Content

About ESPACOMP

ESPACOMP, the International Society for Medication Adherence, is an international scientific association dedicated to promoting cutting-edge research in the field of medication adherence to increase the quality of research and support dissemination, implementation and uptake of knowledge in healthcare systems and policies.

Main programme topics:

This year's ESPACOMP Conference have a special focus on digital health and patient empowerment and medication adherence.

Information / Registration / Abstract Submission at

www.espacomp.eu

Venue

Faculty of Pharmacy of the University of Porto

FFUP/ICBAS complex in Porto

R. Jorge de Viterbo Ferreira 228, 4050-313 Porto, Portugal

Pre-conference educational days on November 19, 20 and 21.

Website: www.espacomp.eu

E-mail: info@espacomp.eu

The ESPACOMP Executive Committee 2019

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Juliet Foster
Dyfrig Hughes
Alpana Mair
Marie-Paule Schneider
Liset van Dijk
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Leah Zullig

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Leah Zullig
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Local Collaborators / Volunteers

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C-IN
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Welcome Word

Dear ESPACOMP Community and Conference Participants,

With great pleasure we welcome you to the **23rd ESPACOMP meeting in Porto**, Portugal. We are all very pleased that you joined us for this unique event focused on patient adherence to medications **with a special focus on digital health and patient empowerment**.

ESPACOMP aims to facilitate the dissemination of knowledge and cutting-edge evidence in the field of patient medication adherence to. Since 1996, the annual meeting of ESPACOMP has provided a networking opportunity for an increasing number of international adherence researchers, health care professionals, and pharmaceutical industry personnel as well as patients and other important stakeholders.

The ESPACOMP annual meeting has matured over the years reflecting the increased interest in adherence related issues across Europe and beyond. This year, more than **100 abstracts** were **submitted, of which 26** were selected for **oral presentations and 64** were confirmed for **poster presentation**. The pre-conference educational days have 3 **workshops** focused on: **Adherence Data Analysis, Implementation Science and e-Health** and **Motivational Interviewing**.

We are very delighted that world renowned adherence experts have accepted our invitation to present at this conference. This is the 4th **John Urquhart Memorial lecture** honouring the memory of John Urquhart, the outstanding researcher, colleague, mentor and friend. We are thrilled that this year's lecture, will be given by **Jacqueline Dunbar-Jacob** (School of Nursing, University of Pittsburg, USA). **Keynote speakers** at the conference will be **Alexandra Teynor** (Augsburg University of Applied Sciences, Germany), **Andrew Farmer** (Oxford University, UK), **Sandra van Dulmen** (Nivel, Utrecht and Radboudumc, Nijmegen, The Netherlands), **Bart van den Bemt** (Maartenskliniek, Nijmegen, The Netherlands) and **Hayden Bosworth** (Duke University, USA).

The six abstract sessions demonstrate the direction of medication adherence in Europe and around the globe. More specifically, abstract sessions will focus on (1) digital & adherence in oncology, (2) patient empowerment and its role in promoting adherence, (3) Interventions to improve medication adherence with focus on digital health (4) multilevel determinants of medication non-adherence (5) stakeholder involvement in medication adherence research and (6) novel design approaches in adherence research.

Poster presentations will be made during the meeting and the poster walk will be on Friday lunchtime. The best poster presentation will be awarded the Jean-Michel Métry poster prize. There will be time and opportunity to network, meet colleagues and exchange ideas, during the breaks and after the sessions and also during the social program. Moreover, this year we will award the best student abstract for the first time.

On behalf of the scientific & organizing committees, we wish you a very inspiring conference and a wonderful stay in Porto.

We thank you for your active participation in 2019 ESPACOMP meeting!

The ESPACOMP executive committee 2019

Sabina De Geest, Dyfrig Hughes, Alpana Mair, Juliet Foster, Marie Schneider, Liset van Dijk, Bernard Vrijens, Leah Zullig

EACCME® Accreditation

"The ESPACOMP – International Society for Medication Adherence", Porto, Portugal, 21 – 23/11/2019 has been accredited by the European Accreditation Council for Continuing Medical Education (EACCME®) for a maximum of 10 European CME credits (ECMEC®s). Each medical specialist should claim only those hours of credit that he/she actually spent in the educational activity.

Through an agreement between the Union European Union of Medical Specialist and the American Medical Association, physicians may convert EACCME® credits to an equivalent number of AMA PRA Category 1 Credits™. Information on the process to convert EACCME® credit to AMA credit can be found at www.ama-assn.org/education/earn-credit-participation-international-activities.

Live educational activities occurring outside of Canada, recognised by the UEMS-EACCMEC® for ECMEC® credits are deemed to be Accredited Group Learning Activities (Section 1) as defined by the Maintenance of Certification Program of the Royal College of Physicians and Surgeons of Canada.

All participants must confirm their presence before the morning AND before the afternoon sessions in order to obtain the CME credits

Corporate Members

Platinum Corporate Member

Gold Corporate Members

Silver Corporate Member

Venues

Conference Location

Faculty of Pharmacy of the University of Porto.

FFUP/ICBAS complex in Porto

University of Porto, Faculty of Pharmacy

The Faculty of Pharmacy of the University of Porto (FFUP, www.ff.up.pt) was established in 1921. Since then it has provided education, research and development in the field of pharmaceutical sciences. In addition to the transmission of scientific knowledge and skills, FFUP has a constant concern with the human and ethical dimensions, graduating professionals of excellence in the different areas of the pharmaceutical sciences. The faculty is one of the most renowned and sought-after institutions in Portugal, due to the experience and skills of the highlyqualified teaching and research staff, the quality of training provided and the type of research performed. The Faculty currently offers an integrated master in Pharmaceutical Sciences, six masters and seven PhD programs, some of them in collaboration with other institutions. The academic staff is integrated in four R&D Units (classified as Outstanding, Excellent and Very Good). These research units are focused on many different research fields, covering subjects such as analytical chemistry, bromatology, cell and molecular biology, biochemistry, biotoxicology, environment, medicinal chemistry, microbiology, pharmaceutical technology, pharmacology and phytochemistry. FFUP is highly active and productive as far as scientific research is concerned, holding one of the top positions in the ranking of the scientific production at University of Porto.

Official images of Faculty and additional information are available here: https://indd.adobe.com/view/1f96a4ec-f5ba-4904-848f-767d58b6abdb

Address: R. Jorge de Viterbo Ferreira 228,
4050-313 Porto, Portugal
+351 22 042 8500
www.ff.up.pt

Conference dinner:

VINUM – RESTAURANT & WINE BAR | W. & J. GRAHAM'S

Address: Rua do Agro nº 141 (Caves Graham's)
4400-003 Vila Nova de Gaia, Portugal

18:40	Departure by bus
19:00–21:00	Dinner
21:15	Return transfers back to Faculty of Pharmacy of University of Porto

Pre-registration necessary

- Transfer from venue and back
- 3-course served menu with drinks
- 1 person included in the registration fee

Additional ticket price 75 EUR (based on availability)

Workshop 1:

Adherence Data Analysis

Room: Computer Room 15.P1.E3

Faculty:

Dr. Alexandra Dima, PhD, CPsychol, Senior Research Fellow (Université Claude Bernard Lyon 1, France),

Dr. Samuel Allemann, PhD, RPh, Clinical Pharmacist (University of Basel, Switzerland) and Medication adherence expert (Swiss Pharmacists' Association, Switzerland)

Prof. Dr. Marie Schneider, PhD, RPh, Chair of Adherence and Interprofessionality (University of Geneva, Switzerland)

Dr. Isabella Locatelli, PhD, Statistician (University of Lausanne, Switzerland)

Prof. Dr. Bernard Vrijens, PhD, Invited professor of Biostatistics (Liège University, Belgium) & CEO, Scientific Lead (AARDEX Group, Belgium)

Prof. Dr. Ira Wilson, PhD, MD, MSc, FACP, Professor and Chair of Health Services, Policy and Practice, Professor of Medicine (Brown University, USA)

Introduction:

The 2019 ESPACOMP annual meeting in Porto will be preceded by a 3-day workshop on Adherence Data Analysis, on 19 – 21 November. This workshop expands on previous ESPACOMP training in order to provide more practical tools for researchers to learn and perform analyses of adherence data in a supportive environment and interactive manner. Adherence to medications is usually estimated based on three data sources: electronic monitoring (EM), electronic healthcare databases (prescription, dispensing or claims data; EHD), or self-report (SR). There are numerous options available for data processing, which make it difficult for individual researchers to select the most appropriate options for their research question and study context. Moreover, although generic methods of data processing can be adapted to adherence analyses, there are numerous specificities, which researchers need to take into account. This 3-day workshop aims to provide the theoretical structure and practical tools for researchers to design adherence studies and perform analysis of adherence data in a transparent and reproducible manner. Data analysis will be performed using the statistical programming language R, and the programme will cover R basics, adherence concepts, research design issues, hands-on demonstrations, and group and individual practice sessions on these three data sources. Participants will be able to use the example datasets and code provided, and also to adapt code for their own datasets and research needs. The workshop will be facilitated by Samuel Allemann (Switzerland), Alexandra Dima (France), Isabella Locatelli (Switzerland), Marie Schneider (Switzerland), Bernard Vrijens (Belgium) and Ira Wilson (USA).

This workshop is intended for researchers and advanced students interested to estimate adherence from electronic monitoring, electronic healthcare databases or self-report data. R experience is not required, basic training will be provided; likewise, we will provide a quick up-to-date overview of adherence concepts and measurement tools.

Learning objectives:

By the end of the workshop, participants will be able to:

(1) perform basic data analysis and plotting in R

(2) describe the process of adherence to medications and its components, and how they apply to different research questions and study designs

(3) explain the different measurement options available from EM, EHD and SR

(4) calculate adherence to medications from SR, EM and EHD using/adapting prepared step-by-step R scripts on sample datasets.

Learning methods:

Interactive presentations; hands-on demonstrations (datasets provided); discussion; small group and individual work. Throughout the workshop, participants will be required to use the datasets and code provided to run the analyses presented on their own computers and interpret the output. They will be invited to examine the R code and identify elements that could be adapted for similar analyses in other datasets (existing or hypothetical). Optionally, they could work on their own datasets and develop an R-based analysis script based on the code provided.

Bibliography:

A reading list will be sent to participants approximately one month prior to the meeting.

Maximum number of participants:

30.

Requirements for participation:

To help preparing the workshop content and targeting their needs, participants will be asked to provide information on prior training and work experience in statistics, their level of familiarity with R & R Studio, their current/ recent/ future work with adherence data, their interest to work with their own dataset in the practice session, and their expectations from the workshop.

They will be given the option to describe an example of study (at any stage) & related questions for group work. They could also prepare a dataset from their own research to analyze during the workshop.

Before the workshop, participants will be asked to download R and R Studio on their personal laptops and familiarize themselves with the interface and basic options.

All participants need to print out the materials themselves.
Hard copies will not be provided at the conference!

AGENDA

Day 1: Tuesday, 19 November, 2019

08:45 – 09:00	**Welcome and Review of the Workshop Program** *Alex Dima* General overview and welcome.
09:00 – 10:45	**R and R Studio refresher/introduction (optional)** *Alex Dima, Sam Allemann* Basics of working with R and open science workflows; working with R operations, functions and scripts.
10:45 – 11:00	Break
11:00 – 12:00	**Introduction to adherence measurement** *Bernard Vrijens, Ira Wilson* Review of adherence definitions and guidelines: ABC taxonomy; EMERGE guidelines; adherence events, periods, timelines; research designs; data sources; context factors.
12:00 – 12:45	**Discussion on applying ABC and EMERGE guidelines** *All* Group discussion of examples of medication event histories and different data sources.
12:45 – 13:45	Lunch
13:45 – 15:15	**Choice of adherence measures (1)** *Small group work* Practical exercise on choice of measurement tools and reporting – study examples.
15:15 – 15:30	Break
15:30 – 17:00	**Choice of adherence measures (2)** *Small group work* Practical exercise on choice of measurement tools and reporting – study examples.
17:00 – 17:30	**Q&A on adherence measurement** *All* Group discussion on conceptual bases of adherence measurement and their practical applications.

Day 2: Wednesday, 20 November 2019

08:45 – 09:00	**Welcome and Review of the Day Program** *Alex Dima* General overview and welcome.
09:00 – 10:00	**Introduction to SR analysis** *Alex Dima, Ira Wilson, Marie Schneider* Overview of SR tools in adherence measurement; principles of psychometrics, questionnaire development, choice and validation of tools.
10:00 – 10:45	**How to ask patients about their medication adherence?** *Small group work* Practical exercise on question wording and strategies to improve data quality.
10:45 – 11:00	Break
11:00 – 12:00	**Demo R analysis SR tool** *Alex Dima* Presentation of an R script for analyzing an example adherence SR tool; dataset provided.
12:00 – 12:45	**Run analysis on the SR dataset provided** *Small group work* Participants will re-run the analysis demonstrated on their own computers and interpret & experiment with the script provided.
12:45 – 13:45	Lunch
13:45 – 14:45	**Introduction to EM data analysis** *Isabella Locatelli, Bernard Vrijens* Review of data characteristics and methods appropriate to EM data; visualization, summary statistics, longitudinal approach, time series of binary data.
14:45 – 15:15	**EM data preparation** *Marie Schneider* Review of steps necessary for preparing EM data for analysis – data preparation checklist and range of choices available.
15:15 – 15:30	Break
15:30 – 16:45	**Statistical elements and demo R analysis EM data** *Isabella Locatelli* Presentation of statistical bases and R script for analyzing an example EM dataset.
16:45 – 17:30	**Run analysis on the EM dataset provided** *Small group work* Participants will re-run the analysis demonstrated on their own computers and interpret & experiment with the script provided.

Day 3: Thursday, 21 November 2019

08:45 – 09:00	**Welcome and Review of the Day Program** *Alex Dima* General overview and welcome.
09:00 – 10:15	**Introduction to EHD data analysis** *Sam Allemann, Alex Dima* Review of data characteristics and methods appropriate to EHD data; types of EHD datasets; AdhereR functions for initiation, implementation and persistence; summaries vs trajectories.
10:15 – 10:45	**EHD data preparation** *Sam Allemann* Review of steps necessary for preparing EHD data for analysis – data preparation checklist and range of choices available; using multiple datasets (prescription, dispensing, hospitalisations).
10:45 – 11:00	Break
11:00 – 12:00	**Demo R analysis EHD data** *Sam Allemann* Presentation of an R script for analyzing an example EHD dataset.
12:00 – 12:45	**Run analysis on the EHD dataset provided** *Small group work* Participants will re-run the analysis demonstrated on their own computers and interpret & experiment with the script provided.
12:45 – 13:45	Lunch
13:45 – 15:15	**Practical work on EM/EHD/SR data (1)** *Small group work* Participants will choose a type of data to focus on for the afternoon and a personal objective (in-depth study of the code and dataset provided; adapting code to their own dataset) and work in small groups with similar objectives.
15:15 – 15:30	Break
15:30 – 16:45	**Practical work on EM/EHD/SR data (2)** *Small group work* Participants will continue work on their personal objectives; problem solving and general help by workshop facilitators.
16:45 – 17:15	**Discussion and Evaluation of Workshop & Conclusion** *All* Review current workshop and discuss improvements in future workshops.

Alexandra L. Dima

is a Health Psychology researcher and Senior Research Fellow at the University Claude Bernard Lyon 1, Health Services and Performance Research. For the past 15 years, her research has focused on self-management of chronic conditions, including medication adherence, aiming to understand how people adjust psychologically and manage their health, how their health care providers support them in their efforts, and ultimately how self-management support services can be improved. With Dan Dediu and Sam Allemann, she has developed AdhereR, an R package for visualizing medication histories and computing adherence to medications from electronic healthcare databases (www.adherer.eu).

Samuel Allemann

is a clinical pharmacist and medication adherence specialist at the Swiss Association of Pharmacists. He is active in the development and evaluation of pharmacy-related personalized patient care. In the field of adherence, his research focuses on adherence to polypharmacy and the assessment of temporal adherence patterns from electronic healthcare data.

Marie Schneider

is a titular professor of medication adherence and interprofessionality at the Institute of Pharmaceutical Sciences of Western Switzerland, University of Geneva, Switzerland. Her research focuses on the long-term management of medication adherence in chronic patients. From 2004 to 2018, she implemented and managed an interprofessional medication adherence program at the Pharmacy of the Department of Ambulatory Care and Community Medicine in Lausanne. Since 2019, she is implementing it in Geneva, at pharma24, an academic-oriented pharmacy at the interface between the hospital and the community. She is the author of over 70 publications on medication adherence.

Isabella Locatelli

got a Master degree in Economics and Social Sciences in 1999 and a PhD in Methodological Statistics in 2003 at the "Bocconi" University, Milano (Italy). She is statistician at the Center for Primary Care and Public Health (Unisanté) – University of Lausanne. Since 2012, she is Senior Scientist and Lecturer (MER-1) at the Faculty of Biology and Medicine (FBM), University of Lausanne. She has large experience in teaching statistics to medical students and health researchers (Certificates of Advanced Studies). She has methodological competencies in robust statistics, survival analysis, reliability methods, longitudinal models, and epidemiological and demographic methods. Her main applied research areas are the analysis of the length and cost of hospital stays, calculation of prediction scores, statistics for primary care and clinical decision making, and drug adherence estimation using Electronic Monitoring (EM) longitudinal data.

Bernard Vrijens

is CEO and Scientific Lead at AARDEX Group. He is Professor of Biostatistics at Liege University, Belgium. Vrijens holds a PhD from the Department of Applied Mathematics and Informatics at Ghent University, Belgium. He leads research programs investigating (a) the most common errors in dosing using a simple but robust taxonomy, (b) particular dosing errors that can jeopardize the efficacy of a drug, and (c) the optimal measurement-guided medication management program that enhances adherence

to medications. Dr. Vrijens is the co-author of seven book chapters, over 100 peer-reviewed scientific papers, and named as inventor on 6 patents.

Ira Wilson

is Professor and Chair of the Department of Health Services, Policy and Practice at the Brown University School of Public Health, as well as Professor of Medicine at the Alpert Medical School. Dr. Wilson's main research interests are in how structural features of healthcare systems affect the interactions between physicians and patients, and how those interactions in turn affect patients' health outcomes. He has studied patients with chronic conditions such as the elderly, persons with depression, and persons with HIV. In recent years, his research has focused on understanding and improving the quality of medication prescribing and medication management, the development and testing of interventions to improve adherence, and aspects of HIV and aging.

Workshop 2:

Implementation science as a driver for eHealth-powered complex interventions Applying the Behavior Change Wheel (BCW) to develop an eHealth-powered complex interventions to change a behavior

Room: Classroom 03.P1.E3

Faculty:

Prof. Dr. Sabina De Geest, PhD, RN (University of Basel, Switzerland & KU Leuven, Belgium)
Janette Ribaut, MSN (University of Basel, Switzerland)
Lynn Leppla, MSN, RN (University of Basel, Switzerland & University Hospital Freiburg, Germany)
Dr. Bart van den Bemt, PhD, RPh (UMC St Radboud, Netherlands)
Prof. Dr. Leah Zullig, PhD, MPH (Duke University and Durham Veterans Affairs Centre for Health Services Research in Primary Care, USA)

Introduction:

The 2019 ESPACOMP annual meeting in Porto will be preceded by a day-long workshop on 21 November addressing the intersection of implementation science and eHealth. More specifically, we will discuss theory-driven development of eHealth powered complex interventions. We will address the significance of implementation science methods to drive successful implementation of eHealth interventions in real life settings. While we will build upon prior ESPACOMP implementation science workshops, this advanced workshop will delve deeply into how theory-based intervention development is an essential step in successful adoption, implementation and sustainability of eHealth powered interventions. The goal is to create eHealth interventions that can be adapted to local context, disseminated or translated to other settings, and sustained over time. To accomplish this goal, we will learn to apply knowledge and understanding using an international best practice case study. The case study will be an eHealth tool. It is a medication adherence module developed as part of an implementation science project in stem cell transplantation, the SMILe study (see below). The workshop will be facilitated by an international, multidisciplinary team: Sabina De Geest (Switzerland & Belgium), Janette Ribaut and Lynn Leppla (Switzerland & Germany), Bart van den Bemt (The Netherlands), Leah Zullig (USA).

This workshop is intended for health services researchers, clinicians, educators, and policy makers who have some experience in the design, implementation, testing and/or dissemination of (adherence-/eHealth-) interventions. Participants should have knowledge of evidence-based behavioral and organizational theories relevant to intervention development and implementation. Balancing theoretical discussions and practical hands-on learning, the workshop will compromise interactive presentations, group work, and discussion. The case study on the eHealth powered medication adherence module for stem cell transplant patients (SMILe study) will provide concrete examples to guide and stimulate the application of new content learned.

Learning objectives:

- To understand the relevance of implementation science for the successful development, implementation and evaluation of an eHealth powered complex behavioral intervention (SMILe study as an example)
- Applying behavioral science (i.e. Behavioral Change Wheel) in the development of a medication adherence module ready to inform the Agile Software Development process
- Reflect the SMILe example lessons learned for student's own ongoing projects

Learning methods:

Interactive presentations; case study analysis; critical reflection; discussion; small group work.

The SMILe medication adherence module: our example

We will focus during this preconference on the methods used to develop the SMILe medication adherence module. The SMILE medication adherence module is one part of an eHealth-powered integrated care model for follow-up of patients after stem cell transplantation *(SMILe study)*. We will show how theory i.e. Behavior Change Wheel (BCW) and the Capability-Opportunity-Motivation-Model (COM-B) guides intervention development of the medication adherence module. We will also show how the development of users' stories provides a final step to integrate the medication adherence module for agile software development.

Bibliography:

Participants must be well prepared in order to get the maximum benefit from the workshop. A limited list of journal articles and workshop case studies (mandatory reading) will be sent to participants approximately one month prior to the meeting.

Maximum number of participants:

50.

Requirements for participation:

Knowledge of implementation science methods, behavioral science and medication adherence interventions. Reading of preparatory materials.

All participants need to print out the pre-reading materials themselves.

Thursday, 21 November, 2019

08:45 – 09:05	**Welcome and Review of the Workshop Program** *Bart van den Bemt* General overview and welcome.
09:05 – 09:45	**Implementation science as a driver for an eHealth powered integrated care model (including a medication adherence module) in stem cell transplantation: the SMILe study** *Lynn Leppla, Sabina De Geest* Overview of SMILe study methodology. We will showcase how implementation science methods drive the development, implementation and evaluation of an eHealth-powered integrated care model (including a medication adherence module) in alloSCT follow up care.
09:45 – 10:00	**Discussion** **Clarification of open question** Sharing the participants' experiences in view of eHealth and implementation science.
10:00 – 10:30	**Developing the SMILe medication adherence module using the Behavior Change Wheel (BCW) and Capability-Opportunity-Motivation-Model (COM-B) as well as user stories to prepare for agile software development** *Janette Ribaut, Sabina De Geest* We will provide an overview of each step in the theory-based development of the SMILe medication adherence module (steps of the BCW / user stories) to prepare for Agile Software Development. This overview will provide a basis to review each step in the rest of the workshop and to do exercises to gain deeper insight what each of the steps entails.
10:30 – 10:45	**Discussion** *All* **Clarification of open question** Sharing the participants' experiences in view of theories and methods applied in developing behavioral interventions to be powered by eHealth.
10:45 – 11:00	Break
11:00 – 11:30	EACH STEP OF THE SMILE MEDICATION ADHERENCE MODULE DEVELOPMENT WILL BE DISCUSSED IN THE REST OF THE WORKSHOP TO DEEPEN KNOWLEDGE AND UNDERSTANDING. **BCW stage 1 *(Understand the behavior)*:** *Janette Ribaut* How to define the problem in behavioral terms, select the target behavior based on a systematic approach, how to specify the target behavior and identify what needs to change via the COM-B.
11:30 – 12:45	**Team work:** *Bart van den Bempt, Leah Zullig, Lynn Leppla, Janette Ribaut, Sabina De Geest* Groups work on provided case examples and receive fictional quantitative and qualitative data. This enables participants to map information from different sources (patients and clinicians) to the BCW.

12:45 – 13:45	Lunch
13:45 – 14:05	**BCW stage 2: *Identify intervention options*** *Sabina De Geest, Lynn Leppla, Janette Ribaut* Introduction in how to identify intervention functions and policy categories.
14:05 – 15:15	**Team work:** *Bart van den Bemt, Leah Zullig, Lynn Leppla, Janette Ribaut, Sabina De Geest* Groups work further on their examples and use the APEASE criteria to choose adequate intervention functions and policy categories.
15:15 – 15:30	Break
15:30 – 15:50	**BCW stage 3: *Identify content and implementation options*** *Sabina De Geest, Lynn Leppla, Janette Ribaut, Leah Zullig* Introduction in how to identify behavior change techniques, mode of delivery, how to write user stories and how implementation strategies can facilitate the implementation process.
15:50 – 17:00	**Team work:** *Bart van den Bemt, Lynn Leppla, Janette Ribaut, Sabina De Geest* Groups will work with the previous example and work out stage 3 of the BCW. They can write 1 – 3 user stories and discuss which implementation strategies would fit their context if they would implement this intervention in their clinical setting.
17:00 – 17:30	**Discussion, lessons learnt and Evaluation of Workshop & Conclusion** *Sabina De Geest, Leah Zullig, Bart van den Bemt*

Bart van den Bemt

is clinical pharmacist/pharmacologist/senior scientist at the departments of Pharmacy in the Sint Maartenskliniek and the Radboud University Medical Center in Nijmegen, The Netherlands. After working in a community pharmacy, Bart started to work as pharmaceutical care-developer for a franchise formula for community pharmacies. Since 2003 Bart is working at the Sint Maartenskliniek. Due to his experiences as community-, clinical- and formula-pharmacist Bart has extensive experience in pharmacy practice and, pharmaceutical care. Bart's research interests (PhD completion: 2009) are focused on Individualized Pharmacotherapy including medication adherence, cost-effective pharmacotherapy and medication wastage.

Leah L. Zullig

is a health services researcher and implementation scientist. She is an Associate Professor in the Duke Department of Population Health Sciences and an investigator with the Center of Innovation to Accelerate Discovery and Practice Transformation (ADAPT) at the Durham Veterans Affairs Health Care System. Dr. Zullig has experience leading and collaborating on projects using a broad range of research methods to implement, adapt, and scale up evidence-based interventions and practices. Dr. Zullig's overarching research interests address the reduction of healthcare disparities, improving cancer care delivery and quality, and promoting cancer survivorship and chronic disease self-management.

Sabina De Geest

is a Professor of Nursing and Chair of the Department of Public Health of the Faculty of Medicine at the University of Basel (Switzerland). She leads the Leuven Basel Research Group, an international, interdisciplinary research group focusing on behavioural and psychosocial issues in solid organ & stem cell transplantation. Driven by implementation science methodology, her research portfolio focuses the development of innovative care models partially also powered by eHealth. In addition, research addressed psychosocial and behavioural pathways and their relation to outcomes in chronic illness and the development and testing of instruments to assess patient reported outcomes.

Lynn Leppla

works as trained oncology nurse since 2001 at the University Hospital Freiburg, Germany. Besides, in 2008 she started studying nursing research and completed her master's degree in 2013. Masters prepared and with ten years work experience she started as clinical nurse specialist in allogeneic stem cell transplantation. In 2016, Lynn began her PhD in Nursing Science at the Institute of Nursing Science, Basel. Her focus of research is the re-engineering of care towards an integrated, eHealth-facilitated follow-up care after allogeneic stem cell transplantation. With special attention to self-management and behavioral support interventions improving e.g medication adherence or infection prevention.

Janette Ribaut

completed her training as a nurse in 2009 in Berne, Switzerland. In 2016, she completed the Bachelor in Nursing Science at the University of Applied Sciences in Berne and in 2019 the Master in Nursing Science at the Institute of Nursing Science (INS) in Basel, Switzerland. Janette Ribaut worked as a registered nurse and as a clinical nurse specialist in several internal medicine departments in Switzerland and since 2018 also as an assistant at the INS. In September 2019, Janette Ribaut started her PhD at the INS with focus on medication adherence and evaluation of eHealth applications.

Workshop 3:

(for Portuguese speakers): Addressing medication nonadherence with patients: Enhancing motivation to improve medication adherence

Room: Classroom 04.P1.E3

Course language:

Course will be taught only in Portuguese.

Faculty:

Motivational interviewing trainer:

Daniela Dunker Scheuner is a psychologist-psychotherapist of the Swiss federation of psychologists (FSP), specializing in cognitive behavioural treatment. She teaches cognitive behavioural treatment at the University Institute of Psychotherapy, in the Department of Psychiatry at University Hospital (CHUV), Lausanne, Switzerland. Daniela lives in the French part of Switzerland but comes from Brazil.

Local coordinator:

Rute Sampaio, PhD, is specialist in Clinical and Health Psychology. She is a researcher at the Institute of Molecular and Cellular Biology (IBMC) and is responsible for the genesis and development of a research line named "Therapeutic Adherence in Chronic Pain" within the Pain Research Group at the Department of Biomedicine of the Faculty of Medicine of Porto. She completed a Motivational Interviewing course at Tavistock and Portman NHS Foundation Trust in London.

Organizers:

ESPACOMP Education Committee (**Marie P. Schneider**, University of Geneva, Switzerland; **Juliet Foster**, Woolcock Institute of Medical Research, University of Sydney, Australia; **Todd Ruppar**, Rush University, US).

Introduction:

Motivational interviewing (MI) is a collaborative conversation style for strengthening people's motivation and commitment to change. It is an approach that has been demonstrated to enhance engagement and adherence in medical settings resulting in positive outcomes for patients. The aim of this interactive one-day workshop is to provide an introduction to motivational interviewing and expand your engagement skills.

This workshop is intended for **Portuguese-speaking** healthcare professionals, physicians, pharmacists, nurses, including health psychologists, academics, educators, patient association managers, medicine agencies, pharmaceutical industry and other interested parties.

Learning objectives:

- Get familiar with basic concepts and methods of motivational interviewing
- Engage in building an effective relationship with patients around medication adherence

Learning methods:

Interactive presentations; small group work; role play; critical reflection; discussion.

Bibliography:

will be provided during the course

Maximum number of participants:

25.

Thursday, 21 November, 2019

09:00 – 10:00	**Welcome, Introduction and Foundations** The challenges in a conversation about medication adherence
10:00 – 10:15	Break
10:15 – 12:15	**Motivational Interviewing (MI): Understanding change** • What helps people change and what gets in the way • The four processes of MI
12:15 – 13:00	Lunch
13:00 – 15:00	**Motivational Interviewing (MI): Understanding change** The foundational skills of MI
15:00 – 15:30	Break
15:30 – 16:30	**Motivational Interviewing (MI): Understanding change** Change talk: Strengthening motivation and commitment to change
16:30 – 17:00	**Discussion and Evaluation of Workshop & Conclusion**

Marie Schneider

is a titular professor of medication adherence and interprofessionality at the Institute of Pharmaceutical Sciences of Western Switzerland, University of Geneva, Switzerland. Her research focuses on the long-term management of medication adherence in chronic patients. From 2004 to 2018, she implemented and managed an interprofessional medication adherence program at the Pharmacy of the Department of Ambulatory Care and Community Medicine in Lausanne. Since 2019, she is implementing it in Geneva, at pharma24, an academic-oriented pharmacy at the interface between the hospital and the community. She is the author of over 70 publications on medication adherence.

Elísio Costa

Professor at the Department of Biological Sciences of the Faculty of Pharmacy of the University of Porto and researcher in the Research Unit on Applied Molecular Biosciences of the same institution (UCIBIO). He is also the Director of the Competence Center on Ageing of the University of Porto, which aims to work as a convergence Centre of all the skills and knowledge of the University in the field of ageing; and co-coordinator of the activities of the University of Porto as an INNOSTARS RIS-Hub of EIT-Health.

He is a member of the European Innovation Partnership on Active and Healthy Ageing (EIP-AHA) on the Action Group A1 on Adherence to Prescription and Medical Plans, being the co-coordinator of one of the objectives of this Action Group. Moreover, he is the scientific coordinator of the EIP-AHA two-starred Reference Site: Porto4Ageing. He is author of more than 200 publications (orcid.org/0000-0003-1158-1480) and has collaborated in national and international research projects in the field of chronic diseases, namely chronic kidney disease and ageing (SACHI2; SKILLS4ADHERENCE; ICTSKILLS4ALL, FAIR4HEALTH, others).

Juliet Foster

is a Research Psychologist with a special interest in the patient's perspective on chronic disease and self-management. Her work centres on understanding the treatment attitudes and lived experience of people with respiratory disease to develop effective patient-centred interventions which improve medication adherence and other health behaviours. Dr Foster is an experienced crisis counsellor and a training specialist in health communication skills for facilitating medication adherence. She currently serves on the ESPACOMP Executive Committee, the American Thoracic Society Behavioral Science programming committee and Asthma Australia's Professional Advisory Council.

ESPACOMP Scientific Meeting Program

PRELIMINARY

Thursday November 21

Room: Noble Hall

17:30 – 18:00	Doors open
18:00 – 18:20	**Welcome Word** ESPACOMP representative executive board: *Leah Zullig* Local organizer: *Susana Casal*
18:20 – 18:50	**Literature review:** Recent adherence research on digital health and patient empowerment
18:50 – 20:00	**Welcome reception**

Friday November 22

Room: Noble Hall

08:00 – 08:30	Registration
08:30 – 08:45	**Welcome:** *Liset van Dijk*
08:45 – 09:45	**John Urquhart Memorial Lecture** *(Chair: Todd Ruppar)* **The influence of measurement on our understanding of patient adherence** *Jacqueline Dunbar-Jacob,* *School of Nursing, University of Pittsburgh*
09:45 – 10:20	Coffee break & poster viewing
10:20 – 11:00	**Plenary keynote speaker** *(Chair: Sabina de Geest)* **On the interdisciplinary challenge of designing user friendly eHealth solution** *Alexandra Teynor*

11:00 – 12:50	**Parallel sessions (oral presentations – accepted abstracts)**	
	Noble Hall	**Amphitheater**
	A1: Digital & adherence in oncology	**A2: Patient empowerment and its role in promoting adherence**
	Chair: Liset van Dijk	*Chair: Alpana Mair*
11:00 – 11:20	**Consumer-informed development and feasibility testing of a Smartphone Program to Support Oral Chemotherapy Adherence in Young and Adult Cancer Patients** *Xiomara Skrabal Ross*	**Does HIV Care Engagement Improve Statin Adherence among People Living with HIV and Concurrent Cardiometabolic Disorders?** *Theresa Shireman*
11:20 – 11:40	**Feasibility of Digital Medicine in Improving Adherence to Orally-administered Anticancer Therapy** *Shelley Jazowski*	**Patients' attitudes to the use of as-needed budesonide/formoterol for treatment of mild asthma** *Juliet Foster*
11:40 – 12:00	**Development of a community pharmacy-based intervention to enhance adherence to adjuvant endocrine therapy among breast cancer survivors** *Sophie Lauzier*	**Effectiveness of using a medication adherence tool in primary care: Results of a clustered randomized controlled trial** *Joyca Lacroix*
12:00 – 12:20	**Adherence to endocrine therapy and quality of life in women with stage I to III breast cancer** *Caitriona Cahir*	**What happens in treatment initiation consultations? Mapping communication strategies in patient-provider interactions** *Annemiek Linn*
12:20 – 12:40	**The Basel Approach for coNtextual ANAlysis (BANANA) in implementation science using the SMILe project as an example** *Juliane Mielke*	**Brief complex intervention to improve patients' beliefs and skills on inhaler use and its clinical impact in COPD and asthma** *Andrea Torres Robles*
12:40 – 12:50	**Reflection and key points of the session**	
12:50 – 14:50	Lunch	
12:50 – 13:45	**Poster viewing** *Moderators: Juliet Foster, Rebecca Bartlett Ellis, Marcia Vervloet, Annemiek Linn, Alexandra Dima, Marie-Paul Schneider*	
12:50 – 14:45	**Small Meeting Room 20.P3.E3** **From knowledge to action: Interprofessional round table on polypharmacy** *Moderators: Bernard Vrijens & Todd Ruppar*	

14:45 – 16:00	**Room: Noble Hall** **Plenary Invited speakers** *(Chair: Bernard Vrijens)* **Digital Health**	
14:50 – 15:20	**How can clinicians best contribute to apps used by patients to support self-management of long-term conditions?** *Andrew Farmer,* *Oxford University*	
15:20 – 15:50	**eHealth interventions: does patient involvement guarantee use?** *Sandra van Dulmen,* *Nivel, Utrecht and Radboudumc, Nijmegen*	
15:50 – 16:00	**Reflection and key points of this session**	
16:00 – 16:30	Coffee break & poster viewing	
16:30 – 18:20	**Parallel sessions (oral presentations – accepted abstracts)**	
	Noble Hall	**Amphitheater**
	A3: Interventions to improve medication adherence with focus on digital health	**A4: Multilevel determinants of medication non-adherence**
	Chair: Leah Zullig	*Chair: Marcia Vervloet*
16:30 – 16:55	**Changing public beliefs about antimicrobials and antimicrobial resistance using the Necessity-Concerns Framework (NCF)** *Amy Chan*	**Behavioural determinants of adherence to preventive medication in adults with cardiovascular disease: applying the IMAB-Q questionnaire in community pharmacies** *Debi Bhattacharya*
16:55 – 17:20	**Self-management of medication by the patient in hospital: development and evaluation of a structured and evidence based intervention** *Tinne Dilles*	**Medication adherence barriers to oral antibiotics – a focus group discussion enriched by literature** *Melanie Haag*
17:20 – 17:45	**Optimizing pharmaceutical care for pediatric eczema patients: improving knowledge and perceptions of pharmacy staff** *Ellen Koster*	**Racial disparities in antihypertensive medication persistence among New York City Medicaid beneficiaries: challenging the conventional wisdom about African-American adherence** *Adam Schweber*

17:45 – 18:10	**Identifying and addressing patient beliefs driving short- acting beta-agonist use and over-reliance using an online digital intervention** *Amy Chan*	**Association between chronic opioid use and antiretroviral therapy adherence among people with HIV** *Theresa Shireman*
18:10 – 18:20	**Reflection and key points of this session**	
18:40	Meet for departure to dinner	

Saturday November 23

08:45 – 10:35	**Parallel sessions (oral presentations – accepted abstracts)**	
	Noble Hall	**Amphitheater**
	A5: Stakeholder involvement in medication adherence research	**A6: Novel design approaches in adherence research**
	Chair: Todd Ruppar	*Chair: Juliet Foster*
08:45 – 09:10	**Theory-driven development of an intervention including user-stories for future eHealth translation to support medication adherence in allogeneic stem cell transplantation** *Janette Ribaut*	**Adding GINA step 5 therapies to ICS/LABA in a real-life moderate/severe asthma population: is inhaler adherence a treatable trait?** *Job Van Boven*
09:10 – 09:35	**Nurses' role in monitoring medication adherence and interprofessional collaboration: experiences of pharmacists, physicians and nurses** *Elyne De Baetselier*	**Identifying patients at risk for disengagement from HIV care and sub-optimal clinical outcomes** *Mallory Johnson*
09:35 – 10:00	**Associations between ART failure with wildtype virus and adherence to second-line ART regimen: A secondary analysis of prospectively collected data** *Lentlametse Mantshonyane*	**The relationship between real-world inhaled corticosteroids adherence and asthma outcomes: a multilevel approach in a longitudinal asthma cohort** *Marcia Vervloet*
10:00 – 10:25	**The perceptions of HIV+ patients on Real-Time Measuring and Monitoring of Antiretroviral Adherence** *Susan Kamal*	**Adherence to oral antidiabetics: a cohort study of patients participating in an interprofessional chronic patients support program in Switzerland** *Noura Bawab*
10:25 – 10:35	**Reflection and key points of this session**	
10:35 – 11:05	Coffee break	

11:05 – 12:20	**Room: Noble Hall** **Plenary Keynote session** *(Chair: Dyfrig Hughes)* **Digital health**
11:05 – 11:35	**Using e-health to accompany and empower the patient in his patient journey** *Bart van den Bemt,* *Maartenskliniek, Nijmegen*
11:35 – 12:05	**Implementation of digital health interventions** *Hayden Bosworth,* *Duke University*
12:05 – 12:15	**Reflection and key points of this session**
12:15 – 13:00	Lunch
13:00 – 13:15	**Room: Nobel Hall**
	Presentation of the Jean-Michel Métry poster prize *(Chair: Liset van Dijk)*
13:15 – 14:15	**ESPACOMP business meeting** *(Chair: Bernard Vrijens, Leah Zullig)*
14:15 – 15:15	**ESPACOMP initiatives** *(Chair: Liset van Dijk)*
14:15 – 14:30	**ESPACOMP Website** *Leah Zullig, Bernard Vrijens*
14:30 – 14:45	**ESPACOMP Education Initiative / white paper** *Marie Schneider*
14:45 – 15:00	**ESPACOMP adherence data analysis white paper** *Alex Dima*
	ESPACOMP Medication Adherence Reporting Guidelines (EMERGE) *Sabina De Geest for the EMERGE group*
15:00 – 15:15	**Closure of the meeting** *(Chair: Liset van Dijk & Leah Zullig)*

Posters at a Glance

P.01 **Who can benefit from digital solutions for polypharmacy management?**
Costa, Elísio

P.02 **A consumer designed smartphone app for young people with asthma: Engagement and acceptability**
Foster, Juliet

P.03 **Inodiab: Randomized study evaluating the impact of personalized SMS (with TTM) on compliance in patients with type II diabetes**
Kombargi, Léa

P.04 **eHealth literacy skills, preferences and needs of pharmacy visitors**
Koster, Ellen

P.05 **Re-engineering follow-up care after allogeneic stem cell transplantation: Prototype development for an eHealth-supported integrated model of care- the SMILe study**
Leppla, Lynn

P.06 **Novel electronic adherence monitoring devices (NEMD) in children with asthma**
Makhecha, Sukeshi

P.07 **'Ademgenoot'– A serious game to motivate and empower asthma patients in adherence to their maintenance medication: A user-centered design study**
Poot, Charlotte

P.08 **Timely initiation of second prevention treatment after hospital discharge following acute stroke in French patients**
Allemann, Samuel

P.09 **Adherence trajectories of adjuvant endocrine therapy among women with breast cancer: A five-year cohort study using administrative databases**
Lauzier, Sophie

P.10 **The development of a novel Modern Journal System for embedding patient-reported data into diabetes management: A user-centered design approach**
Schoenthaler, Antoinette

P.11 **Cost saving potential of community pharmacist led adherence intervention: retrospective analysis of professional services program utilising patient dispensing data**
Torres Robles, Andrea

P.12 **Persistence with statin treatment in diabetic and non-diabetic patients with transient ischemic attack**
Wawruch, Martin

P.13 **Longitudinal trajectories of medication adherence: A latent class growth analysis of electronic drug monitoring data**
Wouters, Hans

P.14 **SABA Risk Questionnaire (SRQ): A novel measure for assessing patients' beliefs underpinning reliance on short-acting beta agonists in asthma**
Chan, Amy

P.15 **Exploring adherence to inhaled corticosteroids using the Beliefs about Medicine Questionnaire for Young People With Asthma (BMQ-YPWA): A pilot study**
Pearce, Christina Joanne

P.16 **Modifiable determinants of medication adherence in bipolar disorder: A systematic review**
Prajapati, Asta Ratna

P.17 **Patients' beliefs about medicines and self-reported adherence to drug treatment two years after stroke**
Sjölander, Maria

P.18 **The relationship between trust in medicines, beliefs about medication and medication adherence**
Te Paske, Roland

P.19 **PreSTOP: Patients' perspective on discontinuation of CML TKI-treatment**
Tromp, Vashti

P.20 **A qualitative study of barriers and facilitators to medication adherence among stroke and transient ischemic attack French patients**
Viprey, Marie

P.21 **Involving patients and healthcare professionals in intervention development: A participatory approach to improving medication adherence in cystic fibrosis**
Viprey, Marie

P.22 **Development and validation of a novel measure of practical barriers to medication adherence (MPRAQ)**
Chan, Amy

P.23 **Limitations of basic and instrumental activities of daily living among polymedicated older adults in Europe: a cross sectional study**
Costa, Elísio

P.24 **Hospitalizations among polymedicated european older adults**
Costa, Elísio

P.25 **Profiling patient treatment behavior to improve adherence: Development of the SPUR tool**
Kombargi, Léa

P.26 **Experiences and effectiveness of Medication Management Apps to support self-management in patients with diabetes (EMMA study)**
Koster, Ellen

P.27 **Pharmaceutical intervention in promoting adherence to topical treatment of chronic dermatosis: identification of the needs of educational interventions**
Almeida, Isabel

P.28 **Cultural and English/German language differences may shift answers to three questions on medication adherence**
Arnet, Isabelle

P.29 **Empower nurses to empower patients to better medication adherence**
Axelsson, Malin

P.30 **Optimizing patients' recruitment in an oral anticancer drug adherence program**
Bandiera, Carole

P.31 **A new approach to catch the dynamic of medication adherence with clustering refill patterns in long term medication users**
Baumgartner, Pascal Claude

P.32 **Acceptability of eHealth technology by kidney transplant patients and health care team: the Renal Health Project**
Bezerra Da Silva Junior, Geraldo

P.33 **A proactive inter-disciplinary CME to improve medication management in the elderly population**
Cena, Clara

P.34 **Assessment of the level of adherence in elderly hypertensive patients**
Chudiak, Anna

P.35 **Impact of adverse effects to oral antidiabetics on adherence and quality of life in patients with type 2 diabetes**
Cruz, Rui

P.36 **Benefits linked to the use of a medication plan – a systematic review**
Dietrich, Fine

P.37 **Balancing medication use in nursing home residents with life-limiting disease**
Dilles, Tinne

P.38 **Implementation of theoretical models in quantitative studies on medication adherence: Findings from a systematic review**
Giardini, Anna

P.39 **Interventions on medication adherence in chronic older population: A systematic review and meta-analysis of randomized controlled trials**
Giardini, Anna

P.40 **U (undetectable) = U (untransmittable) steatment as a unique opportunity to reinforce adherence to antiretroviral therapy**
Guastavigna, Marta

P.41 **Perspectives on adherence supportive care from clinicians and adults with type 2 diabetes; An explorative qualitative study in the dutch primary care**
Hogervorst, Stijn

P.42 **Trivial or troublesome, experiences of medicine taking among patients with coronary heart disease**
Johansson Östbring, Malin

P.43 **Determinants of non-adherence to treatment for tuberculosis (TB) in high income, low TB incidence contexts: A scoping review**
Jones, Annie

P.44 **The importance of therapeutic communication in compliance among patients with hypertension**
Karniej, Piotr

P.45 **Adherence to therapeutic recommendations in chronic diseases**
Karniej, Piotr

P.46 **Designing a personalised digital patient support programme (PSP) for patients treated with growth hormone: Key design considerations**
Koledova, Ekaterina

P.47 **Implementaion and persistence to cardiovascular medication across Scotland**
Leslie, Kirstin

P.48 **The impact of cognitive impairment on adherence in a elderly patients with hypertension**
Lomper, Katarzyna

P.49 **Interventions to improve medication adherence in patients with schizophrenia or bipolar disorders: A systematic review**
Loots, Elke

P.50 **Interactive tool to empower the management of the medication regimen**
Lumini, Maria José

P.51 **Preferences of people with diabetes to build an app: Study pilot**
Lumini, Maria José

P.52 **Adherence to antiretroviral therapy among naïve patients attending an outpatient pharmacy in a tertiary care hospital**
Martin Conde, Maria Teresa

P.53 **Engage: Designing and building an evidence-based digital health platform to support treatment management and adherence**
Moloney, Clare

P.54 **Using m-health to design an adherence enabling intervention to empower cancer survivors on oral medication**
Moreira, António

P.55 **Self-efficacy and adherence behaviors in rheumatoid arthritis patients**
Oshotse, Christiana

P.56 **Medication adherence in elderly patients of the centre region of Portugal**
Roque, Fátima

P.57 **Discontinuation from antihypertensive treatment among New York City Medicaid patients: the case for enhanced surveillance and ACEi/ARBs**
Schweber, Adam

P.58 **Antiretroviral-therapy (ART) use was not associated with improved birth outcomes in an analysis of 33,785 pregnancies in US Medicaid beneficiaries**
Shireman, Theresa

P.59 **The CANP project: enhancing tele-medicine improvement in the hospitalization at home process**
Traina, Sara

P.60 **Non-medical prescribing behaviour in midwifery practice: A mixed-methods review**
Van Rompaey, Bart

P.61 **PRIME-study: PRescribing In Midwifery – Women's and midwives experiences**
Van Rompaey, Bart

P.62 **Development and implementation of intervention program tailored to non-adherent patients after kidney transplantation: Primary results**
Vankova, Barbora

P.63 **The effectiveness of using mobile applications to improve medication adherence: A systematic review**
Wiecek, Elyssa

P.64 **Gamifying medication adherence: Retrospective analysis of a mobile application utilising gamification and incentives to improve adherence**
Wiecek, Elyssa

Plenary Invited Speakers

The influence of measurement on our understanding of patient adherence

Jacqueline Dunbar-Jacob

Significant attention has been given over the past several decades to the issue of measurement of medication adherence, including the design of measures and comparison studies. Much of the measurement research has emphasized the accuracy of instruments and the identification of patterns of medication taking. Significant data from these studies support differences in adherence estimates between measures with electronic measures identified as the gold standard. A review of 506 medication adherence studies reporting a measure, referenced in PUBMED in 2018, reveals that 77 % of studies relied on self-reported adherence, many using a variety of non-validated measures. Just 3.6 % used electronic event monitors. Thus, much of how we conceptualize adherence is derived from self-report, reports that raise questions about their utility. What does this mean for the development of theoretical models of medication adherence and the resulting design and evaluation of interventions? This presentation will address the complexity of designing models of adherence for intervention use due to the influence of measurement method. Data will be drawn from three NIH supported studies of adherence in four chronic conditions: primary prevention (cholesterol lowering); asymptomatic chronic disease (hypertension); symptomatic chronic disease (rheumatoid arthritis); and, disease requiring extensive self- management (type 2 diabetes mellitus). Recommendations for research going forward will be offered.

Biography

Jacqueline Dunbar-Jacob is distinguished service professor and dean, school of Nursing, at the University of Pittsburgh and professor of psychology, epidemiology, and occupational therapy. She received her BSN from Florida State University, her MSN and post-master certificate from UCSF, and her PhD in counseling psychology from Stanford University. She is a registered nurse and licensed psychologist. She served as a behavioral scientist for key NIH-funded multi-center trials. Her research on medication adherence, funded by the NIH for more than 25 years, has yielded over 130 papers and chapters focusing primarily on patient adherence. Dr. Dunbar-Jacob is a fellow of the Society for Behavioral Medicine, the Academy of Behavioral Medicine Research, the American Heart Association, The American Psychological Association, and the American Academy of Nursing. She served as president of the Society of Behavioral Medicine, the Academy of Behavioral Medicine Research, and the Friends of the National Institute of Nursing.

On the interdisciplinary challenge of designing user friendly eHealth solution

Alexandra Teynor

Designing user friendly e-Health solutions is a team effort – different professions must work together to obtain the best results. This lecture sheds light on the various aspects of development - from the first ideas, over content and design development, usability testing, technology development, legal and social issues to finally putting a running system into practice. In a complex world, this can not be a one-way-road, but must be implemented using feedback-loops. The SMILe project will serve as a running example to illustrate this process. The talk will also address some of the obstacles one can encounter when different professions communicate with each other in a development project. Finally, in order to better judge the quality of health apps regarding usability and privacy, the talk will give some guidelines.

Biography

Alexandra Teynor studied computer science in media at Augsburg University of Applied Sciences. She got her PhD in 2008 at the university of Freiburg in the field of pattern recognition and started to work in projects for various companies. In 2012 she became a full professor for software engineering at Augsburg University of Applied sciences with an emphasis on agile software development. She is leading the software innovation lab (HSA_innolab) there, where students can work on innovative digitization projects together with partners form industry and academia. A focus of the lab is to develop user friendly self-management applications.

How can clinicians best contribute to apps used by patients to support self-management of long-term conditions?

Andrew Farmer

Smartphone and computer based health apps are promoted as a technology that will transform health care. They promise self-management support and improved outcomes for the patient and a more efficient healthcare system. However, only a tiny fraction of downloaded apps are used and even fewer used for more than a few weeks. Apps and other digital innovations need to be designed, developed and evaluated by an interdisciplinary team of (among others) patients, clinicians, and technical experts. Clinicians have led the transformation of electronic medical records in UK primary care. Clinical applications, building on established clinical pathways, can link data, analyse it and provide actionable information to patients and clinicians.

Using a series of case studies covering clinical care for hypertension, chronic obstructive airways disease, and diabetes, this presentation will describe research aimed at building digital systems to support patients with these conditions. It will describe the process of co-development involving clinicians and the clinical trials led by clinicians evaluating these systems in the context of the UK NHS. The presentation will discuss how clinicians can best contribute to this process.

Biography

Andrew Farmer worked as a full-time primary care physician for seventeen years before taking up a teaching and research role alongside clinical practice in 2001. He was appointed to his current post of Professor of General Practice at the Nuffield Department of Primary Care Health Sciences, University of Oxford, in 2010. He works as an associate general practitioner at the South Oxford Health Centre and is a Research Associate of the Oxford Diabetes Trials Unit. His research is focused on delivering improvements to the care of people with long-term conditions, including diabetes. His work to improve the self-management of diabetes in general practice includes the best use of blood glucose monitoring, supporting people in their use of medication, and evaluating mobile health devices and apps. He has chaired a number of research funding committees including in his current role as a Committee Chair in the UK NIHR Health Technology Assessment Programme.

eHealth interventions; does patient involvement guarantee use?

Sandra van Dulmen

When a person becomes sick, a new reality is imposed. As a patient, one has to adjust to living with a chronic condition, accept to become dependent on others, leave old habits behind, adopt a healthier and more structured lifestyle and employ different self-management skills like regularly taking medication and visiting a healthcare provider. Not everyone is capable of making these shifts, some prefer to continue the life they lived, regardless of restrictions and loss of energy or strength. Others are clearly motivated to apply the necessary self-management tasks but lack resources and skills. These people need self-management support, nowadays increasingly delivered online. Such eHealth interventions have the potential to fill the gap caused by shortages in healthcare in terms of manpower, money and time. ICT offers numerous possibilities to replace costly face-to-face medical visits by easy to access, remote devices. Yet, these seemingly simple solutions also generate new problems, like insufficient use or implementation in healthcare. The use of eHealth interventions is determined by external and internal factors, like perceived usefulness, ease of use and the intention to use the intervention (Davis et al, 1989). Too many eHealth interventions are designed for which there is no need. What could help is to engage patients much earlier in the process of designing interventions to make sure they fit their needs and abilities instead of the other way around. In my lecture I will present different ways of co-designing eHealth interventions with patients, give examples of projects that applied such strategies and answer the question if participatory development is feasible, effective and valued by patients. Recent experiences with co-designing eHealth interventions are used to round up with a list of tips and tricks to ensure future eHealth interventions are developed with patients producing interventions that will be used and valued.

Biography

Sandra van Dulmen studied psychology. Since 1995 she works at NIVEL (Netherlands institute for health services research), first as a researcher, since 1999 as the leader of the research program Communication in Healthcare. In 2012, she became Professor in Communication in Healthcare at Radboud university medical center in the Netherlands and later that year also at the University of South-Eastern Norway in Norway. She obtained many grants for research in the field of communication in e.g. pediatrics, oncology, general practice, pharmacy and medical genetics. In many of these projects, smartphones or the Internet are used as an instrument to foster provider-patient communication, self-management and medication adherence. In 2001 she was co-founder and until 2014 secretary of EACH (International Association for Communication in Healthcare). She currently supervises 14 PhD students. She has published around 240 international papers in peer-reviewed journals and 75 papers in Dutch journals.

Using e-health to accompany and empower the patient in his patient journey

Bart van den Bemt

Health care for patients with chronic conditions does not end or begin at the doorway of the clinic. It has to extend beyond clinic walls and permeate patients' living and working environments. In fact, health care systems are currently organized around the concept of acute, infectious disease, and perform best when addressing patients' episodic and urgent concerns. However, in chronic care patients are livelong confronted with their disease and have questions/practical problems with their disease during their daily life. Current health care only provide support on preplanned,

supply-driven visits to the doctor, whereas a more continuous (demand-driven) patient support might better coach people during their live.

E-health can change patient care from supply-driven to demand driven. Patients and health care providers can have interactions when there is really a need for interaction irrespective from place or time. This will not only assure more individualized healthcare, but also helps to realize to future proof health care system. In the next decade, the number of aged people will double, whereas the amount of available health care staff members will halve, e-health is needed to support the decreasing number of health care providers.

In this lecture, it will be illustrated that e-health will support and empower (chronic) patients in their patients journey. Both real live examples from health care and published articles will be presented in order to illustrate the role of e-health in the diagnosis, treatment, education and adherence management of chronic conditions. Also the possible role of the patient in his own medical record will be illustrated.

Biography

Bart van den Bemt is clinical pharmacist/pharmacologist/senior scientist at the departments of Pharmacy in the Sint Maartenskliniek and the Radboud University Medical Center in Nijmegen, The Netherlands. After working in a community pharmacy, Bart started to work as pharmaceutical care-developer for a franchise formula for community pharmacies. Since 2003 Bart is working at the Sint Maartenskliniek. Due to his experiences as community-, clinical- and formula-pharmacist Bart has extensive experience in pharmacy practice and, pharmaceutical care. Bart's research interests (PhD completion: 2009) are focused on Individualized Pharmacotherapy including medication adherence, cost-effective pharmacotherapy and medication wastage.

Implementation of digital health interventions

Hayden Bosworth

Dr. Hayden Bosworth discuss the current challenges of Digital Health and why context is important. He will use case studies provide examples of barriers and successes related to the integration of Digital Health into the health care system. He will discuss the roles of Predictive analytics and implementation science, particularly on scalability as these concepts pertain to digital health. Lastly, he will conclude with recommendations on next steps for the Digital health in the context of medication adherence for chronic conditions.

Biography

Hayden Bosworth is a health services researcher and Professor of Population Health Sciences, Medicine, Psychiatry, and Nursing at Duke University Medical Center as well as the Vice Chair of Education in the Department of Population Health Sciences. He is also the Deputy Director of the Center for Health Service Research in Primary Care Center of Innovation (COIN) at the Durham VAMC. His expertise is in developing and implementing scalable/sustainable interventions to improve health behaviors and reduce the burden of chronic diseases. He has focused on various methods of engagement (e.g., telehealth) and including various members of the healthcare system (e.g., pharmacists and nurses). He has been the Principal Investigator of over 30 trials involving medication adherence resulting in over 350 peer-reviewed publications and four books. His work involves on-going implementation projects in Medicaid of North Carolina, The United Kingdom National Health System, Kaiser Health care system, and the Veterans Affairs.

Oral Presentations

A1: Consumer-informed development and feasibility testing of a smartphone program to support oral chemotherapy adherence in young and adult cancer patients

X. Skrabal Ross[1], *K.M. Gunn*[1], *P. Patterson*[2], *I. Olver*[3]

[1] *University of South Australia, Cancer Research Institute, Adelaide, Australia*
[2] *CanTeen, Research- Evaluation and Social Policy, Sydney, Australia*
[3] *University of Adelaide, Faculty of Health and Medical Sciences, Adelaide, Australia*

Introduction: Oral chemotherapy non-adherence compromises the efficacy of cancer treatment and can result in death. Mobile phone-based interventions are providing new opportunities to improve medication adherence among people with several chronic diseases. However, evidence of their effect on adherence to oral cancer chemotherapy is lacking. Such interventions need to be translatable into 'real' oncology settings. We describe the evidence and theoretically-based design of a novel smartphone-based tool and present preliminary findings on end-users acceptability and satisfaction.

Methods: The intervention development is described in three stages based on Whitaker et al.'s (2012) development and evaluation framework for mhealth interventions and Mohr et al.'s (2014) Behavioural Intervention Technology model. Literature reviews and a formative qualitative study with oral chemotherapy users informed the design of the tool. The intervention was tested via a multi-site (6 Australian private and public hospitals), non-randomized 10-week trial with assessment of oral chemotherapy adherence (self-report and MEMS devices), knowledge of oral chemotherapy, side-effect presence and severity, and satisfaction.

Results: A smartphone text message-based tool, consisting of behavioral strategies to address the three main reasons for oral chemotherapy non-adherence (forgetfulness, side-effects and poor knowledge of oral chemotherapy) was developed. The tool includes delivery of oral chemotherapy intake reminders and hyperlinks to documents with information about oral chemotherapy and side-effect management. Technical aspects of the tool (e.g. frequency of text message delivery, personalization, directionality) were informed by the formative qualitative study (9 oral chemotherapy patients, 20–71 years) and preliminary findings on cancer patients' acceptability of, and satisfaction with the intervention will be presented.

Conclusions: This tool could easily be made available to help cancer patients follow their oral chemotherapy schedules. Findings from the consumer-informed design and feasibility testing process will help to inform the development of future mobile phone-based interventions to increase oral chemotherapy adherence.

A1: Feasibility of digital medicine in improving adherence to orally-administered anticancer therapy

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Introduction: Use of orally-administered anticancer therapies (OAT) has risen over the past decade, increasing patients' burden to manage side effects and adhere to complex dosing schedules. Proteus Digital Health has developed a novel Digital Medicine Program (DMP), which informs medication-taking behavior by detecting medication ingestion. This may improve symptom management and completion of oral cancer treatment. The objective of this multi-site, single-arm pilot study is to assess the feasibility of the DMP in tracking completion of an orally-administered anticancer therapy and to assess patient-reported symptoms and outcomes.

Methods: The Proteus DMP includes: (1) an ingestible sensor co-encapsulated with prescribed medications (for the purposes of this study, we are using capecitabine, an OAT); (2) an adhesive wearable patch which detects medication-taking, physiologic metrics, and physical activity; and (3) software (mobile application and web portal) that aggregates and displays data. All DMP medical device components are cleared for marketing by the FDA.Fifty adultswith adjuvant colon cancer will be recruited from the Duke Cancer Institute and Duke Cancer Network community clinics in North Carolina, US. Enrolled patients will be active on the study for 3 or 6 months, consistent with completing 4 or 8 cycles of adjuvant capecitabine.The primary outcome will be adherenceto capecitabine as assessed by completion of prescribed cycles per the DMP. Additionally, we will conduct semi-structured qualitative interviews and administer surveys to assess patients' and providers' experiences with the DMP (e.g., usability, satisfaction, and impact on medication-taking).

Results: Enrollment beginning summer 2019. Results forthcoming.

Conclusions: To our knowledge, this pilotstudy will be one of the first to evaluate the role of a DMP in improving adherence to, and completion of OAT in a real-world setting, including a hospital-based pharmacy and community-based clinics. Findings could inform future randomized studies and support the expansion of DMP to enhance OAT adherence.

A1: Development of a community pharmacy-based intervention to enhance adherence to adjuvant endocrine therapy among breast cancer survivors

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Introduction: Adjuvant endocrine therapy (AET) is prescribed for 5 or 10 years to women with non-metastatic breast cancer to reduce recurrence and mortality risks. However, AET adherence is suboptimal for many women. The few interventions specifically designed to enhance AET adherence and evaluated to date have provided inconclusive results. None of these interventions was offered in the community pharmacy setting. We aim to describe the development of the PAcHA program, a community pharmacy-based intervention aiming to enhance AET adherence.

Methods: The development of the intervention was guided by the six-step *Intervention Mapping* approach: development of a logic model (Step 1); formulation of objectives (Step 2); selection of intervention methods and practical applications (Step 3); development of the intervention (Step 4); planning its implementation (Step 5); and its evaluation (Step 6). Researchers, pharmacists and women prescribed AET took part in a planning group consulted at key steps.

Results: The logic model was developed based on women's needs identified through a literature review and a qualitative study (Step 1). The behavioral outcome of the intervention is the optimal use of treatment for each woman with a new AET prescription. A woman is expected to: acquire knowledge about AET; make an informed decision about AET initiation and persistence; respect administration modalities and cope with side effects (Step 2). Motivational interviewing principles serve to guide the pharmacist intervention (Step 3). The intervention is brief and tailored to AET initiation and follow-up visits. Standardized intervention tools are available as support for pharmacists in their counseling (Step 4). An implementation plan was established and web-based training was designed to train the pharmacists (Step 5). A cluster-randomized controlled trial is planned to evaluate the intervention (Step 6).

Conclusions: The systematic approach used for developing the intervention may increase its potential for being efficiently implemented and effective.

A1: Adherence to endocrine therapy and quality of life in women with stage I to III breast cancer

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Introduction: Taking endocrine therapy for 5–10 years is recommended to prevent breast cancer recurrence and mortality. Despite the proven clinical efficacy of this treatment many women do not take their therapy as prescribed. The aim of this study was to investigate the association between adherence to endocrine therapy and quality of life (QoL) in women with stage I – III breast cancer.

Methods: Women with a diagnosis of stage I – III breast cancer prescribed endocrine therapy were identified from the National Cancer Registry Ireland (N=2,423) and invited to complete a postal survey (N=1,606; response rate=66 %). QoL was measured using the Functional Assessment of Cancer Therapy and endocrine subscale (FACT-ES). Adherence was measured by participant self-report and included suboptimal implementation (failure to take the correct dosage at the prescribed frequency) and treatment discontinuation. The association between adherence and QoL and endocrine symptoms was assessed using linear regression with adjustment for socio-demographic and clinical covariates.

Results: In total 1,211 (75 %) women were adherent; 180 (11 %) women had suboptimal implementation and 215 (14 %) women had discontinued treatment. In multivariable analysis, women with suboptimal implementation had a statistically significant lower overall QoL (β=-6.99, standard error (SE) 2.10, $p<0.01$), social QoL (β=-1.81, SE 0.54, $p<0.01$), functional QoL (β=-1.09, SE 0.44, $p<0.05$), emotional QoL (β=-1.15, SE 0.36, $p<0.01$) and experienced a higher symptom burden (β=-2.64, SE 1.07, $p<0.05$) than adherent women. Women who discontinued treatment had a statistically significant lower physical QoL (β=-0.85, SE 0.37, $p<0.05$) and social QoL (β=-1.37, SE 0.57, $p<0.05$).

Conclusions: Healthcare professionals need to ease the burden of endocrine therapy side-effects in order to improve adherence and survival in women with breast cancer.

A1: The basel approach for coNtextual ANAlysis (BANANA) in implementation science using the SMILe project as an example

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Introduction: Implementation of patient self-management support interventions (e.g., medication adherence) supported by eHealth is challenging, since high dropout rates (44–67 %), low acceptance and suboptimal sustainability in technology-based studies are observed. Successful translation into practice can benefit from implementation science methods, which require a thorough understanding of the context where the intervention will be delivered. Conceptualization of context and methods for contextual analysis are currently under construction. We aim to report the Basel Approach for coNtextual ANAlysis (BANANA) using the SMILe project as an example, which aims to develop and implement an integrated model of care in allogeneic hematopoietic SteM cell transplantation faciLitated by eHealth.

Methods: BANANA builds on the work of the Agency for Healthcare Research and Quality and is embedded in the Context and Implementation of Complex Interventions (CICI) framework. CICI differentiates between setting and context. Setting is the physical location within a context, in which the intervention is implemented. We propose to use higher granularity to map setting and to use a specific theoretical framework that fits the intervention to be implemented. Methodological approaches based on mixed methods were applied.

Results: Using BANANA in the SMILe project, we complemented the CICI with the eHealth enhanced Chronic-Care Model to assess the setting. Mapping of practice patterns relevant to chronic illness management, a technology acceptance analysis and patient's and clinician's needs-assessment, informed the SMILe-V1 prototype development (consisting of a care-coordinator and SMILe-App), as well as choice of behavioural intervention modules provided. Facilitators and barriers identified in interviews and focus groups, such as physicians limited time resources, guided choice of implementation strategies (e.g. care-coordinator).

Conclusions: BANANA is a valuable approach to guide contextual analysis in implementation science. The principles of BANANA can also be applied in other implementation science projects to make sense of context and to strengthen next steps in an implementation science project.

A2: Does HIV care engagement improve statin adherence among people living with HIV and concurrent cardiometabolic disorders?

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Introduction: Statin therapy is a mainstay of cardiovascular prevention, and people living with human immunodeficiency virus (PLWH) face an increased risk for adverse cardiovascular events. We hypothesized that better HIV care engagement (assessed by antiretroviral (ART) exposure) would be associated with higher statin adherence in PLWH.

Methods: We identified an adult cohort of PLWH who had diabetes or cardiovascular disease based on claims and were enrolled in US Medicaid for two years between 2008 and 2012. We characterized ART and statin exposure across two years and modeled statin adherence as a continuous variable (proportion of months with statin use) and a binary indicator (at least >=0.80) using prescription claims. We modeled statin exposure with linear regression and the statin binary adherence indicator with logistic regression, accounting for numerous person-level covariates. The key independent variable of interested was a three-level ART exposure measure (none, referent group; low, >0 and < 90 %; high, >=90 %).

Results: There were 16,865 PLWH who received a statin. Mean statin exposure was 16.3 ± 8.0 months: 35.2 % reached the 80 % threshold. ART exposure was: none, 45.8 %; low, 29.3 %; and high, 24.9 %. Low ART use (vs. none) was associated with a lower statin adherence (β=-0.038, p<0.001) while high ART adherence was positively associated with statin adherence (β=0.221, p<0.001). For the binary outcome, low ART adherence (vs. none) reduced the odds of statin adherence (AOR = 0.64; CI, 0.58–0.70) but high ART persistence was strongly associated with statin adherence (AOR = 4.09; CI, 3.71–4.52). When restricted to new statin users (n=7,211), results were consistent with negligible changes in parameter estimates.

Conclusions: In this large, national US-based cohort, a surprisingly high number of PLWH had no ART exposure. ART persistence was strongly associated with statin adherence, suggesting that HIV care engagement may lead to better chronic disease care.

A2: Patients' attitudes to the use of as-needed budesonide / formoterol for treatment of mild asthma

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Introduction: Combination budesonide/formoterol taken as-needed was recently shown to reduce exacerbation risk in mild asthma. This study explored patients' attitudes toward using this novel therapy.

Methods: Participants were adults with mild asthma randomized to as-needed budesonide/formoterol Turbuhaler in a multinational 52-week open-label randomized controlled trial (ACTRN12615000999538; Beasley et al. NEJM 2019). Participants were interviewed about facilitators/barriers to as-needed budesonide/formoterol use after ≥10 months' treatment. Semi-structured interviews were conducted until saturation by telephone, audio-recorded, and thematically analyzed.

Results: Interviews with 35 participants (66 % female; mean age: 43.5 [range: 18.7–74.4]; mean 5-item Asthma Control Questionnaire: 1.09 ± 0.55 [range: 0–6]) identified 5 adherence facilitator themes: *Treatment effectiveness and safety:* e.g. effective relief and/or prevention of symptoms, fewer or no side effects compared to conventional relievers; *Preference for as-needed regimen*: e.g. less difficulty remembering prevention treatment because symptoms prompted use; *Treatment cost:* e.g. single prescription to purchase; *Doctor-patient relationship:* trust in doctor's prescribing; and *Device attributes:* e.g. easy-to-use inhaler.

The 4 adherence barrier themes were: *Treatment effectiveness and safety:* e.g. less effective relief and/or prevention of symptoms, more side effect concerns or experiences compared to conventional reliever; *Attachment to trusted treatment: e.g.* faith in salbutamol puffers drove a strong preference for them; *Asthma severity*: e.g. mild or infrequent symptoms reduced the perceived necessity for taking a preventer treatment; *Device attributes:* e.g. difficult-to-use inhaler.

Most interviewees (25/35) reported being likely to use as-needed budesonide/formoterol if it were prescribed. Factors that might encourage use for the 10 interviewees who were doubtful included: trust in the doctor prescribing; discussing side effect concerns; and receiving advice that their asthma would be better long-term with this therapy.

Conclusions: Key factors important to patients may support or inhibit adherence to as-needed budesonide/formoterol therapy in mild asthma. Supportive patient-physician interactions appear essential when a new therapeutic approach is being considered.

A2: Effectiveness of using a medication adherence tool in primary care: Results of a clustered randomized controlled trial

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Introduction: Medication-non-adherence in people with chronic conditions is highly prevalent. We developed a medication adherence tool that identifies patients with an increased risk for non-adherence and their personal adherence barriers and subsequently guides the pharmacist to deliver a tailored intervention strategy to overcome those barriers. We evaluated the effect of using the tool in starters with cardiovascular or oral blood glucose lowering medication.

Methods: We performed a cluster randomized controlled trial in 15 community pharmacies in the Netherlands. Pharmacies were randomized into intervention pharmacies using the tool and control pharmacies providing usual care. In all pharmacies, patients were included when they started with cardiovascular or oral blood glucose lowering medication. The primary outcome was adherence with the initiated medication in patients with an increased initial risk of non-adherence at 8 months follow-up calculated from pharmacy dispensing data.

Results: In the 15 participating pharmacies 492 patients (intervention: 253; control 239) met the inclusion criteria, gave their consent, completed the first questionnaire and had medication data available, 50 % were at high non-adherence risk. The results showed no effect of the intervention on medication adherence (-0.01; 95 %CI-0.59 – 0.57; p = 0.96). A post hoc per protocol analysis showed a non-significant positive result (0.19; 95 %CI -0.50 – 0.89; p=0.58). Additional analyses showed that adherence in the control group was significantly higher than the overall adherence in starters from the control pharmacies (72.8 % versus 47.8 %).The positive predictive value of the risk assessment was 33.9 % and of the barrier assessment was 74 %.

Conclusions: Possible explanations for the lack of effectiveness of the intervention were a lower number of patients included than planned, higher adherence rates in the control group than anticipated, poor quality or lack of intervention execution. Process evaluation should elicit possible improvements and inform the redesign of the intervention and implementation.

A2: What happens in treatment initiation consultations? Mapping communication strategies in patient-provider interactions

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Introduction: Medical consultations at treatment initiation may improve adherence to medication, e.g. by providing information and advice or addressing any concerns. Various communication strategies are recommended and used by healthcare professionals and patients in consultations. Prior studies usually focus on use and effects of specific strategies, without considering their co-occurrence with other communication strategies. Examining interrelationships between

strategies would enable better understanding of how patient-provider communication takes place and possibly affects adherence. We aimed to explore whether co-occurrence of communication strategies at initiation of immunosuppressive treatment for inflammatory bowel disease can be used to identify 1) distinct consultation types, and 2) communication patterns within consultations.

Methods: Consultations (N=164) in which nurses (N=8) discussed treatment with patients were recorded, transcribed and coded. The coding scheme included categories (N=76) of validated coding instruments potentially related to adherence based on previous research. Cluster analysis (hierarchical, k-means) and network analyses (partial correlation coefficients with adaptive and graphical LASSO regularization) were performed on strategies occurring in >10 % consultations.

Results: Fifty five categories occurred in >10 % consultations. Consultations were rather homogenous regarding strategies used, i.e. no distinct clusters were identified. Network analyses highlighted several groups of strategies that tended to co-occur. For example, when nurses gave information about the medication, they used medical jargon which often co-occurred with patients asking questions. Recall promoting techniques (categorizing, summarizing and repeating) often occurred with nurses actively acknowledging patients' medication concerns (e.g., reassuring the patient). When patients expressed their concerns about side effects and their wellbeing, nurses often reacted minimally or acknowledged that these concerns were legitimate.

Conclusions: Cluster and network analyses can be used to unravel most prominent (patterns) of communication strategies in discussing medical information and thus describe consultations more synthetically. Their impact on medication adherence needs to be examined in future research.

A2: Brief complex intervention to improve patients' beliefs and skills on inhaler use and its clinical impact in COPD and asthma

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Introduction: Inhaled medications are the treatment of choice to treat respiratory conditions such as asthma and COPD. However, unintentional non-adherence to these medications is frequent, usually driven by lack of skills, incorrect technique and inappropriate medication use. There is evidence this is linked to poor clinical outcomes. Interventions involving patients' empowerment could positively impact those outcomes. This study aims to evaluate the effectiveness of a complex intervention improving inhaler technique. AdherenciaMED is a research program, led by General Pharmaceutical Council of Spain, University of Granada and University of Technology Sydney, funded by Cinfa Laboratories.

Methods: A six-month cluster randomized controlled trial was conducted in six Spanish provinces. Community pharmacies were randomized into a Control (CG) and Intervention Group (IG). Adult Asthma and COPD patients were included. After identifying unintentional non-adherence, patients in the IG received a monthly brief complex intervention based on various frameworks for changing patient behaviour. Inhaler technique and clinical outcomes (Asthma control and Clinical COPD Questionnaires) were recorded in an electronic data collection form.

Results: A total of 92 pharmacies and 582 patients (249 COPD and 333 asthma) were included in the study. At the end of the study, the proportion of patients with correct inhaler technique was statistically significantly higher in the IG compared to the CG [63.3 % (CG) and 89.2 % (IG), $p<0.05$]. A similar trend was observed for asthma control [58.8 % (CG), 70.5 % (IG), $p<0.05$] and COPD control [30.4 % (CG), 47.6 % (IG), $p<0.05$]. Further sub-analysis regarding critical errors and types of inhaler and clinical are being conducted and will be reported.

Conclusions: A brief complex intervention delivered by community pharmacists was effective at improving inhaler use with associated enhancement of clinical outcomes. The study indicated that continuous follow-up and assessment of inhaler technique is crucial. Future exploration of the integration of these services in daily practice should be considered.

A3: Changing public beliefs about antimicrobials and antimicrobial resistance using the Necessity-Concerns Framework (NCF)

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Introduction: Patient demand is an important driver of inappropriate antibiotic prescribing. Demand is often driven by misplaced patient beliefs about antibiotics (high perceived antibiotic Necessity (AB-Necessity) and low concerns about antibiotic harm (AB-Concerns), which is in line with the Necessity Concerns Framework (NCF). The NCF has not been applied previously to target antibiotic demand and AMR. The aim of this study is to test an online NCF-tailored intervention to identify and change misplaced beliefs about antibiotics (i.e. high Necessity, low Concerns) associated with inappropriate antibiotic demand.

Methods: Participants were recruited via Amazon mTurk, an online survey platform, and research networks. Participants aged 18 years or older, and residing in the UK, were included. Participants were presented with a hypothetical situation of cold and flu symptoms, then exposed to the online intervention. The intervention was delivered by the Persignia™ algorithm; this algorithm profiles patient beliefs and delivers targeted behaviour change messages to address these beliefs. Patient beliefs and knowledge were measured post-intervention using an adapted version of the Beliefs about Medicines Questionnaire, and a paired samples t-test used to determine the effect of the intervention.

Results: A total of 100 respondents completed the online study between 19th November and 11th December 2018; 81 were recruited via the Amazon mTurk platform (the mTurk sample), and 19 from research networks (the non-mTurk sample). Significant positive shifts in beliefs about antibiotics related to demand, and antibiotic knowledge occurred after exposure to the intervention. Total AB-Necessity beliefs reduced by 2.29 points after the intervention ($t=7.254$; $p<0.0001$), with an increase in AB-Concerns by 0.93 points ($t=-7.214$; $p<0.0001$). There was a corresponding increase in antibiotic knowledge by 0.92 points ($t=-4.651$; $p<0.0001$).

Conclusions: Beliefs about antibiotics associated with inappropriate demand, and antibiotic knowledge, can be changed using an online NCF-tailored intervention.

A3: Self-management of medication by the patient in hospital: Development and evaluation of a structured and evidence based intervention

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Introduction: Self-management of medication by patients during hospitalization regularly occurs. A structured and evidence base approach seems absent. Literature suggests its potential to positively influence self-management of medication after discharge and related medication adherence.

The SelfMED project aimed to (1) describe the legal context of self-administration of medication and current practices including the prevalence of self-administration of medication in Flemish hospitals;

(2) explore and describe the willingness of patients, nurses, physicians and hospital pharmacists to perform or allow self-administration of medication, their attitude towards it, and prerequisites and perceived consequences of self-administration in hospital; (3) develop and validate an evidence based SelfMED procedure for self-management of medication by patients whilst in hospital, and to evaluate the safety, feasibility and acceptability of the SelfMED procedure.

Methods: A combination of methodologies was used. Cross-sectional quantitative and qualitative designs were used in order to describe current practices and explore the context. In close collaboration with stakeholders (patients, health care providers, legislators and professional associations) procedures and tools were developed. In a pilot test on a cardiology ward, the feasibility and acceptability of the SelfMED intervention was tested.

Results: At the start of the project 22 % of hospitalized patients (n=1269 multicenter) self-administered at least one medicine and 41 % was deemed capable. Only a few wards had a procedure, a screening tool to assess the eligibility, monitoring tools or educational support. Stakeholders were willing to allow or perform self-administration of medication in hospital. Important conditions and prerequisites for implementation were reported. After the development, the intervention (procedure, tools) was evaluated in 159 consecutive patients. Based on the interprofessional stepped assessment, 61 patients were found capable to self-manage. In 367 self-managed medicines three (0.8 %) administration errors were observed.

Conclusions: The approach and SelfMED intervention were positively evaluated. After some minor adjustments, the effect on medication adherence after hospital discharge can be tested.

A3: Optimizing pharmaceutical care for pediatric eczema patients: Improving knowledge and perceptions of pharmacy staff

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Introduction: Not all children with eczema use their medicines as prescribed. Non-adherence may be the result of steroidphobia or incorrect knowledge. Pharmacy staff has an important role to inform (parents of) children with eczema on appropriate medication use. We previously showed that pharmacy staff themselves expressed concerns towards topical steroid use. This may lead to non-adherence at the patient level. We aimed to implement an intervention for community pharmacy staff to improve knowledge and stimulate positive perceptions towards topical steroid use, in order to optimize patient counseling and support good medication use.

Methods: We developed an intervention consisting of a knowledge test, background information about eczema (treatment) and materials for patient counseling. The intervention was implemented in 10 Dutch community pharmacies. At baseline and follow-up (3 months), pharmacy staff filled out a questionnaire. The TOPICOP questionnaire was used to assess steroidphobia (beliefs and worries). Higher scores indicate a more negative attitude. Knowledge was assessed using the Royal Dutch Pharmacy Association knowledge test for eczema, with sum scores ranging between 0 and 10.

Results: A total of 32 pharmacy staff members participated, 19 of them also filled out the follow-up questionnaire. There was a decrease in (negative) beliefs (38.4 % vs. 31.6 %) and worries towards topical steroid use (36.1 % vs. 19.1 %) at baseline vs. follow-up. Knowledge of pharmacy staff increased (increase from 7.3 to 8.4). All pharmacy staff members mentioned the toolbox to be useful and clear, in particular materials for patient education. Most of them indicated that they improved the patient's treatment by giving advice on proper medication use, but also practical solutions such as advice on (limited) bathing.

Conclusions: Knowledge and opinions of pharmacy staff regarding treatment of pediatric eczema can be improved by implementation of a relatively simple intervention. This will lead to improved patient counseling with better adherence rates as a result.

A3: Identifying and addressing patient beliefs driving short-acting beta-agonist use and over-reliance using an online digital intervention

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Introduction: Reliance on and overuse of short-acting beta-agonists (SABA ROU) increases the risk of asthma attacks[1] and is recognised by GINA as a key issue in asthma management. Patient beliefs can drive SABA ROU – assessing these can identify those at risk of ROU. The aim of this study was to assess patient beliefs influencing SABA ROU and whether such beliefs can be changed online by brief, behaviourally-intelligent messages.

Methods: A total of 446 people with self-reported asthma, recruited via Amazon mTurk, completed validated questionnaires assessing perceptions of SABA and anti-inflammatory reliever (Necessity Beliefs and Concerns)[2] and reported adherence[3]. We examined whether beliefs about SABA and anti-inflammatory reliever were amenable to change in a subset of 55 patients who, after completing the baseline questionnaires, were exposed to brief messages designed to change their beliefs. The questionnaire assessments were repeated immediately after exposure to the messages, and 2 weeks later.

Results: Many patients held beliefs about SABA that were consistent with over-reliance. For example, 71.7 % (320/446) believed that '*using their reliever was the best way to 'keep on top of their asthma'* and 59.9 % (267/446) agreed that '*the benefits of the reliever markedly outweighs any risks*'. Over-reliance on SABA correlated with low adherence to inhaled corticosteroids ($p<0.0001$). Significant changes in beliefs driving SABA ROU occurred after exposure to brief, behaviourally-intelligent messages at both timepoints ($p<0.0001$).

Conclusions: Patient beliefs driving SABA ROU are amenable to change using online brief behaviourally-intelligent messages. There is potential for this intervention to be used by clinicians to reduce SABA ROU and improve patient asthma outcomes.

1. Pavord et al. Lancet 2018;391:350–400.
2. Horne et al. Psychology & Health 1999;14:1–24.
3. Cohen et al. Ann Allergy Asthma Immunol 2009;103:325–31.

A4: Behavioural determinants of adherence to preventive medication in adults with cardiovascular disease: applying the IMAB-Q questionnaire in community pharmacies

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Introduction: Effectively supporting medication adherence requires practitioners to work with patients to identify and address modifiable adherence determinants. The Identification of Medication Adherence Barriers Questionnaire (IMAB-Q) is an evidence and theory-based tool for supporting health practitioners in achieving this goal. IMAB-Q design was underpinned by the Theoretical Domains Framework (TDF); a collation of behaviour change constructs grouped into 14 domains. We aimed to identify key patient-reported modifiable determinants of adherence to cardiovascular disease preventative medicine.

Methods: The 30-item prototype version IMAB-Q comprised three statements for each of 10 TDF domains relevant to non-adherence. Each statement invites a response on a 5-point Likert scale ranging from strongly agree (score=1) to strongly disagree (score=5); higher scores indicate stronger barriers to adherence. Adults prescribed medication for cardiovascular disease prevention, recruited from nine community pharmacies, completed the IMAB-Q and self-reported adherence using a visual analogue scale (VAS).

Results: Among 608 respondents, the mean (95 %CI) IMAB-Q score for respondents reporting <80 % adherence (VAS) was significantly higher (p=0.016, ISTT) at 56 (52, 60) compared with 50 (49, 51) for those reporting >=80 % adherence. Concern about unwanted medication effects (beliefs about consequences TDF domain, n=212; 34.5 %) and negative emotions relating to medication taking being burdensome and an unwelcome reminder of their condition (emotions domain, n=99; 16.1 %) were the most frequently reported determinants representing adherence barriers.

Conclusions: The IMAB-Q identified key behavioural targets to prioritise for adherence interventions do not align with current practice. Practitioners largely focus on patient capabilities such as knowing how and remembering when to take their medication. The resulting adherence interventions are compliance aids, regimen simplification and counselling regarding how to take the medication. There remains an unmet need for patients; this could be addressed through interventions designed to address concerns about side effects and negative emotions evoked by taking medicines.

A4: Medication adherence barriers to oral antibiotics – a focus group discussion enriched by literature

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Introduction: Adherence and persistence to oral antibiotics (AB) are crucial to reach health outcomes, avoid antimicrobial resistance, and decrease healthcare consumption. Adherence rates to oral AB between 48.4 % and 76 % have been observed in patients attending a community pharmacy. We aimed to identify and prioritise barriers to adherence to oral AB. We then categorised modifiable barriers associated with non-adherence to oral AB following the Theoretical Domains Framework (TDF) adapted by Allemann et al.

Methods: We performed a systematic literature search in Pubmed to retrieve published barriers to adherence to oral AB. Patients who had taken oral AB within the past six months were invited to a focus group discussion (FGD). They generated barriers and prioritised them by adjudicating points according to importance. Barriers with a low rating (<1st quartile, Q1) were excluded from further proceeding. Two investigators (MH, AS) categorised collected barriers independently into the TDF.

Results: In total, 192 articles were retrieved that reported on 36 modifiable barriers. FGD participants (n=8) mentioned 26 barriers of which 6 were not mentioned in the literature. FGD participants rated "Difficulties in integrating the regimen into daily life" and "No awareness of consequences of missed intake" as the most significant barriers. "Feeling ashamed" or "Financial aspects" were excluded (<Q1). Finally, 23 barriers were identified that fitted into 9 out of 11 TDF domains. Essential domains were "Beliefs about consequences" and "Environmental context and resources – regimen".

Conclusions: Our results suggest that 23 barriers and 2 theoretical domains seem particularly important for adherence to oral AB. Tackling issues related to "Beliefs about consequences" may be key to overcome some barriers. Our findings may serve to assess medication adherence barriers to oral antibiotics in healthcare settings. A future study will investigate whether a targeted intervention may ameliorate medication adherence to oral AB.

A4: Racial disparities in antihypertensive medication persistence among New York City Medicaid beneficiaries: Challenging the conventional wisdom about African-American adherence

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Introduction: Prior research has consistently shown that African-Americans have poorer anti-hypertension (AHT) medication adherence and has suggested that this disparity contributes to the higher rate of cardiovascular mortality among African-Americans in the U.S. However, few of these prior analyses have controlled for socioeconomic differences, the capacity to pay, or the interaction of race and ethnicity. Our objective was to evaluate the role of race and ethnicity on persistence in a patient sample with nearly uniform socioeconomic status and medication costs.

Methods: Using New York State Medicaid administrative claims data, we identified a cohort of 9,877 adult patients (18–65) from New York City who were prescribed AHT medication in 2015 (no AHT claims in the prior 270 days) and were continuously eligible for Medicaid benefits from 2015–2016. Patients self-identified their race and ethnicity. Discontinuation was defined as not having therapy days in the final 90 days of a year-long evaluation period. Multivariable Cox hazard modeling was used to assess racial and ethnic differences in discontinuation, controlling for multiple confounders including age and drug class.

Results: Overall, 44.2 % of new AHT patients discontinued treatment within one year. Among the 66 % of patients who were Non-Hispanic, African-Americans discontinued at a nearly 20 % lower rate than Whites (HR 0.81; 95 % CI 0.73–0.89, p-value<.001). This disparity in discontinuation rates was most pronounced during the first 90 days of therapy (i.e., "early discontinuation period"). By contrast, among Hispanic patients, there was no racial disparity in discontinuation (p-value=0.95).

Conclusions: Among New York City Medicaid patients who self-identified as Non-Hispanic, African Americans who were new to AHT medication therapy discontinued at a significantly lower rate than Whites. These findings challenge the potentially reductive conventional wisdom that African Americans demonstrate poorer AHT medication adherence. They suggest that socioeconomic, ethnic, and cultural factors may account for previously observed racial disparities in AHT medication adherence.

A4: Association between chronic opioid use and antiretroviral therapy adherence among people with HIV

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Introduction: Chronic pain is common in people living with HIV (PLWH). Effective pain management in PLWH may lead to improved antiretroviral therapy (ART) adherence. We examined ART adherence among those with chronic opioid use in a low income population with HIV in the US.

Methods: Using a previously established cohort of PLWH enrolled in Medicaid, we characterized annual opioid prescription patterns (2001–2012). Chronic opioid use was defined as ≥180 days of opioids for enrollees each calendar year. Annual study outcomes were ART adherence (proportion of days covered, PDC ≥90 %). We modeled the associations between opioid use and ART adherence, accounting for substance use disorder (SUD) and subject characteristics with generalized estimating equations of person-year data.

Results: During the entire period, we analyzed data for 297,287 PLWH: mean age increased slightly over time [40±9 years in 2001 to 43±12 in 2012], while sex (female, 50 %) and race (black 53 %; white: 18 %) annual distributions were stable. Chronic opioid use increased from 7.7 % (2001) to 11.7 % (2012). The most common opioid products in 2012 contained hydrocodone (20.4 %), oxycodone (19.5 %), tramadol (10.9 %), and codeine (9.3 %). Annual ART adherence averaged 54.3 %. Chronic opioid use was significantly associated with ART adherence (AOR=1.52, 99 % CI, 1.49–1.55), after adjusting for subject characteristics. Those with chronic opioid use had better ART adherence regardless of SUD status.

Conclusions: In this large, national US sample of PLWH, we demonstrated that chronic opioid use was associated with better ART adherence. Chronic opioid use may signal stronger care engagement, even among people with SUD. One possible explanation is that managing pain may lead to better patient-physician interactions. Further work is needed to identify the mechanism(s) influencing these outcomes.

A5: Theory-driven development of an intervention including user-stories for future eHealth translation to support medication adherence in allogeneic stem cell transplantation

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Introduction: eHealth supported care models in follow-up of allogeneic stem cell transplantations (alloSCT) are demanded by the National Institutes of Health (USA). Medication adherence (MA) support should be an integral part of eHealth supported care, since adherence to immunosuppressive drugs (IS) is essential to prevent or treat side effects after alloSCT (e.g. Graft-versus-Host Disease). We report the theory-driven development of a MA intervention module as part of the development, implementation and testing of an *Integrated model of care in hematopoietic SteM cell transplantatIon faciLitated by eHealth* (SMILe).

Methods/Results: We applied Michie's Behavior Change Wheel and the Capability-Opportunity-Motivation and Behavior (COM-B) model with following steps: (I) *Correct taking* and *timing of IS* were defined as target behaviors. (II) Quantitative and qualitative evidence, clinical expertise and data from a comprehensive contextual analysis were compiled using COM-B, e.g. in the dimension Capability *lack of knowledge* and *lack of routine* need to change, in Opportunity *lack of cues* and *interruptions in daily routine* and in Motivation *lack of problem solving* as well as *trivialization/denial* need to change. (III) Seven intervention functions were chosen, e.g. *education*, *training* and *enablement*. (IV) 24 behavior change techniques (BCT) were selected, e.g. *information about health consequences*, *goal setting*, *action planning* and *problem solving*. (V) User-stories were developed to guide the future agile software development process of the SMILe app. Linked to the BCT *action planning*, e.g. we formulated the user-story: "As a patient, I want to read information how to plan actions (e.g. leaving home) so that I don't forget necessary preparations".

Conclusions: This theory-driven developed MA intervention module will be integrated in an eHealth application of the SMILe integrated care model, which will be implemented and tested as part of an implementation science study. The applied methods can be adopted to the development of other eHealth applications.

A5: Nurses' role in monitoring medication adherence and interprofessional collaboration: Experiences of pharmacists, physicians and nurses

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Introduction: Within interprofessional care, nurses' role in monitoring medication adherence (MMA) is not well defined. The lack of transparency, can hinder interprofessional collaboration and impact patient outcomes. An interprofessional model that describes nurses' role allows the development of more competence based curricula to prepare students for clinical practice. European labour mobility, research, development and policy ask for an international model. The aim of this study (part of the European DeMoPaC study) was to describe nurses' role and interprofessional collaboration in MMA and evaluate it from the viewpoint of pharmacists, physicians and nurses.

Methods: 16 European countries participated in a multimethod study (online survey and semi-structured interviews). Firstly, a convenience sample of pharmacists, doctors and nurses with an active role in MMA was questioned on nurses' involvement in MMA and experiences in interprofessional collaboration (10 point scale). Descriptive statistics in SPSS were conducted. Secondly, interviews in key-informant pharmacists, physicians and nurses, for nurses' role in MMA, were performed and analysed using thematic analysis.

Results: 6822 respondents completed the survey (854 pharmacists, 984 physicians, 4984 nurses), followed by 262 interviews (80 pharmacists, 91 physicians, 91 nurses). Nurses had an active role in MMA. However, insufficient interprofessional interactions were reported and an open dialogue was missing. The mean score for interprofessional collaboration on MMA was 5.7/10, between nurses and pharmacists 3.8/10 and between nurses and physicians 6.6/10. The majority (95 %) was convinced of the positive impact on care quality if nurse involvement in MMA would increase. Medication adherence could be increased by aligning complementary knowledge of different professionals. Lack of time, shortage of nurses and limited education were perceived as main threats.

Conclusions: Nurses have an active role in MMA. Interprofessional collaboration should be extended. Collaboration between nurses and physicians is limited and between nurses and pharmacists even more. Nurse educational programmes should focus more on MMA.

A5: Associations between ART failure with wildtype virus and adherence to second-line ART regimen: A secondary analysis of prospectively collected data

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Introduction: Recent studies show that patients who switch to second-line anti-retroviral therapy (ART) without a resistant virus experience worse outcomes compared to those with a resistant virus. This inverse relationship is often attributed to better adherence by patients who switch to second-line with a resistant virus. We conducted a secondary analysis of prospectively collected data to investigate whether the resistance status of a virus the patient fails first-line ART with, is associated with their adherence and virologic failure in a PI-based second-line ART. We *apriori* postulated that patients who switch to second-line with resistance will display better adherence to second-line ART.

Methods: Participants aged 18 years or older at nine sites for whom first-line ART had failed with HIV-RNA concentrations greater than 1000 copies per ml were enrolled. We retrospectively sequenced the reverse transcriptase (RT) and protease (PR) regions of the HIV genome on stored plasma samples which were prospectively collected at enrolment during the AIDS Clinical Trials Group (ACTG), A5234 clinical trial study using Real-time population based HIV drug resistance testing with a laboratory developed assay that was DAIDS virology quality assessment (VQA) certified at BARC-SA/Lancet laboratories, South Africa. We measured the level of HIV resistance to both first-line and second-line ART regimens and adherence using the Stanford HIV drug resistance database and electronic monitors respectively. We compared adherence between patients with and without significant resistance at first-line ART failure.

Results: Switching to second-line ART with a virus resistant to first-line ART was associated with better adherence to second-line ART regimens: OR 5.28, $p<0.01$ and was also protective against second-line ART virologic failure: OR 0.41, $p<0.01$.

Conclusions: This study demonstrates that patients having resistance at first-line ART failure adhere better in second-line. Both better adherence and the beneficial effect of Lamivudine resistance, caused by the M184V/I mutations accounts for the documented inverse associations.

A5: The perceptions of HIV+ patients on real-time measuring and monitoring of antiretroviral adherence

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Introduction: Real-time adherence monitoring enables researchers and health care providers to detect any adherence lapses and provide immediate feedback that can result in tailored personalized timely interventions. The aim of this study was to describe and analyze the perceptions and experiences of HIV+ patients towards medication adherence and real-time adherence monitoring with a focus on ingestible sensors (IS).

Methods: This was a hybrid study consisting of a literature review and qualitative data collection. For the literature review; PubMed was searched for English language articles 2011–2019 using the key word "medication adherence" in combination with other relevant terms such as "real-time monitoring, HIV, perceptions". For the qualitative data collection, patients who were part of a trial using the IS system were recruited at UCLA-harbor Medical center by purposive sampling. Semi-structured interviews were conducted and audio-recorded at day 3, weeks 2 and 4 regarding using the IS system. Audio recordings were then transcribed verbatim and thematic analysis was performed using "QSR NVIVO version 10©".

Results: A total of 11 peer-reviewed papers were included in the results describing MEMS©, Wisepill©, Med-e-Monitor, Real-Time Medication Monitors and IS system. Participants in the literature review had mixed opinions on the use of the devices between invasiveness and helpfulness with medication taking. Fifteen patients were interviewed, and the thematic analysis resulted in five main themes. The overall experience was for some patients the IS system can teach them to take their medication at the same time. Others found that it was a new kind of responsibility that takes time and effort getting used to. Most patients said they would recommend the system to others.

Conclusions: IS system is a novel method of real-time measuring and monitoring adherence with advantages and disadvantages. Taking patient experiences into consideration will enhance the development of more useful tools that meet patients' needs the most.

A6: Adding GINA step 5 therapies to ICS/LABA in a real-life moderate/severe asthma population: is inhaler adherence a treatable trait?

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Introduction: Global Initiative for Asthma step 5 therapies (GINA-5), other than inhaled corticosteroids and long-acting beta agonists in fixed dose combinations (ICS/LABA FDC), often entail more expensive (e.g. monoclonal biologics) or less safe [e.g. maintenance oral corticosteroids (OCS)] treatments. It is therefore important to assess poor inhaler adherence as a possible cause of sub-optimal response to ICS/LABA FDC before additional GINA-5. Our aim was to determine the rates of, and time to, additional GINA-5 following first-year ICS/LABA FDC use, and their association with inhaler adherence.

Methods: Patients initiating ICS/LABA FDC between 2013 and 2017 were identified from Australian national dispensing data. Group-based trajectory modelling was used to estimate medication adherence patterns. Multivariable Cox proportional hazards models were used to examine the association between adherence trajectories and GINA-5 addition during 2-year follow-up.

Results: In total, 3062 new ICS/LABA FDC users were identified of whom 120 (3.9 %) received additional GINA-5 (OCS:89; LAMA:39; biologics:1). Mean time to commencing additional GINA-5 was 705.2 (SD 1.7) days. Adherence trajectories were: non-persistent use (20 %), seasonal use (8 %), poor adherence (58 %), and good adherence (13 %). Although poor adherence was associated with longer time to additional GINA-5 (adjusted HR: 0.58; 95 %CI: 0.35–0.95), over 80 % of additional GINA-5 was commenced in poorly-adherent patients. Use of ≥2 OCS/antibiotic courses also predicted additional GINA-5.

Conclusions: Almost one in 20 people with asthma commenced additional GINA-5 after ICS/LABA initiation, most of whom (>80 %) were poorly-adherent to inhaled preventers. There is a substantial unmet need for inhaler adherence to be addressed prior to prescribing additional GINA-5.

A6: Identifying patients at risk for disengagement from HIV care and sub-optimal clinical outcomes

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Introduction: HIV treatments have dramatically increased in simplicity, efficacy, and tolerability, but lifelong engagement in care and medication adherence are necessary to achieve optimal health outcomes. Approaches to define, measure, and intervene on the broader construct of engagement in care have been limited. We describe the development and validation of the HIV Index, a patient-centered measure of perceived engagement in care for patients in HIV clinical care.

Methods: Using an online Delphi process with stakeholders (clinicians and researchers with expertise within and outside of HIV) and patient focus groups, a 10-item measure was developed to assess patient, provider, and clinic dimensions of engagement in care. The HIV Index was administered as part of clinical care to patients at 7 US HIV clinics, and validated cross-sectionally and prospectively.

Results: 3,339 patients completed the HIV Index across the 7 sites, and factor analyses supported a single underlying dimension of engagement in care (α=.88). Lower Index scores were associated with higher concurrent reports of depressive symptoms, HIV stigma, and substance use. Higher Index scores were related to higher recent self-reported medication adherence, medical record verified appointment attendance, and suppressed HIV viral load. Among 2,716 patients with 12-months follow-up, higher HIV Index scores at baseline predicted higher subsequent odds of self-reported perfect medication adherence (OR=1.82), odds of keeping the next scheduled clinic visit (aOR=1.24[95 %CI=1.05–1.48]), odds of keeping all scheduled appointments over the next year (aOR=1.22[95 %CI=1.05–1.41), and greater odds of sustained suppressed HIV viral load (aOR=1.63 [95 %CI=1.31–2.03]).

Conclusions: Findings support the HIV Index as a brief screener of engagement in care that predicts subsequent retention in care, adherence to medications, and odds of sustained virologic control. The Index has the potential to identify patients at risk for disengagement from care and for the implementation of real-time interventions to address perceived barriers to engagement in care.

A6: The relationship between real-world inhaled corticosteroids adherence and asthma outcomes: A multilevel approach in a longitudinal asthma cohort

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Introduction: Low inhaled corticosteroids (ICS) adherence is associated with increased asthma burden. This relationship is likely bidirectional, and may vary across the three adherence stages (initiation, implementation, persistence). Studies rarely examine reciprocal influences. Therefore, the aim of this study was to investigate the relationship between ICS implementation and asthma-related outcomes across two years, considering bidirectionality and temporal sequence.

Methods: This study used primary care records (1987–2012) from the Optimum Patient Care Research Database, United Kingdom. Eligible patients had ≥3 years continuous registration starting 1 year before ICS initiation (index date), physician-diagnosed asthma, were ≥6 years, had ≥2 ICS and/or short-acting beta-agonists (SABA) prescriptions in each follow-up year, and used no long-acting beta-agonists, leukotriene receptor antagonists or maintenance oral corticosteroids in the year before index date. ICS implementation (percentage of days covered) and risk domain asthma control (RDAC; defined as no hospitalizations, emergency visits or outpatient visits related to asthma, and no oral corticosteroid or antibiotic prescriptions with evidence of respiratory review) were estimated for each prescription interval (period between two successive ICS prescriptions). Multilevel analyses modeled simultaneous and lagged relationships between ICS implementation and RDAC (and its components), controlling for socio-demographic and clinical characteristics.

Results: Prescription data from 10,472 patients were included. ICS implementation in the preceding interval did not predict RDAC, but was weakly positively associated with simultaneous RDAC. Being male, non-current smoker, without a COPD diagnosis and having <4 comorbidities significantly increased odds of RDAC. Asthma-related antibiotic prescriptions and asthma-related outpatient visits in the same interval, and SABA overuse in the preceding and same interval predicted lower ICS implementation.

Conclusions: The lack of an association between ICS implementation and RDAC in consecutive intervals may suggest that in long-term care, patients may adapt their ICS use to meet their current needs without this impacting their later RDAC.

A6: Adherence to oral antidiabetics: A cohort study of patients participating in an interprofessional chronic patients support program in Switzerland

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Introduction: Medication non-adherence is high in type 2 diabetes (DT2) patients and is associated to low clinical and economic outcomes. An interprofessional patient support program to investigate the pharmacist's contribution in chronic care management was implemented in the French-speaking part of Switzerland. The program includes motivational interviewing (patient-pharmacist), electronic drug monitoring (MEMS, Aardex MWV) and feedback reports to the physician. The aim of this study was to assess the effectiveness of this program for DT2 patients.

Methods: This is a prospective, multicenter, observational cohort study. DT2 patients were recruited by 27 community pharmacies whatever their level of adherence. Adherence was measured for at least one oral antidiabetic drug using electronic monitoring. Correct intake on a given day was defined as taking at least all prescribed doses of all monitored diabetes medications on that day. Adherence was estimated each day of the follow-up as a product between implementation (Generalized Estimating Equations model) and persistence (Kaplan-Meier survival curve). Clinical outcomes and quality of life (QoL) were analyzed using linear mixed-effect models.

Results: 212 patients were included: 120 (57 %) were followed ≥ 15 months. 140 (66 %) patients were male, mean age was 64±11 years and mean number of chronic drugs was 5±3. Implementation was stable at around 88 % during 15 months (n=178 patients, 84 %). At 15 months, persistence was 95 %, seven patients discontinued their monitored treatment. At baseline, mean HbA1c and BMI were 7.5 % and 31 kg/m^2 respectively and decreased by 0.5 (p=0.012) and 0.6 units (p=0.017) over 15 months. QoL remained stable over time.

Conclusions: Implementation and persistence at 15 months were high and HbA1c decreased over time. The program seems to support medication adherence and clinical outcomes. This finding deriving from real-life community pharmacies and primary care physicians needs to be further explored in well-designed studies exploring the impact of the intervention versus standard care.

Poster Viewing and Oral Poster Presentations

Poster Viewing with Oral Poster Presentations

P.01 Who can benefit from digital solutions for polypharmacy management?

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Introduction: On 2017, the proportion of European citizens aged 65+ was 19.4 % and it is expected to be 29.1 % in 2080. Polypharmacy, usually defined as the concurrent use of 5 or more medications, goes in parallel with ageing of population. Across Europe, 32.1 % of older adults are polymedicated. To face these challenges, several approaches based on digital solutions for polypharmacy management are being developed. But, actually, who may benefit from these solutions?

Methods: Therefore, in this study we evaluated the prevalence of digital skills among polymedicated older adults. In this cross-sectional analysis, we used data from participants aged 65 or more years from Wave 6 of the Survey of Health, Ageing, and Retirement in Europe (SHARE). Digital skills were assessed through the question "How would you rate your computer skills (personal computer and/or tablet?", and answers were rated as: *good*; *basic* and *never used a computer.* Its association with country, gender, age and shortage of money was studied.

Results: Our final sample included 10,452 participants, being 57.7 % female, with an average age of 76.2 ± 7.1 . Overall, 14.0 % of participants have *good* digital skills, 31.0 % have *basic* digital skills and 54.6 % have *never used a computer.* Absence of digital skills was higher in older participants, in women and in participants that reported shortage of money. Denmark (37.5 %), and Sweden (28.4 %) were the countries with better digital skills, while Spain (3.4 %) and Greece (3.2 %) exhibited lower proportion of good computer skills.

Conclusions: Digital tools are reshaping the landscape of healthcare, and efforts are being made to develop digital solutions for management of polypharmacy. Herein we found that the prevalence of good/basic digital skills is still low over community-dwelling elderly people. Therefore, it is important to improve digital skills and promote health literacy so that patients may benefit from digital transformation in healthcare.

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P.02 A consumer designed smartphone app for young people with asthma: Engagement and acceptability

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Introduction: We have published the consumer-driven development processes for a goal-setting smartphone app, Kiss myAsthma (Davis 2017, J Asthma). The present research aimed to pilot test the six week engagement, acceptability, and usefulness of the app in young people with asthma.

Methods: Young people aged 15–24 years old were invited to trial the Kiss myAsthma smartphone app to support their asthma management for six weeks. A mixed-methods approach combined quantitative analysis of self-report questionnaires and app usage log data with qualitative thematic analysis of open-ended questions at baseline and six weeks after downloading the app. App log data (pages visited, frequency of use and content of participants interaction, e.g. goals set, symptoms recorded) were analysed.

Results: Nine participants completed self-report questionnaires at baseline and six-weeks. Participants reported high satisfaction with app content and usability (median score 5 out of 6 [range 4–6]) and rated the app highly on 'having easier discussions with my doctor about asthma' and 'feeling confident in my ability to manage my asthma'. At 6 weeks there was a clinically signification change in asthma quality of life (e.g. Emotional Function domain score baseline: 4.7 [2.7–6.3], follow-up: 5.7 [4.7–6.7]; p=0.043). Participants logged information about asthma severity, flare-ups and mood and tracked their symptoms with the app's History functionality. Five participants (42 %) nominated asthma management goals and strategies and 3 participants (25 %) entered data in the Inspiration section, a tool to support intrinsic motivation to manage asthma. Qualitative data aligned with quantitative results.

Conclusions: This six-week pilot of the Kiss myAsthma app showed it's potential to support self-management, quality of life and health behaviour change in young people with asthma. A recent systematic evaluation rated Kiss myAsthma as having the highest number of behavior change techniques and highest quality scores of available asthma management apps (Ramsey 2019, JACI: In Practice).

P.03 Inodiab: Randomized study evaluating the impact of personalized SMS (with TTM) on compliance in patients with type II diabetes

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Introduction: The aim of the study was to evaluate the impact of personalized SMS messages offered by pharmacists to patients with type II diabetes (SMS reminders and advice on illness and treatment) on compliance at 1,2,3 and 6-months.

Methods: 140 pharmacies are divided into two groups: A(patients received personalized SMS messages over 3-months in addition to the standard drug dispensation) and B(simply dispensing drugs). The study lasts 6-months. The primary endpoint is 3-month compliance on the Morisky Compliance Scale (MMAS-8). We also investigated whether sending personalized SMS messages could influence exercise (IPAQ), HbA1c, HDL, body mass index and waist circumference. SMS tone/sending algorithm were created using the TransTheoritical Model and theory of reactance. The topics covered in the SMS were varied: diet, physical activity, treatment management/understanding...

Results: 114 pharmacies included 499 patients. The average BMI is 29.9±5.4 kg/m^2 and abdominal perimeter is 106.9±14.4 cm which means that patients are overweight. The results show that the Morisky score increases further for patients in group A between visits. The difference in the Morisky score between V0 and V3 is significant (p-value=0.004 and p-value=0.002,Wilcoxon rank tests). This score decreases at the 6-month visit due to the discontinuation of SMS after 3-months, which leads to the patient forgetting to take the medication. The HbA1c level decreases more significantly for group A patients. That confirmed an improvement in compliance.

Conclusions: Personalized SMS messages are effective in increasing compliance. This is confirmed by the analyses of the secondary criteria, where the significant differences identified support the beneficial effect of SMS for the patients. Taking treatment correctly also seems to have a beneficial effect on the presence or absence of adverse events, as the proportion of patients with at least one adverse event is always lower for the group of patients receiving SMS.

P.04 eHealth literacy skills, preferences and needs of pharmacy visitors

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Introduction: The internet is an important source of information for patients. Studies have shown that a large proportion of patients have limited health literacy, but less is known about patients' *eHealth* literacy, specifically with regard to information related to medication. Our goal was to gain insight into the eHealth literacy, online information preferences and needs of community-dwelling pharmacy visitors.

Methods: Between April - June 2017, pharmacy visitors were asked to fill out a questionnaire consisting of sociodemographic information, questions on medication information preference and information seeking behaviour, and the Digital Health Literacy instrument, comprising 7 skills (*operational skills, navigation skills, information searching skills, evaluating reliability, determining relevance, adding content* and *protecting privacy*) measured on a 4-point Likert scale (1=very difficult; 4=very easy).

Results: In 34 community pharmacies, 167 patients (mean age 47.9 years, 62.3 % female) participated in the study. Patients mostly use a search engine (91.0 %) or the website of the health care professional (47.9 %) to obtain information online. They mostly look for information about possible side effects of medication (65.9 %) and how medication works (51.6 %). Fourteen patients (8.4 %) indicated that the pharmacist had ever referred them to online information, and all found this information sufficient. Patients scored highest on *operational skills* (mean 3.7, SD 0.44) and *protecting privacy* (mean 3.7, SD 0.51) and lowest on *evaluating reliability* (mean 2.8, SD 0.62) and *determining relevance* (mean 2.9, SD 0.58). On performance-based items, patients had the most difficulty selecting which search terms would yield the best results (32.9 % correct) and which search results provide the best answer (58.7 % correct).

Conclusions: Patients could benefit from guidance on which information online is reliable or relevant for them. Pharmacists can help patients by more actively providing them with information about reliable online content when medication is dispensed at the pharmacy.

P.05 Re-engineering follow-up care after allogeneic stem cell transplantation: Prototype development for an eHealth-supported integrated model of care- the SMILe study

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Introduction: Re-engineering follow-up care in allogeneic stem cell transplantation (alloSCT) is needed due to increasing numbers of long-term survivors in need of comprehensive care. eHealth solutions show promise in improving outcomes in cancer patients yet successful implementation and sustainability of eHealth-supported care models require implementation science methods as well as a user-centered design approach. We report on the context and theory-driven development, of the first prototype of an *Integrated model of care in hematopoietic SteM cell transplantatIon faciLitated by eHealth* (SMILe-V1).

Methods: A single-center, multi-methods design was used to map out the context and understand patients and clinicians perspective on the current follow-up care and possible eHealth support. 60 patients and 5 clinicians were surveyed, 10 respectively 11 interviewed. Out of the context analysis and external evidence, intervention module topics for the SMILe-V1-Prototype emerged. By using the Behavior-Change-Wheel we mapped all findings and existing evidence upon each topic to define target behaviors, effective behavior change techniques and modes of delivery.

Results: SMILe-V1 consists of: a) a care-coordinator, and b) the SMILe-platform which connects the patient via an App to a care-coordinator in the center. The care-coordinator delivers 12 face-to-face intervention modules compromising interventions on monitoring, medication adherence, infection prevention and physical activity which will subsequently facilitated by technology. The SMILeApp collects a set of medical, behavioral and psychosocial parameters and transfers them to the care-coordinator. Patients receive feedback based on predefined algorithms, helping to recognize symptoms or signs of complications. Deviations from pre-defined cut-offs, produces alarms to patients and care-coordinators and gives advice.

Conclusions: The use of implementation science methods combined with a user-centered design as well as theory-driven intervention development provide a solid basis of the SMILe-V1 that will be tested in a first randomized clinical trial mid-2019.

P.06 Novel electronic adherence monitoring devices (NEMD) in children with asthma

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Introduction: Adherence monitoring to inhaled corticosteroids (ICS) is an essential component of asthma management.

Electronic monitoring devices (EMD), provide objective data on date, time and number of actuations. However, most give no information on inhalation. Novel platforms in development monitor both activation and inhalation, ensuring more accurate estimates of adherence.

Aim: To assess the feasibility of novel electronic monitoring devices (NEMDs) , in terms of accuracy, usability and acceptability and assess impact on asthma control.

Methods: Open label, pragmatic randomised, mixed method (qualitative and quantitative) study. Children with asthma on ICS attending tertiary care were invited to trial one of four NEMD: Remote Directly Observed Therapy (R-DOT), Hailie, INhaler Compliance device (INCA) and the Rafi-tone App. Following up to 16 weeks monitoring, participants (parents, children and their Specialist nurses) participated in face-to-face focus group meetings, or one-to-one interview. Accuracy was assessed using adherence data, acceptability and usability using themes identified from focus groups and interviews. Spirometry and measures of asthma control were recorded at baseline and follow-up.

Results: 35 children were recruited:18 (52 %) (11 males, median age 13.5 (7–16) years) completed; 7 (20 %) were lost to follow up; 4 (11 %) experienced device failure, 4 (11 %) lost their device and 2 (6 %) withdrew. 11/18 (61 %) attended focus groups or were interviewed. Thematic analysis identified four main themes: device functionality, usability, perceptions and emotions; enhancements, improvements and preferences. The Halie and INCA were the most accurate and were preferred by participants. FEV1 significantly improved in R-DOT (p=0.02). There were no other differences in measures of asthma control.

Conclusions: Devices that attach to inhalers requiring no additional effort or steps were selected as the devices of choice, however, there is no 'one size fits all' NEMD and there are advantages and disadvantages of each devices tested.

P.07 'Ademgenoot'– A serious game to motivate and empower asthma patients in adherence to their maintenance medication: A user-centered design study

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Introduction: Non-adherence, following a reasoned choice or failure to understand the necessity for adherence to maintenance medication, is considered an important challenge in asthma treatment. Electronic adherence monitoring via electronic monitoring devices (EMDs) provides promising ways for measuring adherence objectively. With digital health interventions, such as EMDs connected to a smartphone, adherence intervention can be tailored to the needs and situation of the patient and important behavioural change elements can be incorporated.These include continued self-monitoring, motivational messages and symptom logging.

This study aimed to develop a digital health intervention that helps non-adherent patients to adhere to their maintenance medication.

Methods: The study employed a user-centred, participatory design approach, during which patients and healthcare professionals took an important part in the design process. The approach consisted of several iterative phases. Semi-structured interviews were held in combination with creative assignments to gain in-depth understanding of the needs, motivations and experiences of asthma patients regarding adherence to their maintenance medication. These insights were used to identify design opportunities which were translated into different concepts and prototypes. Prototypes were then evaluated on feasibility and user experience during multiple user-tests.

Results: Interviews with patients (n=16) and healthcare professionals (n=4) led to four important design insights which resulted in the development of the serious game 'Ademgenoot'. Ademgenoot aims to increase medication adherence by empowering the patient, working goal-oriented and by creating awareness of the positive outcomes of being adherent. User-tests demonstrated that 'Ademgenoot' is feasible in clinical practice and can empower patients in their asthma self-management behaviour and thus has the potential to improve adherence to maintenance medication.

Conclusions: We developed a concept for (and prototype of) a serious game that meets patients' and healthcare professionals' needs and is designed to increase medication adherence. Moreover, this study demonstrates the importance of including users in the development of digital health interventions.

P.08 Timely initiation of second prevention treatment after hospital discharge following acute stroke in French patients

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Introduction: Secondary prevention treatment reduces the risk of recurrence following an ischemic stroke (IS). Its effectiveness requires timely initiation of therapy, which is usually prescribed in-hospital. Evidence about initiation of therapy after hospital discharge is lacking. This study aimed to assess time to initiation (T2I) of oral antithrombotic and statin therapy after hospital discharge in French patients following an IS.

Methods: For this cross-sectional study, community-dwelling residents of the Rhône area (France) with an IS between November 2015 and December 2016 were prospectively included in the STROKE69 cohort. We collected prescriptions at discharge from the medical file and administrative healthcare claims data between November 2015 and August 2018. For this analysis, we excluded medications with a dispensing event before discharge, patients with re-hospitalizations or treatment switches within the first 30 days after discharge, or if claims data were only available after the time of discharge. We defined T2I as the time difference in days between the date of hospital discharge and the first subsequent pharmacy claim.

Results: Data from 384 patients were analyzed. After application of the exclusion criteria, we included 203 and 122 patients who initiated antithrombotic and statin therapy after hospital discharge, respectively. Within the antithrombotic class, most patients started with either an antiplatelet (n=162) or anticoagulant treatment (n=34). A minority initiated a dual antiplatelet (n=5) or dual therapy with an antiplatelet and anticoagulant (n=2). Across all treatment classes, around two thirds of patients initiated therapy at the day of discharge. Patients initiated 94 % of antithrombotic and 89 % of statin therapies within the first week. Eight (4 %) and seven (6 %) patients did not initiate antithrombotic or statin therapy within three months of discharge, respectively.

Conclusions: This original study shows that most patients initiated secondary prevention therapy within the first week after hospital discharge following an IS.

P.09 Adherence trajectories of adjuvant endocrine therapy among women with breast cancer: A five-year cohort study using administrative databases

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Introduction: Despite the benefits of adjuvant endocrine therapy (AET) for reducing recurrence and mortality risks after hormone-sensitive breast cancer, AET adherence is sub-optimal for a high proportion of women. However, little is known about long-term patterns of AET adherence over the recommended 5 years. Our objectives were to: 1) identify five-year AET adherence trajectory groups; 2) describe trajectory groups according to adherence measures traditionally used (i.e. the proportion of days covered (PDC)); and 3) explore factors associated with trajectories.

Methods: We conducted a five-year cohort study using data from a French national study (VICAN2) including AET dispensing administrative data and patient-reported data collected by interviews. Women diagnosed with a first non-metastatic breast cancer and having ≥1 AET dispensing in the 12 months after diagnosis were included. Group-based trajectory modeling was used to identify adherence trajectory groups by clustering similar patterns of monthly AET dispensing. Multinomial logistic regressions were used to identify factors associated with trajectories.

Results: Among 674 women, five AET adherence trajectory groups were identified: 1) quick decline and stop (5.2 % of women); 2) moderate decline and stop (6.4 %); 3) slow decline (17.2 %); 4) high adherence (30.0 %); and 5) maintenance of very high adherence (41.2 %). Overall, mean 5-year PDC was 80 % but varied from 10 % to 97 % according to trajectories. Women who did not receive chemotherapy (adjusted odds ratio (aOR) = 2.07; 95 % confidence intervals (95 % CI) = 1.19–3.63) or a personalized care plan (aOR = 1.69; 95 % CI = 1.01–2.83), were more likely to belong to trajectories where AET adherence declined and stopped.

Conclusions: Our results provide information on the diversity of longitudinal AET adherence patterns, the timing of decline and discontinuation and associated factors. These results could inform healthcare professionals and guide the development of AET adherence-enhancing interventions.

P.10 The development of a novel Modern Journal System for embedding patient-reported data into diabetes management: A user-centered design approach

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Introduction: Patient-reported outcome (PRO) measures are a quantifiable approach that integrates data on patients' perspective into disease management. Despite the benefits of PROs, majority of PRO tools have lacked patient involvement in their development thus, they fail to meet the unique needs of end-users. In this study, we applied the user-centered design approach to develop a technology-based PRO system, the Modern Journal System (MJS) to improve medication adherence in patients with type 2 diabetes (T2D).

Methods: MJS utilizes text-messaging to capture PRO data in real-time, enhance patient engagement through data-driven feedback and motivational messages, and creates visualizations of the PRO data. We used a mixed-methods approach that combined patient focus groups and ranking surveys to create PRO text-messages that would be incorporated into MJS. User testing was then conducted to refine the messages to ensure they meet the needs and preferences of T2D patients.

Results: Analysis of the focus groups identified four themes: (1) patients feel as though their lives are controlled by their blood sugar (BS) values; (2) patients greatest fears about having T2D are vision loss, kidney failure, and amputation; (3) patients want to feel in control of their T2D, live a long healthy life and not take medications for life; and (4) non-adherence, insufficient sleep, and poor emotional health are barriers to BS control. Ranking surveys resulted in the selection of 6 PRO categories: (1) Emotional health; (2) Dietary behaviors; (3) Physical activity; (4) Quality of life; (5) Medication Adherence; and (6) Sleep quality. In user testing, patients preferred messages that use numerical scales, provide definitions of the behavior, and help patients make associations between their behaviors and BS levels.

Conclusions: PROs that capture the psychosocial and behavioral aspects of T2D are most important to patients. A clinical trial will test the efficacy of MJS in 282 patients with uncontrolled T2D.

P.11 Cost saving potential of community pharmacist led adherence intervention: retrospective analysis of professional services program utilising patient dispensing data

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Introduction: Containment of healthcare expenditure is a growing concern of many governments, providers and administrators. Reducing waste and improving cost effectiveness in the delivery of patient care remain at the forefront of policy and decision making. Pharmacist led medication adherence interventions represent an opportunity for future cost containment across a dynamic population.

Methods: Retrospective observational study. De-identified patient dispensing data captured through GuildCare professional services software program was utilised to analyse patient medication adherence across three molecules; rosuvastatin, irbesartan and desvenlafaxine. Patient adherence rates six months prior to a pharmacist led adherence intervention and six months post intervention were determined through calculation of proportion of days covered. The estimated national cost saving potential of a pharmacist led intervention was determined through comparison of costs pre and post intervention utilising disease prevalence and literature reported per patient disease specific adherence related costs.

Results: Medication adherence rates of 22,335 patients across 1,805 community pharmacies in Australia were analysed. Pharmacist led adherence intervention resulted in increased patient adherence across all molecules. National estimates revealed that pharmacist intervention saved annually $368 million in hypertension related non-adherence expenses, $1.1 billion in dyslipidaemia related non-adherence expenses and $414 million in depression related non-adherence expenses. Across three prevalent conditions community pharmacist led adherence interventions saved the Australian healthcare system $1.9 billion annually.

Conclusions: Community pharmacist led adherence interventions demonstrate significant cost saving opportunities to ease the rising economic burden on health care systems. Utilisation of pharmacist intervention to improve adherence rates across hypertension, dyslipidaemia and depression was associated with approximately $1.9 billion in cost avoidance per year.

P.12 Persistence with statin treatment in diabetic and non-diabetic patients with transient ischemic attack

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Introduction: Administration of statins in patients with a recent stroke or transient ischemic attack (TIA) represents one of key tools of effective secondary prevention. Our study was aimed at evaluating the extent of non-persistence with statin treatment in diabetic and non-diabetic patients after TIA and identifying patient-associated characteristics that influence the risk of non-persistence.

Methods: Data for our study were assembled from the database of the largest health insurance provider of the Slovak Republic. Our study cohort included 797 TIA patients (63.2 % of them women), in whom statin treatment was initiated between 1 January 2010 and 31 December 2010. Patients were followed for three years from the index date. Patients with a treatment gap, defined as a 6-month period without any statin prescription, were classified as non-persistent. The Cox proportional hazards model was used to identify patient-related characteristics influencing patient´s risk for non-persistence. All analyses were performed in the whole study sample (n=797) and separately in the subgroups of diabetic (n=244) and non-diabetic (n=553) patients.

Results: At the end of the 3-years follow-up period, 441 (55.3 %) patients of the whole sample (n=797) were found to be non-persistent with statin treatment. In the analysed subgroups, 109 (44.7 %) of 244 diabetic patients and 332 (60.0 %) of 553 non-diabetic persons were non-persistent with statins. Diabetes mellitus represented a factor associated with decreased patient´s probability for non-persistence. Patients aged <65 years, females and those without hypercholesterolemia appeared as subjects with increased risk for non-persistence.

Conclusions: The results of our study indicate that TIA patients with diabetes mellitus can be considered as a group with better persistence with statin treatment in comparison with TIA patients without this condition.

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P.13 Longitudinal trajectories of medication adherence: A latent class growth analysis of electronic drug monitoring data

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Introduction: Medication Event Monitoring Systems (MEMS) provide detailed longitudinal data of medication intake which enables the monitoring of adherence over time. However, commonly adopted measures derived from MEMS data e.g. 'percentage of missed days' tend to underutilize the potential of MEMS data. Conceiving adherence as a longitudinal process, the aim was to examine whether distinct longitudinal trajectories of medication adherence could be discerned from MEMS data.

Methods: Patients who were treated with antidepressants were invited through community pharmacies from April 2011 to April 2012 and asked to have their antidepressants dispensed in a MEMS device for 6 months. MEMS data were divided into 25 separate weeks and for each week the total number of days were counted on which the MEMS vial had been opened (range 0–7). The most likely number of distinct longitudinal trajectories were empirically derived with Latent Class Growth Analysis (LCGA) using 'goodness of fit' statistics.

Results: Data from 169 participants (73 % women; mean age = 53, SD = 14) were available. 'Goodness of fit' statistics (Bayesian Information Criterion = 16654, Bootstrap Likelihood Ratio Test of 4 versus 3 trajectories = 227, p-value < 0.01, Entropy = 0.99) indicated the presence of 4 quadratic trajectories which we labeled as 'adequate implementation & fair persistence' (35 %), 'adequate implementation & early non-persistence' (6 %), 'delayed implementation & non-persistence' (28 %), and 'poor implementation' (31 %).

Conclusions: LCGA and related methods capture distinct longitudinal trajectories of adherence over time. As such, these methods have the potential to better utilize the detailed longitudinal nature of MEMS data. For clinical practice, awareness of distinct adherence trajectories may facilitate the timing and tailoring of adherence improving interventions for individual patients e.g. some patients may benefit from interventions to implement (or initiate) medication use, while other patients with adequate implementation (or initiation) need subsequent support to persist taking their medications.

P.14 SABA Risk Questionnaire (SRQ): A novel measure for assessing patients' beliefs underpinning reliance on short-acting beta agonists in asthma

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Introduction: Reliance on and overuse of short-acting beta-agonists (SABA) increases the risk of asthma attacks, and is recognised in the latest GINA update as a key issue to target in asthma. Patient treatment beliefs are a key driver of SABA use. Many see asthma as a short-term rather than long-term condition, thus reinforcing SABA reliance and non-adherence to inhaled corticosteroids, based on personal need for rapid symptom relief. Assessing beliefs about SABA can help identify patients at risk of SABA reliance and overuse. The study aim was to develop and validate a questionnaire for assessing patient beliefs about SABA to identify patients at risk of SABA reliance and overuse.

Methods: Statements assessing patients' perceptions of SABA use were adapted from the Beliefs about Medicines Questionnaire (BMQ). The BMQ is a well-validated questionnaire for assessing patient treatment beliefs. Thirteen statements related to beliefs about SABA were developed; these were reduced to five statements after expert consensus review to form the SRQ.

Participants with self-reported asthma, who responded to an online Amazon MTurk survey, were invited to complete the SRQ and Medication Adherence Report Scale for inhaled corticosteroids (MARS-ICS). Perceptions of the importance of reliever inhalers were rated using visual analogue scales (VAS).

Results: A total of 446 people responded. Internal reliability was acceptable with Cronbach's $\alpha = 0.74$. Criterion validity was demonstrated by inverse correlation between SRQ scores and MARS-ICS ($r = -0.291$, $p<0.0001$) and significant correlation between SRQ scores and reliever importance ($r=0.216$, $p<0.0001$). Discriminant validity was demonstrated by statistically significant differences in SRQ scores between those with high vs. low ICS adherence (MARS-ICS $F=21.989$, $t=4.825$, $p<0.0001$).

Conclusions: The SRQ demonstrated acceptable internal reliability, and criterion and discriminant validity, supporting its potential utility as a pragmatic tool for identifying patients' beliefs that may put them at risk of SABA reliance and overuse.

P.15 Exploring adherence to inhaled corticosteroids using the Beliefs about Medicine Questionnaire for Young People With Asthma (BMQ-YPWA): A pilot study

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Introduction: Clinicians find it difficult to identify patients who are at risk of medication nonadherence and to tailor interventions to address this. The Beliefs about Medicine Questionnaire (BMQ) is a validated questionnaire that assesses treatment beliefs but has not been validated in young people with asthma (YPWA). It also does not identify practical adherence barriers. Following qualitative work at a paediatric tertiary care clinic in London, the BMQ was adapted for YPWA to form the BMQ for Young People With Asthma (BMQ-YPWA). The aim of this study was to pilot test the BMQ-YPWA.

Methods: Young people with asthma who had been previously had their adherence to their preventer inhalers monitored using an electronic monitoring device (EMD) were recruited from a tertiary care clinic in London. Participants completed the BMQ-YPWA and a one item visual analogue scale (VAS) for adherence. Their BMQ-YPWA responses were analysed to evaluate the questionnaire's internal reliability and explore the relationships between the variables.

Results: Thirty participants aged 12–17 years old (mean=14.3, SD: 1.4) were recruited.The BMQ-YPWA was found to have good internal reliability between the 30 questionnaire items = 0.83). The VAS for adherence was significantly correlated with the BMQ-YPWA(rs=0.45, p=0.01). The BMQ-YPWA scores has a small but positive relationship with objective EMD adherence data but this did not reach statistical significance (rs=0.11, p=0.57).

Conclusions: Initial findings from this pilot suggest that the BMQ-YPWA has good internal reliability. Despite the small sample size, weak correlations in the expected direction between study variables were as predicted. This tool may be a useful and cost-effective alternative to current adherence measurement tools. Further exploration in a large-scale validation study is warranted. Further developments of the BMQ-YPWA may enable clinicians and researchers to quickly identify the beliefs underpinning nonadherence, which can be targeted in tailored interventions to improve adherence.

P.16 Modifiable determinants of medication adherence in bipolar disorder: A systematic review

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Introduction: Little progress has been achieved with addressing non-adherence to medication for bipolar disorder. This may be partly attributable to the limited understanding of the modifiable determinants of adherence that should be targeted by interventions. This systematic review aimed to synthesise the reported modifiable determinants of medication adherence in bipolar disorder.

Methods: We searched CINAHL, Cochrane Library, Embase, Medline, PsychINFO, PubMed up to Oct 2018 using MeSH terms "Treatment Adherence and Compliance", "Bipolar Disorder" and "Psychotropic Drugs". We used framework synthesis to map literature identified modifiable determinants of medication adherence to the Theoretical Domains Framework. The study protocol registration number is PROSPERO: CRD42018096306 and published in BMJ Open [http://dx.doi.org/10.1136/bmjopen-2018–026980].

Results: We included 55 out of 814 retrieved studies. Fifty-one studies explored modifiable determinants of medication adherence from the perspective of patients, four from healthcare professional but none from carers. The most frequently reported modifiable determinants of adherence across both patients and health professionals were experiencing adverse effects, medication cost, pill burden/regimen complexity, mistrust in medicines and/or prescribers, and insufficient knowledge about medications and bipolar disorder. Fear of addiction to the psychotropic medication and negative effects on creativity/productivity were prominent patients reported determinants of medication adherence infrequently reported by healthcare professionals.

Conclusions: These provide a foundation for developing an adherence intervention. Mapping the prioritised modifiable determinants to a theoretical framework will enable relevant behaviour change techniques to be identified. This will, in turn, help design individualised patient centred adherence support. Carers often play a significant role in managing medicines for patients with mental health disorders thus the absence of their perspective on determinants of medication adherence is a gap in the literature that requires addressing.

P.17 Patients' beliefs about medicines and self-reported adherence to drug treatment two years after stroke

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Introduction: To improve patient adherence in clinical practice it is important to understand reasons for non-adherence. Problems with handling or remembering medicines are important but we hypothesize that also patients' beliefs about medicines are associated with drug adherence among stroke patients. The objectives were to examine patients beliefs about medicines two years after a stroke, and to investigate if these beliefs are associated with patients' adherence to drug treatment.

Methods: Validated questionnaires were filled two years after stroke onset to assess personal beliefs about medicines (the Beliefs about Medicines Questionnaires, BMQ) and self-rated adherence to treatment (Medication Adherence Report Scale, MARS). MARS scores were dichotomized with scores 5–22 as non-adherent and 23–25 as adherent. Background and clinical data were included from Riksstroke, the Swedish Stroke register. Multivariable logistic regression was used to test associations between beliefs about medicines and adherence.

Results: The questionnaire was sent to 560 individuals and 423 (75,5 %) answered. Of the 416 with no missing answer on MARS, 67 (16.1 %) were classified as non-adherent. Non-adherent patients scored higher on negative beliefs measured on BMQ subscales Concern (OR=1.15, 95 %CI 1.08–1.23, Harm (OR=1.27, 95 %CI 1.13–1.42), and Overuse (OR=1.40, 95 %CI 1.24–1.59), and lower on positive beliefs measured with BMQ scales Necessity (OR=0.83, 95 %CI 0.76–0.91) and Benefit (OR=0.86, 95 % CI 0.75–0.99).

Conclusions: We found associations between personal beliefs about medicines and self-reported medication adherence in individuals two years after stroke. Non-adherent individuals scored higher on negative beliefs and lower on positive beliefs about medicines. Patients' beliefs about medicines needs to be considered when trying to improve medication adherence.

P.18 The relationship between trust in medicines, beliefs about medication and medication adherence

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Introduction: Trust in medicines is a precarious and fundamental factor in the use of, and adherence to medication. A lack of trust in medicines may cause scepticism towards medicines, which may affect adherence negatively. Hitherto, trust in medicines has not yet been assessed extensively in the Netherlands. This study aimed to assess Dutch citizens' level of trust in medicines, the extent to which their beliefs about medication affect their trust, and its relation with medication adherence.

Methods: A questionnaire was send out to 1,500 members of the Dutch Healthcare Consumer panel, and filled out by 753 respondents. Respondents were asked to grade their level of trust on a scale from 1–10 in, amongst others, healthcare in general, medicines in general, and medicines they used themselves. Medication adherence was assessed through the Medication Adherence Rating Scale (MARS). The Beliefs about Medication Questionnaire (BMQ-specific) assessed their beliefs. Regression analyses were conducted to study the relationship between the BMQ and trust in medicines, and between trust in medicines and medication adherence, controlled for sociodemographic characteristics.

Results: The average score citizens gave their trust in medicines in general was lowest: 7.1 (SD 1.3), followed by trust in healthcare in general (7.5, SD 1.2). Respondents' trust was highest for medicines they used themselves (7.9, SD 1.3). A significant positive relationship was present between the level of trust in medicines in general and medication adherence (b 0.48 SE 0.16). Negative beliefs about medicines adversely affected trust in medicines significantly (b 0.07; SE 0.01).

Conclusions: Citizens have trust in medicines, especially in their own medicines. Maintaining high trust in medicines fosters medication adherence, as well as positive beliefs about medicines.

P.19 PreSTOP: Patients' perspective on discontinuation of CML TKI-treatment

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Introduction: Chronic myeloid leukemia (CML) is a malignant hematologic disease with recommended life-long treatment with tyrosine kinase inhibitors (TKIs). Several trials show that some CML patients with stable disease can discontinue TKI-treatment without loss of efficacy. However, little is known about Dutch patients' perspective and attitude on, and willingness to discontinue TKI treatment and influencing factors.

Gaining insight into patients' willingness and preferences regarding discontinuation of CML TKI-treatment and to identify possible influencing factors.

Methods: A cross-sectional, multicenter study using a questionnaire was conducted in the Netherlands. Adult CML patients were recruited. Patients were asked about their willingness and preferences regarding discontinuation of TKI-treatment. Logistic regression analysis was used to determine factors associated with patients' willingness to discontinue TKI-treatment.

Results: A total of 185 patients participated in this study. Most CML patients (79.5 %) were willing to discontinue treatment. Patients most frequently reported: no more side effects, being afraid of an aggressive relapse, and being frequently monitored as the most important advantage, disadvantage, and condition for discontinuing treatment respectively. Univariate logistic regression showed that young age (2.47 (1.09–5.59) P = 0.03), paid work (3.04 (1.44–6.41), P = 0.00), being informed about discontinuation studies (6.25 (2.36–16,52) P=0.00), and severe adverse events (2.64 (1.21–5.76), P = 0.01) were associated with patients' willingness to discontinue TKI-treatment.

Conclusions: Most patients were willing to discontinue TKI-treatment and reported their preferences about this. Several factors were associated with TKI-treatment discontinuation. Our findings can be used to optimize and tailor patient information about TKI-treatment discontinuation.

P.20 A qualitative study of barriers and facilitators to medication adherence among stroke and transient ischemic attack French patients

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Introduction: Secondary prevention treatment (SPM) reduces the risk of recurrence following an ischemic stroke (IS) or a transient ischemic attack (TIA), its effectiveness being conditioned by good medication adherence. However, the rate of non-adherence was estimated at about one third of patients. A good knowledge of the determinants of adherence is essential to identify people at risk of non-adherence and before developing effective interventions. This qualitative study aimed to explore barriers and facilitators to adherence to SPM after IS or TIA.

Methods: As qualitative methodology is particularly adapted to explore determinants of health behaviors, we conducted face-to-face semi-structured interviews with patients autonomous in taking their treatment 12 months after IS/TIA. A thematic analysis was performed.

Results: Thirty-six interviews were included in the analysis, conducted with 14 TIA patients and 22 IS patients. One of the main reasons for following SPM was the fear of stroke recurrence. Another reason identified as a major facilitator of adherence was the high trust in their physician. This trust may result in an acceptance of scientific authority and physicians' knowledge. However, patients highlighed that information about SPM was lacking and/or delivered at inappropriate timing, but they admitted not to ask for more information to their physician. Patients made then their own decision regarding adherence by considering the different information they have at their disposal, their representation of their disease and the positive and negative effects of the treatment. In this way, both perceived threat of a recurrence and concerns about treatment side effects influenced the level of adherence in opposite ways.

Conclusions: Encouraging patient-physician communication and the provision of adapted information throughout the course of illness and recovery may positively influence patients stroke representations and then adherence to SPM. Promoting discussion with their GP may also help them for making more informed decision concerning their treatment.

Poster Viewing

P.21 Involving patients and healthcare professionals in intervention development: A participatory approach to improving medication adherence in cystic fibrosis

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Introduction: Cystic fibrosis (CF) is an inherited and life-shortening disease involving significant treatment burden. Few interventions have been developed to improve medication adherence of CF patients with limited results. Involving patients and providers in intervention development is recommended for improving effectiveness and intervention adoption in routine care.

A participatory approach involving patients, health care professionals (HCP) and researchers was used to co-construct an adherence-enhancing intervention program in the CF reference medical center of Lyon (France).

Methods: Six focus groups were conducted at 4-week intervals with three HCP (physician, nurse, physiotherapist), seven patients and two researchers (sociologist, public health pharmacist). Two initial sessions focused on sharing experiences of CF treatments to identify determinants of adherence. The group developed solutions and tools to target key determinants in four subsequent sessions.

Researchers produced supporting materials and discussion logs to guide co-construction according to relevant theories and research evidence and record qualitative results. A qualitative analysis of group dynamics during intervention development was conducted.

Results: In addition to the already known barriers to adherence (number/types of drugs, age…), planning medication intake schedules for multiple medications, maintaining adherence during periods of significant life changes, and adjusting routines after new medication initiation were identified as particularly critical for adherence.

The group has co-constructed tools and solutions such as: completing a questionnaire with barriers to adherence before consultation; completing a breath diary in case of new medication initiation; accessing support from peers or consulting pedagogical tools when significant life changes occurred (pregnancy, transplantation…).

The process facilitated an active participation of patients and HCPs in intervention development. Both patients and HCPs were able to share their complementary expertise, with the former beingslightly more active.

Conclusions: A 6-session focus group format is a feasible participatory approach to intervention development. The co-construct intervention will be tested in a multicenter, open-label study in Auvergne-Rhône-Alpes area.

P.22 Development and validation of a novel measure of practical barriers to medication adherence (MPRAQ)

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Introduction: Currently no self-report measures specifically for practical barriers for medication non-adherence exist. This study reports the development and validation of a self-report measure that assesses practical adherence barriers (MPRAQ).

Methods: MPRAQ comprises fifteen statements describing practical barriers to medication adherence, developed based on factors identified from previous research. Responses were measured using a 5-point Likert scale. Initial face validity and reliability were evaluated in 15 people with diabetes. Following refinement, internal reliability and criterion validity were assessed in two samples: patients recruited via Amazon mTurk and the Dutch Health Care Consumer panel. Respondents were invited to also complete the Beliefs about Medicines Questionnaire (BMQ), and the Medication Adherence Report Scale (MARS). The mTurk sample also completed the Perceived Sensitivity to Medicines questionnaire (PSM), and repeated the questionnaire in two weeks to assess test-retest reliability.

Results: Face validity was confirmed in 15 people with diabetes (46 % female; mean(SD) age 64(12) years. The questionnaire was well accepted by patients, with good internal reliability ($\alpha = 0.94$). A total 184 participants responded to the questionnaire on mTurk and 334 in the consumer panel. Internal reliability was acceptable in both mTurk (n=184) and Dutch Consumer (n=334) panels (mTurk $\alpha = 0.89$; panel $\alpha = 0.94$). Criterion validity was confirmed, with significant hypothesised correlation between MPRAQ scores and BMQ-Specific Concerns = (mTurk r=0.546, p<0.0001; panel r=0.370, p<0.0001); BMQ-General Harm (mTurk r=0.504, p<0.0001; panel r=0.219, p<0.0001); BMQ-General Overuse = (mTurk, r=0.324, p<0.0001; panel r=0.109, p=0.047), and PSM (mTurk only, r=0.463, p<0.0001), and a negative correlation with MARS (mTurk r=-0.450, p<0.0001; panel r=-0.260, p<0.0001). As hypothesised MPRAQ scores were not correlated with BMQ-Specific Necessity or BMQ-General Benefit. Correlation between MPRAQ baseline and 2-week follow-up scores confirmed test-retest reliability (r=0.745, p<0.0001; n=52).

Conclusions: The MPRACS is a reliable and valid self-report measure of practical barriers to medication adherence.

P.23 Limitations of basic and instrumental activities of daily living among polymedicated older adults in Europe: a cross sectional study

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Introduction: Around 35 % of persons aged 65+ have 3 chronic diseases, which may explain the high prevalence of polypharmacy in this population (32.1 %). It is known that comorbidities impair the independence in performing activities of daily living (ADLs) and instrumental activities of daily living (iADLs), decreasing quality of life. This study aims to evaluate the association between limitations in ADLs and iADLs and polypharmacy in community-dwelling European older adults.

Methods: In this cross-sectional analysis, we used data from participants aged 65+ from Wave 6 of SHARE. The index which analyse basic self-care and instrumental activities of daily life were assessed from the modified version used in SHARE, from Katz and Lawton & Brody Index.

Results: Our final sample included 34,145 participants, in which 56.0 % were women, with an average age of 75.1±7.2, with 34.1 % of participants being under polypharmacy. The proportion of polymedicated participants that report difficulties performing at least 1 ADL is 3 times higher than in non-polymedicated participants (33.0 % vs. 11.0 %). Of these, 71.3 %, 66.0 % and 39.5 % have difficulties in dressing, bathing and getting in/out of bed, respectively. Regarding iADLs, 47.6 % of polymedicated individuals report difficulties in 1 or more iADLs (vs non-medicated participants having these difficulties in 19.8 %). Among these, 75.3 %, 53.3 % and 49.9 % have limitations in doing work around house/garden, leaving the house independently/assessing public transports and shopping for groceries, respectively.

Conclusions: We have demonstrated that polypharmacy is associated with high prevalence of limitations on ADLs and iADLs. In fact, limitations in self-care and ability to do activities necessary for independent community living are commonly used indicators of disability, and therefore it is important to address these questions and promote interventions to enhance quality of life among community-dwelling people. These limitations pose a risk to the execution of health plans, which may seriously affect medication adherence.

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P.24 Hospitalizations among polymedicated european older adults

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Introduction: Polypharmacy is associated with high healthcare costs due to adverse drug events, drug-interactions, medication non-adherence, inappropriate medication taking and multiple geriatric syndromes, which increases the risk for hospital admissions. In fact, hospitalizations of older patients are an increasing health care burden and leads to higher morbidity and mortality. Therefore, this work aims to evaluate the association between hospitalizations and polypharmacy.

Methods: In this cross-sectional analysis, we used data from participants aged 65 or more years from Wave 6 of the Survey of Health, Ageing, and Retirement in Europe. Prevalences of hospitalizations were studied, and a multilevel logistic regression was used, with hospitalizations as the dependent variable, to study its association with polypharmacy, gender and age groups.

Results: From all the 34,124 participants included in this study, 19,119 (56.0 %) were women, and the average age was of 75.1 ± 7.2 years old. Globally, 20.3 % of participants were hospitalized in the past 12 months, this number being higher in polymedicated participants as compares with non-polymedicated (30.9 % and 14.8 %, respectively). The proportion of men that were hospitalized was slightly higher than women (33.4 % vs. 15.9 %, in polymedicated participants; 29.1 % vs. 13.9 % in non-polymedicated) and increased along age group. Polymedicated participants were found to be more prone to be hospitalized in the last year [OR: 2.544; CI: 2.406–2.689; p<0.001], compared with non-polymedicated.

Conclusions: Herein, we showed that polypharmacy correlates with increased risk of hospitalization, which poses a major healthcare problem. According to current knowledge, the medication of the older population should be carefully addressed and reviewed in order to minimise the risk of adverse effects that results from polypharmacy, such as non-adherence, and related hospitalizations, leading to better outcomes in the older patients and improving their quality of life.

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P.25 Profiling patient treatment behavior to improve adherence: Development of the SPUR tool

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Introduction: The SPUR framework, as outlined in Dolgin, 2019, postulates a holistic framework to examine adherence behavior in patients with chronic diseases. We have developed a questionnaire that serves as a profiling tool for individual patients and have validated the psychometric properties of it.

Methods: An international advisory board (IAB) was created consisting of academic expert in the field of patient behavior in the United States, the United Kingdom, and France. The IAB undertook a literature review of relevant materials, reviewing 311 abstracts, of which 143 references were examined in detail and 128 existing tools were identified as pertinent. 27 of these were used and 621 items extracted, of which 417 were retained, and then merged into 49 items grouped into five sections, corresponding to the SPUR methodology (including an "other" category). A questionnaire was then created using a 10-point numerical rating scale (later reduced to a 5-point scale). Thirty patients were then recruited in France and the United States and a further thirty in China and comprehension and psychometric testing was carried out with all patients. Items were adjusted via a reiterative process and re-tested in order to generate a profiling tool that is easily understood and relevant to patient concerns.

Results: The questionnaire supports the hypothesis around the SPUR framework the current format of the questionnaire has proven itself to be of interest to patients and both well accepted and well understood.

Conclusions: A further set of studies are currently placed to refine the questionnaire and to demonstrate the predictive validity of the resultant SPUR profiling tool with respect to patient behavior.

P.26 Experiences and effectiveness of Medication Management Apps to support self-management in patients with diabetes (EMMA study)

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Introduction: Therapy adherence with oral diabetes medication is often low. Medication management apps can be a tool to support patients in their medication intake. The number of apps has grown significantly during the last years which makes it difficult to choose one. We aimed to gain more insight into the needs of patients about the use of medication management apps and support in choosing a suitable app. In addition, we wanted to gain insight in needs of pharmacy staff related to information provision about use of these apps.

Methods: The project consists of: (1) patients and pharmacy staff needs assessment, (2) developing and testing of decision aid (website) to support patients and healthcare providers in choosing a suitable app. For the first project phase, 20 diabetes patients and 10 pharmacy staff members were interviewed.

Results: Eight patients were positive about use of apps, 7 mentioned advantages and disadvantages and 5 patients had a more negative attitude. Patients who were positive mainly saw added value in easy registration of information (diary function). A medication reminder and access to understandable (visual) information were also mentioned. Patients with a negative or doubtful attitude mentioned lack of reliable information or that they did not know which app to choose. To date, pharmacy staff indicated to provide written and oral information during patient counseling. They mentioned little use of apps and online information. The majority of pharmacy staff was positive about future recommendation of apps. However, they indicated lack of knowledge about type of available apps suitable for an individual patient.

Conclusions: Both patients and pharmacy staff seem to be positive about use of medication management apps. However, they need more information about type of available apps. These results have been incorporated in an online decision aid (website), which will be tested in Dutch community pharmacies.

P.27 Pharmaceutical intervention in promoting adherence to topical treatment of chronic dermatosis: identification of the needs of educational interventions

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Introduction: Dermatosis are high prevalent diseases that affect the quality of life of the patients. Most of these pathologies can be treated effectively and safely with topical medicines. However, low adherence to treatment often leads to the clinical ineffectiveness of this therapeutic approach. The contribution of pharmaceutical intervention in promoting adherence to topical treatment in dermatology is insufficiently characterized. This study aims to characterize the pharmacists' literacy about topical treatment of dermatosis and adherence to this treatment modality, and to identify the needs of educational interventions.

Methods: Development, validation and administration of a questionnaire for the evaluation of the literacy of pharmacists on topical treatment of chronic dermatosis. The questionnaire was divulgated by the college of Portuguese pharmacists. A total of 230 pharmacists completed the protocol.

Results: Pharmacists' knowledge about the prevalence, clinical characteristics and treatment of chronic dermatosis was adequate. Pharmacists considered that adherence to topical treatment of chronic dermatosis can be increased with pharmaceutical intervention (83.9 %), but the results were very diverse with regard to the strategies deemed relevant for this purpose. Regarding the factors that influence adherence, the participants (about 85 %) considered the socioeconomic conditions of the patient and the severity of the dermatosis to be the most relevant. Although the majority of pharmacists recognized the information given about the treatment (dose, frequency and duration of the treatment) to be important in promoting adherence to treatment, they reported a large set of types of information and admnistration modes. The analysis of the data allowed also to verify a great heterogeneity between the practices of adherence promotion carried out in the Portuguese pharmacies.

Conclusions: Heterogeneous adherence promotion practices were identified. This finding emphasizes the importance to carry out educational actions related to topical treatment, focused on dosing instructions and strategies to promote adherence to treatment in chronic dermatological patients.

P.28 Cultural and English/German language differences may shift answers to three questions on medication adherence

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Introduction: Questionnaires can assess medication adherence. Wilson developed and validated a 3-item self-report scale that targets *days with missed doses* ("On how many days did you miss at least one dose of any of your medicines?"), *rating* ("How good a job did you do at taking your medicines in the way you were supposed to?") and *taking* ("How often did you take your medicines in the way you were supposed to?") over the past 30 days. Answer options are numbers and 6-point Likert scales (very poor-excellent; never-always). Score ranges from 0 to 100 % (perfect adherence). We aimed at translating into German, and testing acceptance in English and German speaking outpatients.

Methods: Translation was performed with standard forward-backward procedure. The scale was integrated into larger surveys on swallowing difficulties (Cork, Ireland, IR; Basel and Valais, Switzerland, CH) and medication management (Saxony and Thuringia, Germany, DE). Patients ≥18 years old and taking ≥3 medicines (IR, CH) or ≥5 medicines (DE) for at least three months were eligible and completed the questionnaire in the community pharmacy between 05.2018 and 04.2019.

Results: 473 patients participated, 303 in IR (mean age 70.3±12.5 years, 60.7 % women), 115 in CH (67.8±14.7 years, 58.3 % women) and 55 in DE (68.8±10.0 years, 56.1 % women). Mean adherence scores were high (IR: 93.1±11 %; CH: 90.0±8.6 %; DE: 87.8±11.3 %). However, 100 % scores were more frequent in IR (47.5 %) versus CH (20.9 %) and DE (21.8 %; $p<0.001$), while 93 % scores were more frequent in CH (35.7 %) and DE (25.5 %) versus IR (13.5 %; $p<0.001$). Reasons were more "excellent rating" in IR (58.7 %) versus CH (22.6 %) and DE (21.8 %; $p<0.001$) and more "very good rating" in CH (47.8 %) and DE (52.7 %) versus IR (25.4 %; $p<0.001$). Taking also differed.

Conclusions: Overall scores might conceal cultural and language differences in answering options. English and German patients may understand "excellent" and "very good" differently.

P.29 Empower nurses to empower patients to better medication adherence

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Introduction: Adherence to medication treatment among individuals with asthma or chronic obstructive pulmonary disease (COPD) generally needs to be improved. In Sweden, nurses with competence in asthma, allergy and COPD care independently follow up prescribed medication treatment. They work closely with the patients and therefore have good opportunities to address adherence issues. However, empowering patients to better adherence requires know-how. Therefore, the aim was to empower nurses to empower patients who have asthma, an allergy and COPD to better medication adherence.

Methods: Asthma, allergy and COPD nurses (n=66) working in primary care in a county in southern Sweden participated in an intervention. The intervention consisted of an educational package with lectures and workshops. The lectures focused on adherence to medication treatment and on professional communication. During the workshops, the nurses worked with fictitious patient cases regarding how to empower patients for better medication adherence. The nurses completed questionnaires prior to and after the intervention.

Results: A majority of the nurses, 95.4 %, reported that patients´ adherence to medication is to be followed up at each reception visit and 96.9 % reported that patients´ inhalation technique is to be checked at each reception visit. After the intervention, the nurses´ knowledge of adherence, how to empower patients' adherence and their knowledge on how to measure patients´ adherence behavior was improved. Additionally, they developed their knowledge of how to communicate effectively with patients about adherence. The nurses reported that their readiness to support patients to better adherence had been strengthened after the intervention. The nurses developed tailored adherence support for three fictitious patients with various adherence barriers.

Conclusions: An intervention consisting of an educational package empowered nurses to empower patients with asthma, allergy or COPD to better adherence and tailored adherence support was developed.

P.30 Optimizing patients' recruitment in an oral anticancer drug adherence program

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Introduction: One of the major issues in prospective intervention studies is the slow recruitment of patients. Indeed, investigators often overestimate the number of eligible patients who will willingly participate, resulting in underpowered studies. We present key strategies which increased the recruitment in the "Optimizing targeted anticancer therapies" (OpTAT) study. OpTAT is a 12-month randomized study, which aims at evaluating the impact of an adherence intervention program on patient initiating protein kinase inhibitors (PKI) for solid cancer compared to usual care.

Methods: As recommended by literature, we combined passive and active strategies to recruit the 202 planned patients. As passive strategies, oncologists identify eligible patients during their consultations. Moreover, an OpTAT flyer is posted in the different ward units. As active strategies, the University hospital data research team has been working on providing identification of eligible patients thanks to an algorithm scrutinizing patients' medical files. Besides, all the investigators meet every four months and provide study advancements to the stakeholders (residents, chief doctors, nurses) during regular staff meetings and through emails. Investigators communicate actively in the oncology service and introduce the study to the patients.

Results: Recruitment is steady but low; oncologists do not announce eligible patients systematically. Seventy-eight patients were included and 48 patients refused to participate. Mostly due to PKI side effects, oncologists stopped treatment in 12 patients before the study was introduced to them and in 8 patients who accepted the study but were not included yet. The study was not introduced to 56 patients because of specific reasons (drug reimbursement issues, no French or English-speaking patients).

Conclusions: At the mid-term of this study, investigators gather their efforts to overcome barriers for recruitment. Key presence of a research member in the clinical team as well as electronic identification of eligible patients represent main targets for increasing inclusion.

P.31 A new approach to catch the dynamic of medication adherence with clustering refill patterns in long term medication users

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Introduction: Calculating patients' medication availability from refill data is a common method to determine medication adherence. The Medication Possession Ratio (MPR) is the most often used measure and averages medication supplies over a defined period. However, averages obliterate the variability of refill behavior over time i.e., the dynamic of adherence. We aimed at developing a new approach to analyze consecutive refill events of long-term NOAC patients (with 19 refills) and determining clusters of behavior.

Methods: We calculated the difference ΔT between the theoretical refill day (extrapolated from the last day's supply) and the effective refill day for each refill. The difference ΔT can either be "on time" (ΔT >= 0; patient has enough supply) or "too late" (ΔT <0, patient has no supply). For each patient the ΔT was graphed as the succession of "on time" and "too late" events. We used cluster analysis method for potential refill behavior groups and compared them to MPR.

Results: The 19 refills of 116 NOAC patients stretched over a period of 3.15±1.28 years (range: 0.74 to 5.39 years). Mean MPR was high (97.5±12.9 %). Overall, the patients refilled their NOAC 8.5 days too early (median ΔT). Hence, only 12.1 % of patients had constant supply. The refill behavior did not change over time (Cochran's Q: 20.165; p = 0.324). We observed three dominant refill behaviors: a) Refills too early; b) series of gaps, either b1) in the middle of refills or b2) at the end of refills; and c) erratic refill behavior. Patients with series of gaps (b) had a significantly lower mean MPR (76.7 %; Mann-Whitney-U-Test: z= -5.825; p <0.05) and are predestined for adherence interventions.

Conclusions: With the newly used method, long-term NOAC patients can be clustered in different refill behavior groups. This method is promising to detect non-adherent patients in need of targeted interventions.

P.32 Acceptability of eHealth technology by kidney transplant patients and health care team: the Renal Health Project

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Introduction: The mobile App RENAL HEALTH was developed for improving self-care management and adherence of helping patients with chronic kidney disease (CKD), including those who received a kidney transplant (KT). The project results from the collaboration of a multidisciplinary healthcare team, graduating and post-graduating students and CKD patients. As a complementary phase of context analysis, we evaluated the acceptability of this kind of technology by KT patients.

Methods: Cross-sectional study of a convenience sample from a single KT center of moderate transplant activity. We included adult KT patients and health care professionals, from January to May 2019. Demographic, clinical, and acceptability data were collected by semi-structured interview.

Results: We evaluated 147 patients: 63.2 % males, mean age of 45.1±13 years, 84.3 % received grafts from deceased donors, 10±4 years of schooling, median time of KT 5 years. 90 % of patients own smartphones, 39.5 % notebooks, 36 % personal computers, and 12.2 % tablets. The interest in using an eHealth technology was impressive (96.6 %) and directed to the smartphone (93.2 %). We included 10 physicians and 3 nurses involved in the care of those patients. Among the main barriers to treatment, 76.9 % reported the patient adherence and 53.8 % the low health literacy. All professionals believed an e-health technology could help in the care of KT patients but 23 % had doubts about effective acceptability by patients. The

professionals also considered e-health has the potential of increasing communication between patient and services, but saw as challenges the availability of technology and human support.

Conclusions: This is the first study about the acceptability of an eHealth technology in Brazilian KT patients. We found the patients are already users of information technology, and both patients and health professionals are fully interested in eHealth directed for helping the treatment. These findings justify the developing of this kind of technologies for seeking better results.

P.33 A proactive inter-disciplinary CME to improve medication management in the elderly population

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Introduction: A major concern to healthcare systems in primary care is represented by medication inappropriateness and non-adherent behaviour in patients with multi-morbidity and polypharmacy. A strategy to improve the management of elderly population's polytherapies is the reinforcement of the collaboration between Hospital Pharmacists (HPs) and General Practitioners (GPs). A Continuing Medical Education (CME) was organised for a group of GPs by HPs from a Territorial Pharmaceutical Centre of Northern Italy with the following aims: to increase awareness on the topic, to enhance optimization of non-transmissible chronic pathologies' therapies and de-prescription.

Methods: The course was structured in four sessions: 1) update of expertise on management of elderly patients' polytherapy review, 2) use of a Clinical Decision Support System (CDSS) and collaboration with HPs, 3) reconciliation and production of an Illustrated Therapy Schedule (ITS) for each patient, 4) communication with patients and delivery of the ITS. Number of drugs, dosage units, Drug-Drug Interactions (DDIs – Micromedex®) were analysed. Questionnaires have been administered to GPs and patients to evaluate the program proposed.

Results: Twenty GPs started the CME, but only 13 were actively involved. Each GP reviewed with the CDSS about 20 polytherapies with the HPs' collaboration and support from the University of Torino. 218 patients were included; now, 176 patients are experiencing the therapy support of the ITS. Number of drugs, dosage units and DDIs were respectively – mean(sd) – 9.69(2.89), 10.05(3.40), 1.37(1.32). The percentage of DDIs solved is only 14.5 %.

Conclusions: This project embodies a possible solution to re-consider polytherapies in the elderly through a CME. The process would benefit from a deeper knowledge of the chances of a multi-disciplinary approach to a multifaceted problem. This study highlights the strengths and limits of the co-work within GPs and HPs, supported by a CDSS, as well as the possible limitations to overcome in order to increase the project's scalability.

P.34 Assessment of the level of adherence in elderly hypertensive patients

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Introduction: The prevalence of hypertension (HNT) in the general population is about 30–45 %. Effective The antihypertensive treatment depends on the use of the proper pharmacotherapy. Non-compliance with the recommendations related to the drug administration may result from irregular dosage, improper dosage or discontinuation of therapy. Unfortunately, ineffective treatment causes increased mortality due to cardiovascular complications.

Methods: The study included 100 patients diagnosed with hypertension based on European Society of Hypertension guidelines. The study was carried out during hospitalization due to exacerbation of disease symptoms in the Department of Hypertension in the Wroclaw University Hospital. Basic socio-demographic and clinical data were obtained from medical record analysis. The level of adherence was assessed using the Adherence to Refills and Medication Scale (ARMS) questionnaire. The analysis assumed the level of significance $p<0.05$.

Results: The study comprised 59 women and 41 men of mean age 69.53 (SD=69.53; Me=69). The average duration of the disease was 14.04 (SD=81.64; Me 12.92). The evaluation of the level of adherence showed that the respondents achieved an average of 17.42 points out of 48 possible points (SD=6.65), while the higher the number of points the worse the adherence. Multifactorial analysis showed significant correlation between adherence and professional activity. Unemployment had a negative effect on the adherence ($p<0.001$, regression parameter 12.661). Moreover, the number of hospitalizations turned out to be a significant factor. The higher the number of hospitalizations, the lower the adherence level ($p<0.01$, regression parameter 4.522).

Conclusions: Professionally active patients and less frequently hospitalized patients showed higher levels of adherence.

P.35 Impact of adverse effects to oral antidiabetics on adherence and quality of life in patients with type 2 diabetes

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Introduction: The "epidemics" of the 21st century are the chronic pathologies like Diabetes Mellitus. In Portugal the prevalence was 13,3 % which corresponds to 1 million portuguese diagnosed, but the forecasts are for a big increase. Diabetes is a metabolic disorder with many comorbidities, microvascular and macrovascular complications. The various therapeutic options currently available have been shown to be effective in controlling glycaemia and HbA1 levels. Adherence with this therapeutic is essential for optimization and control of chronic conditions. However, they present side effects that may compromise adherence to therapy and the quality of life of the patients.

The objective of this study is to evaluate the impact of the adverse effects of oral antidiabetic medicines on patients' quality of life and adherence to therapy.

Methods: We developed a cross-sectional study in a sample of 65 patients with type 2 diabetes recruited in several pharmacies in the center of Portugal. Data collected through a questionnaire previously validated with MAT Scale and EQ-5D-3L questionnaire.

Results: In total, 36 men (55,4 %) and 29 women (44,6 %) participated in the study, the mean age was 64,8 years. 73,8 % take oral medication and 92,30 % of people have high adherence. The adverse events with more impact in the patients' perception are "Discomfort in the genital area", "Dry mouth" and gastrointestinal events such as "Abdominal distention", "Flatulence" and "Constipation". The number of adverse events have a negative impact on patients' quality of life (rs=-0,479;p≤0,01). The satisfaction with the therapeutic regime is significantly associated with adherence (rs=0,348;p≤0,01)and their quality of life (rs=0,316;p=0,01).

Conclusions: We concluded that the adverse events have a negative impact on adherence and quality of life. The presence of adverse events, the type of medication and the therapeutic regimen are factors that negatively influence the patients' quality of life, especially in the polymedicated elderly people.

P.36 Benefits linked to the use of a medication plan – a systematic review

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Introduction: Patients with multiple chronic conditions often receive multiple medications. When entering hospitals or nursing homes, information concerning their current treatment tend to be incomplete. A medication plan that contains all essential information on the actual therapy is likely to increase patient safety. We aimed to investigate the benefits linked to medication plans in practical use.

Methods: We searched PubMed and Web of Science with end date February 2019 using the search term "medication plan" and synonyms. We included studies, which examined the effect of a medication plan regardless of study design and intervention. We extracted study results narratively and categorized the benefits inductively. We classified the methodical quality of included studies as weak, moderate or strong according to the EPHPP tool.

Results: Thirty studies met the inclusion criteria (4 RCTs, 10 cohort studies, 8 cross-sectional studies, 1 systematic review), mostly from Germany (18 studies) and the US (5 studies). On the patient level, the most obvious benefits were an increase of medication knowledge, a reduction of medication errors, and increased adherence. On the interprofessional level, a medication plan represents a helpful tool to increase communication and intersectoral cooperation between healthcare providers. Accuracy and up-to-datedness are prerequisites for any positive effect linked with the use of a medication plan. The quality of the studies was mainly weak due to unmet criteria (not RCT study design, not reported dropouts).

Conclusions: Overall, the retrieved studies confirm the presence of clear benefits linked to the use of a medication plan for patients and the healthcare system. It is unknown whether the observed benefits will lead to improvement in the clinical outcomes. Further research is needed.

P.37 Balancing medication use in nursing home residents with life-limiting disease

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Introduction: Balancing medications that are needed and beneficial, and avoiding medications that may be harmful is important to prevent drug related problems, and improve quality of life. Unbalanced medication use may foster polypharmacy, PIM use, and associated health related outcomes, such as falls, hospitalizations and increased risk of mortality. The aim of this study is to describe medication use, the prevalence of deprescribing of medications suitable for deprescribing, and the prevalence of new initiation of potentially inappropriate medications (PIMs) in nursing home (NH) residents with life-limiting disease in Flanders.

Methods: NH residents aged >= 65, suffering from end stage organ failure, advanced cancer and/or dementia (n=296) were included in this cross-sectional study with retrospective analyses of medication use at the time of data collection (t2) and three to six months before (t1). The appraisal of appropriateness of medications was done using a list of medications documented as suitable for deprescribing, and STOPPFrail criteria.

Results: Residents' (mean age 86 years, 74 % female) mean number of chronic medications increased from 7.4 (t1) to 7.9 (t2). In 31 % of those using medications suitable for deprescribing, at least one medication was actually deprescribed. In 30 % at least one PIM from the group of selected PIMs was newly initiated. In the subgroup (n=76) for whom deprescribing was observed, deprescribing was associated with less new initiations of PIMs (r=-0.234, p=0.042).

Conclusions: Medication use remained high at the end of life for NH residents with life-limiting disease, and deprescribing was limited. However, in the subgroup of 76 residents for whom deprescribing was observed, less new PIMs were initiated. In these 76 people medication use can be considered to be carefully balanced.

P.38 Implementation of theoretical models in quantitative studies on medication adherence: Findings from a systematic review

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Introduction: Numerous studies are conducted in order to define the most effective strategies to provide interventions enhancing adherence. Despite the growing interest in the matter, literature findings remain uncertain, leaving the gap between theory and practice still partially unsolved.

Methods: A PRISMA systematic review was performed (2633 articles screened, 102 papers included, after a full-text analysis) through indexed databases (Scopus, PubMed), to establish how frequently adherence theoretical models were adopted in quantitative studies on chronicity in the older population (65+). Eligible articles were reviewed through the lenses of two well-established adherence descriptive models (ABC Taxonomy, Three Factor Model) in order to determine if significant contents were implicitly considered in the methodologies applied. Lastly, each paper was retrospectively examined through

the recently published EMERGE guidelines, to evaluate the accuracy of the scientific reporting upon medication adherence (focus: *additional criterion*).

Results: Amongst the 102 papers, only eighteen studies explicitly considered baseline theoretical frameworks. Adherence to medication was defined operatively and indirectly, by means of the instruments applied (e.g. questionnaires, pill count), with no reliance to conceptually validated definitions (e.g. WHO definition). As for the screening models, the studies reviewed were often neglecting the *Initiation* phase, mainly focusing on *Implementation* and *Persistence* (ABC Taxonomy). Parallelly, at least two of the Three Factor Model components (*Information, Motivation, Strategy*) were satisfactory accounted in each paper. According to the EMERGE guidelines, the scarce implementation of theoretical models able to guide the interventions represents a significant accuracy limit at the present time.

Conclusions: The results highlight the need for a dedicated space for reflection upon theories subtending adherence interventions. Our findings may encourage the application of a concept-based practice, providing methodological cues for future studies aiming at exploring the same matter, enhancing the soundness of the results and easing the comparability of behavioural outcomes.

P.39 Interventions on medication adherence in chronic older population: A systematic review and meta-analysis of randomized controlled trials

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Introduction: Interventions on medication adherence are called upon facing increasingly complex scenarios, in which various factors (socio-economic, healthcare system-related, therapy-related, condition-related, patient-related) play an important role. As a result, researchers and healthcare providers need to constantly refine strategies on how to appropriately assist older and chronic patients; nevertheless the efficacy of the contributions is still to be clarified.

Methods: A systematic PRISMA metanalysis will be performed on RCTs studies only searched through indexed databases (Scopus, PubMed), covering a period from January 2010 to May 2019, in order to determine efficacy proofs upon adherence interventions strategies being used in literature. The meta-analysis will be based on reviewed record after databases search and on records previously collected through a systematic review already performed. The following data will be analyzed: patients' mean age, sample sizes, main outcomes (with a focus on medication adherence related outcomes), reliability of adherence evaluation criteria, eventual presence of digital supports, eventual presence of theoretical frameworks, healthcare or non-professional figures involved, interventions' setting and interventions' cost-efficacy.

Results: The process is still ongoing. Results from a sound metanalysis could hopefully highlight strength and limits of the most applied approaches, with focus on behavioral outcomes, medication adherence evaluation criteria, digital health, interprofessional frameworks and family involvement.

Conclusions: Future interventions on medication adherence in older adults should include a focus upon real-life implementation (feasibility, cost-effectiveness). Context variables need to be accounted as well (multi-professional teams, family, caregivers) in order to collect patient-centered and holistic information.

P.40 U (undetectable) = U (untransmittable) steatment as a unique opportunity to reinforce adherence to antiretroviral therapy

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Introduction: The Undetectable=Untransmittable (U=U) campaign declares that a PLWHIVA (persons living with HIV and AIDS), who has undetectable viral load, cannot transmit HIV. The aim of this research is to examine knowledge and empowering effects of the U=U concept on PLWHIVA; the survey was important to inform and educate patients and to improve self-esteem and adherence to treatment.

Methods: An anonymous questionnaire was administered to outpatients in 2 regional clinics and 2 community centers in the Piedmont region, from January to May 2019. Questions were about age, education, gender and sexual orientation, time on ART, U=U knowledge, HIV transmission, U=U effects on behaviors. At the end of compilation, a short educational message (video + counselling) was offered.

Results: 252 questionnaires. Mean age: 47 years (20–72); 189 males, 57 females, 1 transgender, 5 non responders; 126 heterosexuals, 103 homosexuals, 17 bisexual, 6 non responders; Mean time on ART: 11 years (6 months – 32 years); Education: secondary and upper: 148; 1 no education; 4 non responders. Knowledge about U=U concept: 204 no, 48 yes; Personal belief about U=U: 138 disagree, 107 agree. 7 non responders; Information from physician about U=U: 108 yes, 138 no, 5 non responders; Personal belief about U=U on changing PLWHIVA preventive behaviors: 113 yes, 120 no, 19 non responders; Personal belief about U=U impact on stigma against PLWHIVA: 113 positive impact; 110 no change; 29 non responders. 41 patients (85 % of 48 patients aware of U=U concept) did not change preventive behavior; 34 (71 %) reported improved quality of life.

Conclusions: Results show that U=U concept is mostly unknown by PLWHIVA in Italy and informational/educational campaigns are needed by PLWHIVA and by general population (perceived stigma is still an important issue for PLWHIVA). The goal of the first U (= undetectable) is a great opportunity to reinforce adherence issue.

P.41 Perspectives on adherence supportive care from clinicians and adults with type 2 diabetes; An explorative qualitative study in the dutch primary care

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Introduction: In order to successfully implement medication adherence interventions, a good 'fit' between the program, clinicians and patients is critical. An exploration of the needs and wishes of clinicians and the patients in development of care is currently needed. The aim of the present study was to explore both patients' and clinicians perspectives on adequate adherence supportive care.

Methods: A qualitative study was conducted as part of a medication adherence pilot project (HOUVAST 2.0). Using a purposive sampling strategy, data were collected through two focus groups with respectively five clinicians and twelve patients. Topics discussed included medication adherence, communication, collaboration and satisfaction with current standards of care. Focus group sessions were audiotaped and transcribed verbatim. Atlas.ti 8.0 software was used for coding and structuring

of themes. A thematic analysis of the data was performed. Results: Main themes that emerged were 'views on adequate adherence supportive care', 'current standards of care' and 'bottlenecks in current practice'. Medication adherence was seen as very important both by patients and clinicians. Medication non-adherence was often recognized by clinicians, but not properly addressed. Main reasons for not addressing were lack of time by GPs, lack of proper identification of non-adherent diabetes patients by GPs, difficulties with using pharmacy information technology systems and lack of clear guidelines aimed at improving medication adherence. T2DM patients mainly noticed these shortcomings by not receiving their medications (on time) at the pharmacy counter or not receiving the right medications. This led to patients perceiving pharmacists as solely profit oriented and not involved in actual caretaking.

Conclusions: According to patients and clinicians medication adherence should receive more attention in routine primary care. Currently medication adherence is often observed, but not addressed. This is mainly due to shortcomings in ICT, communication and collaboration. These results can be used to shape future medication adherence interventions.

P.42 Trivial or troublesome, experiences of medicine taking among patients with coronary heart disease

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Introduction: Living with coronary heart disease (CHD) means, among other things, being prescribed usually five medicines for the prevention of new events. Using medicines for long-term conditions impacts day-to-day life, and coping with medicines can be burdensome and affect quality of life. We wanted an understanding of these patients' experiences of medicine taking to further improve the intervention tested in the Motivational Interviewing and Medication Review in Coronary Heart Disease (MIMeRiC)-trial (Östbring et al, JMIR Res Protoc 2018). The purpose of this study was to describe patients´ experiences of using medicines one year after diagnosis of CHD.

Methods: This was a qualitative study using a descriptive approach. Semi-structured interviews were conducted among 19 patients not included in the MIMeRiC-trial. Interviews were held in their home or at the university and were recorded and transcribed verbatim. Qualitative content analysis with inductive approach was used.

Results: Patients could find the handling of and treatment with medicines after diagnosis of CHD as very easy, natural and straightforward or as something distressing or mostly troublesome that influenced life extensively. Patients also related to their own responsibility about the treatment and use of medicines in different ways. Patients' experiences were characterized by seven categories: sense of security, unproblematic, learning to live with it, require own responsibility, something uncertain, troublesome and distressing. Participants might express an unproblematic relation to medicines or a feeling of security, but this was often completed with experiences of dilemmas or questions regarding some aspects of their medicine taking.

Conclusions: Experience with medication differs among patients with CHD, for some it is trivial and others find it very troublesome. Patients also differ in the way they want to take responsibility for their treatment. Continuing dialogue and follow-up counselling adjusted to the needs of the individual patient are needed to better support patients in managing their medication.

P.43 Determinants of non-adherence to treatment for tuberculosis (TB) in high income, low TB incidence contexts: A scoping review

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Introduction: Although tuberculosis (TB) can be cured with specific treatment, non-adherence is a persistent global health concern. Understanding factors which influence adherence behaviour in TB is necessary to develop effective interventions. The majority of studies examining determinants of non-adherence to treatment for TB have understandably been conducted within high TB burden contexts. However, TB also remains a public health issue within high income, low incidence settings, where the factors that influence adherence behaviour may be distinct from other populations with TB. As part of the development of an intervention to support adherence within this healthcare context, we performed a scoping review to identify the determinants of non-adherence to treatment for TB in high income, low incidence settings.

Methods: Literature searches were conducted in MEDLINE, EMBASE, Web of Science, PsycINFO, and CINAHL. Following the PRISMA extension checklist for scoping reviews, articles will be screened and extracted into a standardised spreadsheet. As a proxy quality measure, we will examine the power of studies to detect effect sizes over a minimum threshold. Determinants of non-adherence will be grouped into demographic, clinical, psychosocial, and health-systems factors.

Results: Screening and data extraction will be completed from June to July 2019. Eligible studies will be those published in peer-reviewed journals, reporting primary data on characteristics, predictors or determinants associated with adherence to TB treatment or completion, and in patients with active, not latent, TB. Results are therefore pending for this piece but will be available before the ESPACOMP conference date in November. The results of the review will be considered within theoretical frameworks of adherence, to provide insights for intervention development.

Conclusions: As detailed above, the results for this review are pending but will be available before the conference date.

P.44 The importance of therapeutic communication in compliance among patients with hypertension

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Introduction: According to the World Health Organization, non-compliance to therapeutic recommendations is a basic barrier to achieving the benefits of current medical knowledge therapy. Negative consequences of non-compliance with therapeutic recommendations include the spectrum of consequences - from the deterioration of health to death. An important role is attributed to behavioral therapy and satisfaction with therapeutic communication. So far, there is little research dedicated to this issue.

Methods: The study included 102 patients (mean age 61.7 ± 15.05) with hypertension. A CAT-R questionnaire was used to assess satisfaction with communication. Social and clinical data was obtained from medical records.

Results: In the study group over 32 % of the respondents were dissatisfied with the doctor-patient communication. In a comparative analysis, patients dissatisfied with the communication compared to satisfied patients obtained a lower level of compliance with the recommendations for all domains of the Hill-Bone questionnaire, respectively: general result 24.69±5.25 vs. 21.59±6.22, reduction of sodium supply 6.62±1.54 vs. 5.78±1.82; control appointments 5.22±0.94 vs. 4.32±1.16; taking drugs 12.88±3.7 vs. 11.49±4.96 ($p<0.001$) and in the field of pharmacological treatment evaluated by the ARMS questionnaire 21.69±7.65 vs. 16.44±4.74 ($p<0.001$). The majority of patients satisfied with the communication with the same doctor most of the time (78.5 %), the average appointment time was 17.23 ± 6.3 minutes, with the time devoted to the interview 13.71±8.73 minutes . Among satisfied patients (75.49 %) the contact with the doctor was dominated by the positive features of communication: a lot of information, questions about symptoms, trust and concentration on the patient's needs.

Conclusions: Satisfaction with communication is an important factor positively affecting the level of compliance with pharmacological and non-pharmacological therapeutic recommendations of patients with hypertension. For patients, the most important is the time spent talking, trusting and focusing on their problems and needs.

P.45 Adherence to therapeutic recommendations in chronic diseases

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Introduction: Low adherence to chronic diseases management, especially hypertension (HT) and diabetes mellitus (DM), is one of the major problems leading to complications, rehospitalisation and lower quality of life. Approximately 40 %–60 % of patients with these conditions do not follow the prescribed treatment. The aim of the study was to analyze the relationship between selected variables and adherence to pharmacological treatment and determining the differences between diabetes and hypertension.

Methods: The study included 1571 patients (mean age 64.7±11.3) with chronic diseases (1030 DM and 541 HT). Adherence was assessed using the Adherence Refills Medication Scale (ARMS; lower scores indicating better adherence). Social and clinical data was obtained from medical records.

Results: Average adherence score for the whole group was 18.4±6.3. (55 % of patients had a low level of compliance). The comparison between DM and HA shows a statistically significant difference and a higher level of compliance with pharmacological recommendations in the group of patients with diabetes (17.5±12.0 vs 19.2±8.0). In the single factors analysis, HT diagnosis had a statistically significant negative effect on compliance (β=0.92, p=0.000). In simple linear regression analysis, independly of chronic disease, the higher level of adherence was observed among women (β=-0.40, p=0.015), people with secondary education (β=-1.26, p=0.000) and inactive patients (β=-0.48; p=0.005). However, place of residence - countryside (β=0.35, p=0.044) and higher education level (β=0.90, p=0.000) negatively influenced the level of compliance. In multiple linear regression analysis HT (B=0.99; p=0.000), female (B=-0.47; p=0.003) and secondary education (B=-1.16; p=0.000) were important independent determinants of compliance.

Conclusions: Hypertension is the significant predictor of low compliance with pharmacological treatment. The independent sociodemographic determinants of higher compliance with pharmacological recommendations in chronic diseases are female sex and secondary education level.

P.46 Designing a personalised digital patient support programme (PSP) for patients treated with growth hormone: Key design considerations

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Introduction: Recombinant human growth hormone (r-hGH) treatment can optimise growth potential; however, optimum outcomes are not always achieved owing to several reasons, including poor adherence. A recent systematic review has identified a range of potentially modifiable factors, which can influence levels of adherence to GH treatment. These comprise three broad groups of factors, which can be grouped according to the COM-B framework for understanding medication adherence. Insights from the systematic review were used to guide the development of a PSP to support patients receiving growth hormone to maximise their growth potential.

Methods: The behaviour change wheel was used to inform the development of the patient support programme. The behaviour change wheel provides a comprehensive framework to support the design of interventions, drawing on behaviour change theory and evidence-based techniques. The COM-B factors were firstly mapped across the disease/treatment journey to determine when support needs may fluctuate. Appropriate intervention types and behaviour change techniques were then selected to address these factors across the patient journey. Strategies to enhance engagement with digital elements of the PSP were also built into the design process.

Results: Three high-level support recommendations were made as a part of TUITEK® programme: 1. A personalisation questionnaire to identify individual needs and tailor support for each person. 2. Tailored reminder and support messaging delivered electronically, prioritised by COM-B factors. 3. Development of a multicomponent eHealth solution with addition of human interactive elements such as PSP-nurse-coaching modules, focussed on core behavioural drivers and including evidence-based behaviour-change techniques.

Conclusions: The TUITEK®, is currently being piloted with patients with growth disorders receiving treatment with Saizen® to assess engagement with the programme and determine the impact on patient outcomes. Results from the pilot will be used to further refine the programme to ensure it meets user needs.

P.47 Implementaion and persistence to cardiovascular medication across Scotland

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Introduction: Despite the availability of efficacious drugs, cardiovascular disease (CVD) remains a leading cause of global mortality, and prevalence of CVD is higher in Scotland than in other developed countries. Research into adherence to cardiovascular drugs is particularly important in this setting. Furthermore, Scotland has valuable nation-wide administrative databases which can be used for the study of adherence at a population level. With these datasets, it is possible to define different levels of disease severity and compare adherence across a range of drug classes.

Methods: Using the Prescribing Information System (PIS) linked to hospital admissions data (SMR01, SMR04) and death certificates (NRS) we have defined four key patient subgroups: primary prevention (n=1,504,869), treatment for symptomatic CVD (n=246,710), secondary prevention (n=25,236), and secondary prevention with treatment (n=23,866). Using the Treatment Anniversary Model (TAM) combined with Proportion of Days Covered (PDC) we have identified broad levels of adherence across 10 key CVD drug classes.

Results: Of patients considered persistent with TAM, implementation was greatest in secondary and secondary-with-treatment groups across all drug classes. Persistence is lowest in Nitrates (range 29–55 %) and highest in Lipid-lowering drugs (41–87 %). However, persistence in secondary prevention is negatively skewed due to patients quickly moving out of this group and into secondary-with-treatment, which must be accounted for.

Conclusions: This is a longitudinal, Scotland-wide, retrospective study of adherence with cardiovascular drugs, with near-universal population coverage. This allows identification of population-level risk factors and identification of patient groups who may require extra support. Using combined measures of persistence (TAM) and implementation (PDC) allows insight into two key aspects of drug adherence.

P.48 The impact of cognitive impairment on adherence in a elderly patients with hypertension

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Introduction: Following the recommendations of pharmacotherapy in hypertension (HTN) in one year after the start of treatment is estimated to be <50 %. Adherence to anti-hypertensive drugs is a key factor in controlling blood pressure and preventing complications of the disease. The phenomenon of non-adherence in the population of elderly people is attributed, among other things, to cognitive disorders.

Methods: The study was conducted in 100 patients with diagnosed HTN (mean age 69.53±11.48 years) hospitalized due to exacerbation of disease symptoms in the Department of Hypertension and Occupational Diseases at the University Clinical Hospital in Wroclaw. In order to obtain basic sociodemographic and clinical data, two standardized research tools were used: the Montreal Cognitive Assessment (MoCA) to evaluate cognitive impairment and the Adherence to Refills and Medication Scale (ARMS) to evaluate adherence. The analysis assumed the level of significance $p<0.05$.

Results: The majority of the studied group were women (59 %), people with secondary education (67 %) and in relationships (64 %). The most common coexisting diseases were diabetes mellitus (62 %) and cardiovascular diseases (60 %). Analysis of the MoCA questionnaire results revealed cognitive impairment in 81 % of respondents. Adherence analysis based on ARMS questionnaire showed an average score of 17.42 (SD=6.65). A statistically significant negative correlation between adherence and cognitive impairment was found. Cognitive impairment was accompanied by a decrease in adherence ($p<0.001$, rho-0.35).

Conclusions: As cognitive impairment increases, the incidence of non-adherence increases.

P.49 Interventions to improve medication adherence in patients with schizophrenia or bipolar disorders: A systematic review

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Introduction: Psychiatric disorders are a public health challenge and assigned 13 % of the total global burden of disease. Patients with major psychiatric disorders such as schizophrenia and bipolar disorders are most likely to be non-adherent to their medication. High non-adherence rates are described: 63–74 % for schizophrenia and 50 % for patients with bipolar disorders. The aim of this systematic review is to provide a comprehensive overview of the available data on interventions developed to improve adherence in patients with schizophrenia or bipolar disorders.

Methods: Literature published in the last decade was searched for interventions studies to improve medication adherence in patients with schizophrenia or bipolar disorders. Interventions were categorized based on type, and the context and effectiveness of the interventions were described.

Results: Twenty-three publications met the selection criteria. Different types of interventions to improve adherence in patients with schizophrenia and bipolar disease have been tested: educational, behavioural, family based, technological, self-management training or a combination of previous types. Fifteen (65 %) publications reported significant intervention effects. The greatest improvement in adherence was seen with interventions employing combinations of education and self-management training strategies.

Conclusions: Medication non-adherence remains a challenging problem in patients with schizophrenia or bipolar disorders. Additional efforts are required to address this problem, which causes significant burden to the patient, his environment, health care and society. The systematic review allows to learn about what works and what doesn't in order to create the prototype of complex intervention.

P.50 Interactive tool to empower the management of the medication regimen

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Introduction: The demographic evolution and increasing the incidence of chronic diseases lead to a scenario in which people are more vulnerable to factors that may compromise their ability to manage the medication regimen properly and require the help of a caregiver. This study is part of the INTENT-CARE project, which is an interactive technological tool that enables the familiar caregivers of dependent person to manage the information they need to know. The aim of this study was to develop and validate contents relating to the management of medication regimen, to be included the tool in order to contribute to the empowerment of family caregivers.

Methods: This is an exploratory, descriptive and qualitative study. The sample comprised 7 experts, using the focus group technique in two sessions. To validate the contents developed regarding the management of medication regímen.

Results: The contents developed were related to the following parameters: Introduction, List of medication, General recommendations, Oral administration, Ophthalmic administration, Otological administration, Inhalation administration, Cutaneous administration, Rectal administration and Special situations. The experts were unanimous in considering that the contents developed are useful and relevant to improve the quality of nursing care provided to family caregivers of dependent persons in the field of medication regimen management.

Conclusions: The use of educational technologies could be an innovative resource and an educational strategy used by nurses with the aim of empowering dependent people or family caregivers.

P.51 Preferences of people with diabetes to build an app: Study pilot

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Introduction: Self-management is a central concept in diabetes care, being a complex process that requires the individual's ability to manage the symptoms, treatment, consequences and lifestyly changes inherent of the condition chronicity. The eHealth strategies have demonstrated positive results in the capacity for self-management, allowing the attainment of individual health goals, greater awareness about the health-disease situation and greater adherence to the therapeutic regimen. The aim of this study was to identify the needs and preferences of the diabetes population concerning the content and use of smartphone apps.

Methods: A qualitative, cross-sectional study with people with type 2 diabetes diagnosed for more than 12 months, with abilities to autonomously manage their disease, and who accepted to participate in the study. Participants were selected from an association of diabetics through the snowball strategy. The semi-structured interview for data collection was used.

Results: So far, three participantes have been interviewed. These have never used an app for diabetes and admit to not knowing how well an app could help them in managing the disease. The analysis of the data obtained concludes that people prefer apps that combine information with glycemic monitoring tools and feedback messages. The participantes do not focus on the need to monitor parameters such as weight or blood pressure, but denote the importance of controlling diet and physical activity. The interactivity with the health professional and the possibility of clarifying doubts are other aspects mentioned.

Conclusions: Although still preliminary, the results allow us to unveil some essential points in building an app that meets the needs and integrates the client's individual goals.

P.52 Adherence to antiretroviral therapy among naïve patients attending an outpatient pharmacy in a tertiary care hospital

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Introduction: Treatment adherence in HIV is the primary determinant of viral suppression, and is associated with drug resistance, progression to AIDS and reduced survival. However, it remains unsatisfactory and varies between 27 and 80 % in various studies.

Our aim was to assess adherence rates to antiretroviral therapy (ART) in naïve patients with HIV infection.

Methods: Observational retrospective study. Patients with HIV infection treated for the first time with ART in our hospital between January and September 2018 were included, but only HIV-naïve patients were analyzed.

Demographic data such as age, gender and origin country were collected. Clinical registered variables were: transmission route of HIV infection, viral load, CD4 cell count and initial ART.

Adherence during the first 6 months of therapy was calculated from the drug dispensation records at the Pharmacy Service.

Results: A total of 319 patients were included, 127 of them were HIV-naïve patients (and 192 were pretreated patients transferred from other hospitals). HIV-naïve patients mean age was 35.5±10.0 years, 91.3 % were males, 53.5 % were Latin American and 42.5 % Caucasian.

The most common transmission route was homosexual contact (93 patients, 73.2 %), followed by heterosexual contact (24 patients, 18.9 %). Median viral load was 35,400 copies/mL (IQR:5,880–157,000) and median CD4 cell count was 346 cells/µL (IQR:216–479).

Most frequent initial ART was Elvitegravir/Cobicistat/Emtricitabine/Tenofovir alafenamide (EVG/COBI/FTC/TAF) (55 patients, 43.3 %) and Darunavir/Cobicistat/Emtricitabine/Tenofovir alafenamide (DRV/COBI/FTC/TAF) (32 patients, 25.2 %).

Primary adherence rate was 100 % since all patients collected their newly prescribed medication. Mean adherence during the first 6 months was 91.9 % ±19.8 (91.9 % ±19.2 with EVG/COBI/FTC/TAF and 97.9 % ±11.8 with DRV/COBI/FTC/TAF; p=0.12). Adherence was >90 % in 76.4 % patients (n=97), between 80 and 90 % in 11.0 % patients (n=14) and <80 % in 12.6 % (n=16).

Conclusions: Both primary and secondary adherence have improved compared with previously reported data, probably due to the decrease in ART complexity and the improvement of tolerability to therapy.

P.53 Engage: Designing and building an evidence-based digital health platform to support treatment management and adherence

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Introduction: There is evidence that multi-channel patient support programmes (PSPs) can significantly improve health outcomes and that the most impactful programmes are those that understand the drivers of patient behaviour, deploy interventions matched to individuals' needs and integrate high-touch HCP / nurse-led support, with multi-channel digital and print support. Our aim was to design and build a digital health solution to support treatment management and adherence in chronic illness that utilised principles of behavioural science, systems design and worked cohesively as part of a multi-channel, person-led support programme.

Methods: A narrative review of the literature was conducted to determine key features of successful digital health interventions. These features were mapped using the Behaviour Change Techniques Taxonomy (v1) and the Usability.gov guidelines for health literate digital design. Once identified, prototype modules were designed and built, aligned to these key features, with consideration for how they would work as part of a multi-channel intervention. User experience testing was then conducted to refine the modules. A customisable, digital patient platform was then built ('Engage') to incorporate these module designs, available for deployment as part of broader patient support interventions.

Results: The five core, evidence-based modules underpinning the 'Engage' platform are: Action Planning, Progress Tracking, Knowledge Shaping, Scheduling and Management plus Relationships and Communications. Each module incorporates behaviour change techniques from the taxonomy, examples include: feedback and monitoring, social comparison, regulation, goal setting. Key design features include individual tailoring, patient / healthcare provider communication and responsive content.

Conclusions: Taking an evidence based approach to digital health design, that incorporates both behaviour change and digital design theories has allowed us to create a patient support platform that can be tailored by disease, treatment and individual and provides comprehensive treatment management and adherence support. Instances of the platform are currently being tailored for migraine and a range of immune disorders.

P.54 Using m-health to design an adherence enabling intervention to empower cancer survivors on oral medication

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Introduction: Anticancer therapy is developing to an extent never achieved before. This calls for a shift in in the type of support that is required from the healthcare system. This project aims to explore the use of the Capability, Opportunity and Motivation (COM-B) model to develop a mHealth adherence enabling intervention for breast cancer and multiple myeloma patients taking oral oncolytics.

Methods: A ten-year time-series analysis (2009–2018) was undertaken using the drug regulatory database for consumption of medication in the hospital setting. A literature review on the most important determinants of non-adherence was followed by the development of two focus groups involving psychologists, nurses, pharmacists, oncologists and cancer survivors. These aimed to identify the core elements to consider for a mHealth intervention. Future work will use the COM-B model to identify behaviour change components and appropriate techniques for an interactive mHealth intervention to keep oncologic patients engaged in care.

Results: National data indicates that both quantities and costs of oral therapy for cancer have been steadily increasing annually (median: 4.1 % and 4.2 %, respectively). Despite the increased use of oral chemotherapy, the number of studies addressing adherence remains surprisingly low. So far, very little data have been published on adherence and persistence to oral molecular targeted therapies in solid malignancies. During the patient focus group, the main feature emerging was a need for closer and easier contact with the hospital team and a perceived current difficulty in this timely access. The focus group held with healthcare professionals revealed some openness to new technologies, although fear with the accuracy of any decision-support systems.

Conclusions: To our knowledge, this is the first project trying to understand how a comprehensive and evidence-based behaviour change framework can be applied to a currently developing mHealth intervention to improve adherence in oncology.

P.55 Self-efficacy and adherence behaviors in rheumatoid arthritis patients

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Introduction: Rheumatoid arthritis (RA) is a common disease that requires patient self-management with chronic medications. Adherence rates for RA medications are suboptimal. This study explores medication adherence and self-efficacy behaviors among RA patients.

Methods: We conducted a qualitative study comprising focus groups and individual interviews. Nineteen participants were recruited and screened to participate in three 90-minute focus groups (n=13) and six 60-minute individual interviews. We created and maintained a codebook to analyze data. Interviews were analyzed by using NViVo qualitative analysis software.

Results: Key points in participant interviews were 1) self-efficacy as influenced by the ability to establish routines, and having an understanding relationship with their healthcare provider; 2) self-efficacy to adjust medications depended on having permission from providers to adjust medications, perceptions of the effectiveness of medications, and confidence in self-knowledge to make appropriate adjustments; and 3) changes in self-efficacy over time were influenced by initial denial and later acceptance of the diagnosis. Participant interviews revealed that medication adherence is a spectrum that ranges from adherent to nonadherent.

Conclusions: Participants' experience with RA medications revealed varied underlying reasons for adherence behaviors. Recognizing adherence as a dynamic behavior has important implications for how adherence interventions are designed. For example, participants reported adjusting medications in response to the unpredictable nature of RA. Interventions could collect information about RA symptoms and be tailored to provide adherence support at times when patients need it most. The importance of self-efficacy in influencing participants' adherence behaviors is an area for continuing research among patients and providers.

P.56 Medication adherence in elderly patients of the centre region of Portugal

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Introduction: Aged-related physiological alterations prompt the occurrence of several alterations, like deterioration of medical conditions, increased number of prescribed medicines, diminution of social life as well the ability to understand the treatment regimen and management of medicines, these factors can compromise patient's adherence. Non-adherence among elderly patients is public health concern, as it accounts for poor treatment outcome, frequent hospital admission due the deterioration of medical conditions and increased economic and human healthcare costs. Considering that Portugal has one of the highest percentage of the world´s elderly we aim to assess the level of medication adherence in elderly polymedicated patients of the center region of Portugal.

Methods: Medication adherence was measured in elderly patients with 65 years old who took ≥ 5 prescription drugs regularly and lived in Interior's Center region of Portugal. It was applied a medication adherence measure validated in the Portuguese population by Delgado et Lima.[1]

Results: A total of 289 elderly patients were assessed for the level of adherence for chronic medication. The mean age of patient was 76.49 years. There were 172 (59,5 %) female patients and 117 (40.5 %) male patients. The adherence was high (5.42± 0.56), with only 19.1 % patients in poor adherence category. Patients admit that sometimes they don't take the medicines exactly like the physician prescribes due to forgiveness, the price of the medicines or/and difficulties in managing all medicines.

Conclusions: Conclusion: Educational interventions aimed to empower patients tailoring factors of non-adherence are important to improve efficacy and safety of medicines.

[1] Delgado, A.; Lima, M. - Contributo para a validação concorrente de uma medida de adesão aos tratamentos. Psicologia, Saúde & Doenças. 2: 2 (2001) 81–100

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P.57 Discontinuation from antihypertensive treatment among New York City Medicaid patients: the case for enhanced surveillance and ACEi/ARBs

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Introduction: Prior studies have shown that one in four commercially insured, pre-retirement aged patients in the U.S. discontinue antihypertensive medication (AHT) within the first year of therapy. Less in known about AHT discontinuation among the 65 million patients who qualify for Medicaid coverage, a government program for the income restricted and disabled. Our objective was to evaluate the scale and predictors of AHT medication discontinuation among a sample of Medicaid patients.

Methods: Using New York State Medicaid administrative claims data, we identified a cohort of 9,877 adult patients (18–65) from New York City (NYC) who were newly prescribed AHT medication in 2015 (no AHT claims in the prior 270 days) and were continuously eligible for Medicaid benefits from 2015–2016. Discontinuation was defined as not having therapy days in the final 90 days of a year-long evaluation period. Multivariable Cox hazard modeling was used to identify predictors of discontinuation.

Results: Overall, 44.2 % of new AHT patients discontinued treatment within one year. Of these discontinuers, 70.4 % discontinued before filling a fourth prescription. Compared to ACEi/ARBs, discontinuation was significantly higher for patients initiated on: beta blockers (HR 1.93;95 %CI 1.77–2.11), diuretics (HR 1.72;95 %CI 1.57–1.89), CCBs (HR 1.35;95 %CI 1.23–1.48), and combination therapy (HR 1.18;95 %CI 1.02–1.36). Younger and non-Hispanic white patients were also more likely to discontinue. Drug class, age, and race were much stronger predictors of "early discontinuation" (i.e., within the first 90 days of therapy) than later discontinuation.

Conclusions: NYC Medicaid patients initiated on an AHT medication discontinued therapy at nearly twice the rate of pre-retirement patients with commercial insurance. Furthermore, the effect of drug class on non-persistence was more pronounced among Medicaid patients than commercially insured patients. These findings suggest that even greater adherence surveillance should be afforded Medicaid patients and that ACEi/ARBs should be considered over other classes as first-line AHT therapy in the Medicaid population.

P.58 Antiretroviral-therapy (ART) use was not associated with improved birth outcomes in an analysis of 33,785 pregnancies in US Medicaid beneficiaries

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Introduction: To our knowledge, no study has examined whether the use of ART during pregnancy improves pregnancy outcomes for HIV-infected women in the US. This study compares stillbirth and prematurity rates between mothers who did and did not use antiretroviral therapy (ART) during pregnancy.

Methods: We used 12 years (2001–2012) of Medicaid Analytic eXtract (MAX) data from the fourteen states with the highest prevalence of HIV. HIV+ women were identified using a previously published approach, and ART use was classified as none vs. any. For any ART use, we categorized months of use. We estimated two multivariate logistic regression models for the two outcomes, adjusting for potential confounding variables and clustering at the patient level. Covariates in the model included

age group, race, state, year, Medicaid coverage type, basis of eligibility, substance use, rurality, comorbid conditions, and pregnancy complications (e.g. gestational diabetes).

Results: We identified 33,785 pregnancies in 26,085 pregnant HIV+ women. Crude rates of stillbirth and prematurity were 1.0 % and 7.9 %, respectively. Only 36.1 % of pregnant women ever used ART during pregnancy. Of those, the median number of months of ART was 4 (SD 2.5). In both crude and unadjusted analyses, ART use was not significantly associated with either outcome. Black race was a strong independent predictor for both stillbirth and prematurity (ORs: 1.78 and 1.63, respectively). Age, months on ART, number of comorbid conditions, rural residence, and substance abuse were not significantly associated with either outcome.

Conclusions: ART use during pregnancy was low, despite recommendations during this period that all pregnant women get ART, highlighting access problems, and a need to address disparities. These findings do not suggest that ART use during pregnancy is unnecessary, only that it does not affect these two specific outcomes. This dataset does not allow us to examine perinatal transmission. Pre/post natal care analysis efforts are ongoing.

P.59 The CANP project: enhancing tele-medicine improvement in the hospitalization at home process

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Introduction: "La Casa nel Parco" (CANP - http://casanelparco-project.it/) is a human-centred project based on e-health: specifically, forefront tele-medicine, monitoring and assisting patients included in the Hospitalized at Home Service (HHS). The main focus of the study is the analysis of a multi-disciplinary approach to patients' assistance, improving self-management capabilities, health services processes and rationalization of the economic resources. In this context, Clinical Pharmacists (CPs) contribute to the development of an ICT tool (App) which supports medication reviewing and reconciliation, giving patients or caregivers a mean to improve therapy management and adherence consequently.

Methods: The CANP project develops in several amendments. In our setting, CPs collaborate with geriatricians to review and reconcile patients' polytherapies through an App, developed as an interface of an existing Clinical Decision Support System (CDSS), NavFarma®. A multi-disciplinary team, involving CPs, geriatricians, nurses and IT specialists is validating contents, developing the future architecture of the App. It will be installed on patients and caregivers' smartphones, helping them managing and understanding their therapies, improving patients' empowerment and adherence to treatments. Some of the features tested are, for instance, the use of alarms, reminding patients and caregivers the timings and dosage units to be taken daily, or short warnings on the choice of herbal products and dietary supplements preventing possible interactions with prescribed drugs.

Results: The release of a final version of the App is expected to allow forthcoming clinical studies to reinforce evidence on digital tools' role, supporting medication appropriateness and adherence in the HHS setting.

Conclusions: CANP is an opportunity for a multi-disciplinary approach to hospitalization at home, testing new solutions improving patients and caregivers' self-capabilities during hospitalization and chronic states. Nonetheless, the study will give results concerning adaptability of the technologies tested to a pool of population and the possible outcomes on health care costs.

P.60 Non-medical prescribing behaviour in midwifery practice: A mixed-methods review

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Introduction: Non-medical prescribing is a new skill in midwifery practice. Information is needed on whether this is an activity that is feasible, appropriate, meaningful and effective.

Aim: To report on the determinants of midwife prescribing behaviour to inform midwifery practice.

Methods: A mixed-methods review using an integrated approach of the literature was conducted. Data were categorised according the feasibility appropriateness- meaningfulness-effectiveness (FAME) scale and thematised according the attitude, social-influence, self-efficacy (ASE) model. A thematic analysis, a Bayesian descriptive analysis and Bayesian Pearson correlations of the FAME-categories and ASE-themes were performed.

Results: Seven studies showing moderate to good quality were included for synthesis. The FAME categories feasibility and appropriateness tended to affect the utility of midwife prescribing; meaningfulness and effectiveness were related to non-utility of prescribing. There were weak to moderate correlations between the FAME categories and the ASE themes social influence, intention, barriers and supportive factors and perceived knowledge (r-.41 to -.34 and r.37 to .56). ASE themes showed a strong negative correlation between attitude and self-efficacy (r-.70); weak positive correlations between attitude and social influence (r.31) and perceived knowledge (r.30); a weak positive correlation between self-efficacy and social influence (r.30), and a weak negative correlation with intention (r-.31); a moderate negative correlation between social influence and barriers/supportive factors (r-.50); a weak negative correlation between barriers/supportive factors and perceived knowledge (r-.38).

Conclusions: Prescribing fits the midwife's professional role and is enhanced by the midwife's willingness and supportive practice. Prescribing requires collaborative practice, meaningful relationships with women, (applied) knowledge, expertise, and theoretical, practical and logistic support in the clinical area. Midwives who consider prescribing or who are autonomous prescribers should be aware of their role as autonomous prescriber.

P.61 PRIME-study: PRescribing In Midwifery – Women's and midwives experiences

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Introduction:

Background: In Flanders, non-medical prescribing is implemented since 2014. It is unknown how women and midwives perceive midwife prescribing.

Objectives: To explore and describe (1) women's perceptions regarding midwife prescribing and (2) midwives' attitudes and experiences with non-medical prescribing.

Design: A cross-sectional study is being conducted

Methods: Two separate online surveys are conducted; one aiming at women and the other one at midwives. Data regarding women's perceptions are collected with the Consultation Satisfaction Questionnaire (CSQ) and a subscale of the Compliance intent of the Medical Interview Satisfaction Scale (MISS). Data among midwives are collected using the Prescribing Course Outcomes Evaluation Questionnaire (PCOEQ) and the Prescribing Course Evaluation Questionnaire (PCEQ). Demographic details from both groups are being collected. Women are recruited through midwifery practices and social media (e.g. Facebook). Midwives are recruited via the Flemish Organisation of Midwives (VBOV) and existing midwifery networks. Ethical approval has been granted. Data collection has started in December 2018 and continues until September 2019.

Results: Descriptive analyses of demographic details and of items as included in both the questionnaires will be conducted. A multiple linear regression analysis for women's perceptions will be performed with intention as dependent variable and attitude, advice & education and consultation as independent variables. Experiences of prescribing midwives will be described. Attitudes of prescribing and non-prescribing midwives will be described and compared using ANOVA. Preliminary results can be shown in autumn 2019.

Conclusions: To inform the midwifery profession about women's perceptions regarding midwife prescribing and about midwives' attitudes and experiences with non-medical prescribing.

P.62 Development and implementation of intervention program tailored to non-adherent patients after kidney transplantation: Primary results

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Introduction: Patients after kidney transplantation (KTx) are on long-term immunosuppression with an emphasis on strict medication adherence, especially implementation and persistence. Non-adherence can result to poor clinical outcomes, e.g. onset of late acute rejection. The aim of this study is to develop a patient-tailored intervention program dealing with non-adherence to immunosuppressives in KTx outpatients and implement it into standard clinical practice.

Methods: A pre and post intervention study with 12 months follow-up is being conducted in one of seven hospitals providing KTx in the Czech Republic. Firstly, non-adherent outpatients are identified (inclusion criteria: adulthood, ≥4 weeks after KTx, basal immunosupression and signed consent with study participation), while non-adherence is measured by self-reported questionnaire (Basel Assessment of Adherence to Immunosuppressive Medications Scale (BAASIS©)), provider-reported questionnaire and variation in 6 consecutive immunosuppressives trough blood concentrations, all combined with Beliefs about Medicine Questionnaire (BMQ©). Next step consists of multiple interviews led by trained pharmacist with non-adherent patients, focused on detection of possible risk factors of non-adherence on multiple levels and delivering interventions according to individual barriers to adhere to medication. The effectiveness of interventions will be tested on both behavioral and transplant (e.g. progression of graft dysfunction, rejection episodes) outcomes. This is an ongoing study and result analysis is in progress per protocol basis.

Results: Of 412 patients registered in the hospital, 267 were men, with mean age 59.8 years and 8.3 years after KTx. Main measured immunosuppressive was tacrolimus (278 patients), cyclosporine (88), sirolimus (43), and everolimus (3). Until June 2019, 192 KTx patients were approached in the first part, 3 patients declined participation. According to BAASIS, 69 of 192 patients were non-adherent. The most frequent deviation was in timing.

Conclusions: Intervention program, tailored to the needs of concrete health facility, has potential to improve medication adherence and reduce the risk of late acute rejection.

P.63 The effectiveness of using mobile applications to improve medication adherence: A systematic review

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Introduction: With over 3.7 billion mobile health applications downloaded in 2017, mobile applications can be a realisable opportunity to improve medication adherence. Evidence has proven mobile applications to be an effective intervention, however no reviews have been completed comparing different applications and their effectiveness. The objective of this study was to summarise the evidence available on the effectiveness of mobile applications to improve medication adherence in patients using prescription medications.

Methods: The systematic review followed Cochrane guidelines. PubMed and Scopus searches were conducted in March. Experimental studies evaluating a mobile application to improve medication adherence in patients from any age group, with any clinical condition using any measure of adherence were included. To identify relevant articles, title and abstract screening was conducted and full-text articles were read. Study and population characteristics, application characteristics, measures of adherence and adherence outcomes were extracted. All articles were assessed using the Cochrane Risk of Bias tool.

Results: 1551 records were identified. Following exclusion of 1539 ineligible records, 12 studies were included in the review. All 12 studies were randomised control trials. Control groups in all but two studies received usual care. All studies assessed a mobile application utilising at least two components. Dose reminders were the most common application component, occurring in all studies. In eight studies the applications also included an educational component, six a pharmacist or peer chat component, and six allowed the user to record clinical information. Regardless of features, applications with multiple components were most effective. All reviewed studies reported significantly improved adherence in the intervention group when compared to the control.

Conclusions: The data collected in this review suggest that regardless of the specific features, multi-component medication adherence mobile applications significantly increased medication adherence. Future research should evaluate the feasibility and attitudes of patients and stakeholders toward mobile application use for medication adherence.

P.64 Gamifying medication adherence: Retrospective analysis of a mobile application utilising gamification and incentives to improve adherence

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Introduction: Strategies to improve medication adherence have been widespread and effective in the literature, yet their impact is limited in real practice due to low levels of patient engagement. Present-biased preferences explain individuals' irrational tendency to avoid immediate inconveniences such as taking a medication- the positive health outcomes are too distant and uncertain of a reward. With an estimated 68 % of patients using a mobile health application, digital gamification and incentives may be a solution to use extrinsic, short-term rewards to create intrinsic, long-term motivation toward better health and adherence. This study aims to analyse a mobile application utilising gamification, reminders and incentives and its impact on adherence.

Methods: Retrospective observational study. Adherence rates of patients with chronic conditions using Perx Health, a mobile health application that aims to improve medication adherence through gamification, dosage reminders and incentives, were analysed over a 6-month time period. Adherence was measured through Mobile Direct Observation of Therapy (M-DOT). Data was analysed for implementation adherence defined as percentage of doses on which the correct dose of the medication(s) was taken in addition to timing compliance, or percentage of doses taken at the appropriate time (+/- one hour).

Results: Patients using the app for 6 months were analysed with 138 users included. The average age was 45 years (SD 15.9) and 66.6 % were female. Implementation adherence averaged at 84 % (SD 19.4 %) and timing compliance was an average of 65 % (SD 26.6 %) doses taken on time. Additional sub-analyses on patients using the app over a 3-month time period, by clinical condition and age are currently being conducted and will be reported.

Conclusions: While patients do not always engage in optimal health behaviour, gamification can nudge intrinsic motivation and patient empowerment through extrinsic incentives. Mobile technology utilising these theories are an effective intervention in increasing patient engagement and improving medication adherence.

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