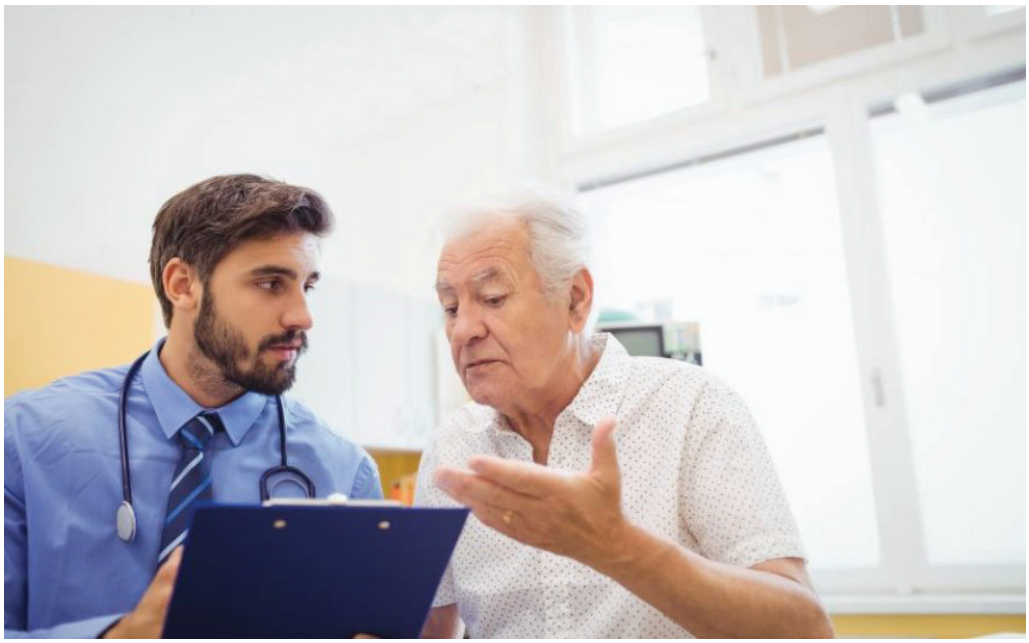
EASD 2019

CONNECTING RESEARCHERS
DESG
EASD DIABETES EDUCATION STUDY GROUP

CONGRESS SCIENTIFIC SYMPOSIA



IS THERE A PLACE FOR THERAPEUTIC PATIENT EDUCATION IN THE ERA OF NEW TECHNOLOGIES?

18TH OF SEPTEMBER 2019
HALL 4.2 10.00-12.00

With the support of





WELCOME NOTE

Diabetes is a condition of rising prevalence worldwide, which treatment is not only costly, but also very laborious. Thus, it creates major problems to every nation's public health. In the era of limited resources in healthcare – both in terms of workforce and budget – there is an urgent need to redesign approaches to diabetes treatment. This might be possible with employment of novel technologies to both prevention and treatment of diabetes.

Living with diabetes can be very challenging. We ask patients to perform multiple tasks day after day, including monitoring blood glucose at frequent intervals, planning meals, calculating insulin doses based on current blood glucose and carbohydrate intake, balancing meals and medication with physical activity, to achieve and maintain glycemic targets. It is no wonder that many patients have difficulty doing all that they are asked to do on a daily basis.

With the availability of more and more technological tools to manage diabetes, it is more important than ever to provide support, comprehensive and structured education to our patients in order for them to succeed in controlling their

diabetes, without compromising quality of life, and what is more important - always keeping in mind their safety.

This will be the main theme of the next DESG Conference in Barcelona, during the 55th EASD Congress. Researchers, educators, health care providers and people with diabetes, will gather to share and discuss different point of view about the importance of technology for a better diabetes treatment, and the central role that education still holds to achieve this goal.

Education and technology are complementary to each other. The right mixture of them both allow care for patients to be better coordinated, and jointly planned by the health and social care professionals across preventive and curative services.

Education needs to find "innovative solutions". It encompasses technological innovations, organizational innovations and public health policies. But still we need, and I hope for many years more, the human touch, relation, and collaboration, that makes diabetes therapeutic education such a fine art, and a beautiful medical tool.

We wish you may enjoy the program and be active part of it.

Yours sincerely

Prof. Florian Toti



Chair of Diabetes Education Study Group – EASD Study Group
On behalf of the Organizing Committee

PROGRAM OF DESG CONFERENCE BARCELONA

FIRST SESSION

MODERATOR: FLORIAN TOTI, TATJANA MILENKOVIC

10.00-10.15 THERAPEUTIC EDUCATION AND TECHNOLOGY – HELPING FOR A BETTER UNDERSTANDING OF DIABETES
FLORIAN TOTI

10.15-10.35 THE EVOLUTION OF DIABETES CARE AND EDUCATION. WHERE ARE WE GOING?
MASSIMO MASSI BENEDETTI

10.35-10.55 CONTINUOUS GLUCOSE MONITORING – CAN IT SERVE AS AN EDUCATIONAL OR MOTIVATIONAL TOOL FOR TYPE 2 DIABETIC PATIENTS
BANSHI SABOO

10.55-11.15 DIGITAL TECHNOLOGY IS THE TOOL OF THE DIGITAL AGE, NOT THE GOAL. CARE AS YOU LIVE.
SERGIO PILLON

11.15 - 11.30 GUIDO RUFFINO PRIZE

11.30 - 11.55 ROUND TABLE
MODERATOR: JOAO FILIPE RAPOSO, ANNA MAJCHRZAK

CHALLENGES FOR THERAPEUTIC EDUCATION TODAY.
STILL A CORNERSTONE OF DIABETES TREATMENT OR AN ANCIENT TOOL?
Tsvetalina TANKOVA, Tatjana MILENKOVIC, Massimo MASSI BENEDETTI, Evgenya PATRAKEEVA, Iryna VLASENKO, Shaukat SADIKOT, Mohamed HASSANEIN

11.55-12.00 FINAL REMARKS AND CLOSURE: FLORIAN TOTI, ANNA MAJCHRZAK



Prof. Florian Toti

Professional address: Service of Endocrinology & Metabolic diseases .
University Hospital Centre "Mother Theresa". 370, Rruga e Dibres
1010-Tirana / ALBANIA
E-mail: floritoti@yahoo.it

Actual position: Lecturer at the Faculty of Medicine, Tirana Medical University
President of Albanian Diabetes Association

Graduated from the Faculty of Medicine Tirana / ALBANIA on 1992.

1993-1997 Resident and Diploma of Internal Medicine.

1998-2001 Resident and Diploma of Endocrinology & Diabetology

Received the title of Doctor in Medical Sciences on 2005. Assoc. Prof. in 2010 and Professor of Medicine, Tirana University of Medicine in 2015.

Participant in several national and international programs on Diabetes such as: ALBDIAB, National Diabetes screening campaign, Train the trainers in Europe for Diabetic foot, IMAGE Project etc. Invited lector at EASD post graduate courses, and several international congresses. National representant of Albania in D-Foot, and Screening Diabetic Retinopathy. Initiator and moderator of different training programs for PWD, GP, nurses and pharmacists in Albania, and editor of Diabetes education platform. First author of writing group for National Guidelines on Type 2 Diabetes in Albania 2008 and 2012.

During the period 1995-2019 has published as first author or co-author, more than 40 articles in peer-reviewed journals and presented more than 55 oral presentations in national and international conferences/congresses on Diabetes.



Prof Tatjana Milenkovic

Prof Tatjana Milenkovic is a professor of internal medicine at the University "St Cyril and Methodius", Medical Faculty in Skopje.

She works at the Clinic of Endocrinology, Diabetes and Metabolic Diseases since 1985, where in 1995 she has established the Department of education of people with diabetes - and she has been Head of the department ever since. She obtained specialty in Internal Medicine 1991, PhD in Medical Science 1999, and subspecialty in Endocrinology 2004.

She was on education and training in UK (Ipswich Diabetes Center), Denmark (Steno Diabetes Center). Prof. Milenkovic has published and authored scientific articles and papers in national and international journals, and has been principal investigator and co-investigator in 16 scientific projects of which 11 international.

She is author of 2 monographs and 5 book chapters. She is a member of the Executive Committee of Diabetes Education Study group (DESG).

She is the President of Macedonian Diabetes Association, since 2013 and the President of the Macedonian Scientific Association of endocrinologists and diabetologists since 2014.



Massimo MASSI-BENEDETTI

Qualifications:

- 1971: MD, University of Perugia (I)
- 1974: Specialized in Endocrinology and Metabolic Diseases, University of Perugia
- 1981: Specialized in Internal Medicine, University of Perugia

FORMER POSITIONS

Academic and research positions:

University of Perugia:

- 1992-2004: Associate Professor of Internal Medicine
- 2004-2009: Associate Professor of Endocrinology and Metabolic Diseases
- 1999-2004 Chair of the University School on Nursing Sciences
- 2004-2007: Chair of the University School on Podology
- 2006-2009: Member of the Academic Senate;
- 1978-2007: Academic Courses in the School of Medicine, Post-graduate Schools in Endocrinology, Nephrology, Nutrition, Nursing and Podology, Doctorates in Clinical Biochemistry
- 2007-2012 "Chiara fama" Professorship at the University of Perugia for EU Projects coordination

University of Newcastle Upon Tyne (UK)

- 1979-1980: NATO Research Fellow Department of Clinical Biochemistry, Chair Prof. Sir George Alberti,

Dasman Centre for Diabetes Research (KW)

- 2007-2009: Director for Research and Education

Clinical responsibilities:

- 1982-1992: Deputy Director Institute of Internal Medicine, Teaching Hospital Perugia University
- 1992-1999: Chair of the Department of Internal Medicine Foligno Teaching Hospital, Perugia University
- 1999-2007: Chair of the Service of Diabetology Regional Teaching Hospital, Perugia University

Region of Umbria HC Directorate:

- 1992-2009 Chair of the Co-ordination Office of the Umbria Reference Centre for Diabetes.

Ministry of Health of the Italian Republic:

- Member of the Committee for the production of the Italian National Plan for Diabetes.
- Member of the Scientific Subcommittee of the "Istituto Superiore di Sanità" for prevention of Diabetes and its chronic complications

International Institutions:

- WHO
- 1993-2009 Co-director of the WHO Collaborating Centre for Improvement of Diabetes Care located at the University of Perugia;
- European Union:
- 1986-2017: Member of the following Research Consortia (completed): EURODIABETA;
- DIABCARD 1-4;
- DIABCARE 1-3; MFIT;
- DIABSTYLE 1-2; ADICOL; IMMIDIAB. PARENT CHRODIS BRIDGE-HEALTH
- 2006-2009: Coordinator of the EU Consortium BIRO (www.biro-propject.eu)
- 2008-2012: Coordinator of the EU Consortium EUBIROD (, www.eubirod.eu) (19 EU countries, shortlisted amongst the 6 finalist for the 2012 European Health Award)

International Diabetes Federation:

- 1993-1997Member of the Board and Treasurer of the European Region
- 1997-2000/2000-2003 Chairman of the European Region
- 1997-2003 Co-chairman of the Executive Group of the St.Vincent Declaration IDF E, WHO E, EASD initiative
- Member of the European Policy Group for the production of the Guidelines for the management of Type 1 and Type 2 Diabetes
- 1997-2000 Chairman of the "IDF World Congress Development" Task Force
- 2003-2006/2006-2009 Vice-President IDF Global
- 2006-2009: Chairman of the Task Force for IDF-IFD Guidelines on Oral Health and Diabetes

- 2009-2011: Member of the Nominating Committee
- 2009-2012: Chair of the IDF Science Task Force
- 2013-: Senior IDF Programme Advisor
- 2016-2017 Chair Stream "Diabetes and Societies" of the 2017 IDF World Congress
- 2016-… Member of the IDF Presidential Advisory Board
- 2017: Chair of the "Diabetes, Society and Culture stream" of the Scientific Committee of the IDF 2017 World Congress

PRESENT POSITIONS

- President and Scientific Director of the "HUB for International health ReSearch-HIRS"
- Coordinator of the EUBIROD Network
- 2013-…Senior IDF programme Advisor
- 2016-…Member of the IDF Presidential Advisory Board

SCIENTIFIC ACTIVITY:

Areas of interest in the field of diabetes:

- pathophysiology
- evaluation of new drugs for type 1 and type 2 diabetes
- advanced systems for insulin delivery
- complications
- pregnancy
- IT
- Advanced systems for metabolic monitoring
- epidemiology
- health economics
- HC models
- registers
- ethics
- Author of over 350 publications (full papers, abstracts, chapters of books, books).
- Organiser, member of scientific committees, chairman, and speaker in more than 300 national and international meetings.

<u>Editorship:</u>

- Accepting Editor for Diabetes Research and Clinical Practice scientific journal of IDF.
  Editor in Chief of the St. Vincent Newsletter; Assistant Editor of Diabetes

Nutrition and Metabolism; Assoc. Editor of Diabetes Management; Member of the Editorial Board of the Azerbaijan Journal of Metabolism; Member of Editorial Board of Il Diabete & L'Infermiere

Honours:

- Doctor Honoris Causa at the University of Cluj-Napoca, Romania;
- Honorary Member of the Rumanian Society of Diabetology
- Honorary Member of the Argentine Society of Diabetology

Membership of learned Societies (Present and Past):

- Società Italiana di Diabetologia (SID)
- Associazione Medici Diabetologi (AMD)
- European Association for the Study of Diabetes (EASD)
- Medical General Council (U.K.),
- American Diabetes Association (ADA)
- American Association of Pump Therapists
- Mediterranean Group for the Study of Diabetes (MGSD)
- Società Italiana di Endocrinologia
- Società . Italiana. di Nutrizione Umana
- AIDID

Società Italiana di Diabetologia (Italian Society of Diabetology):

- Member or Chairman of Scientific Committees and Working groups on Diabetes and IT
- Eyes Disease
- Implementation of the SVD
- Socio-economics
- General Secretary 1988-92
- General Treasurer 1992-96

Associazione Italiana per la Difesa dei Diritti dei Diabetic (Italian Association for the Protection of the Rights of People with Diabetes

- Chair of the Scientific Committee
- European Association for the Study of Diabetes (EASD) Study Groups:
- Artificial Insulin Delivery Systems, Pancreas and Islet Transplantation -AIDSPIT: member of the Board
- Diabetes Optimisation Through IT- DOIT founder and member of the Board
- DECADE: founder and member of the Board



Dr. Banshi Saboo (MD, Ph.D.)
Chief Diabetologist & Chairman of Diabetes Care & Hormone Clinic at Ahmedabad

Honoured with Fellowship of American College of Endocrinology (USA), American College of Physician (USA), International College of Nutrition (FICN), Royal College of Physicians (Glasgow), MNAMS (Diabetology)

- Executive Secretary of Diabetes India
- Launched a Project "Diabetes Free India – 2030", acknowledged by Hon'ble President of India Shri Pranab Mukherjee
- President of AIAARO (Indian Obesity Society)
- Hon. Secretary of Diabetes in Asia Study Group (DASG)
- Managing Editor for Sadikot's International Textbook of Diabetes
- Founder of NGO, Diabetes Care India and India Sweet Registry Project
- Advisory Board Member JAPI, Journal of Diabetology, JOMR
- Expert of RSSDI Guidelines for management of Diabetes, ATTD CGM Guidelines & ISPAD Guidelines for Paediatric Diabetes
- Organizing Committee Member of IDF 2017 ,ABU Dhabhi
- He has 47 Publications in Indexed Journals and have contributed chapters in various textbooks and monograms
- He has awarded Most Impactful Healthcare Leaders by World Health and wellness congress and awards
- Completed many Public Awareness Projects under Diabetes Care India, such as;
  - KADAM (Knowledge based Diabetes Awareness Movement)
  - IDEA (Intensive Diabetes Education & Awareness) to STOP Heart Attack
  - Multiple Diabetes Clinic along with AMC with support of WDF
  - Improve standard of Care for Type 1 Diabetes in Gujarat (Supported by WDF)



Sergio Pillon

Title proposed (any other suggestion?):

Digital Technology is the tool of Digital Age, not the goal. Care as you liv

MD, Specialist in Vascular Medicine and Digital Health, e Health Master degree. A strong scientific background transferred in daily e Health activities.

Member of the VAS Advisory Board (European Scientific Association on Angiology/Vascular Medicine), responsible for Digital Medicine and VAS representative at European Public Health Alliance (EPHA) Digital Health Working Group.

Medical Director of CIRM, Centro Internazionale Radio Medico, one of the oldest telemedicine service in the wold, in charge of Vascular Telemedicine at San Camillo-Forlanini Hospital in Roma.

Nominated by Ministry of Health as Coordinator of the Italian National Committee for the governance of the implementation process of the Telemedicine National Guidelines. Co-Author of Italian National Telemedicine Guidelines (2014 Italian Ministry of Health).

Member of Faculty in ASIMSS society, (Italian System Medicine Society) Co-Founder and Professor in the first e-Health European Master (university of Camerino). ast Italian National Representative al Life Science Scientific Standing Group in the Scientific Committee on Antarctic Research, SCAR, in charge of Telemedicine Activities,. Co-Founder, Past Vice President and Member of The board of SIT (Società Italiana di Telemedicina).

Was Secretary of Joint Medical Group (from Scientific Committee on Antarctic Research SCAR and Council of Managers of National Antarctic Programs CoMNAP) and was CNR (Italian National Research Council) Researcher on Telemedicine and the Vascular Adaptations to the Extreme conditions. In charge of operative unit of Telemedicine in the research Project "Everest K2-CNR" (Pyramid on the bottom of the mount Everest Khumbu valley, 5050 mt, Nepal,) 1993-96 and responsible (1989-2001) of operative unit of Telemedicine and Vascular Adaptations in the Italian National Research Program in Antarctica (PNRA), Mario Zucchelli and Concordia station, Antarctica

Beata Stepanow



Beata Stepanow - socially - President of the Association of Diabetes Education in Poland, scientific

-PhD student of the Silesian Medical University in Katowice at the Faculty of Health Sciences, professionally-for almost 20 years educates people with diabetes and their families, socio-professional environments, a specialist in the field of diabetes nursing.

In recent years, she has been honored with the Nurse of the Year title and the "Crystal Hummingbird" award from the Polish Diabetic Association, "The Personality of the Year" title and "The "Woman of the Medicine" title. In 2012, she created Diabetheater© and realized a performance titled "From the Angel's Diary", indicating that the form of presentation is of great importance in the process of educating a patient with a chronic disease.

Distinction of St. Kamil in 2013, the patron of the sick and health care, awarded on the occasion of the World Day of the Sick, in categories health professionals with a passion pursuing its mission for the benefit of the sick and the suffering.

Chairwoman of scientific committees, organizer and lecturer at national and international conferences. Author of educational programs for chronically ill people and projects implemented with the support of European funds in cooperation with government administration.

Co-author of the SED Holistic Diabetes Education Standards, as well as the Report "Polish Family with Diabetes" and the Report "White Paper - Dignity in Chronic Disease". She took part in the Scientific Council of the Institute of Health Care in developing the Report "Diabetes - Where are we? Where are we heading?".

She cooperates with the Ministry of Health on solutions in the healthcare system for a patient with diabetes - she has prepared a Health Problem Card with a proposal for providing diabetes education.



João Filipe Cancela Santos Raposo

João Filipe Cancela Santos Raposo, graduated in Medicine in 1988 by the Medicine Faculty of University of Lisbon and got his PhD in Medicine - Endocrinology in 2004 by the NOVA Medical School of NOVA University of Lisbon. He had his Endocrinology residency in the Portuguese Cancer Institute being a Consultant of Endocrinology since 2006 at APDP - Diabetes Portugal.

He is a member of the Executive Committee of the DESG (Diabetes Education Study Group)

Currently he is an Assistant Professor of Public Health in the NOVA Medical School of NOVA University of Lisbon, Clinical Director of APDP – Diabetes Portugal, Vice-President of the Portuguese Society of Diabetology and Director of the Portuguese Diabetes Observatory



Anna Majchrzak, M.D., Ph.D.,

Anna Majchrzak, M.D., Ph.D., graduated from United World ofthe Atlantic, UK, and Faculty of Medicine in Poznan University of Medical Sciences, Poland.

Specialized in internal medicine and diabetology.She works in the Department of Diabetology and Internal Medicine as well as in the out-patient clinic.

Actively involved in education of diabetic patients, nurses, medical students, general practitioners and diabetologists. Member of Diabetes Education Study Group since 1999, recently Honorary Secretary of DESG. Married, 2 children.



Prof. Tsvetalina Tankova

Tsvetalina Tankova is Professor of Endocrinology, Head of the Division of Diabetology at the University Hospital of Endocrinology, Head of the Department of Endocrinology and Vice Dean of Science at the Faculty of Medicine, Medical University, Sofia, Bulgaria.

Specialist in Internal Medicine and Endocrinology.

Master's degree in Public Health and Healthcare Management.

Has specialized at WHO Collaborating Center, University Hospital, Geneva, Switzerland; King's College Hospital, London, UK; Steno Diabetes Center, Copenhagen, Denmark.

Author of over 190 peer-reviewed publications; over 3800 citations in international journals; over 400 presentations at national and international meetings.

Invited speaker at EASD postgraduate training courses in many countries.

Serves as Editorial Board member and reviewer at a number of national and international journals. Secretary of the Bulgarian Society of Endocrinology since 2003.

Member of the Expert Committee on Endocrinology at the Ministry of Health.

Runs several national and international research projects on prediabetes, diabetes, obesity, metabolic syndrome, complications of diabetes.



Dr. Shaukat M. Sadikot

Dr. Shaukat M. Sadikot, Immediate Past President of the International Diabetes Federation (IDF).

President Diabetes India (Research Trust of Diabetes India), Core group member of the Metabolic Syndrome Institute, Vice President International Atherosclerosis Society, Executive Board member of the Residual Risk Initiative (R3I), Editor-In Chief: Diabetes and Metabolic Syndrome, Clinical Research and Reviews.

He is author and co author of more than 90 publications in peer reviewed and impact factor journals. Presently Dr. Sadikot is Consultant in Endocrinology, Diabetes and Metabolic Disorders at Jaslok Hospital and Research Centre, Mumbai, India



Iryna Vlasenko

From 2015 Iryna Vlasenko is Board Member International Diabetes Federation Europe regional. She is international expert in diabetes.

She graduated from Pharmaceutical Department of Zaporizhzhia Medical State University, Ukraine. She has the highest qualification for a pharmacist. She has worked in The Capital Pharmaceutical Municipal Union "Pharmacy" in Kiev and at the Pharmaceutical Management department for 10 years.

She got PhD of pharmacy (technology drugs) in 2009. Since 2010 Vlasenko I. is Associate Professor at the National Medical Academy of Post-Graduate Education (Ministry of Health of Ukraine), and she is Supervisor of the international PhD students.

Research interests are: Pharmaceutical care for people with diabetes; herapeutical education for people with NCD; Ethical aspects and the rights of patients, including in clinical trail. Reform of the health care; The development technology of new complex action medicines (medical films, gel, cream) for treatment chronic wounds, and diabetic foot wounds, for dentistry; T

Dr Iryna Vlasenko is Responsible Editor of scientific «Pharmaceutical Journal». Editor of «Diabetes and Life». She has 160 publications/ 8 patents/ 7 books / Branch innovations - 2 /. Also she co-author of publications of IDF-Europe 2017.

She is Member of The Multidisciplinary working group to draft medical-technological documents for standardization of medical care on "Diabetes, Type I and II" (Ministry of Health of Ukraine), Member of Public Council of the Ministry of Health of Ukraine (2011-2015), Deputy chairman of Public Council of the State Administration of Ukraine on medicinal products (2011-2013). Member working group on the development and support of activities for the prevention of diabetes (Ministry of Health of Ukraine) (2018-2019). Expert of The Advisory Expert Group on Antimicrobial Resistance and Infectious Disease

Control (Ministry of Health of Ukraine) (2017-2019). Member of the European Medicines Agency Working Party with Patients and Consumers (Representativ IDF-Europe) since 2019. Represenativ IDF Europe in on the Health Technology Assesment Regulation. Member of Branch Competition Commission of the All-Ukrainian Competition of Student Scientific Works in the field of Pharmacology, Pharmacy (in English).

From 2003 Iryna Vlasenko became an active member of the Ukrainian Diabetic Federation/ now she is Member of board. She has big experience in organizing camp: International youth camp, forum (2006, 2007), educational camps for adults (2008-2011). She is organizer and adviser of Youth Leadership Camps IDF-Europe (2016-2019) She is educator self-management school (for people with diabetes) since 2008. Director of first International Football Championship for people with diabetes DiaEuro (2012), member of international organizing committee DiaEuro International Futsal Championship for people with diabetes (2012-2019). Vlasenko Iryna is member executive committee of Association of football of invalids in Ukraine (Federation Football Ukraine).



Evgenia Patrakeeva

Dr. Evgenia Patrakeeva is a teaching assistant in Endocrinology and Consultant Endocrinologist at the First St. Petersburg Medical University names after I.P. Pavlov where she also received her medical degree in 2005, graduating Cum Laude and completing her residency in endocrinology and internal medicine.

Her research interests include insulin therapy, patient education, psychological issues in diabetes care and the use of new technologies in diabetes. She also has an interest in the development of web-based resources and social media use as components of diabetes therapy and patients' psychological support.

Dr. Patrakeeva is a member of the advisory board of the education site for Russian diabetologists, www.diaeuni.ru, co-founder of the educational web-resource www.rule15s.com and educational social networks for Russian speaking diabetes patients, @diabet.connect. She organises, on a regular basis, postgraduate courses for young diabetologists in St. Petersburg as well as an innovative course for CSII and ready-for-CSII young patients.



Dr Mohamed Hassanein MB ChB, FRCP-Lon, FRCP-Edin, MPhil, CCST

Dubai Hospital, Dubai Health Authority, UAECardiff University School of Medicine, Cardiff, UK

Mohamed Hassanein was appointed as Consultant Endocrinology at BC University Health Board, Rhyl, UK, in 2002. He is an Honorary Senior Lecturer and the Associate Director for Postgraduate Diabetes Education, Cardiff University, UK. He's currently working as a consultant in Endocrinology in Dubai Hospital, UAE.

He is the Chair of the diabetes and Ramadan International Alliance –DAR (www.daralliance.org), which has been set up in collaboration with the IDF MENA & Africa regions, the education study group (DESG) of the EASD and the Gulf Group for the Study of Diabetes. He co-authored recommendations on this subject for the IDF in 2016, ADA in 2005 & 2010, and for the *BMJ* in 2010 and participated as the first author or a co-author in almost 50 papers and has presented more than 40 oral presentations at international meetings. He also developed 2 educational programs for diabetes and Ramadan in collaboration with various international centres. He is a co-recipient of the Diabetes–UK Structured Education first prize in 2008 and 2009 as well as the European Association for the Study of Diabetes (EASD) education prize in 2009.

Dr Hassanein has also helped develop the Wales Diabetes Guidelines and is an examiner with the Royal College of Physicians for the MRCP clinical exam. He has been closely associated with a number of educational projects and has provided e-Diabetes learning to many countries in collaboration with Université Numérique Francophone Mondiale.

POSTER ABSTRACTS

"UBERIZATION" OF THERAPEUTIC EDUCATION THROUGH A NEW AND INNOVATIVE VIRTUAL CLINIC FOR TYPE-1 DIABETES PATIENTS

Authors: Orly Tamir, Elizabeth Tarshish [1]

1) The Pesach Segal Israeli Center for Diabetes Research and Policy Sheba Medical Center, Israel

Care for Type-1 diabetes in Israel and worldwide lacks access to highly specialized multidisciplinary teams, with the expertise to manage the rapidly changing technologies for Type-1 Diabetes care, and the provision of adequate therapeutic education (TE). Furthermore, Type-1 diabetes patients, especially youngsters and young adults, are characterized by major difficulties to adhere to their treatment plan. With prior studies suggesting that telemedicine can overcome such challenges, a virtual clinic for adult type-1 diabetes patients was launched in the Sheba Medical Center in 2018. This new clinic is intended to provide advanced medical care along side with TE to patients throughout Israel.

In order to support the clinic in the delivery of services in an accessible, convenient, effective and efficient manner, a patient-centered approach was utilized in the architectural process of the clinic. Using a participatory design, patients and caregivers were recruited to serve as 'advisors'.

With a focus on TE, the aims of this study were to assess the perception of adult type-1 diabetes patients and caregivers regarding the role of TE through telemedicine, as well as their preferences, wishes and needs regarding TE through telemedicine. In addition, to evaluate changes in subjective and objective measures among patients enrolled in the new virtual clinic throughout the first year of operation.

Methods: Overall, 7 patients and caregivers serve as advisors. They were administered baseline questionnaires and underwent semi-structured interviews. Three months after commencement of the clinic they were asked to fill out a follow-up questionnaire and were encouraged to discuss with the

clinic's diabetes educator all motivational and operational issues. All patients that were enrolled in the virtual service during the first year were eligible to participate in the study. Patient-reported outcomes, patient-reported experience and clinical measures are being collected 4-times during this first year.

This presentation will describe the patient-participation process in the design of the new virtual clinic and will share valuable information generated from the 'advisors'. In addition, data will be provided on various measures collected from and on patients enrolled in the virtual service.

We believe that this clinic would be a true innovation only and if it will utilize a patient centered approach, using participatory design, studying patient-reported outcomes and harnessing new and mobile technologies to guide patient-tailored and more precise therapeutic decisions.

EFFECTIVENESS OF CHO-COUNTING ON GLYCOMETABOLIC CONTROL AND COMPARISON BETWEEN THE METHODS OF I/CHO RATIO CALCULATION IN SUBJECTS WITH CYSTIC FIBROSIS RELATED DIABETES (CFRD)

Authors: Valeria Grancini[1], Alessia Gaglio[1], Veronica Resi[1], Eva Palmieri[1], Laura Giarratana[1], Emanuela Orsi[1]

1) U.O. Endocrinologia, Fondazione IRCCS Ca' Granda, Ospedale Maggiore Policlinico Milano, Italy

DM is a complication of cystic fibrosis and it's caused mainly by insulin deficiency. A glycometabolic decompensation, due to incorrect therapeutic management, leads to a worsening of the catabolic state (already caused by malabsorption and high metabolic requests, and a known risk factor for worsening of respiratory function). The therapy for CFRD is insulin. Cho-counting, an effective technique to manage insulin therapy in T1DM subjects, allows patients to achieve a better glycemic control.

Purpose: to evaluate the efficacy of cho-counting in patients with CFRD on glycemic control.

Materials and Methods: 21 patients with CFRD, randomized in 2 groups. gr.1: 9 patients performing cho-counting; gr.2: 12 patients followed according to ambulatory standard care. Glycometabolic control was evaluated with: a. variation of HbA1c, b. variation of pre and postprandial average SMBG in a period of 12 months. In group 1, the I/CHO ratio obtained with the 500-formula was compared with those obtained from food and glucose diaries.

Results: gr.1 showed a reduction of HbA1c, compared to gr. 2 (7.4 ± 0.9% to 6.6 ± 0.3%, Δ -0.8% vs 7.4 ± 1.5% to 7.5 ± 1.4%, Δ + 0.1%, $P < 0.05$). There was also an improvement, even if not significant, in gr.1 and a worsening ($p < 0.05$ for post) in gr.2, of pre and post-prandial average SMBG. In gr.1, the I/CHO ratio obtained through the 500-formula was 1/20. Based on diaries, it was 1/18 for breakfast, 1/25 for lunch and 1/25 for dinner.

Conclusions: Cho-counting is effective in improving glycometabolic control in individuals with CFRD, avoiding the risk to worsen the already delicate metabolic balance of these patients. The use of dietary and glycemic diaries allows to estimate the I/CHO ratio differentiating the insulin needs during the

day. This allows a more accurate personalization of the therapy compared to the use of 500-formula, which, in these patients, often overestimate the need for insulin at meals.

PEDOMETER USE TO EVALUATE PHYSICAL ACTIVITY, AND MOTIVATE DIABETIC PATIENTS FOR BETTER METABOLIC CONTROL, AND WEIGHT REDUCTION

Authors: Florian Toti[1], Blerina Resulaj[2], Adriana Lapardhaja[3], Dorina Minxuri[2], V. Xega [2]

1) Service of Endocrinology & Metabolic diseases University Hospital Center "Mother Theresa" Tirana/ Albania; 2) Albanian Diabetes Association; 3) Policlinic of Specialty Nr.2 Tirana/Albania

Background and aims: Physical activity (PA) is one of the most important factors for diabetes prevention and care. It helps to improve metabolic control, lipid profile, personal wellbeing, and to reduce weight. The aim of our study was to demonstrate the positive effect of a single session of PA to the glycaemic profile, and to use the technology for increasing daily physical activity, with a positive impact on metabolic, weight and lipid profile.

Patients and method: 50 patients were recruited for a 8 weeks training session. Every PA session lasted 30 minutes of brisk walking. The number of daily steps was measured through a pedometer, and the participants were encouraged to complete at least 10000 steps/day. All the patients had completed anthropometric measures, fat body composition, and lipid profile at the beginning and at the end of study period.

Results: 30 (60%) of the patients completed the 8 weeks training session, 17 (56.6%) males. Mean age 52.07±11.3 yrs, mean diabetes duration 4.37±2.9 yrs. Mean HbA1c decreased from 8.43±1.09% to 8.17±1.07% ($p=0.07$), mean weight 81.74±20.8kg vs 79.47±20.11 kg ($p<0.05$), mean of daily steps 4535±2590 vs 11315±2013.6 ($p<0.01$). Body fat composition decreased from 33.04±11.8% to 31.09±11.2% ($p<0.05$). The patients had a slight increase in HDL cholesterol 54.7±7.65 mg/dl to 59.05±7.29 mg/dl.

Conclusions: Physical activity, even in simple everyday actions, should be integrated part of diabetes treatment and weight control. Technology, assuring measurable results, could help diabetic patients to implement and increase PA in their daily life

SOCIAL MEDIA AND DIABETES: A TOOL TO IMPROVE GLUCOSE CONTROL IN TYPE 1 DIABETIC ADOLESCENTS ON INSULIN PUMP: CROSS-OVER STUDY

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Background and aims: To evaluate results from Facebook as tool to improve glucose control in adolescents with type 1 diabetes.

Materials and methods: A total of 114 adolescents with type 1 diabetes on insulin pump, ages 13–23, were randomized in two groups: **Regular visits** (Group 1)- 55 type 1 diabetes patients were treated using standard medical protocol with regular visits at clinic (evaluation glycemic control and education) were given to the patient and **Internet visits** (Group 2)- 59 type 1 diabetes patients were treated using Facebook, Skype and Carelink personal program (Medtronic Diabetes), where the data was downloaded by the patient at home and interventions (same as group 1) were given via Facebook. After a period of 6 months with washout period of 8 weeks, a crossover study was performed for next 6 months, where patients from regular group switched to internet group and patients from internet group switched to regular group. A1C was obtained before and every three months during the study in one year period.

Results: Regular visits were 0.4.±0.8 per patient/month in group 1 and Internet visits were 0.5±0.9 per patient/month retrospectively. There was significantly improvement in both groups (group 1 and 2 retrospectively, 7.8±0.7% and 7.9±1.0% on beginning with 6.4±0.8% and 6.3±1.2%, $p<0.05$) in the first six months. After the crossover (the next 6 months), A1c in both groups (regular 6.5±0.7% and internet 6.4±0.6%) stays on satisfactory level without significant difference.

Conclusion: We can conclude that social media such as Facebook and Skype with special glucose software can be used as treatment option for type 1 diabetics on insulin pump.

TO WHATSAPP OR NOT TO WHATSAPP? WHAT COULD BE DONE WITH NEW SOCIAL MEDIA TO MANAGE TYPE 1 DIABETES IN ADOLESCENTS

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Objective: WhatsApp Messenger is a proprietary, cross-platform instant messaging subscription service for smartphones. The aim of our study has been to evaluate if using WhatsApp Messenger could in any way influence glycemic control in children and adolescents with type 1 diabetes.

Methods: Just after our last summer camp, a group on WhatsApp Messenger has been initiated, involving 18 patients, aged 14.8±3.6 years, with type 1 diabetes since 6.8±4.2 years (insulin requirement 0.84±0.24 U/kg/day; HbA1c 7.9±1.1%). The group was named "Disciulina alla mattina…" that is something like 'Pills to be more smart given in the morning…'. At the beginning the aim was only to maintain contact among patients and between them and the diabetes team (physicians, psychologist, dietician). After some time we had the feeling that this simple tool could help the young patients to behave themselves. That is why we compared HbA1c and insulin requirement before starting the group and after 4-month follow-up.

Results: Surprisingly, HbA1c improved (7.6±0.9%, −0.3%, p=0.048), especially in the group that at baseline had HbA1c>8.0% (n=10, 8.6±1.7% vs 8.0±0.9%, p=0.003). Insulin requirement did not change during follow-up.

Conclusions: New social media could be useful and effective in create harmony in a group of teens, some of them with poor motivation and compliance, to food their spur and help them succeeding in gain a better glycemic control. Our are only preliminary results of an unplanned study that need to be confirmed in larger cohort, during a longer follow-up and better in a RCT study.

TELEDIABETES: A DIARY/BLOG SOLUTION THAT FACILITATES DOCTORS-PATIENTS COMMUNICATION IN ALBANIA

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Background: Albania is completing the epidemiological transition manifested, among others, in increased rate of diabetes and diabetes care needs. With financial support of USAID/Albania, International Virtual e-Hospital is implementing the Integrated Telemedicine and e-Health Program (ITeHP) of Albania - a multi-years project that resulted in the establishment of an integrated telemedicine network. ITeHP supports numerous clinical programs such as teletrauma, teleautism, teleophthalmology, telestroke and, more recently, telediabetes.

Objective: The objective is to develop a web based platform that serves as a medium of communication between experts of the Albanian Diabetes Association (ADA) and recently diagnosed diabetic patients with the aim to improve their health status.

Method: Experts of ITeHP and ADA developed the web based program that allows diabetic patients to create, maintain and update a diary/blog of their health status as related to diabetes. An account is created for each enrolled patient, whereas doctors accounts are created for all ADA members that participate in the pilot project. A patient will write a comment, concern or question that is addressed within 2 business days by an ADA member that is either a licensed endocrinologist or a senior endocrinology resident. After an experience of 3 months, a survey is organized with each enrolled patient and doctor.

Results: 100% of enrolled patients deem telediabeti a helpful tool to increase control of their health status. Interaction level is reportedly "very satisfactory" or "satisfactory" by 92% of the patients. 100% of the enrolled doctors "would recommend telediabetes to a colleague".

Conclusions: Telediabeti, as other digital platform, could be a useful technological tool for educating, people with diabetes, erasing the distances, and difficulties in deplacement. Surprisingly, even for older patients, Telediabeti was easy to access and use.

THE USE OF HIGH-DEFINITION VIDEO TECHNOLOGY ON IMPROVING DIABETES MANAGEMENT

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Background: Diabetes, a metabolic disorder, has reached epidemic proportions in developed and developing countries. So, The Use of High-Definition Video Technology has gained acceptance as a tool for improving diabetes management. **The Aim** of this study was to determine the effect of using High-definition video technology on improving diabetes management.

Methods: Subjects: All "120" diabetic children, in the Diabetic center in The EL Mogamaa EL Teby AL Shamal, Menoufia Governorate, Egypt.

Instruments: It consisted of three tools; 1) questionnaire for socio demographic data. 2) Questionnaire for nutritional practices and practicing of exercise. 3) Observational checklists; urine analysis for acetone or sugar, care for feet and nails and blood glucose monitoring by using the home device. All tools were used for pre-post intervention.

Results: The study showed a statistical significant reduction in fasting blood sugar, Post prandial blood sugar and glycosylated hemoglobin level of cases group after intervention (120.57+29.13, 165.57+29.13 and 7.08+1.56, respectively) compared with cases group before intervention (166.37+27.66, 232.80+57.02 and 9.61+1.94, respectively). Also, there was statistical significant improvement in care of feet and nails, blood glucose monitoring and nutritional practices of cases group after intervention (64.25+2.81, 36.35+2.44, and 10.88+1.45, respectively) compared with control group (23.21+1.37, 17.63+2.11, and 5.28+1.37, respectively).

Conclusion: the implementation teaching-assisted High-Definition Video Technology has succeeded in achieving significant improvement in diabetic children' diabetes management practices skills.

USE OF PATIENT-RECORDED DATA IN SMARTPHONE-BASED GAME FOR CHILDREN WITH DIABETES

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Background: Games represent an unobtrusive and ubiquitous way of learning for children. An educational smartphone-based game for children with diabetes, DiaSpill, has been developed and integrated with a mobile-phone-based self-help platform for people with type 1 and type 2 diabetes, the Few Touch Application (FTA).

Methods: User-specific parameters including the user's blood glucose measurements (BGM) data are embedded into the gameplay. A small-scale game test by children with diabetes has been performed and got positive feedback.

Results: For a child playing DiaSpill, insulin sensitivity- and carbohydrate compensation factors are calculated using the user's input of age and height at the first time the game is played. These parameters influence the effects of game enemies and useful items to the game character's BG level.

DiaSpill accesses the FTA database in the mobile phone's internal storage. At each game level, the game character's BG level corresponds to the user's last BGM value. The child's success in regularity, periodicity and frequency of BGMs is encouraged in the game. The better BGM management - the more Superpoints (which are used for purchasing useful items in the game) and Goldpoints (which can be spent for real-life bonuses) the player gets.

Game test feedback from the children has been collected both using semi-structured interviews and test monitoring of real-life gameplay.

Conclusion: Since the blood glucose control when having diabetes is one of the main cornerstones in good self-management, encouraging this behavior based on patient-gathered data is considered promising as motivator for educational games for children with diabetes.

ONLINE CONSULTING AS THE ELEMENT OF THE TRAINING SKILLS IN PREGNANT WOMEN WITH TYPE 1 DIABETES MELLITUS ON PUMP THERAPY

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Aim: Evaluate the effectiveness of the distant online consulting system in pregnant women with type 1 diabetes mellitus (DM1).

Subjects and methods: Control group (group 1) consists of 11 pregnant women with DM1 on insulin pump therapy consulted in the clinic. In the other group (group 2) 16 pregnant women with DM1 have been consulted via online consulting. The duration of the disease was 9,8±4,1 yrs, comparable in both groups. Glycaemia, HbA1c, glucose variability index (MAGE) and frequency of hypoglycaemia (<3,5 mmol/l) per week were studied.

Results: Initially both groups were similar in HbA1c (7,46±1,09% vs. 7,19±0,95%), mean glycaemia level (7,4 vs. 7,6 mmol/l), MAGE (4,214 vs. 4,396) and hypoglycaemic episodes (29 vs. 39). After 3 months of the study HbA1c decreased in both groups: group 1 6,54±0,69% (p=0,03) vs. group 2 6,38±0,44% (p<0,045); the mean glycaemia level significantly decrease in group 2 (6,4±2,21 mmol/l) vs. group 1 (7,6±3,14 mmol/l, t=8,031 p<0,001). Glycaemia variability by MAGE was significantly lower in group 2 (4,18 [range 2,3–6,0]) vs. group 1 (5,10 [range 3,2–7,0]), p<0,001. Frequency of hypoglycaemia at the end of the study in group 2 was lower (1,25 episodes per week) in comparison with control group (3,18 episodes per week) (p=0,731).

Conclusion: Online consulting tends to improve training skills in pump insulin therapy. Also it helps to optimize glycaemic control and decrease glycaemic variability without any increase in hypoglycaemic episodes in pregnant women with DM1.

SWEET-O-BIKE TM - A COMPUTER-BASED NOVEL INTERACTIVE DIABETES EDUCATIONAL TOOL

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Aim: In this pilot study feasibility of recruitment, validity and acceptability of the Sweet-o-Bike (S-o-B) intervention in a small group of type 2 diabetes patients was explored.

Methods: Patients were asked to participate in a consecutive way until 30 agreed to participate. Random selection of 6 OAD-only and 6 insulin/OAD-treated patients attended 2 sessions during 1 month in small groups. Selected questions of the ADKnowl questionnaire were verbally administered by the dietician. Each had 3 cycling tours. A print-out of their cycling served as a discussion tool for the patients to understand what happened during cycling. After cycling, the ADKnowl was applied again. Finally, patients were interviewed about acceptability of the S-o-B. After 1 month the intervention was repeated in the same manner. Paired t-tests were applied to calculate the mean differences in scores before and after the intervention.

Results: For the OAD-groups 27 patients were asked of which 17 patients agreed to participate. For the Insulin groups, 29 patients were asked of which 16 patients agreed to participate. The mean ADKnowl score of both groups was 16.6 at baseline (maximum score=22). The scores improved at follow-up. Mean difference between the first and second measurement was 2.9 ($p<0.01$); between the first and third measurement 2.9 ($p<0.05$); and between the first and fourth (last) measurement 3.8 ($p<0.05$).

Conclusion: Sweet-o-Bike™ appears to be a feasible and promising educational tool, which type 2 diabetic patients, both on OAD-only and on insulin/OAD treatment, highly benefit from.

IMPROVING DIABETES CARE BY USING MOBILE TECHNOLOGY IN ADULTS WITH TYPE 1 DIABETES

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Objectives: The **r**ol**e** of **mo**bile **te**chnology to improve diabetes care in adults with **t**ype **1 d**iabetes (**REMOTE-T1D**) study was aimed to evaluate the use of mobile technology (iBGStar® [iPhone plus the BGStar®]) in improving Patient Reported Outcomes (PRO).

Methods: This single-center, prospective, randomized, open-label, investigator initiated pilot study enrolled 100 adult patients with T1D. Patients were randomized in a 1:1 fashion to an intervention group using self-monitoring of blood glucose (SMBG) with BG Star® and mobile technology (iBG Star) vs. SMBG with Accu-Chek Nano® (Control). All subjects had similar clinic and phone visits for 3 months with a 3 month extension period and wore a blinded DexCom Gen4 Platinum® continuous glucose monitor (CGM) for 4 separate 7-day periods. The PRO included a hypoglycemia fear questionnaire and the secondary outcomes included improvement in glycemic variability indices and reduction in A1c values.

Results: Baseline characteristics included age (39±12 years old), gender distribution (□52% male), diabetes duration (23±12 years), glycemic control (A1c 7.9%) and body mass index (□27 kg/m^2) were similar between the two groups. There was a significant improvement in Hypoglycemia Behavior Scale (HBS) and A1c at three months compared to baseline in each arm (Table), with a difference which may be more meaningful for iBGStar group. Both groups significantly improved in Hypoglycemia Fear Scale and Hypoglycemia Worry Scales. SMBG and CGM data analysis is pending.

Conclusions: Glucose control and HBS improved similarly in both groups with a tendency for meaningful improvement in the iBGStar group.

SUMMARY

THERAPEUTIC EDUCATION AND TECHNOLOGY – HELPING FOR A BETTER UNDERSTANDING OF DIABETES

Prof. Florian Toti
Chair of DESG, University of Medicine Tirana/Albania

The latest figure published by the World Health Organization and IDF revealed an estimated of more than 422 million adults living with diabetes. A rapid increase from 108 million in 1980. Globally, the number of affected individuals continue to grow.

New therapies, monitoring, and revolutionary-enabling technologies applied to healthcare represent an historic opportunity to improve the lives of people with diabetes. Over the past couple of years, technology in the diabetes field has advanced rapidly. It has allowed for improvements in all aspects of diabetes management. The phone has become a very important tool in diabetes management and can be used in many different ways by both parents and patients who have type 1 and type 2 diabetes.

One of the biggest advances in connectivity is with the CGM. One of the new insulin pens now available, relays insulin-dosing information to a phone, which then can be used in an app in conjunction with a continuous glucose monitor (CGM) so that patients can look at blood glucose trends resulting from insulin pen injections. Communication among devices, clinicians, and patients including remote coaching is now increasingly possible.

As the future unfolds, we will be seeing more and more technological advances in diabetes that assist patients and families in daily management. More than ever before, patients are being empowered with the tools to maximize self-care and collaboration with their healthcare providers. Still, there is nothing that takes the place of responsibility for carbohydrate counting and paying attention to the resulting blood sugar results. Patient motivation and therapeutic education continues to be required, however, to achieve optimal results from new technologies. The human brain, when well trained, can do an excellent job of managing diabetes and taking into account the myriad of variables that affect diabetes management on a daily basis.

THE EVOLUTION OF DIABETES CARE AND EDUCATION. WHERE ARE WE GOING?

Prof. Massimo Massi Benedetti

Starting from the '70s of the last century, diabetes care has gone through an overwhelming evolution based on a numbers of factors such as

- The availability of new drugs for the treatment of both type 1 and type 2 diabetes such as new oral hypoglycaemic agents and new insulins
- New insulin treatment regimens at the time defined "intensified insulin therapy" which nowadays are the routinely adopted ones
- New systems for insulin delivery such as pens and continuous subcutaneous insulin infusion systems (CSIIS)
- New methods for the evaluation of glycaemic control starting from the so called "home blood glucose control- HBGC" to now the more and more widely used "continuous glucose monitoring (CGM)"
- The development of appropriate algorithms and technologies that have allowed the combination of CSIIS and CGM toward the target of an implantable artificial pancreas, likely to be reached in the very next future
- New models for the management of people with diabetes from "patient centred care" to "precision medicine" up to "individualized medicine"
- The evolution of education towards the "therapeutic education" model

More recently, the tremendous advancement of technologies is definitely changing the scenario calling for a profound revision of the approach to diabetes care and to diabetes education.

The innovative technologies on robotics open new perspectives for the treatment and for the replacement of organs and functions damaged by the disease.

However, what calls for more attention is the role of the social media and of the progressive development and increasing implementation of artificial intelligence. Despite their extraordinary advantages, major caveats are to be taken into consideration.

The growing global tendency to rely on information and on advice available in the net is not always safe as it is open to arguable or even biased content.

The artificial intelligence is rapidly evolving from a decision support instrument toward a system characterized by a progressively higher capacity to simulate an "independent" human-like cerebral activity. Such highly sophisticated function is more and more adopted in medicine to interact with humans as a substitute of health providers.

As a result of such global evolution also the models for education need to evolve in order to provide appropriate information on new technologies and training for their use and guidance on the access to the net and correct selection and utilization of the available information.

Special attention is to be paid to the tendency, mostly based on economic reasons, to the progressive increase of the utilization of artificial intelligence in the management and education of patients. In fact, despite the huge capacity to provide advice based on highly complex elaboration of massive amount of data, artificial intelligence is missing the empathic bi-directional interaction between the patient and the health care provider that represents a fundamental pillar of diabetes education.

DIGITAL TECHNOLOGY IS THE TOOL OF THE DIGITAL AGE, NOT THE GOAL CARE AS YOU LIVE

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"What if you could make people as productive at work as they are in their personal lives?" Perhaps that sounds a little funny, but we live in what Google Chairman Eric Schmidt calls "the new digital age" — an age that is naturally mobile, connected and collaborative. An age where we can read the news, set up a dinner party and buy a plane ticket on our smartphone before we get out of bed. So why don't we use 21st-century technology to help employees become more productive, more engaged and more satisfied?"

The same concept could be used in a care environment. The doctors, nurses and patients trust their digital devices. Instead of providing new, unknown digital devices the best way to engage doctors, nurses and patients is to provide APPs and Services using they personal devices, overcoming the problems relate to the use of "non medical grade" APPs A medical grade WhatsApp is a key of success

We're in the midst of a significant transformation regarding the way we produce products thanks to the digitization of manufacturing. This transition is so compelling that it is being called Industry 4.0 to represent the fourth revolution that has occurred in manufacturing. From the first industrial revolution (mechanization through water and steam power) to the mass production and assembly lines using electricity in the second, the fourth industrial revolution will take what was started in the third with the adoption of computers and automation and enhance it with smart and autonomous systems fueled by data and machine learning.

Industry 4.0 optimizes the computerization of Industry 3.0. When computers were introduced in Industry 3.0, it was disruptive thanks to the addition of an entirely new technology. Now, and into the future as Industry 4.0 unfolds, computers are connected and communicate with one another to ultimately make decisions without human involvement. A combination of cyber- physical systems, the Internet of Things and the Internet of Systems make Industry 4.0 possible and the smart factory a reality.

The innovative challenge for the forthcoming years is to make the hospital organization an integrated center able to provide the patient with a personal care service, involving the patient as an active subject. (Healthcare 4.0 , as the Industry 4.0) Several research fields are involved, such as the bioinformatics, the healthcare informatics, the cyber-physical systems, the Internet of Things (IoT), the artificial intelligence, the robotics, the cloud computing and the information security, to cite a few. Furthermore, the Healthcare 4.0 is closely linked with precision medicine, which aims at identifying the genetic-, environmental- and lifestyle-based approaches effective for patient therapy.

With the advances in technology and the increased use of the internet, patients can now reapthe benefits of telemedicine, which is defined as the ability to exchange medical information to improve a patient's clinical health status, using electronic communications." Telemedicine is widely used to help manage and control diabetes and gives patients the means to monitor their blood glucose more closely while making sure they follow medical advice regarding their medications. In addition, patients with limited access to healthcare providers can use telemedicine to access the necessary information and avoid the costs of in-person visits.

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