D. Normally insulin is a powerful activator for beta-cell-proliferation, it is an interesting point to investigate, why beta cells do not proliferate despite the insulin signal. Mr Solimena spoke about PTBP1, which is an mRNA stabilizer and increases translation progress for building insulin. To investigate more in PTBP1 could be an answer of the question of getting more beta cells.

The rationale behind different intervention strategies; Jay Skyler, USA

Jay Skyler from the University of Miami spoke about the rationale behind different prevention strategies. He said that the history of development of T1D tend to be a long one and there is a period between a supposed environmental trigger and the finally clinic. This period could be useful for interventional studies. Mr. Skyler presented some studies, such as DIPP (Type 1 Diabetes Prediction and Prevention Nasal Insulin Trial), TRIGR (Trial to Reduce Insulin Dependent Diabetes in the Genetically at Risk, based on form of weaning), NIP (nutria intervention to prevent, based on omega-3-fatty acids), Endit (European Nicotinamide Diabetes Intervention Trial) or DPT (Diabetes Prevention Trial). Finally he came to the conclusion that recent studies have been well designed, adequately powered, and carefully conducted; unfortunately they have not been successful. Sample sizes require a collaborative, cooperative, multi-center approach. More aggressive therapies may be needed.

Trials for prevention of beta cell loss in type 1 diabetes; Paolo Pozzilli, Italy

Last presentation was held by Paolo Pozzilli of the University of Rome. He spoke about Trials for prevention of beta cell loss in type 1 diabetes.

The prevention should start at the presence of a sufficient residual function with drugs which induce immune tolerance to beta cell antigens with a beneficial cost/benefit ratio. Nowadays there are some drugs, three of them already in phase III studies. First of all he talked about DiaPep 277, a Heat Shock Protein 60. It protects beta-cell function in T1D. Studies showed that the insulin requirance in patients treated with DiaPep 277 was lower than in patients with placebo. Secondly he mentioned GAD trail, which preserve residual beta-cell function in diagnosed T1D children and young adults.

Last drug he presented was Otelixizumab, an anti-CD3 drug. The required insulin dose was lower in patients treated with Otelixizumab than in placebo. Although still there is a huge spectrum of side effects.
Session 6: Practical Guideline for diabetes prevention - The IMAGE Project;
Chair 1: Jaana Lindström, Finland; Chair 2: Kate Sheppard, UK

Practical guideline development; Peter Schwarz, Germany
Prof. Dr. Schwarz presented the IMAGE- Toolkit for the Prevention of Type 2 Diabetes in Europe. Take Action to Prevent Diabetes is the first specific objective of the IMAGE-Project: Development of a European practice-oriented guideline for prevention of type 2 diabetes. Members of the Image-Project built an active working group which represent different professional backgrounds. The first working group meeting took place in May 2009. Now, in April 2010 they present the toolkit at the WCPD 2010. Very special is that the review was done in the Network – actors on the diabetes prevention field commented the Toolkit. A lot of criticism received but much more motivation, so “Lets start and take Action”.

Evidence base for lifestyle to prevent diabetes; Jaana Lindström, Finland
Jaana Lindström from Finland told that the aim of a toolkit should include practical information for anyone and healthcare and prevention activities for high risk persons. But it is necessary that such a toolkit base on a strong scientific background. So, information about physical activity level (30min a day) and healthy nutrition (balanced, nutritious, enjoyable) are evident and from different lifestyle intervention projects. They all showed a risk reduction for T2DM if the aims for lifestyle change in physical activity and nutrition were reached. Of course there are many approaches for a lifestyle intervention, important is that they are evidence-based and practical oriented and this guidance are needed.

Identification of risk / care pathway; Aleksandra Gilis-Januszewska, Poland
Aleksandra Gilis-Januszewska from Poland talked about ways to find people with a high risk of developing T2DM. Screening methods could be biochemical tests like the 2hOGTT. As opportunistic screening models there are non-invasive methods established, which search for other risk-factors like obesity, age or the family history of diabetes to estimate the individual risk. Simple screening tools like the Find Risk or the Dutch Score in Europe exist. Especially the Find Risk is validated in different countries like Finland, Germany, Italy and Poland. With this instrument it is possible to identify more than 70% of the high risk individuals. An other opinion is the use of patient’s records by computer search of database. A quick-self-assessment is to mess the waist circumstance or the waist-to-hip-ratio. Very high number of identified risk persons you get by using a multiple step, that means first a Find Risk and then fasting Plasma Glucose-. With this method you identify 83% of the high risk Persons and 57% of cases with increased glucose tolerance. The care pathway is an intervention on lifestyle-change, where many approaches exist. Mrs. Gilis-Januszewska determined that evidence based and practical oriented guidance are needed.

How to promote lifestyle change?; Kate Sheppard, UK
Kate Sheppard, a member of the working group which developed the IMAGE-Toolkit, said: You have to produce a credible, concise, pragmatic, accessible document with a positive message about health promotion for healthcare professionals & policy makers. Elements of effective lifestyle interventions are published in the chapter “How to change behavior” in the IMAGE-Toolkit. T’Her key massage was :“Behavior change is a complex
process”, means that individual-tailoring of intervention, support for motivation, goal-setting & action-planning and advice on maintaining change & managing setbacks are required. The key issues are empowerment of the individual, responsibility for changing behavior, choice of the individual to change behavior and support needs and it will vary. So, a program for changing lifestyle, should include information and action plan worksheets in the field of diet & physical activity, self-monitoring & self-regulation, goal-setting /action planning, coping strategies (problem solving), social support and relapse prevention.

www.image-project.eu
www.activeindianapetnesprevention.com
The visual approach to make necessary behavioral changes for T2D prevention; 
**Marianne Haug Lunde, Norway**

Marianne Haug Lunde presented a pilot study called “Innva Diab” whose primary aim was to improve T2D risk factors by a culturally adapted lifestyle intervention program. 22 subjects of a minor ethnic group were tested for their fasting oGTT blood glucose and the 2 hour oGTT blood glucose after serving them different variations of cornflakes for breakfast. Separated into two groups half of them were told to take a 15 to 20 minute walk before taking the second oGTT. By showing those subjects the results of their oGTT and by giving them the possibility to discuss their results in their own language without impose an expert’s interpretation of the data on them those people understood on their own the connection between behavior and blood glucose. This study showed that the visualization of blood glucose responses after intake of carbohydrates as influenced by their quality and quantity and by a slow post meal walking may serve as a useful tool to obtain lifestyle changes.

A culturally adopted approach on lifestyle changes in Pakistani women, a RCT; 
**Telle Hjellset, Victoria, Norway**

Victoria Telle Hjellset presented a randomized, controlled lifestyle intervention study to prevent T2D in female Pakistani immigrants in Oslo. The participants should obtain knowledge on how to influence their blood glucose levels in their everyday lives, together with their families. Very interestingly, the aim of the program was not to teach the women how to eat healthily but let them discuss nutritional and health issues in a group, in their own language so they would give the advice themselves. The health professionals just explained them what is happening and made (patho-) physiology understandable.

Significant effects on fasting blood glucose levels, triglycerides, energy expenditure and duration of physical activity (and on fasting insulin, BMI and depression) were found. All in all, this program was effective to prevent T2D and the metabolic syndrome.

Weight loss and nutrient composition; **Andreas Pfeiffer, Germany**

At the beginning, Andreas Pfeiffer reminded us that too much of the wrong food causes the metabolic syndrome (MS). He explained that the cell adapts its metabolism to its energy level. To prevent T2D, weight loss is important – and it depends on the energy balance. He said that energy balance is generally more important than which kind of diet you eat. But unfortunately, long term success is only achieved in a minority. Subjects with a rapid and high insulin response to an OGTT might benefit from low-carbohydrate/low glycaemic load diets, he explained. High protein/low glycaemic index diets performed best, low protein/high GI diets worst – with a difference of 1.5kg. Lower carbohydrate diets seem to favour weight maintenance. It was interesting to hear that if you are obese and eat an unhealthy pattern the risk for T2D is even higher than if you are obese but eat healthily.

Probably, micronutrients also play a role: High magnesium intake lowers the risk for T2D by 15%. Calcium, Vitamin D and café also help prevent diabetes. There is insufficient evidence for a beneficial effect of zinc, chromium and selenium. Furthermore, a high fibre intake plays an important role in preventing diabetes, especially cereal fibre. The importance of vegetable or fruit fibres is not clear yet.
All in all, Andreas Pfeiffer gave a very interesting overview on how nutrition influences weight and diabetes.

**Abstract 5: The Effect of Depression and Anxiety on Outcomes after an Intervention for Prediabetes; Assefi, Melika; Iran**
Dr. Melika Assefi from Iran University in Teheran was presenting a study about the relationship between depression, anxiety and outcomes after participation in the Healthy Living Course (HLC) as an early-intervention diabetes prevention program for adults with prediabetes. Participants completed the HLP and pre- and post-intervention measure data were available. The data they controlled for two years are mood, biochemical, anthropometric, cognitive and behavioral measures and correlations between them. They found, that the intervention alleviated depression and improved eating patterns and scores on cognitive, anthropometric and biochemical measures. Their findings highlight the importance of assessing mood factors in prediabetes and the need to develop theoretical models of change mechanism for mood in health outcomes.

**Abstract 269: Psycho-social and Behavioral Predictors of Successful Weight Loss in Prevention of Type 2 Diabetes; Gorges, Daniela; Germany**
Another author was Daniela Gorges from the Research Institute of Diabetes Akademie Bad Mergentheim in Germany. She presented the findings of a study about the relation between demographic, psycho-social and behavioral factors and a successful weight loss. These factors were assessed of 166 participants at baseline and after an average of 1 year. Significant predictive process factors of weight loss were: early weight loss, flexible and ambitious weight goal setting, changes in exercise, reduced anxiety, satisfaction with the program, satisfaction with modified lifestyle and increased cognitive control of eating behavior. To increase program impact these factors have to be addressed. Pre-treatment depression and less experience with weight loss should be considered as potential barriers to a successful lifestyle modification, while demographic variables are unrelated to weight outcome.
Diabetes and CV mortality in Asia, Europe and other regions; Juliana Chan, HK
Prof. Chan from the Chinese University in Hong Kong presented the main conclusions of several megatrails. She described type 2 diabetes (T2DM) as an epidemic problem of Asian nations. A 3-fold increase of T2DM within two decades is alarming. Furthermore, she stressed the danger of an aggravation of micro- and macrovascular diseases under diabetes. Finally, she introduced the help-promising Joint Asia Diabetes Evaluation, a web-based program to translate evidence to clinical practice in T2DM.

Existing evidence for reducing CV events in diabetic patients; Antonio Ceriello, UK
Prof. Ceriello from Barcelona discussed various studies (ADVANCE, VADT, ACCORD) which examine the effect of lowering HbA1C due to the prevention of cardiovascular events (CV) in type 2 diabetes (T2DM). Interestingly, not only an aggressive glycemic control, but also conquering the postprandial glucose elevation appears to reduce CV. Despite these results Prof. Dr. Ceriello reminded that benefits and risks of diabetes therapy must be assessed for each single patient carefully.

New perspectives for CV patients with prediabetes - The ACE Trial; Rury Holman, UK
Prof. Dr. Rury Holman from The Oxford Centre for Diabetes, Endocrinology and Metabolism described the results of different analysis and trials on CV & diabetes and introduced the Acarbose Cardiovascular Evaluation (ACE). He pointed out that previous studies show that targeting more-intensive glucose lowering can reduce major macrovascular events in type 2 diabetes. Moreover, post-challenge glucose levels are more closely related to future CVD risk and mortality than fasting glucose levels. In the end he presented the ACE trial which is targeting postprandial glycemia in people with IGT and cardiovascular disease using acarbose, an insulin sparing approach. The outcomes are expected in 2014.
The Canadian Experience; Chris Robinson, Canada
Dr. Robinson Canada presented CANRISK, the Canadian prevention and screening program for type 2 diabetes (T2DM). There are 1.1 million people in this country who have impaired fasting glucose (IFG), 1.6 Million have impaired glucose tolerance (IGT) and 0.6 Million suffer IFG&IGT. The CANRISK questionnaire has been translated to 7 languages, for 18% of the population are from different ethnic origin. Fasting plasma glucose measurement and OGTT revealed 23% of the 40-74 year old participants to have pre-diabetes. In the future, multiphasic screening will be carried out to deliver more information about development of dysglycemia in pre-diabetic patients and success of prevention in participants with normal glucose tolerance.

The Austrian Experience, Bernhard Paulweber, Austria
From Austria, Dr. Bernhard Paulweber presented the DE-Plan (Diabetes in Europe-Prevention using Lifestyle, Physical activity, and Nutritional Intervention). It is a 2 year intervention divided into 2 phases: 6 months of intensive intervention and 18 months in the maintenance phase. The aim of the program is to encourage weight reduction, healthy diet and physical exercise. The intervention faced extreme challenges in the screening and recruitment within the occupational health care system. In the future, it was suggested that diabetes prevention programs in Austria put more emphasis on achieving the weight loss goal through group training as well as the use of formula diet if weight loss does not occur after 6 months.

The Spanish Experience; Rafael Gabriel Sanchez, Spain
Dr. Sanchez talked about a diabetes prevention program in Spain. Although there is yet to have a final statistics regarding people with and at risk for diabetes, it is estimated that 2.5 million are affected by the disease. The challenge in the implementation of Diabetes Prevention Program (DPP) in Spain is the implementation of pre-diabetes program in primary care. Today, an online screening is being implemented. Despite this campaign however, the number of Type 2 diabetes continues to grow at 4-8% and half of the population are feared to have diabetes. What is interesting is the relationship between the high prevalence of diabetes compared to CVD, which is low.

Experiences from Pakistan, Abdul Basit, Pakistan
Dr. Abdul Basit clearly presented the diabetes situation in his country. Despite the challenge of lack of resources and the burden of statistics of the entire population predisposed to diabetes, programs are in place to help combat the disease. Gyms were set up in the workplace, education tours are being done in schools, mass media is maximized for public information dissemination. Their program is also supported by national and international organizations as well as human resources from Pakistan.
Diabetes Prevention Practice - Experience with population based physical activity; Theodora Temelkova-Kurktschiev, Bulgaria

Theodora Temelkova from Bulgaria stressed the success rate of physical activity in relation to diabetes prevention program. As highlighted in other studies all over the world, physical activity reduces the risk of diabetes by as much as 34% in a 10 year program and in a 6 year group-based lifestyle intervention, the onset of diabetes can be delayed for up to 14 years. Physical activity also lessens the risk of cardiovascular diseases as proven by the studies she presented.

IDPP on the Change in Insulin Resistance and Beta cell activity during Interventions; Ambady Ramachandran, India

Ambady Ramachandran gave a very interesting speech about the Indian Diabetes Prevention Program (IDPP). In this study, there were 4 groups: control, lifestyle modification (LSM), metformin and LSM + metformin. He told us that there are several differences between the IDPP and the DPP or the DPS. Since Indians tend to be non-obese, the BMI in the IDPP population was much lower than in the DPP and the DPS, and the IDPP population was younger. To reduce stopping the drug, the dose of metformin used in the IDPP was lower than in the DPP. According to the low BMI, there was no significant weight loss in the IDPP. Due to the lack of the effect of weight loss, beta cell function and insulin sensitivity could be explored. In all 3 groups, there was a significant reduction of diabetes. Main mechanism of the prevention was an increase in insulin sensitivity. Beta cell function did not change significantly in those not developing diabetes. The NNT was similar to the NNT in DPP/DPS although the metformin dose was lower and LSM less intensive. Moreover, the costs off the IDPP were lower. Ambady Ramachandran also mentioned the IDPP 3 which just started. This project is designed to test whether LSM by using information technologies (SMS and mobile phones) is cost-effective and accepted. We can look forward to the results.

The visceral fat; Matthias Blüher, Germany

Prof. Matthias Blüher talked about the role of the intraperitoneal fat. According to different studies he showed that the waist circumference has a direct impact on different metabolic diseases. It increases, for example, the risk of T2D, CVD mortality, the occurrence of MI, as well as the number of all-cause deaths. Metabolic correlates of an enlarged intra abdominal fat area are increased HbA1c values and triglycerides, as well as an elevated systolic blood pressure while HDL cholesterol levels decrease. Furthermore Prof. Blüher catered to the specific biology of the visceral fat as the expression of specific molecules and an atherogenic adipokine pattern, an increased lipolysis and catecholamine synthesis. In the end he highlighted that there are many differences on cellular and biochemical level between insulin resistant obesity and insulin sensitive obesity.
GDM as target for diabetes prevention; Boyd Metzger, USA
Boyd Metzger from the USA answered the question why gestational diabetes mellitus (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 (T2D). The potential benefit of the prevention of GDM is great – not only for the women but also for their offsprings. 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.

The liver fat; Norbert Stefan, Germany
Norbert Stefan highlighted the role of the liver fat in metabolism and diseases. Studies prove, that liver fat and visceral fat are intense connected with each other but the last one seems to be an independent and stronger determinant of glucose and lipid metabolism. Measuring the liver fat by MRT it turns out that the amount correlates with the level of prediabetes. Furthermore it was shown that there exists a benign obesity that is identified by insulin resistance. Different biochemical substances were presented that have an influence on the fat metabolism as adiponectin that increases the lipid oxidation and decreases ectopic fat, Fetuin A that impairs insulin receptor autophosphorylation or sex hormone-binding globulin that is known to enlarge liver fat if it is down regulated. Several mechanisms are still to be detected in their participation in developing fatty liver – associated consequences. To identify them may help to prevent and treat diseases as T2D and atherosclerosis.

New technologies in detection of metabolic risk, specifically relating to prevention of type 2 diabetes. A multi-marker blood test to predict T2DM; Michael McKenna, USA
Michael McKenna from the University of California, Berkeley presented an innovative technology to identify high-risk persons with the aim of creating a healthier population. Important is the combination of different markers and how they work together. It is not only used to identify the risk of developing T2DM. It is also practicable in the process of stratification, intervention and monitoring. How to identify the highest risk? This is possible by discover followed biomarkers: glucose, HbA1c, Ferritin, Adiponectin, Insulin, CRP, IL-2-RA. Out of it an algorithm is evolved to predict the 5-year-risk of Diabetes. The named markers shows in comparison to usual markers a differentiate risk. Using more tests in practice you can find out high-risk persons earlier and you have to treat fewer patients at the end. Thus an optimal strategy for an individual intervention can be evolved.

BEVAIR® - A Biomarker Concept for Type 2 Diabetes Beyond Glucose Control; Petra Musholt, Germany
Petra Musholt and colleges from Germany developed a instrument – the BIOVIAR® – to find out high risk persons earlier to give them intervention. Current biomarkers witch are used to diagnose T2DM are: glucose, HbA1c, lipids, BMI and blood pressure. But they identify the
risk lately. This suggests high mortality and high costs. The current markers were complement by intact proinsulin, Adiponectin and hsCRP. For all of them they determine cut offs. For practical use they translate the cut offs into a traffic light system. The evidence of BIOVIAR® is shown by different studies, for example the PIOneer study. In future they want to use chip medicine for establish the system.

**EZ Scan - an easy way to detect diabetes risk and insulin resistance; Jean Paul Deslypere, Singapore**

In her talk Dr. Silke Martin presented an ongoing project of the Bavarian Red Cross, Munich. Using their “Blood Donor Biobank” they want to research on new biomarkers that will help to detect diabetes in a very early stage. On the basis of those biomarkers they want to develop new sensitive and cost effective screening methods. The basic material for their studies will be the blood samples of 60,683 blood donors of their biobank who have been tested to be on risk for diabetes. After their participation in an oral glucose tolerance test 56.1 % of them have been diagnosed with (pre)diabetes. Now the blood samples of these donors collected during the last years can be used to search for new biomarkers.

**Session 11: Free Communication - Diabetes and CVD:**

Chair 1: Eberhard Standl, Germany; Chair 2: Manfred Ganz, Germany

Abstract 61: Long-term outcome of acute coronary syndrome in correlation to different types of glucose metabolism disorders; Koutsovasilis, Anastasio; Greece

A. Koutsovasilis presented a study to evaluate the impact of glucose metabolism disorders on the first year outcome of Acute Coronary Syndrome (ACS) patients. The patients who were included in this longitudinal, prospective, observational, unicenter study were divided into 4 groups: patients with previously diagnosed diabetes (Group A), patients with newly diagnosed diabetes (Group B), patients with IGT (Group C), and patients with normal glucose regulation (Group D). The incidence of the end points – death (of cardiovascular cause), myocardial infarction, cardiac failure and unstable angina pectoris – was recorded. Group A showed the worst outcome during the first 12 months after ACS, the second highest incidence of end points was in Group B, third highest incidence in Group C.
Best outcome was in Group D. The study showed that patients with known diabetes have a worse long-term outcome after ACS compared with newly diagnosed and prodiabetes patients.

Abstract 154: A High Fat Diet during Pregnancy causes Alterations in Cardiac Metabolism in Male Offspring; Kruse, Michael; 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 main focus of attention. A wild type of female mice and a genetic heterozygous deletion of GLUT4 (G4+/−) female mice were fed a 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 programing adult disease suggesting dietary recommendations during pregnancy for prevention.

Abstract 161: The evaluation of metabolic syndrome and 10-year cardiovascular risk in a Chinese population with prediabetes and newly-diagnosed type 2 diabetes; Rong, Shuang; China
Prof. Dr. Liu et al. investigated the prevalence of the metabolic syndrome (MetS) and the potential risk of cardiovascular diseases (CVD) in Chinese individuals with various degrees of glucose tolerance. A 75g OGTT divided the 1014 subjects (women=494, men=520) aged 30-60 years into five groups according to the American Diabetes Association criteria: normal glucose tolerance (NGT), impaired fasting glucose (IFG), impaired glucose tolerance (IGT), combined IFG&IGT and newly-diagnosed type 2 diabetes (new-T2DM). MetS was defined as stated by the International Diabetes Federation criteria. The 10-year cardiovascular risk was predicted by Framingham score. A strong increase of the prevalence of MetS from NGT to new-T2DM was observed in both genders. Similarly, the 10-year cardiovascular risk presented an aggravating tendency from NGT to new-T2DM in both genders.
In summary, these outcomes imply that serious changes of the metabolic system occur before a diabetes diagnosis, for which reason check-ups especially in pre-disease crowds will be eligible for the prevention of T2DM and CVD.

Abstract 167: The Lox-1 receptor as link between atherosclerosis and glucose metabolism; Leuner, Anja, Germany
Anja Leuner presented the Lox-1 receptor as a link between atherosclerosis and glucose metabolism. LOX-1 overexpression increases higher blood glucose levels after high fat diet (HFD). The absolute amount of white epididymal adipose tissue was significantly increased in LOX-1tg rats. This was further increased after high-fat diet. The insulin-mediated vasodilation showed a trend towards an impairment, also the endothelium-dependent relaxation was impaired. Leptin and TNF-alpha mRNA expression was increased, PPAR-gamma mRNA was reduced.
Abstract 152: The Role of Coronary Risk Assessment in Planning and Assessing Treatment of Type 2 Diabetes; Phillips, Patrick; Australia
Dr. Patrick Phillips presented a study to assess the initial and follow-up (2 years later) coronary risk in a cohort of patients with type 2 diabetes managed in Australian general practice.

The data of following variables were collected: age, BMI, HbA1c, blood pressure, cholesterol level, self-reported smoking and exercise data. The coronary heart disease (CHD) risk was calculated. At the follow-up, all assessed risk factors for CHD – apart from age – have improved. The 5 year CHD risk has significantly increased due to the effects of age. Nevertheless, after removing age effect the mean 5 year CHD risk at the follow-up assessment has significantly decreased. After adjusting for age, patients with lower initial HbA1c had maintained their CHD risk while those with an initial HbA1c > 8% had their CHD risk significantly reduced. Their risk remained higher than in patients with lower HbA1c, though. The risk factors improved due to increased use of medication. Single biggest beneficial factor is the improvement of the lipids.

The study showed an overall adequate management of this cohort of diabetes patients.

Abstract 18: Prevention of type 2 diabetes and cardiovascular diseases using a cognitive behavior program aimed at lifestyle changes in people at risk: 6 and 12 month follow-up results; Lakerveld, Jeroen; Netherlands
Jeroen Lakerveld from the EMGO Institute for Health and Care Research Department of General Practice in Amsterdam and his team tried to investigate the effects of a cognitive behavior program targeting the lifestyle factors physical activity, smoking and diet in adults with an elevated risk of type 2 diabetes (T2DM) and/or cardiovascular diseases (CVD), compared to providing brochures only. Outcome measures were changes in T2DM and CVD risk scores at baseline, after 6 and 12 months as measured with the ARIC and SCORE, respectively. Regression analysis showed no significant differences in risk score between the intervention and the control group (in total 500 participants) at both follow-up measurements. Thus, the cognitive behavior program was not more effective at 6 and 12 months than brochures in reducing T2DM and CVD risk.

Abstract 248: Diabetes in Europe - Prevention using Lifestyle Modification. The DEPLAN-Project in Spain. Acosta, Tania; Spain
Dr. Tania Acosta from the University hospital “La Paz” of Madrid presented a paper about prevention of DT2 by using lifestyle modification. Target of the study was to test an educational intervention program including promoting healthy lifestyles. Participants were screened by FINDRISC and it was also looked for risk profile and disorders of glucose metabolism. Results were that the prevalence of high risk of diabetes is very high in primary care in Spain. More than 80% of classified high risk people agreed to participate in the intervention. After one year of education and workshops Dr. Acosta detected decrease in BMI, triglycerides, blood pressure and total cholesterol of the participants, although there were not significant.

Session 12: Free communication - Prevention in Practice
Chair 1: Antonio Ceriello, IT; Chair 2: Thomas Forst, Germany

Abstract 248: Diabetes in Europe - Prevention using Lifestyle Modification. The DEPLAN-Project in Spain. Acosta, Tania; Spain
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Abstract 165: Increased engagement in physical activity reduces the risk of diabetes in Pakistani immigrant men living in Oslo, Norway: a randomised and controlled study. 

Andersen, Eivind; Norway

Mr. Eivind Andersen from Norway argued about the problem of a higher prevalence of lifestyle diseases such as diabetes type 2 (DT2) in some immigrant groups, especially those from the Indian sub-continent. The insulin resistance appears to be a preceding condition possibly caused by lack of physical activity (PA). Aims of the study he spoke about were 1) to increase the PA level by using culturally adapted approach and 2) to examine whether increasing their PA level would reduce plasma glucose and insulin concentration. The intervention was carried out for five month. PA was assessed by accelerometer recordings; diabetes risk was estimated from fasting values of serum glucose and insulin. At last, the intervention group increases their total PA level by 15% and also reduces their insulin values. Using the present culturally approach its possible to increase PA and reduce the risk of DT2.

Abstract 90: How different are diabetes prevalence and diabetes risk factors between migrants from a non-English speaking background and the remaining population? Results from the 45 and Up Cohort Study, Australia; Cardona-Morrell, Magnolia, Australia

Dr. Magnolia Cardona-Morrell from the University of Sydney School of Public Health investigated the diabetes risk profile in residents from non-English speaking background (NESB) compared to the remaining population. All of the more than 100.000 participants were more than 45 years old. They were separated in 3 different groups: pure NESB, mixed NESB and Australian born. The study found that even after controlling other factors such as sociodemographic and behavioral risk factors or family history NESB ethnicity independently predicts increased risk of diabetes. For example, although people with pure NESB were less likely to be overweight or obese than pure ESB, they reported more family history of diabetes, also people with pure ESB achieved a higher percentage -210 minutes per week of moderate physical activity. Multivariate analysis showed that migrants were more likely to report diabetes.

Abst. 286 Impact of intervention for the prevention of Type 2 diabetes: a randomized high-risk population based study in Pakistan. Hydrie, M. Zafar Iqbal; Pakistan

Dr. Hydrie presented a collaborative study between the University of Oslo, the Diabetic Association of Pakistan and the Baqai Institute of Diabetology and Endocrinology. He analyzed the impact of intervention for the prevention of type 2 diabetes in Pakistan. Initially, an oral glucose tolerance test identified the high risk subjects ( > 30 years) with an impaired glucose tolerance (IGT). The participants of the 18 months lasting program were furthermore characterized by fasting lipid profile, fasting insulin and HbA1C (0, 9, 18 months). The IGT subjects were separated into the standard group (n = 212) and the intensive lifestyle modification group (n = 189). Around 40% in both groups agreed to take metformin. The intensive lifestyle modification group achieved the greatest risk reduction while treatment with metformin did not show a synergistic effect. Interestingly, the majority of the participants were males, the mean age of the subjects was 42 years. The speakers findings highlight that an early intervention by the improvement of a poor lifestyle even without medication is a cost effective way to reduce the burden of diabetes and of course a benefit for the patient.
Abstract 268: Metabolic Effects of Successful Weight Loss in People with High Risk of Type 2 Diabetes; Herrmanns, Norbert, Germany

Prof. Dr. Norbert Hermanns from the Research Institute of Diabetes-Akademie in Bad Mergentheim, Germany presented the findings of a study about the factual metabolic effects of successful weight reduction in people with impaired glucose tolerance and/or fasting glucose underwent PREDIAS lifestyle intervention study. Between baseline and follow-up substantial effects of successful weight loss on fasting glucose, HbA1c and 2 hours post OGTT- glucose were found. All values were reduced. The insulin resistance was significantly affected by weight loss (change from 3.4±1.8 to 2.8±1.4), as well as the lipids. Cholesterol and LDL were reduced whereas HDL rose. Triglyceride level and blood pressure decreased as weight loss goal was achieved, but the difference was not significant. Accomplishing a successful weight loss reduced diabetes and cardiovascular risk.

Abst. 264: Efficacy of a Behavioral Lifestyle Intervention Group Program (PREDIAS) for Prevention of Type 2 Diabetes; Kulzer, Bernhard; Germany

Next topic was presented by Dr. Bernhard Kulzer from the Research Institute of Diabetes-Academy Bad Mergentheim. Dr. Kulzer spoke about the efficacy of a behavioral lifestyle intervention group program named PREDIAS for prevention of Type 2 Diabetes in people with high risk. It aims at lifestyle modification and consists of 12 lessons, 8 during the first eight weeks (core-lessons) and last four bi- or three-monthly (booster sessions). The lessons had an average group size of 7 persons and lasted 90 min. After 12 months compared to a control group, which showed no significant baseline differences between the PREDIAS group and the beginning of the study, Dr. Kulzer presented the following evaluation results: Not only the weight loss was significant higher in the PREDIAS group, but decrease of fasting glucose levels and increase of duration of physical activity per week, too. This could be a proof for the potential of group settings in diabetes prevention programs.
Can Type 1 Diabetes be prevented? Jay Skyler, USA
Dr. Jay Skyler from the United States poses the question “Can type 1 diabetes be prevented?” To answer, he presented the natural history of type 1 diabetes and the potential timing of intervention studies. In the program Type 1 diabetes TrialNet, patients were subjected to intervention in the early stage of Type 1 diabetes. After intervention protocols, it was found out that Diabetes Type 1 TrialNet is adequately designed and carefully conducted and the diabetes community accepts the program. Sample size requires a collaborative multi-center approach and successful modulation of immune mechanisms is also required for cellular replacement therapies.

Type 2 Diabetes Prevention: Lessons Learned; Schwarz, Peter, Germany
Primary prevention of T2DM is a process and the actors are still learning from failures, mistakes, unknown barriers and so on. To develop a prevention strategy, you should pay attention to some points. The strategy should be structured and easy to understand. Used screening tools should be applicable in a population setting. For setting approach go out to find people where they are. It is very important to develop structured intervention material. Another very important point is to involve the regular contact with the prediabetic persons. Therefore recruit educated lifestyle managers. A continuously evaluation of the success of the prevention strategies, which includes quality management and prevention management are other basic topics for the lifestyle manager. For all actors in T2DM prevention field there was edited a handbook for Prevention Practice by an international team of editors. These 20 similar structured chapters summarize experiences and future plans about prevention practice over the world.

Insulin in Type 2 Diabetes Prevention, Hanefeld, Markolf, Germany
Dr. Markolf Hanefeld presented the effect of targeting normal fasting glucose levels with basal insulin glargine on glycaemic variability and risk of hyperglycemia. The purpose of this trial is to determine the efficacy and safety of FPG. Participants were randomly allocated to insulin standard care. Conclusion from preliminary ORIGIN data states that insulin glargine was not associated with significantly increased risk of hypoglycemia. There are positive and negative reactions to the results of the trial.
Abst. 98 Dyslipidemia and peripheral prediabetic Neuropathy; *Julius, Ulrich; Germany*  
Prof. Ulrich Julius from the University Hospital Dresden spoke about dyslipidemia and peripheral prediabetic neuropathy. There is increasing knowledge from experimental and clinical studies about evidence for the presence of neuropathy in prediabetic state, prior to development of overt hyperglycemia. It’s not known whether it is the neuropathy result of hyperglycaemia or hyperinsulinemia or other metabolic risk factors. Dr. Julius presented animal studies and showed that treatment with Niacin derivative acipimox reduced shown insulin, free fatty acids and triglyceride concentration without affecting impaired glucose tolerance and total cholesterol concentration. The findings from Dr. Julius suggested that impaired insulin signalling, hyperglyceridaemia and increased fatty acids are responsible for the development of prediabetic neuropathy. This is another rational for early intervention to stop the progression of diabetic complications.

Abst. 321: Comparison of Holter registration with EZSCAN measurements to detect cardiac autonomic neuropathy in Type II diabetes mellitus patients; *Deslypere, J. P.; Singapore*  
Mr. Deslypere presented a study about an instrument to measure the autonomic nervous systems (ANS) functions, the EZSCAN, in comparison to Holter registration, at least for assessing cardiac autonomic neuropathy. A pilot study done in Paris, France in 35 patients with Type 2 DM evaluated its usefulness in the assessment of cardiac autonomic neuropathy (CAN). Holter registration was performed during 15 min of rest (supine position) and again during 45 min of exercise (standing and active). An EZSCAN test was done before the Holter registration. Low frequency (LF) and high frequency (HF) results were significantly associated with EZSCAN readings. The EZSCAN is able to detect early abnormalities in the ANS. Further studies are necessary to confirm its usefulness in the early diagnosis of CAN in DM patients.

Abst. 243: Hemoglobin A1c in diagnosing and predicting type 2 diabetes in impaired glucose tolerance: the Finnish Diabetes Prevention Study DPS  
*Pajunen, Pia; Finland*  
Dr. Pia Pajunen from Helsinki, National Institute for Health and Welfare Diabetes Prevention Unit presented the evaluation of the HbA1c as an additional diagnostic tool for diabetes. The proposed HbA1c criterion was compared with the oral glucose tolerance test (OGTT) in diagnosing-type 2 diabetes among high-risk individuals during a prospective follow up at the DPS. More than the half of the individuals with diagnosed diabetes verified by a second OGTT, would have remained undiagnosed if diagnosis would have been based on HbA1c criterion. The new suggested diagnostic criterion for HbA1c emphasizes specificity rather than sensitivity.

Abst. 367: Healthy Heart Study: Insulin Glargine improves Myocardial Function in Patients with Coronary Artery Disease and Early Type-2-Diabetes including Impaired Glucose Tolerance; *Von Bibra, Helene; Germany*  
Prof. Dr. von Bibra from the Clinic Bogenhausen Diabetes Center introduced a study regarding the effect of insulin glargine on myocardial function in patients with coronary artery disease (CAD) and early type 2 diabetes (T2D) including impaired glucose tolerance. Patients (age 66 ± 10 years) were randomized to metformin (M) (n=15) or insulin glargine sc
o.d. (G) (n=13). Blood and ultrasound tests were performed in the fasting state and 2 hours after a pure carbohydrate meal (48g) at 0, 4, 12 and 24 weeks. Diastolic myocardial function was assessed by pulsed tissue Doppler. The results point up that treatment with insulin glargine o.d. or metformin improves diastolic myocardial function, blood pressure and HbA1c. Finally, this research underlines the importance of secondary prevention as a valuable therapeutic target.

Abstract 46: Diabetes associated complications among non-diabetic patients increase the risk of incident type 2 diabetes; Nichols, Gregory, USA

The work of Dr. Gregory Nichols and his team from Kaiser Permanente Center for Health Research in the USA dealt with the question if diabetes associated complications themselves have a predictive value on the development of type 2 diabetes. They worked on a patient population of 56,694 subjects who did not have diabetes in the beginning of the study but were partially diagnosed with respectively cardiovascular disease, heart failure, depression or chronic kidney disease. Controlling the incidence of diabetes over the next five years they arrived at the conclusion that patients who suffered from a diabetes associated complication have a 1.4-2.2 fold higher risk to develop diabetes in the future. These results highlight the importance of early prevention measures of at-risk patients.

Abstract 310: Reactive hypoglycaemia and prediabetes – favourable effects of mediterranean diet on children and adolescents with pre-metabolic and metabolic syndromes; Dimitrijevic-Sreckovic, Vesna; Serbia and Montenegro

Prof. Dr. Vesna Dimitrijevic-Sreckovic from the Clinical Center of Serbia Diabetes Prevention & Nutrition examined short- and long-term effects of individually adjusted Mediterranean diet on abdominal obesity, lipid status, hypertension and insulin resistance in children and adolescents with pre-metabolic (pre-MS) and metabolic syndromes (MS) and analyzed frequencies of prediabetes in adolescents. He found that the Cardioprotective Mediterranean diet and early discovery of reactive hypoglycemia and prediabetes in adolescents with pre-MS and MS in favourable effects on insulin resistance, abdominal obesity, lipid status, hypertension and prevention of prediabetes, diabetes and vascular complications resulted.

Abstract 105: Prediabetes, increased insulin resistance, thrombotic and inflammatory factors in children, adolescents and youth with metabolic syndrome; Dimitrijevic-Sreckovic, Vesna, Serbia and Montenegro

Prof. Dr. Dimitrijevic-Sreckovic presented the results of a study dealing with prediabetes at younger subjects. Probands, between 7 and 30 years old, were distributed into 3 age groups. Among those they detected the subjects with metabolic syndrome by waist circumference, triglycerides, high density lipoprotein cholesterol, hypertension and glycaemia, using an oral glucose tolerance test to quantify the disorder. Diabetes got diagnosed by impaired fasting glucose and impaired glucose tolerance. Furthermore the scientists analyzed parameters of the glucose and insulin metabolism, as well as thrombotic and inflammatory factors of the subjects. Finally they stated that in metabolic syndrome there is a relation between abdominal obesity together with hyperinsulinism on the one hand and insulin resistance and lipid status disturbance on the other hand where thrombotic and inflammatory factors and tendencies to early diabetes and atherosclerotic complications are present.
Abstract 262: Quality management of prevention programs for type 2 diabetes; Landgraf, Rüdiger; Germany
Large randomized controlled studies have convincingly demonstrated that primary prevention of type 2 diabetes (T2DM) is possible. Most of the German prevention programs outside of well controlled clinical trials, however, are costly, intransparent, insufficiently communicated and lack evaluation. For this reason, Prof. Dr. Landgraf from the German Diabetes Foundation (DDS) explained the importance of quality management of prevention programs for T2DM. The DDS and other prevention specialists set up a database for prevention projects and installed a coordination centre for quality management in prevention (KOQuaP). Standardized datasets include demographic data, social status, genetic background, alcohol and nicotine consumption, details about diet and exercise, BMI, waist circumference, blood pressure, prevention activities, quality of life questionnaire (SF-12) and medication history. Regular feedback reports and evaluation of these comprehensive data allow a quality management, creating constantly improved and adjusted strategies for prevention of T2DM.

Abstract 145: Quality assurance in a large scale diabetes prevention program; Dunbar, James, Australia
Prof. James Dunbar from the Greater Green Triangle University spoke about quality assurance in a large scale diabetes prevention program. The so called Life! Taking action on diabetes program includes: a purchaser provider arrangement with accreditation standards for providers, a training program leading to certification of facilitators, specifically developed training materials and a quality assurance program. Last point includes an annual review day for program facilitators to provide professional development and peer to peer support. For that purpose there are planned measures, discussions and act/change amongst the facilitators.

Abstract 231: Development of a State-of-the-art intervention to support behavior change in adults at risk of type 2 diabetes; Sheppard, Kate; UK
Next presentation was held by Dr. Kate Sheppard from University of Exeter. Aim of her paper was the development of a state-of-the-art intervention to support behavior change in adults at risk of type 2 diabetes. They planned to develop and clearly described an intervention for supporting changes in diet and physical activity for adults at risk of DT2. By using recommendations from their prior systematic review and following an adapted intervention mapping framework they generated a clear set of patient level process objectives: understand the process of behavior change, motivation for the change, indentify and engage sources of social support, make decisions, create an action plan and put it into practice, review progress and deal with setbacks.
Abstract 153: Risk factors of conversion from IGT and IFG to diabetes type 2; Gilis-Januszewska, Aleksandra, Poland
Another work was presented by Dr. Beata Piwońska-Solska from Kraków, Jagiellonian University Medical College. In Kraków they did an eight year prospective study on a randomly selected population of 2,838 inhabitants of at least 40 years of age. The aim was to detect the predictive factors for the development of impaired glucose tolerance or impaired fasting glucose into type 2 diabetes mellitus. The examinations of the patients distributed in a physical part including weight/ height and waist circumference; a biochemical part including glucose, insulin in 0´and 120´ oral glucose tolerance test and an anamnesis concerning CVD health history and family history of type 2 diabetes. It turned out that the risk factors are as follows: fasting glycaemia, fasting hyperinsulinaemia, insulin resistance measured as HOMA IR index, WHR and family history of type 2 diabetes.

Abstract 344: T.A.F.F. - a low threshold, interdisciplinary prevention program for families with overweight and obese children and adolescents; Susanne Blüher, Germany
A presentation about the interdisciplinary intervention T.A.F.F. to prevent juvenile obesity is presented by Dr. Susanne Blüher. Overweight children and adolescents will be screened via the CrescNet data base, an anthropometric network which monitors actually body weight and body height data from children from all over Germany. The participation has to be affected by the local paediatrician and will be randomized into an intervention and a control group. Eating habits, daily physical activity, leisure time habits as well as socio-demographic data and psychosocial data will be engage. The intervention T.A.F.F. consists of a one-year telephone counselling with the parents through trained prevention managers, based on principles of Systemic Therapy. Telephone contacts are preceded by release of newsletters focussing important topics. Anthropometric parameters will be measured after 6 months and 12 months of intervention by the local paediatrician. The primary endpoint is the change in BMI-SDS after one year. In a second step, participation barriers shall be evaluated. The interdisciplinary intervention T.A.F.F might be a novel approach to prevent juvenile obesity, starting already at preschool age. The identification of participation barriers will provide useful information how a greater number of families can be reached for preventive and/or therapeutic approaches.

Abstract 235: “Powerful together against diabetes” A social network intervention for diabetics with a low socio-economic status; Vissenberg, Charlotte, Netherlands
Charlotte Vissenberg from AMC Public Health in Amsterdam presented a study about the social network intervention “Powerful together against diabetes”. It aims to improve and maintain diabetes self-management (DSM) for diabetics with a low socio-economic status by creating multilevel social support and reducing social influences that negatively impact DSM. For that the participants were divided into one intervention group and two control groups. The participants of the intervention group and one control group will be interviewed and physically examined at baseline, 6, 12, 24 months. The main outcome measures are Hba1C, health behavior, diabetes related behavior and psychosocial measures. For the second control group only Hba1C will be collected from their medical records. This study measures will provide more insights in the ways social mechanisms contribute to self-management in chronic diseases.
Use of genetics in the prevention of diabetes; Markku Laakso, Finland
The session was started with a presentation of Mr. Makku Laakso from the University of Kuopio in Finland. He spoke about genetics and prevention of T2D. Since 2000 until now there are 20 gene loci confirmed associated with T2D, although the odd ratio is very small (<1.4). But surprisingly genes do not add significantly to prediction of T2D, there were no differences shown in statistics of prevalence of T2D without genotype compared to some with genotype score.
Mr. Laakso claims that there has to be a change in the idea of the pathogenesis of T2D – there is only one gen loci detected for insulin resistance, but most of them standing for an insulin secretion defect (impaired proinsulin conversion). If it is not a genetic resistance, there should be something else. In his opinion it is an acquired insulin resistance based on obesity, diet, less physical activity and lifestyle. At the end he presented a new study about lifestyle intervention neutralize harmful effects of high risk carrier genes such as TCF7L2, FTO or PPARG2. Even though there are already useful information proving a strong interaction between lifestyle and high risk carriers (increase of insulin sensibility) there are larger sample sizes needed for a gene-lifestyle-interaction study.

Gene-lifestyle interaction in T2D prevention; Charlotte Ling, Sweden
Prof. Charlotte Ling from Lund University gave an exciting talk suggesting a complex interaction model between non-genetic factors, genetic factors and epigenetic factors basing on own research results in this field. Prof. Ling et al. performed studies on skeletal muscles of young men with differences in birth weight and diet comparing the regulation of PGC1a. Furthermore they examined COX7A1 and NDUFB6 in skeletal muscle cells in order to find evidence for their model.
Allby, their findings imply that age, SNPs, diet, birth weight, exercise and type 2 diabetes are associated with the degree of DNA methylation and gene expression in human tissues affecting insulin resistance and glucose metabolism.

The role of milk consumption in the pathogenesis of diabetes mellitus; Bodo Melnik, Germany
Next topic was presented by Dr. Bodo Melnik from the University of Osnabrück in Germany. He spoke about the role of milk consumption in the pathogenesis of T2D. Being a dermatologist, he sees a similar pathogenesis in diseases like acne. Milk starts a mitogenetic signaling system which upregulates PI3K/Akt which inhibits transcription factor FOX01. He proposed to investigate more in the milk-entero-insular-axis. He made the statement that milk affect the beta-cell homeostasis, it accelerates beta cell senescence and apoptosis. Some proves could be that people with Hyperprolactinemia, Acromegaly and Prolactinoma have higher numbers T2D. There could be new strategies for diabetes prevention, by either dietary restriction of milk and dairy products or by production of less insulinotropic and less beta-cell mitogenic milk and milk products. But still we have to identify the signal transduction way.
Epigenetics - Early Life Nutrition and Lifelong Health; **Sam El-Osta, Australia**

Prof. Sam El-Osta from Australia hold an interesting lecture, stating the legacy of metabolic or hyperglycemic memory despite intensive insulin therapy. Non-diabetic mice were exposed to transient hyperglycemia which resulted in persisting epigenetic changes in NfkB p65 promoter and increased p65 expression in aortic endothelial cells for the following 6 days with normal levels of blood glucose. Prof. El-Osta stressed our responsibility to our epigenomes which can be altered, instead of fixed and not changeable genes. As we may influence them, this brings in hope that we start nurturing our epigenomes now for the future.

**Session 16: What can we learn from new and innovative drugs in the treatment of diabetes mellitus?** Chair 1: **Boyd Metzger, USA;** Chair 2: **Thomas Forst, Germany**

Incretin based therapy for the treatment of type 2 diabetes; **Matthias Blüher, Germany**

In his presentation, Dr. Matthias Blüher from Leipzig underlined an important difference between oral glucose uptake vs. i.v. glucose application: the incretin effect. This is an insulinotropic effect, mediated by incretins secreted in the gut, which is markedly reduced in patients suffering type 2 diabetes (T2DM). GLP-1 is one of those incretins. GLP-1 analogues which are longer lasting and more potent compounds than the rapidly inactivated GLP-1 itself, create a beneficial medication strategy for prevention and treatment of T2DM. There are many substances on the market, aiming on lowering HbA1c, reducing body weight and even a silencing mechanism of those drugs on the appetite center in the brain has been discussed recently.

The latest news about new DPP4 inhibitors in clinical care; **Christoph Schindler, Germany**

Dr. Christoph Schindler from Dresden, University of Technology presented a valuable alternative to conventional treatment of type 2 diabetes (T2DM). There are many disadvantages like side effects and contraindactions for available T2DM medication. Additionally, the long-term glycemic control is disappointing with re-increasing HbA1c after some years. Therefore, Dr. Schindler is suggesting the application of Glitpins in prevention and treatment of T2DM. Glitpins inhibit DPP4, an enzyme that deactivates GLP-1 which is secreted by the gut after oral glucose intake. This clarifies why glitpins raise the level of active GLP-1. Thereby, blood glucose decreases, C-peptide goes up and glucagon levels are reduced. The major limitation, however, for clinical use is due to the costs. Further study concerning this promising strategy need to be performed.

New target organs for diabetes treatment (SGLT2); **Helmut Schatz, Germany**

Helmut Schatz from Bochum, Germany was talking about kidney as a new target organ for Diabetes treatment modelled after Ayurveda medicine. SGLT2 is acting in kidneys by reabsorbing glucose out of the primary urine. SGLT2 can be inhibited by phlorizin which is gained out of tree bork, e.g. out of apple trees. This substance is used in the drug Dapagliflozin. Currently it is in the state of development and it is close to admission. Potential benefits of SGLT2 inhibition can be the reduction in plasma glucose independent of insulin, the improvement in glucose toxicity, and the increase caloric expenditure.
Helmut Schatz presented several studies where phlorizin was tested in combination with other drugs or placebos. Results were moderate weight change and the site effect of raised genital infections. So, the recommendation is: be careful with this drug.

Session 17: Prevention of diabetes and cardiovascular disease in developing countries; Chair1: Pablo Aschner-Montoya, Colombia; Chair2: Jaime Davidson, USA

Global Perspective: Jean Claude Mbanya, Cameroon
In developing regions diabetes shows the biggest increases. Therefore Jean Claude Mbanya, president of the IDF, suggests that we all should work on four primary aims: to take care of an economic development that includes long-term health; to reconsider food policies as for the upcoming fast food culture; to create a better urban design that follows the common movement from the rural to the urban areas and further to promote health in all policies. Different studies have already faced the problems in developing countries but their results still have to be transferred in the real world.

Asian Perspective: Akhtar Hussain, Bangladesh
Akhtar Hussain started his talk with some statistics that showed that within 15 years the Asian room will possess the highest number of diabetics. Among others he sees the increased genetic susceptibility as an explanation for these results. To avoid such a situation he promotes interventions as soon as possible. But conventional programs for treatment and prevention suiting the Western world may not fit the risk in the Asian room. Therefore new approaches are required to guarantee an early identification, the detection of multiple risk factors as well as ethnic and culture specific risk factors and motivational factors. Intervention procedures have to become culture specific, involving the community. And they have to be sustainable.

African Perspective: Boniface Venance Mphumuhila, Tanzania
Although CVD are nowadays among the 5 top most killing conditions in adults non-communicable diseases (NCD) are not given an equivalent weight in health settings due to the overwhelming burden of communicable diseases. Among others a lack of knowledge and proper diagnostic tools exacerbate the problem as well as the change into a sedentary and unhealthier lifestyle. Actions taken to fight this situation are the use of modern media to communicate and inform, the use of national days for free screenings and giving health talks to the mass. First fruits of this labor are an upcoming interest and debates in public.

Barriers to diabetes care in developing countries; Samad Shera, Pakistan
Last presentation was held by Mr. Samad Shera from Pakistan. He spoke about barriers to diabetes care in developing countries. In his view the Noncommunicable diseases will be the next health tsunami all over the world. Reasons for huge problems in developing countries with handling diabetes are such as an exponential population growth or limited social resources. But not only the western health care system can stand as an example, you can’t
copy it with its specialist oriented care, related on technology and above all its high costs. Also the proclaimed lifestyle change seems to be hard to realize because of poverty. But you have to have programs to deal with the future burden of diabetes, but to install them some certain circumstances are needed, for example it have to be approached by government or there should at least sufficient resources be available. The main point was that there are still absent or ineffective national diabetes programs. His conclusion is to build a system, to educate the educators and people with diabetes, to link the 6P – Policy makers, Physician, People with diabetes, Public and, supposing most importantly the Press and build Partnerships amongst all of them.

Satellite symposia 3: Diabetes and Cardiovascular Disease: Pathways for prevention- Munich Diabetes Research Institute
Chair 1: Oliver Schnell, Germany; Chair 2: Eberhard Standl, Germany

HbA1c for diagnosis of diabetes: What are we gaining, what are we losing?
Hanefeld, Markolf, Germany
In his speech, Markolf Hanefeld from Germany gave his answer to the question if it is time for a change in diagnosing diabetes. In 2009 the IDF suggested to diagnose diabetes by HbA1c measurement: HbA1c ≥ 6.5% is diagnostic for diabetes. The evidence for this comes from the beginning of retinopathy at an HbA1c level of 6.5%. As Professor Hanefeld explained, we gain several advantages from the HbA1c assay: It is an accurate, precise tool to measure chronic glycemic levels. Furthermore, it correlates well with the risk of diabetes complications. It does not require as careful handling as plasma glucose measurement to prevent operating biases. Moreover, the HbA1c value has minimal day-to-day fluctuations, no bias by stress and day time (fasting status) and low intra-individual variability. But with HbA1c-measurement only you detect not as much (1.6%) pre-diabetics than with 2-hours glucose (4.9%) and fasting plasma glucose (FPG) (2.5%) measurements. More disadvantages are that the HbA1c provides only a late diagnosis – an advantage since pre-diabetes is a ticking clock. And the HbA1c cannot be measured properly in many parts of the world. He summarized that glucose and HbA1c are complementary. And most important, he told us that FPG, postload glucose and glucose fluctuation measurement remain essential.

CV benefits of GLP analogues and DPP-IV-inhibitors: fact or myth?
Tschöpe, Dithelm, Germany
At the beginning of his speech, Dithelm Tschöpe from Germany spoke about the effects of the incretins (GLP-1 and GIP) and DPP-4 inhibitors. The DPP-4 inhibitors result in higher concentration of active GLP-1 and prolonged incretin activity. GLP-1 increases the insulin secretion and improves glycemic control. One of their advantages is that they are comparably effective than other drugs but do not provoke hypoglycaemia. In a trial of 2004, incretins were used in emergency patients with an acute myocardial infarction. They improved the function of the ischemic part of the heart – probably by improving glucose availability. But as Dithelm Tschöpe told us, this is not clear yet. Summarizing, he suggested that if we use incretins for diabetes therapy, there could be CV protection – but it is not proved yet.
Hypoglycemia: The neglected complication? Oliver Schnell, Germany
Oliver Schnell from Germany explained that hypoglycaemia cause harm to patients. They are even a predictor of mortality. He told us that the lowest risk for mortality is at HbA1c levels of 7.0 – 7.5% – the curve is shaped like a U.

The higher the glycemic variability the higher was the hospital mortality in some studies. In this context, he mentioned another problem of HbA1c measurement: the HbA1c can be the same in subjects with very different glucose profiles.

As he explained, clinical experience and recent trials suggest that hypoglycaemia potentially increase mortality. Hypoglycemia may effect the cardiac function (maybe by a prolonged QT interval which increases the risk of sudden death). It also impairs the autonomic cardiovascular function. Moreover it might e.g. cause cardiac arrhythmias due to abnormal cardiac repolarisation, increased thrombotic tendency or decreased thrombolysis. It may adversely affect cerebrovascular function. All in all, there is a need for treatments which are less likely to cause hypoglycaemia and graded HbA1c targets for high-risk populations.

Cardio-metabolic interactions and side effects of multifactorial risk management
Eberhard Standl; Germany
As Eberhard Standl told us, a multifactorial therapy is the gold standard – but a multifactorial therapy including blood glucose control becomes more and more complex. Statins, as an example, increase the risk of a new onset of diabetes by 10%. On the other hand, there is e.g. a little effect of preventing new onset of T2D by drugs lowering the blood pressure.

Referring to several studies, he summarized that patients without a history of macrovascular events prior to randomisation appear to benefit from more-intensive glycaemic control – those without did not.

Summarizing the different effects of the several drugs related to the treatment of the metabolic syndrome, he said that lifestyle intervention should be the basis of all.
House of Health Dresden- Visions for the Future of Prevention- Results of an architectural student competition; Weber, Ralf, Germany

Ralf Weber from Germany had the honour to present the results of the architectural award of the House of Health (HH). The idea was developed during the planning of the WCPD by Prof. Schwarz and Prof. Bornstein. Why is the HH necessary at all? Because: we changed (sedentary lifestyle), transport form changed, and cities changed. Life mostly happens in cars and chairs – you can hardly walk in cities anymore. Additional there is a progress in medicine but stagnation in prevention. Out of this issues a Renaissance of walkable cities is coming up. Architectural students from Dresden worked on the project to combine different functions under one roof: health, communication, work and leisure time. By planning this HH they oriented in landscapes and translated it into a building. Three prizes were awarded. First prize won Kristin Windisch with the “Vertical Park”. And two third prizes were given to Magdalena Josefczyk with “Well of Light” and Janine Müller with “Urban Landscape”

J Joseph Hoet Memorial Award Laudation and Memorial Lecture

Haffner, Steve, USA

Dr. Steve Haffner talked about ‘pre-diabetes and atherosclerosis”. More interesting is his idea of conflict of interest in grant support, mainly from the pharmaceutical company. He also presented in detail the concept of pre-diabetes, concluding that pre-diabetes is an atherogenic state, and that atherogenic prediabetic state appears to be more related to insulin resistance than to decreased insulin secretion. He provocatively posed the question: how come until now, no diabetes prevention strategy has been shown to reduce CHD? He provides possibilities and possible answers.
Abstract 314: Non-alcoholic fat liver disease may be a sign of pre-metabolic and metabolic syndromes in children, adolescents and youth; Dimitrijevic-Sreckovic, Vesna; Serbia and Montenegro

Professor Dr. Vesna Dimitrijevic-Sreckovic presented a study which assessed the connection between non-alcoholic fat liver disease (NAFLD) and the metabolic syndrome (MS) in children, adolescents and youth. There is an association between hepatic fat accumulation in childhood obesity and increased visceral fat and insulin resistance (IR). IR results in NAFLD (through fat deposition in the liver). The patients who were included in this study were divided into 3 groups by age: children, adolescents and youth. To diagnose MS, three of the following criteria had to be pathologic: waist circumference, triglycerides, HDL-cholesterol, hypertension, glycaemia. Patients with less than three pathologic criteria were considered to have pre-MS. Furthermore, the liver was examined (liver function test, ultrasonography). The incidence of NAFLD increased considerably with age, and it was higher in MS patients than in pre-MS patients. The most important risk factors for NAFLD are obesity, hyperinsulinaemia with IR, SGOT and LDL-cholesterol. If NAFLD is the liver sign of pre-MS and MS still has to be proved.

Abstract 356: Management of blood glucose levels by mean of vegetable proteins; Morazzoni, Paolo; Italy

Dr. Paolo Morazzoni from Milano stated that a reasonable dietary approach which could also include optimized interventions with well standardized products along with constant physical exercise seems to be the first barrier for the management of weight control. Legume proteins obtained from kidney beans (Phaseolus vulgaris) and lupin seeds (Lupinus albus L.) are reported to exert quite interesting biological properties which can be related to the management of metabolic syndrome and weight control. In particular the preparation of rigorously standardized and reproducible products containing for each one of the plants the proteic fractions related to the biological effect has allowed the exploitation of preclinical and clinical investigations.

A standardized extract of kidney beans containing a balanced amount of alpha-amylase inhibitor and lectins has been tested successfully in experimental animals for reduction of food consumption, blood glucose and weight control. These data have also been confirmed in a pilot placebo-controlled clinical trial. In the framework of this research, a conglutin gamma-enriched fraction from lupin seeds has been also prepared and tested in experimental animals for its blood glucose reduction activity. The hypoglycaemic activity of the lupin extract has been confirmed in a pilot placebo-controlled clinical trial.

Abstract 116: Is Serum Cystatin C an Independent Predictor of Type 2 Diabetes?; Sahakyan, Karine, USA

Dr. Karine Sahakyan spoke about serum cystatin C as a predictor of type 2 diabetes. In a cohort of Beaver Dam Eye Study participants, the 15-year cumulative incidence of diabetes was measured. The relation of cystatin C and other risk factors to the incidence of type 2 diabetes was determined.

Serum cystatin C at baseline was associated with the 15-year cumulative incidence of type 2 diabetes. This association was independent of the presence of proteinuria, serum creatinine, and other diabetes risk factors.
Abstract 252: Performance of a multi-marker diabetes risk score on the Insulin Resistance Atherosclerosis Study (IRAS), a multi-ethnic US cohort; Kolberg, Janice, USA

Dr. Janice Kolberg from Tethys Bioscience in Emeryville, California (US) presented the results of the performance of a multi-marker diabetes risk score (DRS) in the Insulin Resistance Atherosclerosis Study (IRAS) which is a multi-ethnic US cohort. It was previously developed for a population-based study of Danish subjects. In this survey baseline fasting serum samples from 723 non-diabetic subjects were assayed for the markers which are part of the DRS. It shows that the DRS had a significantly larger AUC than fasting insulin, BMI, alpha fasting plasma glucose or a model built on clinical and anthropometric factors. The AUC for the different ethnic groups did not differ significantly from the entire cohort. Concluding Dr. Kolberg suggest that the performance of the DRS was better than any single baseline measure or measures of insulin sensitivity and acute insulin response during an FSivGTT with exception of disposition index.

Abstract 12: A molecular network of chromatin modification and gene expression explains the antidiabetic effects of Sirtuin 1 "activating" molecules - a nutrigenomics study; Sauer, Sascha, Germany

Sirtuin 1 (SIRT1), a NAD+-dependent deacetylase, has been implicated in the prevention of diabetes and obesity. Dr. Sauer et al. from the Max-Planck-Institute for Molecular Genetics Berlin demonstrated that direct SIRT1 “activation” does not occur. Their studies indicate that SIRT1 “activation” through molecules such as resveratrol, a compound identified in red wine, is rather communicated by specific effects of those molecules on a network of histone modifications and gene expression.

Histone modification patterns were compared between untreated and resveratrol-treated murine skeletal muscle cells. Surprisingly, resveratrol treatment resulted in dense acetylation of histones on the exons of important metabolic sensors (SIRT1, PPARgamma, LXRalpha) in contrary to global deacetylation of histones under resveratrol treatment in general. Gene expression data revealed significant changes in gene expression of key genes for glucose metabolism (upregulation of SIRT1, PPARgamma, LXRalpha). These results suggest the possible use of chromatin and gene level affecting dietary compounds and potent synthetic molecules for prevention and treatment of type 2 diabetes.

Abstract 366: Determinants of postprandial leukocyte excursion in newly detected type 2 diabetes – Results of the “Effect of Acarbose on sub-clinical inflammation and immune-response in early type 2 diabetes and risk of atherosclerosis” (AI(I)DA) study; Schaper, Frank, Germany

Dr. Frank Schaper spoke about the “links between bowel and vessel”. The AI(I)DA study was initiated to give insight on direct links between acarbose and low grade inflammation as possible explanation of its strong vasoprotective effects which have been shown previously. Patients with newly detected type 2 diabetes and proven subclinical inflammation were included in this study. Undergoing a standardized mixed meal, metabolic and fibrinolytic parameters and markers of sub-clinical inflammation as leukocytes were measured. The leukocytes increased significantly and continuously after the meal, based on a significant increase in lymphocytes. No significant association between postprandial plasma glucose excursion and postprandial leukocyte excursion was found. Basal and postprandial triglycerides are the most important determinants for leukocyte excursions.
Abstract 198: Telehealth applications in Diabetes Self-Management Education- use of Intervention Mapping; Anani, Muna, Saudi Arabia

Dr. Muna Anani delivered a presentation about how telephone, as a communication tool, can assist in diabetes care and management. Talking over the telephone can improve self-care because it helps educating the patients. More specifically, telephone calls seem to improve the day to day management of diabetes since 93.1% of diabetes educators on the other line were able to address the needs of the patients. Interestingly, 97% diabetic patients said that they were able to relieve stress and worries about the disease. This service seems to be very beneficial to patients living in isolated areas for they were able to manage their disease in their own environment and enable them to live an independent life. Results of this study also show that telephone service is as well possible in a clinical setting.

Primary Health care prevention programs in Mauritius; Sudhir Kowlessur, Mauritius

The first presentation came from Sudhir Kowlessur from Mauritius and he presented the initiative in Mauritius for the primary prevention of type 2 diabetes. Mauritius is an extremely interesting example, because at this island before the coast of Africa over the last 27 years an intensive epidemiological survey was performed to monitor the development of the prevalence of type 2 diabetes. This was initiated by Jaakko Tuomilehto and Paul Zimmet, and done in five different analyses, that show clearly an increase of prevalence of type 2 diabetes from about 8% in 1987 to more than 20% in 2009. The author presented the national diabetes prevention strategy which involved different layers in initiatives focusing on people with increased diabetes risk, on healthy education at school and training of educating health care workers to be burden and necessity of prevention of chronic diseases. Mauritius is a good example, where the government, private players, physicians and health care personal work together to prevent a chronic disease. Due to the ethnic heterogeneity Mauritius is also a good example to address the different ethnic requirements. Sudhir Kowlessur presented strategies including TV sessions, healthy information material and addressing in one day courses the housewife’s of Mauritius. This entire package together hopefully leads to a decrease in prevalence and higher awareness to type 2 diabetes in Mauritius. In a discussion Sudhir Kowlessur got a lot of support to go on and best wishes to succeed.

Abstract 171: European Curriculum for the training of prevention managers: the Portuguese experience and results; Paiva, Ana Cristina; Portugal

Prof. Paiva presented the results of the research project entitled “European Curriculum for the training of prevention managers: the Portuguese experience and results”. This pilot study employs the use of a curriculum based on the IMAGE project aimed at developing a European curriculum to be followed by Prevention Managers. The research was carried out to determine the acceptance and feasibility of modules and methodologies developed and to
develop and implement projects that promote healthy lifestyle. Generally, the course was considered very satisfactory. The participants became more competent. They know more the value of the development and implementation of intervention projects and they were also able to implement intervention campaigns in their communities. As a result, authors will be able to improve future courses for diabetes prevention.

Abstract 390: DIABETES PREVENTION THROUGH PRIMARY HEALTH CARE SERVICES IN FIJI - THE SNAP PROGRAM; Tukana, Isimeli; Fiji

The SNAP program (Smoking, Nutrition, Alcohol & Physical activity intervention) aims on diabetes prevention through primary health care services in Fiji. Prof. Dr. de Courten from the University of Copenhagen School of Global Health explained the idea of this project. Teams, responsible for certain zones, consisting of a nurse, a dietician and a Community Rehabilitation Assistant screened in 2005, 2006 and 2007 10 to 20% of the adult population over 30 years (total population of residents over 30 years: 108,760). Blood pressure (BP), random blood glucose (RBG), height and weight were measured and a questionnaire on Non-communicable Disease (NCD) risk factors had to be answered. Clients with alarming values were referred to a NCD physician. Clients with pre-diabetes and/or mild hypertension as well as obese clients were asked to return for a follow-up visit within the next 4 weeks. The NCD status was confirmed and the fasting blood glucose level was measured at follow-up. The team offered education on diabetes, obesity and hypertension and gave further advice concerning SNAP. 8.7% clients with high BP, 10.3% clients with high RBG and 3.4% with both remained unchanged over the screening period. Remarkably, there were 31.8% obese patients over the three documented years. As shown by Prof. Dr. de Courten, a public health team is another approach for delaying the onset of NCDs by structured intervention.

Abst. 330 Zoet Zwanger project: registration and follow-up for women with gestational diabetes in the region of Flanders, Belgium; Muylle, Frederik; 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 gestational diabetes (GDM). The first part is an awareness campaign addressing women with GDM and their healthcare providers using a dedicated website, information folders and posters. Secondly, a voluntary registration system has been set up. Registered women receive a first letter (by email 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.

Abstract 93: Primary prevention of type 2 diabetes in primary care: the Dutch APHRODITE study; Wielaard, Frits; Netherlands

Dr. Wielaard of “Primary prevention of type 2 diabetes in primary care: the Dutch APHRODITE study“ talked about how lifestyle intervention can help prevent the onset of type 2 diabetes, yet in the Netherlands, the impact of lifestyle intervention in relation to diabetes has not been studied extensively. As a result, a large prevention study was launched in the Netherlands, dubbed APHRODITE (Active Prevention in High Risk Individuals of Diabetes Type 2 in and out of Eindhoven). Mail questionnaires were sent, consultations were set up, interviews were conducted and interventions were carried out. After one and a half year, some participants dropped out, a small portion shows improved lifestyle and 10% has made no progress.
Abstract 349: Prevention of Type 2 diabetes in a country in transition: Experiences from SERBIA; Lalic, Nebojsa; Serbia and Montenegro

Another very interesting topic is the diabetes prevention strategy from Serbia (Prevention of Type 2 diabetes in a country in transition: Experiences from SERBIA). DR. Lalic acknowledged the increasing number of high risk individuals of diabetes in Serbia, which calls for a design and implementation of a nation wide structured program of early detection and prevention of diabetes. After the implementation of a two – step program, positive results and challenges came out. Response to the intervention increased, there was a high compliance to the questionnaire and high risk individuals are willing to participate. It remains the greatest challenge of this campaign to implement the screening, to continue educating the target population and to evaluate the program.

Session 20: Free communication - Behavioral Medicine - Education and Prevention; Chair 1: Matti Uusitupa, Finland; Chair 2: Bernhard Paulweber, Austria

Abstract 348: Increasing physical behavior of older people: how to overcome barriers? Hopman-Rock, Marijke - Netherlands

Prof. Marijke Hopman-Rock from Amsterdam, University medical center Public and occupational health discusses about how to overcome the barriers for physical activity (PA). It is extremely important in prevention of type 2 DM. She referred several reviews, who offered following possibilities. Two effective informational interventions are “point-of-decision” prompts to encourage stair use and community wide campaigns. In addition “social support in community settings”, “individual adapted health behavior change” and “creation or enhanced access to places for PA” are effective strategies. Remarkable is the advice and counselling of patients in everyday clinical practice, who increases PA for a long time. Determinants and correlates of exercise compliance and adherence will be discussed in relationship to usefullness for practitioners.

Mauritius Morbidity and mortality follow up study; Dianna Magliano, Mauritius

As Dianna Magliano explained, the data from diabetes prevention studies in developed countries cannot readily be extrapolated to developing countries. Getting this information for developing countries is important though, e.g. in political context. For this reasons, the Mauritius Surveillance Diabetes Project was started in 1987. The population is relatively young in Mauritius and it consists of Indians (68%), Africans (25%), Chinese (3%) and Franco-Mauritians (1.3%). The study showed that glucose intolerance from IGT and upwards – and not IFG – predicts all-cause and cardiovascular mortality in men and women and all ethnicities without significant differences. Furthermore, the relationship between diabetes and mortality was similar to developed countries. She concluded that time for intervention in Mauritius is now.
Abstract 283: Depression and diabetes in high-risk urban population of Pakistan;
Basit, Abdul; Pakistan
Prof. Basit spoke about a study that examined the prevalence of depression and its association with diabetes in a high risk population of Pakistan. A joint collaborative primary prevention study was initiated in 2007 between university of Oslo, Diabetes Association of Pakistan and Baqai Institute of Diabetology & Endocrinology for a period of three years. High risk subjects were screened by OGTT. Depressive symptoms were assessed by Montgomery Asberg depression scale. Furthermore demographic and socioeconomic information was collected with a structured questionnaire. Subjects identified as having IGT were invited to participate in the intervention program for a period of 18 months. The study found that diabetes, female gender, non earners and obesity were significantly associated with depression. Along lifestyle modification, psychiatric intervention and counselling of high risk individuals is needed for primary prevention of diabetes.

Abstract 111: Translation of a Modified Diabetes Prevention Program Lifestyle Intervention: The Group Lifestyle Balance Program; Kramer, M. Kaye; USA
The translation of the Diabetes Prevention Program (DPP) to real life settings is depending on the training and support of lifestyle coaches to a great extent. Dr. Kramer from the University of Pittsburgh Graduate School of Public Health discussed this important process. By establishment of the Diabetes Prevention Support Center (DPSC) the DPP was modified to a 12-session program, the Group Lifestyle Balance™ (GLB). The goals of this program are 7% weight reduction and 150 minutes of physical activity per week. The first step for health care professionals in GLB training is a 2-day workshop, followed by broad support (assistance, online accreditation, DVD of the program). 11 training workshops with more than 375 health care professionals have been held so far. Primary care practices, out-patient hospital clinics, fitness centers and several sites within the military have implemented the GLB program. Dr. Kramer stressed, that a program like GLB needs well-trained and intensively supported lifestyle coaches to be a successful prevention intervention.

Abst. 47 Sustained reversal of type 2 diabetes by intensive lifestyle intervention at diagnosis; Bowes, Anita; Great Britain
Anita Bowles presented the study “Sustained reversal of TYPE 2 diabetes by intensive lifestyle intervention at diagnosis”. Participants underwent a 2 phase intensive weight management program. The study yields an interesting and notable results. After a few months of intervention, participants weight decreases and by following the intensive lifestyle intervention and without the help of diabetes medication, more than half of the participants who have type 2 diabetes reverted to the normal glucose tolerance. This only shows that intensive lifestyle intervention will result to sustained weight loss, which can lead to a long term diabetes control.
Session 22: Diabetes prevention practice I
Chair1: Abdul Basit, Pakistan; Chair2: Bernhard Paulweber, Austria

Lets beat Diabetes, New Zealand; Brandon Orr-Walker, New Zealand

Mr. Brandon Orr Walker from New Zealand presented the “Let’s beat diabetes” program. “Lets beat diabetes” is a program aiming to prevent diabetes, slow the rate of progression and improve the quality of life of those with diabetes, but it is concentrating on primary prevention. It is performed in New Zealand and concentrating on the Maori population in the country Manukau, which has the highest prevalence of diabetes in New Zealand. The program is implemented and builds on tight collaboration between communities, private initiatives and sustainability of action and relationships. Progressive supermarkets were established to include healthy eating and cooking celebrations. “Let’s beat diabetes” build up a good foundation and network for collective action increased partnership and was able to implement more healthy food consumption. Interestingly, the most obese people do not see themselves as obese, which was identified as one of the challenges in the program. Progress were made, which includes people were started drinking more water and performing healthy diet and fat was reduced as cooking material. There was an increased interest in healthy eating behavior and more awareness was developed for the concern that overweight leads to health problem. Furthermore, it was achieved that a reduction of the consumption of sugary soft drinks was reached and more people were eating five a times a day fruits and vegetables. Over all “Let’s beat diabetes” is a very interesting, very exciting program to implement real action in practice to prevent diabetes. We are looking forward to hear more in the future about “lets beat diabetes” in New Zealand.

Prevention of diabetes in high risk ethnic populations particularly South Asians; Parmjit Sohal, Canada

Parmjit Sohal gave a talk presenting the requirement and challenges of ethnic minorities in Canada, especially focusing on South Asians. He reviewed the prevalence of diabetes and heart disease in South Asian migrants and showed that it’s 3 to 5 times higher compared than in the home country. He recommended the screening of all individuals who are older than 40 for type 2 diabetes but if risk factors exist also earlier. He introduced waist circumference as an highly interesting parameter to identify high risk in South Asian migrant populations, but also discussed several barriers due to the migrant situation like lack of knowledge, lack of awareness of complication, language barriers, literacy weight, negative police and attitude to believe in fate and “god to look after”. This are the barriers, especially in a population who is more pro to alternative therapies and sometimes even has a literacy problem. For pre-diabetes, an ethnic specific waist circumference should be used to identify people, who could benefit from primary prevention.

Results of the FIN-D2D; Leena Moilanen, Finland

Leena Moilanen from Finland spoke about the FinD2D project were the FINDRISK score was used with the aim to identify people with increased risk to establish an intervention. People with more than 15 points were eligible for the intervention in the FinD2D project. More than 400 centers participated and more than 8,000 oGTTs were performed. 19% of the man and 11% of the women, who were screened, showed diabetes - which means that the screening procedure detected a very high number of people with diabetes. After one year, the weight decreased by 1 kg and waist by 1cm. In an average, the reduction of risk factors were
modest but there was a clear association between the intensity of intervention and the effect. Those people who participated in 4 and more intervention sessions lost more than 2.5 kg of body weight and lost more than 2.6 cm of waist circumference. It was interesting to see, that over this one year follow up people, who had a normal glucose tolerance converted to diabetes in about 1%, but if the people had IGT in about 14% which is extremely high. A clear association was seen between effective weight loss and reduction in cardiovascular risk factors in those people who lost more than 5% of their body weight. Leena Moilanen concluded that screening of diabetes, estimation of global risk and detection of undiagnosed diabetes is possible to perform in real life clinical practice. FinD2D shows that lifestyle intervention to prevent diabetes can lead to a remarkable weight reduction and this finally to an reduction of cardiovascular risk factors. A cross-disciplinary health promotional activities which leads to lifestyle changes at population level are needed to fight against the diabetes epidemic. Focusing only on high-risk subjects is not enough to tackle the diabetes epidemic.

**Primary prevention of diabetes in a young urban population in Sri Lanka DIABRISK SL - stage 2; Mahen Wijesuriya, Sri Lanka**

Mahen Wijesuriya from Sri Lanka spoke about the DIAB RISK – SL STUDY. The objective of this study was to identify persons at high risk of cardio metabolic disease and prevent the development of the metabolic syndrome in them over 3 years. In the a pilot study, they tested 6 different risk factors and saw that out of family history with diabetes, BMI, waist circumference, physical activity, bad diet and high blood pressure, only the first 4 were significantly associated with diabetes risk in their population. Then they set up a 3-step-procedure:

- A screening of those 4 risk factors in the general population
- Select the high risk individuals with 2 and more risk factors and
- follow up them for 3 years in a randomized setting with an intervention and control group

Both groups got the same counseling, but the intervention group more often than the control group. The intervention was focused on diet, increased physical activity and stress reduction. In the study 23,000 people were screened and interestingly 39% of the people with increased risk were between 6 and 14 years, 20% between 15 and 19 years and 40% between 20 and 40 years. 4,666 were randomly separated into a control and intervention group. Dr. Wijesuriya finished her talk with the hypothesis that the life circle approach based on the Katmandu declaration for diabetes prevention is the right concept to move forward. This DIABRISK SL study is a very important study, because it addressing a new clientele, from children until people with the age of 14. This life circle approach for the prevention of diabetes may become a future concept for diabetes prevention. Because of this, the compliance in responding to an intervention in this clientele seems to be much higher than in the known adult clientele be addressed in the past.
Sizing the Problem; **Pesach Segal, Israel**

Pesach Segal from Israel suggested that Diabetes is a global problem because it is increasing everywhere. To prove this, he showed a list of the top 10 countries which are highest in T2D prevalence (Nauru, UAE, Saudi Arabia), the countries with the highest number of diabetes (India, China, USA) and also of IGT prevalence (Nauru, UAE, Saudi Arabia). He aimed to find persons at risk as early as possible. The reliable method seems to be the OGTT but the costs are a huge burden.

So, he was searching for possibilities in other countries and recommended different ways identifying risk persons earlier, e.g. the FINDRISC from Finland. There were all more or less similar besides the one risk score from Denmark which contains invasive parameters. To end, he sais that the whole world need possibilities of early and simple methods of identifying risk persons because the costs of maximal screening are too expensive.

CVD risk estimation in diabetes; **Thomas Forst, Germany**

Thomas Forst from Germany, gave an advice for screening possibilities to identify persons with CVD risk caused by diabetes in an early stage. Traditional parameters are not practicable for this. It is clear that the metabolic syndrome and CV situation is influenced by adipose tissue, insulin resistance and inflammation. He explained different parameters for predicting CVD. He mentioned 1) the hormone Adiponectin as a predictor of Arteriosclerosis and so for CVD risk, 2) Proinsulin as predictor for myocardial infarct and 3) hsCRP as predictor for insulin resistance and Arteriosclerosis. He showed an expended laboratory panel for early CVD risk estimation in future.

Non-Invasive Risk Scoring to Identify High-risk Patients - an alternative: **Cost-effective approach to early risk assessment; Anne Neumann, Germany**

Anne Neumann from Germany, presented a health economic model on how to calculate the long-term cost-effectiveness of diabetes prevention programs. In her talk, she introduced the cornerstones for a health economic evaluation for primary prevention of T2DM to the audience. Anne Neumann explained possible transition probabilities between states in the development of T2DM, the emphasis to consider were costs and health utilities for each state. The end point, having run this model for a number of years, is cost per quality-adjusted life years (QALY) gained. Her first research has shown limitations of the model, which she will address in further ongoing research. The biggest drawback she discovered was the unavailability of appropriate input data and the necessity to merge different source populations. She will now, for example, establish risk equations for the transition probabilities between the stages from the Swedish Västerbotten Intervention Program to quantify the degree of influence of modifiable and non-modifiable risk factors. A first evaluation of the Saxon Diabetes Program showed that this lifestyle intervention proved to be cost-effective for both sexes and all age groups when assuming a threshold value of the incremental cost-effectiveness ratio of 50,000 Euro/QALY gained.
Screening strategies for impaired glucose – a cost per case analysis; **Kamlesh Khunti, UK**

Kamlesh Khunti from the UK, explained a structured and systematic program to identify risk persons and IGT as risk factor for T2DM. The aim was to assess the effectiveness in relation to cost efficiency. A computer based risk score was developed for the study. They tested the participants 3 times. More than 6000 people were screened by OGTT, risk scores, FPG and self-assessment questionnaire. Out of these 3% were diagnosed by T2DM. The structured program showed limited costs for identifying risk individuals. It resulted that it is important to identify high-risk individuals because otherwise the cost will be too high. Inexpensive self-assessment and practice based strategies combined with FPG and HbA1c seemed to be most cost-efficiently. Cost level also depending of health care system and persons.

IDF consensus guideline for diabetes risk deduction + diagnostic criteria; **Jaakko Tuomilehto, Finland**

Jaakko Tuomilehto from Finland presented the results of the IDF workshop from Thursday, 8th of April in 2010. The purpose of this workshop was to find risk tools for identifying people at high risk developing diabetes. There were 40 participants from the whole world in the workshop. They discussed the methods screening vs. diagnosis and decided for screening, e.g. using the FINDRISK as background. Followed criteria for risk tools were performed: 1) to develop a model, 2) discrimination and 3) calibration of the model. For international validation program for T2DM, risk score there will be needed for data coordination, data analysis and a time schedule. Furthermore, it needs to establish an international data pool of relevant prospective and cross sectional studies. He invited everybody who work in this field for sharing and developing ideas and set the timeline until the World Diabetes Congress in Dubai in December 2011.
Plenary 5: Closing Ceremony;
Chair 1: President of the WCPD 2012; Chair 2: Peter Schwarz, Germany

Diabetes, People and Politics, Anne Felton UK, Michael Hall UK
Two speakers of the political session got sick. That is why there was a short statement to this topic added in the Closing Plenary Debate. Anne Maria- Felton and Michael Hall spoke about these very important issues. Health and politics have to find a way together. Today, politics begin to recognize the burden of T2DM. Few weeks ago a new organization was found: the European Coalition for Diabetes (ECD). It is a formal organization which will take part in the European Parliament. Successful European projects like the IMAGE shows the way. It is a pity that the big theme Diabetes is not included in the millennium goals of the UN but it is now a big aim to include it in the next issue of the millennium goals in 2015.

Current stage of diabetes prevention; Pablo Aschner-Montoya, Colombia
Pablo Aschner-Montoya from Colombia, spoke about the current stage of the diabetes prevention. Previous projects all over the world, had shown that primary prevention works. Next step must be the translation of these materials into ethnic, social and other special groups. The highest barrier is to motivate people who do not care about their body. Therefore it is very difficult to address the right person. So lifestyle manager are needed. Those very well-trained persons can be teacher, social workers and others who act close to high risk persons. Furthermore, primary prevention has to be offered in diabetes centre. It is a good idea to use well-known figures for health promotion. Mr. Aschner-Montoya closed his presentation with the message that we should try to live in a healthy way as long as possible. He showed as example a figure of the working era of Mr. Sebastian Bach. He was less producible when he got diabetes than in the years before. Maybe with the IMAGE project it had been different?

Future challenges of diabetes prevention; Li Guangwei, China
Prof. Li, the Head of the China Diabetes Association, showed interesting details from the China-diabetes surveys. To handle with small budget which was given by the government in China, they established a 2-step-screening method (first step is FPG, then OGTT). It is known that there is high prevalence of IGT persons, especially in the urban population. Overweight Asians (BMI >25) show a higher prevalence of IGT than obese Americans. Therefore Asians with less overweight should lose weight. Another strategy should be the combination of lifestyle modification and the inset of drugs.

What we learned at the WCPD 2010
Prof. Tuomilehto from Finland gave a short summary of the WCPD. Very important detail was the presentation of the IMAGE-Toolkit. About a third of the projects which were presented on the congress were summarized in the blue handbook "Diabetes Prevention in Practice". Prof. Tuomilehto presented also the results from the Find Risk action at the WCPD. The majority of the WCPD2010 participants who filled out the test were low-risk persons. But 10% are at high-risk or highest-risk. There is a lot to do also for the actors. At the next WCPD Mr. Tuomilehto wants to compare these results with actual findings.
Thank you very much; Peter Schwarz, Germany

Best Abstract - 3 best abstracts were selected by the participants.
Price 1. Using the Leicester self assessment score to detect undiagnosed Type 2 diabetes in a multiethnic UK population
      Gray, Laura. UK
Price 1. Effects of oxidized lipoproteins on vascular calcification
      Goettsch, Claudia. Germany
Price 3. The prevalence of non-alcoholic fatty liver in newly diagnosed type 2 diabetes and its correlation with HbA1c and electrocardiographic abnormalities
      Kosmalski, Marcin. Poland

We congratulate the winner of the abstract prices

The words of appreciation from the President, Prof. Peter Schwarz followed. He thanked all the individuals and organizations who supported the event as well as those who were present. The ceremony was formally closed with the invitation to the next WCPD from Prof. Rafael Gabriel from Madrid. He invited everyone to participate and attend the next WCPD congress.

The WCPD 2012 will be in Bilbao Spain....

If you want to receive an audio CD from the WCPD2010 go to
http://www.carpediem.la-shops.eu/
Dear members of the world wide network “Who are active in diabetes prevention”,

The 6th World Congress on Prevention of Diabetes and its Complications is now over. We have had a very intensive and exciting meeting. 940 people from 69 countries attended the congress and more than 700 attendees came from all over the world, aside from the about 200 from Germany. The meeting was set under the aim “Prevention in Practice”. In 23 sessions, 5 plenary sessions and several workshops, this topic was debated. Solutions were also searched to face the challenges and overcome barriers. After the 6th WCPD we have the feeling that the primary prevention of diabetes in practice comes into a mature stage. It would be a fulfillment of a dream if this meeting could lead, finally, to more actions in diabetes prevention worldwide. Organizing this meeting is indeed a very hard work, but at the same time very fulfilling. We were able to provide a scientific program, which at the end was a scientific practice program. I hope that this event added value to those who attended the congress and that maybe in the future the WCPD, can become a way of global action for diabetes prevention. During the congress, several attendees expressed their satisfaction about the scientific presentations, they also very much enjoyed the opportunity, to meet so many other people from so many different countries with the same objective. They were able to discussed, among others, strategies, experiences and practical programs concerning diabetes prevention in their from their own community. The WCPD congress, I believe, was a success and had several highlights which includes the issuing of the book “Prevention in Practice”, which summarizes several experiences from 22 partners world wide, and how to implement a diabetes prevention programs. The IMAGE practical toolkit was also released, as well as the curriculum for the training for prevention managers. Our next step is to look for partner’s world wide, who can help us implement those actions. New technology was presented to screen diabetes risk like the EZ Scan, which is a highly interesting new non-invasive fast screening method for insulin resistance and diabetes risk. New strategies on how to prevent type 1 diabetes were also discussed and debated. It is a great honor for me to organize this meeting and now I hand over the organization and the responsibility to the next 7th WCPD congress organizers. The 2012 congress will be held in Bilbao, Spain and as early as now we are counting on your support. May you also show the same enthusiasm as what you have shown here in Dresden. I hope that this report, in a form of a short summary of the scientific sessions of the 6th WCPD will help you to get an overview about what was discussed and presented. Our team attended all sessions, patiently listened to all the discussions, taking careful notes of all the details and effectively summarized the presentations and the discussions. We hope that this helps you draw your own picture of what diabetes prevention is about and how it is practice worldwide.

Thank you very much for your attendance and we welcome your comments. Again, I salute the people, who work diligently and passionately on diabetes prevention and care. We are on our way to achieving what we’ve been working hard for.

Prof. Peter Schwarz
President of the 6th WCPD