Programme and abstracts

Diabetic Foot Study Group

18th Scientific Meeting

16-18 September 2022
Bratislava, Slovakia

www.dfsg.org

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Welcome

Dear participant!
It is a great pleasure to welcome you to the 18th meeting of the Diabetic Foot Study Group of the in Bratislava. We are delighted that we can meet in person for the first time since 2018.

The three meeting days of DFSG 2022 will offer you a unique opportunity to meet with leading Diabetic foot experts and to be updated on the diabetic foot research being carried out across Europe.

We look forward to updates on main subjects like Epidemiology, Basic and clinical science, Diagnostics, Classification, Foot clinics, Biomechanics, Osteoarthropathy, Orthopaedic surgery, Infection, Revascularisation, Uraemia and Wound healing/ outcome.

We are very proud to call the DFSG a true interdisciplinary collaboration between diabetologists, podiatrists, specialist nurses, orthopaedic and vascular surgeons, as well as all other specialists with an interest in diabetic patients with foot problems and we wish all participants a very pleasant and interesting time in Bratislava.

A warm welcome to Bratislava. Enjoy the conference!

On behalf of the DFSG executive committee

Nikolaos Papanas
DFSG Chairman

General information

CONTACT
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CONFERENCE VENUE
Crowne Plaza, Bratislava,
Slovakia.
Podchod Hodžovo námestie 2,
816 25 Bratislava, Slovakia

BADGES
All participants and exhibitors should wear the name badge in the conference area at all times.
The badge must be visible.

CERTIFICATES OF ATTENDANCE
Certificates of attendance will be available on 18th September at the registration desk. The certificate will also be available as self-print after the conference. A link will be provided by e-mail to all participants.

LANGUAGE
The language for the DFSG 2022 conference is English.

CONFERENCE HOURS

Friday 16th September

12:00 - 19:00	Registration
13:00 - 18:30	Scientific sessions
12:00 - 19:30	Exhibition
18:30 - 19:30	Welcome reception (open to all delegates)

Saturday 17th September

07:00	DFSG Diabetes Run/walk, 4,5 km (open to all delegates, no pre-registration)
08:30 - 18:15	Registration
09:00 - 18:10	Scientific sessions
08:30 - 15:45	Exhibition
18:10 - 18:40	DFSG Business Meeting (for DFSG members only)
19:30 - 24:00	Conference dinner at the venue, Crowne Plaza. Not included in the registration fee, a separate ticket must be purchased.

Sunday 18th September

08:00 - 15:15	Registration
08:30 - 15:15	Scientific sessions
08:30 - 14:00	Exhibition
15:15 - 16:00	Farewell reception in the Hotel lobby (open to all delegates)

LUNCH AND COFFEE
Lunch and coffee are available in the exhibition area. See programme for exact time of breaks.

WIFI
Wifi name: CrownePlaza
No password.

SPEAKER INFORMATION
Please bring your presentation to the Session Room before your session starts. We recommend you upload your presentation at least 2 Hours before your session.
A technician will be present to assist in the upload if necessary.
Please bring your presentation on a USB. Use of personal laptops is not allowed. Unless otherwise agreed all presentations will be deleted after the conference in order to secure that no copyright issues will arise at the end of the conference.

NO SMOKING POLICY
Smoking is prohibited at the venue. There are dedicated outdoor smoking areas available.

POSTERS
Posters can be mounted from Friday 16th September 2022, 12.00 and must be removed by the end of the conference on Sunday 18th September 2022, 15.00. The posters will be affixed to the poster boards with adhesive which will be provided to you by the conference staff.

MOBILE PHONES
All mobile phones must be on silent mode during the sessions.

LOST AND FOUND
Found items should be returned to the registration desk. If you lose something, please report to this desk for assistance.

PRIZES AND AWARDS
Oral abstract prize
The 5 best oral abstracts will be presented on Saturday 17th September 2022.
Participants will have the opportunity to vote for the best presentation after the 5 presentations.

Poster prize
Poster Prize winners will be chosen from the posters in the session "Top 5 poster abstracts".

Life Time Achievement Award
The DFSG Life Time Achievement award will be announced in the Life Time Achievement Award Session, Friday 16th September.

The Paul Wilson Brand Repetitive Stress Award
The prize is awarded to a presenter who has submitted an abstract to a regular DFSG meeting, presenting new clinical or experimental data on the effects of repetitive mechanical stress on soft tissues, joints or bones. The winner of the prize will present results in the Paul Brand Award Session, 17th September.

PHOTOGRAPHING
Photographing is prohibited during sessions: Please respect the intellectual property right of the presenter.

Morning run/walk

Join your colleagues in a 4,5 km morning run or walk on Saturday 17th September at 7.00

The run will take you through the streets of Bratislava and we encourage all participants to join to get a fresh start of the day and to see the city waking up.

Water and map will be handed out at the hotel lobby at 7.00.

No pre-registration for the run is necessary, just show up!

We hope you will join us!

Social Events

WELCOME RECEPTION
Friday 16th September, 18.30-19.30

The welcome reception takes place in the exhibition area. Join your colleagues for snacks and wine/soft drinks. Please note that the event is not a dinner.

Included in the registration fee, no pre-registration necessary.

MORNING RUN
Saturday 17th September, 7:00

Start the day by running or walking a route of 4-5 km around Bratislava. We meet in the hotel lobby.

Included in the registration fee, no pre-registration necessary.

CONFERENCE DINNER
Saturday 17th September, 19:30-24:00

The conference dinner will take place in the Crowne Plaza Hotel and offer a 3 course dinner, music, dancing and networking.

Not included in registration fee. Tickets must be purchased before the conference (55 EUR incl VAT).

GOODBYE RECEPTION
Sunday 18th September, 15:15-16:00

Enjoy a snack and drink in the lobby of Crowne Plaza Hotel before leaving.

Included in the registration fee, no pre-registration necessary.

DFSG Executive Committee 2022

Chairman
Nikolaos Papanas
Greece

Vice Chairman
Anna Trocha
Germany

Treasurer
Roberto Anichini
Italy

Scientific Secretary
Frances Game
United Kingdom

Members

José Luis Lázaro-Martínez
Spain

Enrico Brocco
Italy

Sicco Bus
Netherlands

Esther García Morales
Spain

Prashanth Vas
United Kingdom

DFSG membership

Diabetologists, orthopaedic and vascular surgeons, podiatrists, specialist nurses and other medical specialists with an interest in caring for diabetic patients with foot problems form the main body of Members of the Diabetic Foot Study Group.

How does one become a member?

One must have an abstract accepted for oral or poster presentation at a DFSG Scientific Meeting. One must present this abstract in person, either as first author, or co-author at the same meeting.

Only after successful presentation can one apply to the DFSG secretariat, dfsg@dfsg.org within 2 months after the conference or onsite at the conference to become a member of the DFSG.

- *DFSG Members do not pay a yearly membership fee. They can register for DFSG Scientific Meeting at a reduced rate.*
- *DFSG Members are entitled to participate in the Scientific and Business Meetings of the Group, to vote and to elect the Executive Committee.*
- *DFSG Members have to attend at least one out of every three Scientific Meetings following each other or else they forfeit their membership.*
- *Please note that membership of EASD does not mean automatic membership of DFSG.*


SKARTIZ

Programme

FRIDAY 16 SEPTEMBER 2022

Time	No.	Title	Speaker
12:00		Registration desk opens Exhibition area	
13:00-14:30		**IADFS-DFSG JOINT SESSION** Plenary room: London Closing session of IADFS – Opening session of DFSG	**Chairs: Nikolaos Papanas, Greece; Venu Kavarthapu, United Kingdom**
		Recent Trials and New Therapies for DFUs	Frances Game, United Kingdom
		Preventing Amputations by Preventing DFU: LEAP Back to the Future	Robert Frykberg, USA
		The Charcot Foot- Is there Consensus on Underlying Pathophysiology?	Nina Petrova, United Kingdom
		Surgical management of diabetic foot infections	Venu Kavarthapu, United Kingdom
14.30-15.00		**Coffee break**	
15:00-15:10		**DFSG WELCOME**	DFSG Chairman Nikolaos Papanas
15:10-16:30		**Oral presentations: Epidemiology and COVID-19; Diagnostics and Classification** Plenary room: London	**Chairs: Edward Jude, Robert Frykberg**
	OP01	IMPACT OF COVID-19 ON DIABETIC FOOT SURGICAL TREATMENT	Roberto da Ros, Italy
	OP02	MORTALITY RATES AFTER LOWER EXTREMITY AMPUTATION IN BELGIUM FROM 2009 TO 2018	Eveline Dirinck, Belgium
	OP03	TEMPORAL TRENDS IN MAJOR, MINOR AND RECURRENT LOWER EXTREMITY AMPUTATIONS IN BELGIUM FROM 2009 TO 2018	Patrick Lauwers, Belgium
	OP04	RISK FACTORS FOR AMPUTATION IN PERSONS WITH DIABETES IN A SWEDISH CONTEXT – A RETROSPECTIVE COHORT DESIGN	Simon Ramstrand, Sweden
	OP05	ONE-YEAR HOSPITALIZATION DATA AND FOLLOW-UP OF DISCHARGED PATIENTS - OUTCOMES FROM LEVEL 3 FOOT CENTRE	Michal Dubsky, Czech Republic
	OP06	THE COMBINATION OF ABI AND TBI IN A PRAGMATIC DESCRIPTION OF LIMB ISCHAEMIA IN PATIENTS WITH DIABETES HIGHLIGHTS THE NEED FOR SPECIALIST CARE AND DELINEATE CLINICAL OUTCOMES	Chris Manu, United Kingdom
	OP07	VIRTUAL RAPID ACCESS VASCULAR (V-RAV) MDT FOOT CLINIC: A NEW LOCAL DELIVERY STRATEGY.	Paula Grannon, United Kingdom
16:30-16:35		**Short break**	
16.35-17.35		**Industry symposium: URGO** Plenary room: London	**See details on page 138-139**
17:35-17:40		**Short break**	
17.40-18.30		**Life Time Achievement Award session** Plenary room: London The DFSG Life Time Achievement Award is awarded to recognize outstanding late-career health care professionals who have made significant contributions to the field of diabetic foot care.	**Chair: Roberto Anichini**
18.30-19.30		**Welcome Reception in the exhibition area (included in the registration fee). Please note that the event is not a dinner.** Exhibition area	

SATURDAY 17 SEPTEMBER 2022

Time	No.	Title	Speaker
07:00		**DFSG Diabetes Run/Walk, 4,5 km, open to all participants. No pre-registration necessary.**	
09:00-10:35		**Oral presentations: Foot Clinics, Organisation of Care And Charcot** Plenary room: London	**Chairs: Nina Petrova, Sicco Bus**
	OP08	USING ULTRASONAGRAPHY TO ACHIEVE EARLIER DIAGNOSIS OF CHARCOT FOOT: A CASE SERIES	Jennifer Pallin, Ireland
	OP09	MORTALITY RATES AMONG PATIENTS WITH CHARCOT'S FOOT ATTENDING MANSOURA DIABETIC FOOT CLINIC: 15 YEARS RETROSPECTIVE STUDY	Ahmed Albehairy, Egypt
	OP10	IMPROVED MAJOR AMPUTATION RATES IN DIABETIC PATIENTS WITH ISCHAEMIC FEET COMPARED WITH NON-DIABETIC PATIENTS WITH ISCHAEMIC FEET; IMPACT OF THE MULTIDISCIPLINARY DIABETIC FOOT TEAM AND THE DIABETIC FOOT CLINIC.	Aparajita Roy, United Kingdom
	OP11	A LONG-TERM PROSPECTIVE COHORT STUDY OF AMPUTATION AND MORTALITY RISK FACTORS IN PATIENTS WITH DIABETIC FOOT ULCER.	Roozbeh Naemi, United Kingdom
	OP12	ANXIETY AND DEPRESSION AMONG ADULT PATIENTS WITH DIABETIC FOOT ULCER ATTENDING A MULTIDISCIPLINARY FOOT CLINIC	Abdullah Almaqhawi, United Kingdom
	OP13	HEALTH-RELATED QUALITY OF LIFE IN PATIENTS WITH DIABETIC FOOT ULCER ACCORDING TO DIABETIC FOOT ULCER SCALE-SHORT FORM IN SPANISH SUBJECTS	Esther Garcia Morales, Spain
	OP14	STANDARD OF CARE AUDIT IN PEOPLE WITH DIABETES ON PERITONEAL DIALYSIS HIGHLIGHTS CONTINUED LACK OF MONITORING OF FOOT RISK.	Prash Vas, United Kingdom
10:35-11:20		**Coffee break**	
11:20-12:15		**Paul Brand Award Session** Plenary room: London	**Chair: Nikolaos Papanas**
	Paul Brand Award Oral	THE INFLUENCE OF WEAR AND TEAR OF THERAPEUTIC FOOTWEAR IN PATIENTS IN REMISSION. A 5-YEARS FOLLOW-UP STUDY	Mateo López Moral, Spain
12:15-13:25		**Lunch break** Exhibition area	
13:25-14:25		**Poster discussion I, 4 parallel sessions**	
13:25-14:25		**Poster Session A: Top 5 posters** Poster rooms: Berlin and Paris	**Chairs: Anna Trocha, Frances Game**
	PP01	OUTCOMES FROM DAY CASE SURGERY OF A SINGLE PODIATRIC SURGEON DURING THE COVID-19 PANDEMIC FROM A MULTIDISCIPLINARY DIABETIC FOOT CLINIC	Jolyon Dales, United Kingdom
	PP02	WOUND BLUSH AS AN INDICATOR FOR LIMB SALVAGE AMONG PEOPLE WITH TYPE 2 DIABETES WITH PERIPHERAL ARTERIAL DISEASE: AN OBSERVATIONAL STUDY FROM SOUTH INDIA	Sukanya Nachimuthu, India
	PP03	ANEMIA AT ADMISSION IS NOT ASSOCIATED WITH A WORSE PROGNOSIS IN DIABETIC FOOT INPATIENTS.	Elisabetta Iacopi, Italy

SATURDAY 17 SEPTEMBER 2022

Time	No.	Title	Speaker
	PP04	AMBULATORY NEGATIVE PRESSURE WOUND THERAPY IN PATIENTS WITH DIABETIC FOOT	Robert Bem, Czech Republic
	PP05	NOVEL TOPICAL ESMOLOL HYDROCHLORIDE FOR DIABETIC FOOT ULCER: RANDOMIZED, DOUBLE-BLIND, PLACEBO-CONTROLLED, MULTICENTRE PHASE 1/2 STUDY	Ashu Rastogi, India
13:25-14:25		**Poster Session B: Biomechanics** Poster rooms: Berlin and Paris	**Chair:** **Maureen Bates**
	PP06	PREDICTIVE VALUES OF FOREFOOT PLANTAR PRESSURE ASSESSMENT TO IDENTIFY A REULCERATION EVENT IN PATIENTS AT HIGH RISK	Marta García-Madrid Martín de Almagro, Spain
	PP07	CLINICAL EFFICACY OF A 3D FOOT SCANNER APP FOR THE FITTING OF THERAPEUTIC FOOTWEAR IN PERSONS WITH DIABETES IN REMISSION: A RANDOMIZED AND CONTROLLED CLINICAL TRIAL.	Raúl Molines Barroso, Spain
	PP08	DIFFERENT PATTERN OF FOOT STRUCTURAL CHANGES BETWEEN DIABETIC AND NON DIABETIC PATIENTS AS A CONSEQUENCE OF WEIGHT LOSS IN SEVERE OBESITY	Elisabetta Iacopi, Italy
	PP09	THE JOINT-VENTURE OF DIABETES AND OBESITY ON HUMAN WALKING STRATEGY.	Elisabetta Iacopi, Italy
	PP10	THE ACCURACY OF BIOMECHANICAL MODELS TO ESTIMATE CUMULATIVE PLANTAR TISSUE STRESS IN PEOPLE WITH DIABETES AT HIGH RISK OF FOOT ULCERATION	Jaap van Netten, Netherlands
	PP11	THE EFFECTIVENESS OF AN AFFORDABLE TOA UZITO (OFFLOADING) DEVICE FOR IMPROVING PLANTAR DIABETIC FOOT ULCER OUTCOMES IN THE DEVELOPING WORLD.	Zulfiqarali G. Abbas, Tanzania
	PP12	FIF!-MOBIL, A NEW, IRREMOVABLE OFFLOADING METHOD DESIGNED FOR WALKING	Mira Mertens, Germany
13:25-14:25		**Poster Session C: Wound healing part 1** Poster rooms: Berlin and Paris	**Chair:** **Vilma Urbančič Rovan**
	PP13	THE IFOOT-PROJECT - A COMPLEX INTERVENTION INTEGRATING E-HEALTH TO PRESERVE MOBILITY OF PEOPLE WITH DIABETIC PLANTAR PRESSURE ULCERS	Dirk Hochlenert, Germany
	PP14	FREEZE-DRIED HUMAN AMNIOTIC MEBRANE ALLOGRAFT IN THE THREATMENT OF DIABETIC FOOT ULCER	Miroslav Koliba, Czech Republic
	PP15	LYOPHILIZED ALLOGRAFT OF THE HUMAN AMNIOTIC MEMBRANE IN THE TREATMENT OF PATIENTS WITH DIABETIC FOOT ULCERS	Emil Martinka, Slovakia
	PP16	DGH EXPERIENCE OF USING COLD PLASMA MEDICAL DEVICE AS AN ADJUNCT THERAPY TO ANTIMICROBIALS IN TREATING CHRONIC NON HEALING INFECTED DIABETIC FOOT ULCERS.	Jemma Cruickshank, United Kingdom
	PP17	THE IMPACT OF TOTAL CONTACT CASTING (TCC) IN CONJUNCTION WITH BOHLER IRON ON A COHORT OF PATIENTS WITH CHRONIC NON HEALING DIABETIC FOOT ULCERS.	Mary Gray, United Kingdom
	PP!8	OUTCOMES OF TREATING HIND FOOT ULCERS AT A UK DIABETES FOOT CLINIC	Hannah Bond, United Kingdom

SATURDAY 17 SEPTEMBER 2022

Time	No.	Title	Speaker
	PP19	EFFECTIVENESS OF THE FAST-TRACK PATHWAY FOR THE MANAGEMENT OF PATIENTS WITH DIABETIC FOOT THROUGH THE NETWORK BETWEEN SECOND AND THIRD LEVEL CENTERS	Michela Di Venanzio, Italy
	PP20	HEALING OF A 10-YEAR-LASTING CHRONIC DIABETIC NEUROPATHIC DEFECT USING A DEHYDRATED HUMAN AMNIOTIC MEMBRANE ALLOGRAFT - A CASE REPORT	Johana Venerova, Czech Republic
	PP21	ANTIPHOSPHOLIPID SYNDROME (APS) - A CLINICAL POSSIBILITY FOR THE ISCHAEMIC FOOT	Peter Reston, United Kingdom
13:25-14:25		**Poster Session D: Infection** Poster rooms: Berlin and Paris	**Chair:** **Vladimíra Fejfarová**
	PP22	INFRARED THERMOGRAPHY FOR MONITORING SEVERITY AND TREATMENT OF DIABETIC FOOT INFECTIONS	Kor Hutting, Netherlands
	PP23	DIAGNOSIS OF OSTEOMYELTITIS: INVESITGATION OPTIMISATION IN DIABETIC FOOT ULCERS – THE DOMINO-DFU STUDY	David Russell, United Kingdom
	PP24	THE QUALITY OF LIFE AND COST BENEFITS OF DOMICILIARY 24-HOUR PIPERACILLIN/ TAZOBACTAM 13.5G INFUSION IN PATIENTS WITH DIABETIC FOOT DISEASE	Michael Pierides, United Kingdom
	PP25	POSSIBLE ADVANTAGES OF BIOACTIVE GLASS IN THE TREATMENT OF SEPTIC OSTEOARTHRITIS	Igor Frangež, Slovenia
	PP26	WHICH FACTORS INFLUENCE IN HEALING TIME IN PATIENTS WITH DIABETIC FOOT OSTEOMYELITIS?	Aroa Tardáguila García, Spain
	PP27	DALBAVANCIN: DOES COSTING MORE ACTUALLY COST LESS?	Joanna Tanner, United Kingdom
	PP28	PERFORMANCES OF TLC-AG DRESSINGS* ON DIABETIC FOOT ULCERS AT RISK OR WITH CLINICAL SIGNS OF LOCAL INFECTION: RESULTS OF A MULTICENTRE, PROSPECTIVE, OBSERVATIONAL STUDY	Michael Dietlein, Germany
	PP29	DOES MULTIDRUG-RESISTANT ORGANISM IMPACT IN CLINICAL OUTCOME OF DIABETIC FOOT ULCERS OSTEOMYELITIS TREATED SURGICALLY?	Esther Garcia Morales, Spain
	PP30	IS TAZOCIN INDUCED AKI A GENUINE PROBLEM IN DIABETIC FOOT INFECTIONS?	Joanne Patterson, United Kingdom
	PP31	EVALUATION OF THE DIAGNOSTIC ACCURACY OF THE COMBINATION OF BONE PROBE, PLAIN RADIOGRAPHY AND ERYTHROCYTE SEDIMENTATION RATE IN THE DIAGNOSIS OF DIABETIC FOOT OSTEOMYELITIS.	Irene Sanz Corbalán, Spain
14.30-15.00		**Industry Symposium: BioHealing** Plenary room: London See details on page 138-139	BIOHEALING®
15:05-15:20		**Industry symposium: Mölnlycke** Plenary room: London See details on page 138-139	Mölnlycke®
15:25-15:55		**Coffee break** Exhibition area	

SATURDAY 17 SEPTEMBER 2022

Time	No.	Title	Speaker
15:55-16:20		**Population differences in diabetic foot ulcers across Europe: Preliminary data from an international database.An update from the DFSG Research Group: Prevention of the First Ulcer** Plenary room: London	**Chairs:** **Anna Trocha, Sicco Bus**
		Population differences in diabetic foot ulcers across Europe: Preliminary data from an international database.An update from the DFSG Research Group: Prevention of the First Ulcer	Elisabetta Iacopi, Italy on behalf of the Prevention of the First Ulcer Group: Jarmila Jirkovska, Czech Republic Johan Røikjer, Denmark Elisabetta Iacopi, Italy Matilde Monteiro-Soares, Portugal Daina Walton, United Kingdom
16:25-17:50		**Oral Award Presentations - Top 5 abstracts** Plenary room: London	**Chairs:** **José Luis Lazaro Martinez, Nikolaos Papanas**
	Award Oral 1	AGREEMENT BETWEEN RADIOGRAPHIC AND NON-CONTRAST MAGNETIC RESONANCE IMAGING IN REPORTING BONE DAMAGE IN ACUTE CHARCOT NEURO-OSTEOARTHROPATHY	Nina Petrova, United Kingdom
	Award Oral 2	CONTINUOUS, HIGH-PRESSURE FEEDBACK 'ALERT' THERAPY REDUCES HIGH PRESSURE AT SPECIFIC PLANTAR SITES ACROSS THE 'HIGH-RISK' DIABETIC FOOT.	Caroline Abbott, United Kingdom
	Award Oral 3	BELOW-THE-ANKLE ARTERIAL DISEASE: A NEW MARKER OF CORONARY ARTERY DISEASE IN PATIENTS WITH DIABETES AND FOOT ULCERS	Ermanno Bellizzi, Italy
	Award Oral 4	THE DESIGN OF AN INTEGRATED PERSONALIZED ASSISTIVE DEVICES APPROACH TO REDUCE FOOT ULCER RECURRENCE IN DIABETES	Lisa Vossen, Netherlands
	Award Oral 5	COMPARISON OF DIFFERENT METHODS TO ASSESS THERAPEUTIC FOOTWEAR USE AMONG PEOPLE WITH DIABETES	Gustav Jarl, Sweden
17:55-18:10		**Award Ceremony** Plenary room: London	
		Winners of the Oral Award and Poster Prize are announced	
18:10-18:40		**Business Meeting and Assembly** Plenary room: London For members of DFSG only	
19:30-24:00		**Conference Dinner** Adress: Crowne Plaza, Bratislava (conference venue) Not included in the registration fee. Tickets must be purchased before the conference	

SUNDAY 18 SEPTEMBER 2022

Time	No.	Title	Speaker
08:30-09:30		**Poster discussion II, 4 parallel sessions**	
08:30-09:30		**Poster Session E: Wound Healing part 2** Poster rooms: Berlin and Paris	**Chair:** **Esther Garcia Morales**
	PP32	THE ACCUMULATING EVIDENCE SUPPORTING THE USE OF CYCLICAL PRESSURIZED TOPICAL OXYGEN THERAPY FOR HEALING CHRONIC WOUNDS	Matthew Garoufalis, United States
	PP33	RAPID IMPROVEMENT OF WOUND HEALING AND HEALTH-RELATED QUALITY OF LIFE IN PATIENTS WITH DFUS TREATED WITH TLC-NOSF POLYABSORBENT DRESSINGS® - RESULTS FROM A PROSPECTIVE, MULTICENTRE REAL-LIFE STUDY	Claas Lüdemann, Germany
	PP34	EFFECTIVENESS OF SUCROSE OCTASULFATE DRESSING IN THE TREATMENT OF NEURO-ISCHAEMIC DIABETIC FOOT HEEL ULCERS: A RETROSPECTIVE SINGLE ARM STUDY	Serge Bohbot, France
	PP35	CLINICAL AND HISTOPATHOLOGICAL EFFICACY OF DAILY APPLICATION OF NEGATIVELY CHARGED POLYSTYRENE MICROSPHERES VERSUS THREE TIMES APPLICATION IN HARD-TO-HEAL DIABETIC FOOT ULCERS: A RANDOMIZED BLINDED CONTROLLED CLINICAL TRIAL.	Yolanda García Álvarez, Spain
	PP36	THE EFFECT OF TRANSCUTANEOUS CO2 ON CHRONIC WOUND HEALING, MICROCIRCULATION AND DIABETIC SYMMETRICAL NEUROPATHY IN DIABETIC PATIENTS	Igor Frangež, Slovenia
	PP37	THE POWER OF TWO2: THE HEALTH AND ECONOMIC BENEFITS OF THE REAL WORLD USE OF CYCLICAL PRESSURIZED TOPICAL OXYGEN THERAPY IN THE HEALING OF DIABETIC FOOT ULCERS	Matthew Garoufalis, United States
	PP38	COMPRESSION BANDAGE ---- IS IT A BOON FOR VENOUS ULCERS IN DIABETICS??	Sangeetha Kalabhairav, India
08:30-09:30		**Poster Session F: Epidemiology and COVID-19** Poster rooms: Berlin and Paris	**Chair:** **Luigi Uccioli**
	PP39	CONTINUATION OF CARE DESPITE COVID-19 PANDEMIC RESULTS IN STABLE OUTCOMES: A NATIONWIDE COHORT STUDY IN BELGIUM	An-Sofie Vanherwegen, Belgium
	PP40	IMPACT OF THE COVID PANDEMIC ON DIABETES FOOT CARE SERVICE IN A TERTIARY SETTING	Sheena Thayyil, United Kingdom
	PP41	TRENDS IN LOWER-LIMB MAJOR AND MINOR AMPUTATION IN PEOPLE WITH DIABETES IN THE FRIULI VENEZIA GIULIA (NORTHERN ITALY) DURING THE COVID-19 PANDEMIC	Cesare Miranda, Italy
	PP42	THE IMPACT OF COVID-19 PANDEMIC IN AMPUTATIONS OF DIABETIC PATIENTS IN VASCULAR DEPARTMENT	Stavroula-Panagiota Lontou, Greece
	PP43	LOWER LIMB AMPUTATIONS IN SLOVENIA BETWEEN 2015 AND 2019	Vilma Urbancic-Rovan, Slovenia
	PP44	CLINICAL CHARACTERISTICS, MANAGEMENT AND OUTCOME OF HOSPITALIZED PATIENTS WITH DIABETIC FOOT PROBLEMS IN VASCULAR SURGERY DEPARTMENT	Stavroula-Panagiota Lontou, Greece

SUNDAY 18 SEPTEMBER 2022

Time	No.	Title	Speaker
	PP45	MICROBIOLOGICAL DATA AND COMORBIDITIES OF HOSPITALIZED PATIENTS WITH DIABETIC FOOT PROBLEMS IN VASCULAR SURGERY DEPARTMENT	Stavroula-Panagiota Lontou, Greece
08:30-09:30		**Poster Session G: Foot Clinics, Orthopaedic Surgery and Revascularization** Poster rooms: Berlin and Paris	**Chair:** **Prashnath Vas**
	PP46	CAN THE DURATION OF HOSPITALIZATION BE RELATED TO MAJOR OR MINOR AMPUTATIONS IN PATIENTS WITH DIABETES?	Alexandra Jirkovská, Czech Republic
	PP48	EVALUATION OF EXTERNAL AUDITS OF FOOT CLINICS IN CZECH REPUBLIC	Pavlina Pithova, Czech Republic
	PP49	IMPACT OF FLASH GLUCOSE MONITORING ON GLYCAEMIC CONTROL IN HIGH RISK DIABETIC FOOT PATIENTS.	Edward Jude, United Kingdom
	PP50	ASSESSING DIABETIC PERIPHERAL NEUROPATHY IN PERSONS WITH DIABETES AND FOOT ULCERS HAS LIMITED USE IN CLINICAL PRACTICE	Louise Barth, Denmark
	PP51	THE USE OF A TOTAL CONTACT CASTING (TCC) ENHANCED WITH THE BÖHLER IRON TO PROMOTE HEALING AND AID SURGICAL INTERVENTION FOR CHRONIC DIABETIC FOOT ULCERS (DFU).	Jacqueline Mildred, United Kingdom
	PP52	MINIMUM INVASIVE TECHNIQUE IS USEFUL OF DIABETIC FOOT DEFORMITY	Yuta Terabe, Japan
	PP53	FOOT REVASCULARIZATION AVOIDS MAJOR AMPUTATION IN PATIENTS WITH ISCHAEMIC DIABETIC FOOT ULCERS	Marco Meloni, Italy
08:30-09:30		**Poster Session H: Basic and clinical science, Classification and Other** Poster rooms: Berlin and Paris	**Chair:** **Klaus Kirketerp-Møller**
	PP54	IMPROVED OUTCOMES IN PATIENTS WITH DIABETIC FOOT ULCERS DESPITE OF DIFFERENCES IN BASELINE CHARACTERISTICS	Afram Akturk, Netherlands
	PP55	FIRST ULCER INCIDENCE IN CORRELATION TO PAIN PERCEPTION IN NEWLY PRESENTING DIABETIC PATIENTS WITH NEUROPATHY IN A PROSPECTIVE OBSERVATIONAL STUDY.	Anna Katharina Trocha, Germany
	PP56	ASSESSMENT OF THE EFFECTIVENESS OF THE CURRENT NUTRITIONAL SUPPORT IN REACHING THE DAILY ENERGY REQUIREMENTS OF PATIENTS HOSPITALIZED FOR A DFU	Anne-Sophie Baart, Belgium
	PP57	A NEW DFU DESCRIPTION FOR PRIMARY CARE: A SIMPLE AND SMART MODEL TO ASSESS WOUND SEVERITY AND AVOID LATE REFERRAL	Juan Pedro Sanchez Rios, Spain
	PP58	SKIN ADVANCED GLYCATION END PRODUCTS AS INDEPENDENT DETERMINANTS OF DISTAL SENSORIMOTOR POLYNEUROPATHY IN SUBJECTS WITH TYPE 2 DIABETES MELLITUS	Stella Papachristou, Greece
	PP59	RESULTS OF A UK RESEARCH PRIORITY SETTING PARTNERSHIP IN DIABETIC FOOT DISEASE	David Russell, United Kingdom
	PP60	A NOVEL ADJUNCT TO SIMULATION TO ENHANCE LEARNING	Sam Little, United Kingdom
	PP61	AN APPLICATION OF SNM FOR THE PROMOTION OF PHYSICAL ACTIVITY IN PATIENTS AT RISK OF DIABETIC FOOT.	Piergiorgio Francia, Italy

SUNDAY 18 SEPTEMBER 2022

Time	No.	Title	Speaker
	PP62	FOOT EXAMINATION IN PEOPLE PRESENTING WITH FALLS, WITH AND WITHOUT DIABETES	Edward Jude, United Kingdom
09:35-10:35		**Industry symposium - AOTI** Plenary room: London See details on page 138-139	Advanced Oxygen Therapy Inc.
10:35 – 11:10		**Coffee break** Exhibition area	
11:10-12:20		**Oral presentations: Biomechanics and Orthopaedic surgery** Plenary room: London	**Chairs:** **Enrico Brocco,** **Anne Rasmussen**
	OP15	VIBRATING INSOLES: INVESTIGATING THEIR INFLUENCE ON DYNAMIC BALANCE AND GAIT QUALITY IN PEOPLE WITH DIABETIC PERIPHERAL NEUROPATHY	Giorgio Orlando, United Kingdom
	OP16	CUMULATIVE PLANTAR TISSUE STRESS AND ITS ASSOCIATION WITH FOOT ULCER RECURRENCE IN PEOPLE WITH DIABETES	Chantal M. Hulshof, Netherlands
	OP17	DIABETIC FOOT ULCER PREVENTION THROUGH FOOTWEAR SENSING TECHNOLOGY: A LITERATURE REVIEW	George Dafoulas, Greece
	OP18	FLEXOR TENDON TENOTOMY TREATMENT OF THE DIABETIC FOOT: A MULTICENTER RANDOMIZED CONTROLLED TRIAL	Jonas Askø Andersen, Denmark
	OP19	HOW DO WE OBJECTIVELY ASSESS DIABETES FOOT SURGERY: A SYSTEMATIC REVIEW & DOMAIN DRIVEN ANALYSIS TO IDENTIFY CRITICAL DIABETES FOOT SPECIFIC OUTCOMES.	Raju Ahluwalia, United Kingdom
	OP20	META-ANALYSIS OF RANDOMISED CONTROLLED TRIALS TESTING THE EFFECT OF AT-HOME FOOT TEMPERATURE MONITORING AND REDUCTION OF AMBULATORY ACTIVITY IN RESPONSE TO HOTSPOTS ON THE INCIDENCE OF DIABETES-RELATED FOOT ULCERS	Wouter Aan de Stegge, Netherlands
12.25-13:00		**Update from the DFSG Research Group: Charcot Foot** Plenary room: London	**Chairs:** **Frances Game,** **Alexandra Jirkovska**
		Update from the DFSG Research Group: Charcot Foot	Jennifer Pallin, Ireland · Anastasios Tentolouris, Greece · Aroa Tardáguila García, Spain · Irene Sanz Corbalan, Spain · Nichola Renwick, United Kingdom Rasmus Bo Jansen, Denmark · Catherine Gooday, United Kingdom
13:00-14:00		Lunch break Exhibition area	
14:00-15:10		**Oral presentations: Wound healing & Basic and clinical science** Plenary room: London	**Chairs:** **Anna Korzon-Burakowska,** **Raju Ahluwalia**

SUNDAY 18 SEPTEMBER 2022

Time	No.	Title	Speaker
	OP21	TISSUE AVAILABILITY OF INTRAVENOUSLY ADMINISTERED ANTIBIOTICS IN PATIENTS WITH INFECTED DIABETIC FOOT ULCERS IN THE CONTEXT OF PAD AND MICROCIRCULATION STATUS – PILOT DATA (DFIATIM STUDY)	Vladimira Fejfarova, Czech Republic
	OP22	THE MAJOR AMPUTATION RISK STRATIFICATION USING DIABETIC FOOT ULCER CLASSIFICATIONS IN PATIENTS WITH CRITICAL LIMB-THREATENING ISCHEMIA AFTER AUTOLOGOUS STEM CELL THERAPY	Jitka Husakova, Czech Republic
	OP23	ULTRASOUND-ASSISTED WOUND (UAW) DEBRIDEMENT IN THE TREATMENT OF DIABETIC FOOT ULCER: A SYSTEMATIC REVIEW AND META-ANALYSIS	Francisco Javier Álvaro Afonso, Spain
	OP24	DOES THE ADDITION OF ANTISEPTIC IRRIGATION WITH INSTALLATION IMPROVE OUTCOMES OF THE DIABETIC FOOT COMPARED TO TRADITIONAL NEGATIVE PRESSURE WOUND THERAPY? A SYSTEMATIC REVIEW AND META-ANALYSIS	Arthur Tarricone, United States
	OP25	MICROCIRCULATION IMPROVEMENT IN DIABETIC FOOT PATIENTS AFTER THE TREATMENT WITH SUCROSE OCTASULFATE IMPREGNATED DRESSINGS	José Luis Lazaro Martinez, Spain
	OP26	COST-EFFECTIVENESS OF TLC-NOSF DRESSINGS IN THE MANAGEMENT OF DFUS, CONSIDERING DIFFERENT HEALTH CARE SYSTEMS WORLDWIDE: AN OVERVIEW ANALYSIS	Chris Manu, United Kingdom
15:10-15:15		**Closing of DFSG 2022**	DFSG Chairman, Nikolaos Papanas
15:15-16:00		**Farewell reception** Hotel Lobby	

Prize Oral Abstracts

[Paul Brand Award Oral] THE INFLUENCE OF WEAR AND TEAR OF THERAPEUTIC FOOTWEAR IN PATIENTS IN REMISSION. A 5-YEARS FOLLOW-UP STUDY

Mateo López Moral[1], Aroa Tardáguila García[1], Irene Sanz[1], Raúl Molines Barroso[1], Francisco Javier Álvaro Afonso[1], José Luis Lázaro Martínez[1]

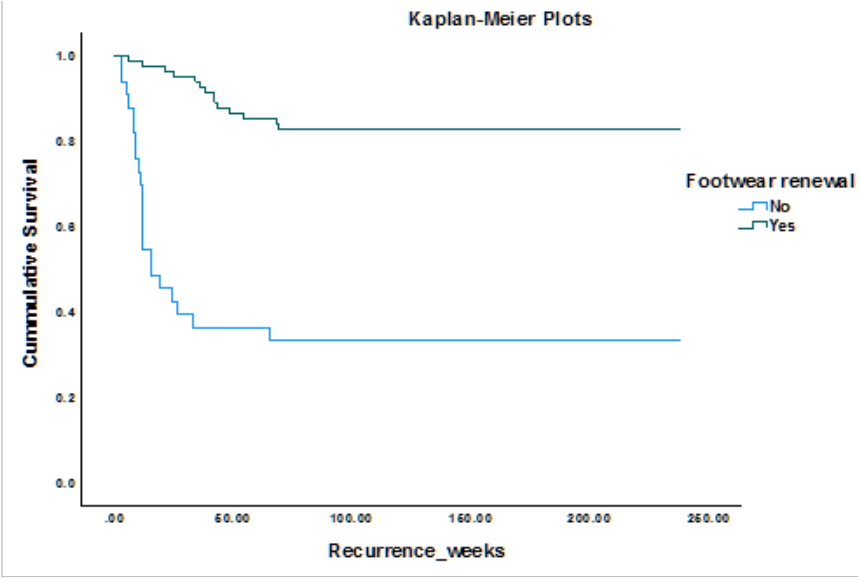
[1]Complutense University of Madrid, Diabetic Foot Unit, Madrid, Spain

Aim: to assess if there exist any relationship between the wear and tear of therapeutic footwear (TF) and the risk of recurrence in persons with diabetes and remission.

Method: a 5-years prospective study in 115 patients in remission with a previous healed diabetic plantar foot ulcer was carried out in a specialized diabetic foot unit, between October 2016 and January 2022. TF was assessed in a three-month interval as recommended by international guidelines to check the wear and tear. The reasons for TF renewal were unfitting, tearing and damage of the outer sole and heel. All the TF were assessed by the same experienced podiatrist. When a worn-out TF was found, the patient was recommended to renew it. The study was divided into two different groups, persons who renewed accordingly the TF and persons who did not renewed it. Primary outcome measure was a recurrent event in the forefoot.

Results / Discussion: During the follow-up period 82 patients (71.3%) renewed their TF and 33 (28.7%) did not renewed it. Patients who did not renew their TF group suffered from more recurrent events (22 vs 14, p<.001, CI[0.04-0.259]) and minor amputations (11 vs 8, p=.002, CI[0.07-0.6]). Both groups showed different recurrence-free survival median times of 205.5 [IQR-188-222] weeks and 89.9 [IQR-53-126] weeks, respectively (fig 1). History of amputation and patients who did not renew the TF were associated with recurrence in the Cox regression model (p<.001, CI[0.03-0.38] and p<.001, CI[10.3-21.3] respectively). Several factors affecting functionality of TF can increase the risk of recurrence. A specialist should determinate the time of renewal. In several countries TF is prescribed for clinicians and patients purchase for it. Behavioral factors such as financial problems can delay the renewal of the TF leading to ulcer recurrence. These behavioral factors should be further investigated.

Conclusion: patients who renewed their TF accordingly because of wear and tear resulted in lower recurrences and minor amputations.


Kaplan-Meier Plots
Cummulative Survival
1.0
0.8
0.6
0.4
0.2
0.0
.00
50.00
100.00
150.00
200.00
250.00
Recurrence_weeks
Footwear renewal
No
Yes

[Award Oral 1] AGREEMENT BETWEEN RADIOGRAPHIC AND NON-CONTRAST MAGNETIC RESONANCE IMAGING IN REPORTING BONE DAMAGE IN ACUTE CHARCOT NEURO-OSTEOARTHROPATHY

Oliver Artz[1], Lisa Macock[2], David Elias[2], Michael Edmonds[1 3], Nina Petrova[1 3]

[1]King's College Hospital NHS Foundation Trust, Diabetic Foot Clinic, London, United Kingdom, [2]King's College Hospital NHS Foundation Trust, Department of Radiology, London, United Kingdom, [3]King's College London, Department of Diabetes, School of Cardiovascular Medicine & Sciences, Faculty of Life Sciences and Medicine, London, United Kingdom

Background and aims: Foot and ankle X-rays and magnetic resonance imaging (MRI) scans are increasingly used in the assessment of acute Charcot neuro-osteoarthropathy (CN). However, the agreement between these modalities in scoring fractures is unknown. The aim was to compare the agreement of non-contrast MRI and X-ray, as diagnostic tests of the extent of bone damage measured in an ordinal scale (0- no fracture; 1-fracture; 2-collapse/fragmentation).

Study Design and Methods: In a cross-sectional study of 46 people presenting with diabetes and acute CN, 961 pairs of scores (X-ray, MRI) of 22-foot bones were analysed. With no reference standard available for the comparison, weighted kappa coefficients and McNemar's and Stuart-Maxwell's tests for symmetry and marginal homogeneity of ordinal ratings, were used.

Results: The weighted kappa coefficient showed that the two modalities have moderate to substantial agreement in the phalangeal, tarsal and tibial/malleolar zones and fair to moderate agreement in the metatarsals. On McNemar's and Stuart-Maxwell's tests, MRI significantly over-performs X-ray in the scoring of fracture vs no-fracture in the metatarsal (Chi(1df)=4.8, P=0.05) and tarsal zones (Chi(1df)=21, P<0.001). However, no significant difference was found between the X-ray and MRI in the scoring of collapse/fragmentation vs no-fracture (metatarsal P=0.12; tarsal P=0.26), or in the scoring of collapse/fragmentation vs fracture (metatarsal P=0.32; tarsal P=0.61). In the phalanges, tibial plafond and sesamoids, no statistically significant differences were found on exact tests, although MRI underscored X-ray in the phalanges and tibial plafond, and X-ray underscored MRI in the sesamoids.

Conclusion: This study shows that X-ray and MRI are complementary in the assessment of acute CN. While X-ray significantly underperforms MRI scoring fracture vs no-fracture in the metatarsal and tarsal zones, no significant difference was found in scoring collapse/fragmentation vs either, fracture or no-fracture. No significant difference was found between X-ray and MRI in the phalanges, sesamoids and tibial plafond.

[Award Oral 2] CONTINUOUS, HIGH-PRESSURE FEEDBACK 'ALERT' THERAPY REDUCES HIGH PRESSURE AT SPECIFIC PLANTAR SITES ACROSS THE 'HIGH-RISK' DIABETIC FOOT

Caroline Abbott[1 2], Katie Chatwin[1], Satyan Rajbhandari[3], Frank Bowling[4], Andrew Boulton[5 6], Neil Reeves[1 2]

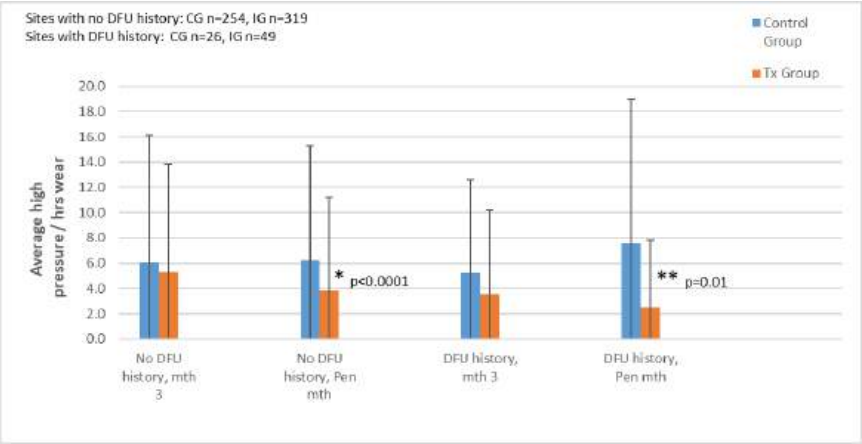
[1]Manchester Metropolitan University , Department of Life Sciences, Manchester, United Kingdom, [2]Manchester Metropolitan University, Institute of Sport, United Kingdom, [3]Lancashire Teaching Hospitals NHS Foundation Trust, Diabetes Centre, Chorley, United Kingdom, [4]University of Manchester, Division of Diabetes, Endocrinology and Gastroenterology, Manchester, United Kingdom, [5]Manchester Royal Infirmary, Manchester Diabetes Centre, Manchester, United Kingdom, [6]University of Miami, Diabetes Research Institute, Miami, United States

Aim: Continuous plantar high-pressure feedback via an intelligent insole system reduces high-pressure bouts across the high-risk diabetic foot, and reduces diabetic foot ulcer (DFU) incidence. We aimed to perform a site-specific analysis of pressure data from this 18-month follow-up study to determine which distinct, high plantar pressure sites are offloaded most effectively following this therapy.

Method: Forty-two patients with previous DFU wore pressure-sensing insoles and digital watch, daily, for a maximum of 18 months following randomisation to Intervention Group (IG; n=24) (receiving audio-visual-vibratory feedback following sustained high-pressures) or Control Group (CG; n=18) (no feedback). Integrated pressure was recorded continuously at 8 distinct sensor sites per foot (Big, Small, Met1, Met2, Met3, Lat2, Lat1, Heel) (CG sites, n=280; IG sites, n=368). Average minutes of high-pressure/hours wear at 'month 3' and 'penultimate study month' were compared between site treatment groups.

Results / Discussion: At month 3, there was no significant effect of intervention on minutes high-pressure/hours wear, at any distinct plantar site. At the penultimate study month, minutes high-pressure/hours wear were significantly lower at IG sites vs. CG sites for: whole foot (3.6±7.1vs.6.3±9.3 min/hr, $p<0.0001$), small toes (2.6±5.5vs.8.2±10.5 min/hr, $p<0.01$) and heel (2.5±4.8vs.7.9±10.0 min/hr, $p<0.01$). Furthermore, minutes high-pressure/hours wear were significantly lower at IG sites vs. CG sites at the penultimate study month, for: a) sites without DFU history ($p<0.001$); b) sites with DFU history ($p=0.01$), as shown:

Prize Oral



Conclusion: Continuous, high-pressure feedback 'alert' intervention reduces periods of high pressure at plantar sites across the 'high-risk' foot, but particularly at the small toes and the heel, where high pressure values become half that for sites without feedback. The effect of intervention is particularly effective at sites of previous DFU; conversely, absence of feedback in the control group results in increasingly greater periods of high plantar pressures at these highest risk areas.

[Award Oral 3] BELOW-THE-ANKLE ARTERIAL DISEASE: A NEW MARKER OF CORONARY ARTERY DISEASE IN PATIENTS WITH DIABETES AND FOOT ULCERS

Ermanno Bellizzi[1], Marco Meloni[1], Alfonso Bellia[1], Laura Giurato[1], Davide Lauro[1], Luigi Uccioli[1]

[1]University of Tor Vergata, Systems of Medicine, Roma, Italy

Aim: The aim of the current study is to evaluate the association between below-the-ankle (BTA) arterial disease and ischaemic heart disease (IHD) in patients with diabetic foot ulcers (DFUs).

Method: The study group was composed of patients with an active neuro-ischaemic DFUs managed in a tertiary care diabetic foot clinic. All patients received a pre-set limb salvage protocol including lower limb revascularization. By a retrospective analysis of individual angiograms, patients were divided in two groups: below-the-ankle (BTA) and above-the-ankle (ATA) arterial disease groups. The rate of IHD at baseline assessment and the new events of acute myocardial ischaemia (AMI) during 1-year of follow-up were evaluated and compared between the two groups.

Results: 272 patients have been included. 120 patients (44.1%) showed BTA arterial disease while 152 (55,9%) ATA arterial disease. The mean age was 68.9±9.6 years, 198 (72.8%) were male, patients with Type 2 diabetes were 246 (90,4%), mean diabetes duration was 20.7±11.6 years, mean HbA1c was 7.8±4.2% (62±22 mmol/mol). The rate of IHD in the whole population was of 172(63.4%) patients, in the BTA group was significantly higher than ATA group, respectively 90(75.4%) vs 82(54.1%), p<0.0001. At the multivariate analysis BTA arterial disease resulted independent predictors of IHD (BTA vs ATA arterial disease OR 2.5, p<0.0001). During the follow-up, BTA group had 5% new cases of AMI in comparison to 1.3% in ATA group (p<0.001).

Conclusion: the current study showed a close association between BTA arterial disease and IHD. The data suggest the need to screen the vascular tree in patients with diabetes with or without DFUs. In patients with PAD screening should be more effective, especially in those with BTA because of the very high risk of concomitant IHD or AMI in the short to medium term.

[Award Oral 4] THE DESIGN OF AN INTEGRATED PERSONALIZED ASSISTIVE DEVICES APPROACH TO REDUCE FOOT ULCER RECURRENCE IN DIABETES

Lisa Vossen[1 2], Jaap van Netten[1 2], Chantal Bakker[3], Heleen Berendsen[4], Tessa Busch-Westbroek[1 2], Marcel Dijkgraaf[5], Edgar Peters[2 6], Louise Sabelis[2 7], Sicco Bus[1 2]

[1]Amsterdam UMC location University of Amsterdam, Rehabilitation Medicine, Amsterdam, Netherlands, [2]Amsterdam Movement Sciences, Rehabilitation & Development, Amsterdam, Netherlands, [3]Máxima Medisch Centrum Veldhoven, Rehabilitation Medicine, Veldhoven, Netherlands, [4]Reinier de Graaf Gasthuis Delft, Rehabilitation Medicine, Delft, Netherlands, [5]Amsterdam UMC location University of Amsterdam, Epidemiology and Data Science, Amsterdam, Netherlands, [6]Amsterdam UMC location Vrije Universiteit Amsterdam, Internal Medicine, Amsterdam, Netherlands, [7]Amsterdam UMC, location Vrije Universiteit Amsterdam, Rehabilitation Medicine, Amsterdam, Netherlands

Aim: Healthcare is shifting from stratified care to personalized medicine, and is accelerated with developments in wearables and assistive devices. However, this transition has not yet occurred for research into diabetic foot ulcer prevention, where it is still common to assess single interventions that are provided to all participants in the same way. In contrast, a combination of interventions is standard care in clinical practice. Therefore, we aimed to design a treatment approach in which multiple evidence- and practice-based preventative assistive devices interventions are integrated into a personalized approach to reduce foot ulcer recurrence in diabetes.

Method: We used existing clinical guidelines and systematically searched the literature for proven interventions to prevent diabetic foot ulceration. For therapeutic footwear, at-home foot temperature monitoring and patient education, we found eight, five and seven studies, respectively. We also identified three studies that assessed a form of integrated care, of which one used a personalized approach and none combined all the above-mentioned single interventions.

Combining these outcomes with our clinical experience, we designed a state-of-the-art integrated approach. This design was discussed during multiple meetings with a multidisciplinary group of 22 experts (i.e. rehabilitation and internal medicine specialists, shoe technicians, podiatrists, scientists, and patient representatives), and an implementation committee of eight members representing a variety of expertise, before finalizing the design.

Results/Discussion: We combined four modalities with assistive devices into an integrated approach, that was personalized by individual biomechanical and behavioral profiles based on objective measurements and questionnaires (Table 1).

Conclusion: This new design for an integrated personalized treatment approach to prevent foot ulcer recurrence represents a shift from stratified healthcare towards personalized medicine in diabetic foot disease. The approach is currently studied in a multicenter randomized controlled trial to assess its efficacy from a clinical, health-economic and patient-related perspective.

Table 1: modalities included in the personalized intervention

	Intervention	Personalization
	Pressure-optimized custom-made footwear, according to a state-of-the-art design protocol [1,2,3]	The design is personalized based on foot type and personal preferences, and individually tested and optimized for pressure distribution with in-shoe plantar pressure measurements.
	Pressure-optimized custom-made footwear designed for indoor use, according to a state-of-the-art design protocol [2,4,5]	The design is personalized based on foot type and personal preferences, and individually tested and optimized for pressure distribution with in-shoe plantar pressure measurements.
	At-home daily foot temperature monitoring at high-risk locations [6,7,8]	Personalized for a maximum 3 locations that are at high risk, based on previous foot ulcer locations, high in-shoe pressure areas and/or signs of pre-ulceration. Usability and temperature profiles evaluated every 3 months to determine need to continue.
	Structured patient education, including motivational interviewing and personalized feedback [3,9,10,1112,13]	Based on a structured model focusing on risk factors and prevention strategies, with multiple teach-back moments. Personalized feedback is given on footwear use, plantar pressures, temperature monitoring and self-care. Motivational interviewing is provided after 6 weeks, 3, 6 and 9 months, to increase or maintain treatment adherence.

1) Bus et al. (2013) Diab Care 2013;36(12):4109-16, 2) Bus et al. (2020). Diab Metab Res Rev. 2020;36(S1):e3237, 3) Van Netten et al. (2020) Diabetes Metab Res Rev 2020;36 Suppl 1:e3270, 4) Keukenkamp et al. (2021) Disb Rehab 2021:1-8, 5) Keukenkamp et al. (2022) BMJ Open Diab Res Care 2022;10:e002593, 6) Alahakoon et al. (2020) Diabet. Med. 2020;37(8):1266-79, 7) Bus et al. (2021) BMJ Open Diab Res Care 2021;9(1), 8) Crawford et al. (2020) Diabetologia 2020;63(1):49-64, 9) Gurney et al. (2017) J Foot Ankle Res 2017;10:24, 10) Jarl et al. (2021) JAPMA – in press. 11) Kaczmarek et al. (2021) J Foot Ankle Res 2021;14(1):12, 12) Keukenkamp et al. (2018) J Am Podiatr Med Assoc 2018;108(2):90-9, 13) Van Netten et al. (2020) Diabetes Metab Res Rev 2020;36 Suppl 1:e3271

[Award Oral 5] COMPARISON OF DIFFERENT METHODS TO ASSESS THERAPEUTIC FOOTWEAR USE AMONG PEOPLE WITH DIABETES

Gustav Jarl[1 2], Chantal M. Hulshof[3], Tessa Busch-Westbroek[3], Sicco Bus[3], Jaap van Netten[3]

[1]Örebro University, Faculty of Medicine and Health, University Health Care Research Center, Örebro, Sweden, [2]Örebro University, Faculty of Medicine and Health, Department of Prosthetics and Orthotics, Örebro, Sweden, [3]Amsterdam UMC, University of Amsterdam, Rehabilitation Medicine, Amsterdam Movement Sciences, Meibergdreef 9, Amsterdam, Netherlands

Aim: Different methods are used in clinic and research to assess patients' use of therapeutic footwear to prevent diabetic foot ulcers. However, the validity of these methods has received limited attention. The aim was to compare four different methods to estimate footwear use.

Method: 40 participants (31 men), mean age 63.9 years (SD 8.6), were followed for seven consecutive days. A temperature sensor (Orthotimer) measured objective wearing time and a tri-axial accelerometer (McRoberts MoveMonitor+) assessed weight-bearing activities, like standing and walking. Adherence was calculated as the proportion of weight-bearing time during which prescribed footwear was used. Objective wearing time was calculated as the average number of hours/day prescribed footwear was used. Subjective wearing time was calculated in two ways based on two multiple-choice questions (Table 1). Spearman's correlation coefficient was calculated for the associations between measures of wearing time and objectively measured adherence (reference).

Results / Discussion: Participants spent on average 3.4 (SD 1.6) hours/day in weight-bearing activities (walking 1.5 (SD 0.9), standing 1.9 (SD 0.8)), whereof they used prescribed footwear 2.4 (SD 1.5) hours/day. Objective adherence was 69.3% (Table 1). Objective wearing time correlated strongly with adherence ($r = 0.80$, $p<0.001$), which is similar to previous research (Waaijman, Diabetes Care, 2013). Correlation coefficients between the two subjective measures of wearing time and adherence were low and not statistically significant (-0.28 and 0.28, respectively, $p>0.05$).

Conclusion: Objective wearing time of prescribed therapeutic footwear can be used to estimate adherence during weight-bearing activities without using an activity monitor. This allows measurements over longer time periods at a lower burden. The two subjective measures of wearing time are not appropriate measures of adherence.

Table 1. Summary of results.

	Mean (SD) or median	Correlation with adherence [a]	P-value
Adherence, [b]% of time of all weight-bearing activities	69.3 (23.0)	---	---
Objective wearing time, h/day [b]	10.4 (5.9)	0.80	<0.001
Subjective wearing time 1, h/day [c]	8-12 [d]	-0.28	0.110
Subjective wearing time 2, h/day [e]	9.3 (5.8)	0.28	0.105

[a] Spearman's correlation coefficient, [b] ratio between weight-bearing time with prescribed footwear over all weight-bearing time, [c] rated on a scale <1, 1-4, 4-8, 8-12, >12 h/day, [d] median value, [e] calculated by multiplying median number of reported hours/day by median number of reported days/week (scale: 0, 1, 2-3, 4-5, 6-7 days/week), divided by 7 (days).

Oral Abstracts

OP01 IMPACT OF COVID-19 ON DIABETIC FOOT SURGICAL TREATMENT

Roberto da Ros[1], Enrica Barro[1], Andrea Michelli[1], Barbara Brunato[1], Roberta Assaloni[1], Cesare Miranda[1]

[1]Diabetic center, Monfalcone Hospital , Monfalcone, Italy

Background: Treatment of diabetic foot during pandemic Covid-19 was a challenge in the management of diabetic foot for the presence of multiple limitations and frail situation. Conservative and low impact surgical treatment of diabetic foot represented a mandatory mission to avoid hospitalization.

Aim of the study: To evaluate diabetic foot treatment evolution during COVID period compared to previous activity.

Materials and Methods: Interrogation of surgical database between January 2019 and December 2021, founded 851 surgical procedures performed in hospitalized patients and 667 surgical procedures in out-patients. 99% of patients have type 2 diabetes, mean age was 71±11 years (mean ± SD), 78% were male, a long history of diabetes 18 ± 11 years was founded. We evaluate activity each year to evaluate Covid influence.

Results: In 2019 we performed 332 surgical procedures in hospitalized patients (71,7 years, 19,7 diabetes years, 75% males) and 192 in out patients. In 2020, first year of pandemic Covid, we performed 294 surgical procedures for in-patients (70,4 years, 16,6 diabetes years, 79% males) and 232 in out patients, while in 2021, 225 surgical procedures for in-patients (71,4 years, 17,8 diabetes years, 83% males) and 243 in out-patients. During the two COVID year's surgical activity on diabetic foot change setting, with a significant reduction of in-hospital patients in favour of out-patients service treatment ($p>0.01$). Diabetic foot presentation with acute infection and need to drainage was similar in the three groups (139 in 2019, 156 in 2020, 137 in 2021, p=ns). Surgical outcome: in 2020 there was an increasing of proximal foot amputation (chopart and syme) respect the other two years, probably due to beginning of pandemic covid-19 and relative fear to access into hospital.

Conclusions: Data from this study evidenced a changed approach to surgical diabetic foot during pandemy. In presence of limited availability of places in hospital activity growth in out-patients setting. Beginning of pandemy lead to a delay in presentation of patients with consequent increase in proximal foot amputation.

OP02 MORTALITY RATES AFTER LOWER EXTREMITY AMPUTATION IN BELGIUM FROM 2009 TO 2018

Eveline Dirinck[1], Kristien Wouters[2], Johan Vanoverloop[3], Avalosse Hervé[4], Frank Nobels[5], Isabelle Dumont[6], Giovanni Matricali[7], Patricia Felix[8], Jeroen Hendriks[9], Patrick Lauwers[9]

[1]Antwerp University Hospital, Department of endocrinology, diabetology and metabolism, Edegem, Belgium, [2]Antwerp University Hospital, Clinical Trial Center, Edegem, Belgium, [3]Intermutualistisch Agentschap/Agence Intermutualiste, Brussel, Belgium, [4]Landsbond der Christelijke Mutualiteiten/ Alliance Nationale des Mutualités Chrétiennes, Brussel, Belgium, [5]Onze Lieve Vrouw Ziekenhuis Aalst, Department of Endocrinology , Aalst, Belgium, [6]Centre Multidisciplinaire du Pied Diabetique, Ransart, Belgium, [7]Leuven University Hospital, Department of orthopedic surgery, Leuven, Belgium, [8]CHR de la Citadelle, Department of Endocrinology, Liège, Belgium, [9]Antwerp University Hospital, Department of thoracic and vascular surgery, Edegem, Belgium

Aim: Diabetes mellitus and peripheral arterial disease are the main indication for lower extremity amputations (LEA) in Western countries. Reported mortality rates after LEA are high, particularly with more proximal amputation level and older age. The influence of diabetes is more ambiguous. In this national study, short and long term mortality after minor and major LEA in people with and without diabetes, compared to controls without LEA, was assessed between 2009 to 2018. Temporal trends in one-year mortality rates were studied as well.

Method: Data on all Belgian citizens undergoing LEA in the study period, and a group of matched controls without LEA, were collected. Age- and sex adjusted survival curves were calculated. A Cox proportional hazard model was used to estimate the relative likelihood of mortality after LEA in individuals with and without diabetes, after correction for age, gender, and district. Matched individuals with and without diabetes but remaining amputation-free were used as controls. Time trends were analysed in negative binomial models.

Results / Discussion: 41304 amputations (13247 major, 28057 minor) were performed in 26526 individuals. Thirty-day, 1-year and 5-year mortality rates (deaths per 1000 individuals) in people with diabetes after major amputation were 13, 35 and 67, and 4.7, 20 and 51 after minor amputation. In people without diabetes, thirty-day, 1-year and 5-year mortality rates after major amputation were 17, 38 and 65, and 4.9, 21 and 48 after minor amputation. Diabetes was significantly related to reduced survival: hazard ratios for mortality for controls without LEA, minor LEA and major LEA were 1.77 (95% CI 1.56-2.00), 1.40 (95% CI 1.24-1.58) and 1.26 (95% CI 1.12-1.41) respectively. Over the ten-year study period, mortality rates after LEA decreased only for individuals without diabetes.

Conclusion: Early and late mortality rates after LEA were high in Belgium, both in individuals with and without diabetes.

OP03 TEMPORAL TRENDS IN MAJOR, MINOR AND RECURRENT LOWER EXTREMITY AMPUTATIONS IN BELGIUM FROM 2009 TO 2018

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Aim: In Western countries, diabetes-related complications are the main indication for lower extremity amputations (LEAs). Multidisciplinary diabetic foot clinics (MDFCs) have been implemented to reduce this number. Temporal trends in the incidence of total, major, and minor LEA in people with and without diabetes from 2009 to 2018 in Belgium, and secondary amputation rates were studied.

Method: Data on all Belgian citizens, both those undergoing LEA and those remaining amputation-free, were collected from the InterMutualistich Agentschap/Agence InterMutualiste, Sex- and age-adjusted annual incidence rates were calculated. Time trends were analysed in negative binomial models. Secondary interventions, defined as an amputation executed on the ipsilateral and/or contralateral limb at any point later in time after the initial amputation, were also studied , with death as competing risk.

Results / Discussion: In individuals with diabetes, the amputation risk decreased from 143.6/100 000 person-years in 2009 to 109.7 in 2018 ($p<0.001$). The incidence of major LEAs decreased from 56.2 to 30.7/100 000 person-years ($p<0.001$); the incidence of minor amputations showed a declining trend in women (54.3 to 45.0/100 000 person-years, $p=0.024$), but didn't change significantly for the total population (99.9 to 87.5/100 000 person-years). In individuals without diabetes, the incidence of major amputation didn't change significantly (6.1 to 5.1/100 000 person-years), whereas minor amputation incidence increased (8.0 to 10.6/100 000 person-years, $p<0.001$). In individuals with diabetes, one-year secondary intervention rates were high (31.3% after minor LEA, 18.4% after major LEA); the incidence of secondary amputations didn't change.

Conclusion: In Belgium, with nationwide accreditation of MDFCs since 2005, there was a significant decline in the incidence rate of major LEA in people with diabetes between 2009 and 2018. This decline is particularly successful since it was not accompanied by a significant rise in minor LEA. Nevertheless, secondary interventions were frequent and their incidence remained stable.

OP04 RISK FACTORS FOR AMPUTATION IN PERSONS WITH DIABETES IN A SWEDISH CONTEXT – A RETROSPECTIVE COHORT DESIGN

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Aim: Risk factors for lower limb amputation (LLA) in individuals with diabetes has been under-studied. We examined how demographic, medical and lifestyles characteristics are associated with LLA among diabetes patients.

Method: Using linked register data from several national Swedish registers, we extracted data for 66,570 individuals who were diagnosed for diabetes between 2007-2016 aged ≥18 years. We followed these individuals from the date of the diagnosis to amputation, emigration, death or the end of study in 2017, whichever occurred first.

Cox proportional hazards models were used to obtain hazard ratio (HR) and 95% confidence interval was used for associations between demographic, medical and lifestyles variables and amputation risk. Both unadjusted and mutually adjusted models were fitted.

Results/Discussion: During the follow-up period, there were in total 133 lower-limb amputations. Based on the model mutually adjusting for all variables, higher age (HR=1.08 [95%CI(0.43 – 0.95)]) per 1-year) and being divorced compared with being married showed positive association (HR=1.68[95%CI(1.08 – 2.62)]) while being female showed negative association (HR=0.64[95%CI(0.43 – 0.95)]). Individuals with a record of foot risk at baseline was associated with increased risk compared to a healthy foot (neuropathy/angiopathy (HR=4.15[95%CI(2.86 – 6.02)]), previous wounds (HR=8.46[95%CI (3.37 – 21.24)]), ongoing severe foot disease (HR=11.53[95%CI(4.94 – 26.94)]). Insulin treatment compared with diet-only treatment showed HR=1.92[95%CI(1.04 – 3.57)]. Hypertension and HbA1c were not statistically significantly associated. Physical inactivity and smoking, compared with daily activity and non-smoking, respectively, showed approximately doubled risk while BMI ≥30 showed lower risk compared with normal weight (HR=0.47[95%CI(0.29 – 0.76)]).

Conclusion: Our study suggested that age, marital status, foot risk category, physical activity, BMI, insulin treatment and smoking may be relevant to higher risk of LLA while absence of associations for hypertension and HbA1c did not agree with previous studies. Further investigation is necessary to confirm the associations between predictors and LLA suggested here.

OP05 ONE-YEAR HOSPITALIZATION DATA AND FOLLOW-UP OF DISCHARGED PATIENTS - OUTCOMES FROM LEVEL 3 FOOT CENTRE

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Aim: Hospitalizations for diabetic foot ulcers (DFU) and its complications have been slightly decreasing in last decade but still remain a significant burden for the healthcare system. The aim of our study was to analyze the number of various procedures performed in patients with DFU and to assess the outcomes of follow-up period in discharged patients.

Method: Three-hundred ten patients with DFU were hospitalized in our level 3 foot centre during 1-year period, in 271 of them was the DFU the main reason for the admission and therefore were included in the study. Number of amputation procedures, vascular interventions and other procedures was analyzed during the hospitalization and all patients were followed-up until 6 months after the discharge.

Results/Discussion: Of 271 admitted patients with DFU 193 (71.2%) were without an amputation procedure, 62/271 (22.9%) underwent minor amputation and in 16/271 (5.9%) was performed a major amputation. Most frequent minor procedures were ulcerectomy (36), toe amputation (24) and MTP joint resection (17). Seventy-two patients underwent PTA, 0 by-pass and 12 autologous cell therapy. Among the non-amputation procedures dominated negative-pressure wound therapy (29), plantar discission (19) and external fixation (7). Median duration of hospitalization was 7 (1;64) days. After 6 months of follow-up, we observed 46.8% healed patients, 75.6% patients with improved DFU and 4.5% patients needed another revascularization. Further surgical procedure after discharge was necessary to perform in 15.4% cases and 16.7% patients needed a re-hospitalization. We observed no significant correlation between number of healed patients at the end of follow-up and type of minor amputation (r=0.18), status at the end of hospitalization (r=0.08) or the length of hospitalization (r=0.04).

Conclusion: Our study showed that even with best standard of care in level 3 foot centre 6 months after the discharge approximately one half of patients is healed and three-quarters DFUs are improved.

Supported by grant 00023001.

OP06 THE COMBINATION OF ABI AND TBI IN A PRAGMATIC DESCRIPTION OF LIMB ISCHAEMIA IN PATIENTS WITH DIABETES HIGHLIGHTS THE NEED FOR SPECIALIST CARE AND DELINEATE CLINICAL OUTCOMES

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Aim: Identification of PAD upon presentation with a diabetic foot ulceration, is usually done via a wound classification which attempts to incorporates the degree of ischaemia within a wound classification. The aim was to assess the value of a dedicated and pragmatic anatomical description of lower limb ischaemia into 3 levels, denoted as; Group-1: non-ischaemic, Group-2: foot ischaemia and Group-3: foot-and-leg ischaemia

Method: Consecutive patients attending a specialist diabetic foot clinic over an 18month period, were retrospectively categorized depending on their paired ABI and TBI; Group-1 with both ABI≥0.9 and TBI≥0.75; Group-2, with ABI≥0.9 but TBI<0.75; Group-3 with both ABI<0.9 and TBI<0.75. Analyses for relative risk of events; angioplasty, bypass, amputation, and clinical outcomes of ulcer healing and mortality rates were also compared between groups. Kaplan–Meier survival curves representing cumulative survival, were used to compare the patient survival and amputation-free survival over a subsequent 5year follow-up.

Results / Discussion: 301 limbs in 154 patients were assessed, Mean age 62±12years, 81% male, mean diabetes duration of 20±15years, 77% with type-2 diabetes: 59% of limbs were ulcerated. 128 patients were retrospectively categorised into the three levels of limb ischaemia: Group-1, n=31, non-ischaemic, Group-2, n=67, with isolated low TBI or foot ischaemia, and Group-3, n=30, with foot–and-leg ischaemia. Neither SINBAD nor WIfI could differentiate the non-ischaemic Group-1 from Group-2 with isolated low TBI. Over 5year follow-up, a progressive decline in mean patient survival time occurred, 51±16 versus 44±20 versus 39±22 months, respectively, for ANOVA across three groups, p=0.04. Patients in Group-2 had angioplasty and bypass at a rate similar to patients in Group-3. The proportion of angioplasties was significantly higher in the isolated low TBI, Group-2 vs Group-1, 19.4% vs 3.2%, p=0.033, with subsequent ulcer healing within Group-2 similar to that of non-ischaemic Group-1, 68% versus 60% over 12months, p=0.454.

Conclusion: Combined use of ABI and TBI to stratify the diabetic limb into these 3 pragmatic levels of ischaemia, could be of value in the identification of limbs and patients requiring revascularisation to achieve ulcer healing rates that are similar to that of non-ischaemic limbs.

OP07 VIRTUAL RAPID ACCESS VASCULAR (V-RAV) MDT FOOT CLINIC: A NEW LOCAL DELIVERY STRATEGY

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Aim: In March 2020 the impact of covid brought about the suspension of the patient facing rapid access vascular (RAV) MDT foot clinics for 10months. The aim of this piece of work is to explore the effectiveness of the hybrid V-RAV that was developed subsequently (Jan 2021) versus the pre-covid face to face RAV MDT foot clinic.

Method: A retrospective review of the V-RAV MDT foot clinics between January 2021 and January 2022. Comparison is made with the patient facing model pre covid for effectiveness and patients' accessibility to timely diagnostics and vascular interventions. The diabetes specialist podiatrist (DSP) became the essential link, bringing together all the relevant history and examination findings accompanied by serial photography. The clinical picture and investigations were reviewed on a combination of medway and PACS systems via the IT platforms of MS teams and Accurx. Collaboratively the vascular surgeon, diabetologist and DSP formulate a holistic plan to be agreed with the patient.

Results: The remote hybrid model borne out of necessity at the time has produced a sleeker and more efficient service. The remote working immediately brought about cost saving and freed up consultant time by more than 5 hours. Distance and the fact that the MDT members were based on different sites became irrelevant, whereas previously clinics would have been cancelled. Furthermore, this remote working pattern brought flexibility if needed at the last minute to prevent cancellations of the clinic. The number of patients reviewed in a 12-month period under RAV was 83 Vs 194 under V-RAV. The major amputations as an outcome measure under RAV were 1 and under V-RAV, 3. The median/ average interval from referral to assessment with a vascular surgeon was keeping with the average of 16 days.

Conclusion: The management of ischaemia in diabetics with non-healing DFUs is challenging. The pandemic resulted into a favourable evolution of vascular rapid access that was effective, applicable and sustainable not only during the height of covid but also in the post covid era as well. Due to its success, it is being adopted in the sister hospital of Northampton General Hospital.

OP08 USING ULTRASONAGRAPHY TO ACHIEVE EARLIER DIAGNOSIS OF CHARCOT FOOT: A CASE SERIES

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Aim: To describe the sonographic features of acute Charcot Neuroarthropathy and assess its potential role in diagnosing patients with clinically suspected acute CN.

Method: A prospective (case series) study design was employed to evaluate the demographic and radiological features of thirty-three patients presenting with clinical signs and symptoms of acute diabetic Charcot Neuroarthropathy (CN). Patients underwent weightbearing plain X-Rays and when possible, Magnetic Resonance Imaging to evaluate whether acute CN was present. Ultrasonographic imaging was carried out on the symptomatic and asymptomatic foot to assess for presence of subcutaneous oedema, intraarticular colour flow (synovitis), periarticular colour flow, spectral waveform morphology of the dorsalis pedis artery. The peak systolic velocity (PSV) and resistive index (RI) of the dorsalis pedis and dorsal intermetatarsal arteries were also assessed.

Results / Discussion: Following clinical and radiological assessment, 49% (n=16) of patients were diagnosed with acute CN, 21% (n=7) were diagnosed with chronic CN changes and 30% (n=10) had no CN detected. One patient was identified as having bilateral CN so in total 17 feet belonging to 16 patients had acute CN. Ultrasound detected acute CN in 94% (n=15) of patients. Intraarticular and periarticular colour flow was present in 94% (n=16) and 100% (n=17) of the feet with confirmed acute CN. 88% (n=15) of feet with confirmed acute CN had monophasic pulses while their contralateral foot had either biphasic or triphasic pulses. The same 15 feet also had a RI of ≤1.0 in the symptomatic limb. PSV (>30 m/sec difference) was higher in the symptomatic foot of 62.5% (n=10) patients when compared to their contralateral foot.

Conclusion: Using a combination of readings, ultrasound is a useful tool in identifying acute CN. These readings, combined with clinical presentation and medical history may enable faster diagnosis, resulting in faster implementation of strategies to prevent deformity.

OP09 MORTALITY RATES AMONG PATIENTS WITH CHARCOT'S FOOT ATTENDING MANSOURA DIABETIC FOOT CLINIC: 15 YEARS RETROSPECTIVE STUDY

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Aim: to detect mortality rates among diabetic patients suffering from Charcot foot attending Mansoura diabetic foot clinic since 2005 till December 2019.

Method: Retrospective cohort study was conducted on a total of 313 subjects suffering from COA attending in Mansoura diabetic foot clinic from July 2005 to December 2019. Data were collected from patients' records including all patients diagnosed as COA; history of diabetes, COA (onset, side, and staging), retinopathy, chronic kidney disease (CKD), cardiovascular diseases {hypertension (HTN), ischemic heart disease (IHD), peripheral artery disease (PAD)} and other co morbid conditions. 39 subjects couldn't be reached. So, only 274 subjects were included in statistics.

Results / Discussion: 15.7% of the studied subjects were Type1 DM and 84.3 % were Type 2 DM with mean duration of diabetes of 18 years. Mortality rate among studied cases was 21% with significant relation to age, CKD, IHD and HTN ($p<0.05$) with overall 79.6 % prediction of mortality. Median overall survival time was 12 years ranging from 9.37 to 14.13 years. Out of 58 died subjects, 8 (13.8%) subjects presented with acute Charcot.

Conclusion: COA had a higher mortality rate in which advanced age and associated co morbidities increase this possibility. Management of acute Charcot requires management of associated comorbidities beside foot care.

OP10 IMPROVED MAJOR AMPUTATION RATES IN DIABETIC PATIENTS WITH ISCHAEMIC FEET COMPARED WITH NON-DIABETIC PATIENTS WITH ISCHAEMIC FEET; IMPACT OF THE MULTIDISCIPLINARY DIABETIC FOOT TEAM AND THE DIABETIC FOOT CLINIC

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Aim: The aim was to compare the outcome of diabetic foot patients with severe leg ischemia (SLI) treated by Multidisciplinary Diabetic Foot Team (MDFT at the Diabetic Foot Clinic (DFC) compared with people without diabetes and severe leg ischaemia treated in the Vascular Clinic.

Method: This was a retrospective cohort study involving consecutive patients (n=212) attending the Diabetic Foot Clinic and the Vascular Clinic from 2004 to 2011. All patients had severe leg ischaemia (SLI) defined by rest pain or minor or major tissue loss. (Rutherford 4,5and 6). Diabetic patients (n=144) were managed by dedicated MDFT in the DFC whereas non-diabetic patients (n=80) were treated in the Vascular Clinic. Distal bypasses were performed and salvage angioplasty was offered to the threatened grafts. The patients were followed up to assess the one-year patency rates of the grafts and 48-months amputation-free survival rates.

Results / Discussion: Two hundred and twelve patients with SLI underwent 224 distal bypasses. Indications for bypass were tissue loss in 109(48.7%), gangrene in 59(26.3%) and rest pain in 56(25%) of the cases. Chronic renal failure and hypertension were significantly higher in the diabetic group (P=0.0094 and 0.0064). The most common inflow arteries were the below knee Popliteal artery (49%) followed by the Superficial Femoral artery (25%) in diabetic patients, whereas in non-diabetic patients, this was the Superficial Femoral artery (39%) followed by the Common Femoral and below knee Popliteal arteries. The posterior tibial artery and the tibio-peroneal trunk were the most common outflow arteries in diabetic and non –diabetic patients respectively.

Duplex surveillance detected 36(25%) threatened grafts requiring salvage angioplasty in the diabetic group versus 24(30%) in the non-diabetic group (p=0.4345). The l one-year mortality was 16.7% in the diabetic group versus 5% in the non-diabetic group (p=0.0435) but major amputation rate was only 2.1% in the diabetic group versus 12.5% in the non-diabetic group (p=0.0023).

Conclusion: The diabetic patients had a more favourable major amputation rate compared to non-diabetic patients in spite of increased morbidity and mortality rates. This was related to the positive impact of care by MDFT in the DFC.

OP11 A LONG-TERM PROSPECTIVE COHORT STUDY OF AMPUTATION AND MORTALITY RISK FACTORS IN PATIENTS WITH DIABETIC FOOT ULCER

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Aim: This study aimed at identifying the characteristics of patients with diabetic foot ulcer who are at increased risk of amputation and death.

Methods: Participants were recruited from patients who attended the clinic with active foot ulcer between January 1998 and December 1999 and were followed for more than two decades till 2020. Ten clinical measures from 103 (M/F:60/43) patients, with active diabetic foot ulcer at baseline, were collected. During a follow-up of 4.2±5.4 years 22(M/F:14/8) patients had an amputation and 50(M/F:32/18) patients passed away during 5.5±5.8 years follow-up period.

Results and Discussion: Cox Proportional Hazard regression (HR[95%CI]) indicated that neuropathy (6.415[1.119-36.778]); PAD (9.741[1.932- 49.109]); smoking (16.148[1.658-157.308]); Diabetes Type-1 (3.228[1.151-9.048]), delay in attending appointment after ulcer (1.013[1.003-1.023]) and death during follow-up (3.458[1.243-9.621]) were all significantly associated with risk of amputation. Neuropathy (3.058[1.297-7.210]); PAD (5.069[2.113-12.160]); amputation history (3.689[1.306-10.423]); and retinopathy (2.389[1.227-4.653]) were significantly associated with risk of mortality. Kaplan-Meier survival analyses showed that the time to amputation for participants who died during follow-up was significantly shorter (11.1±1.5 years) vs those who stayed alive during follow-up (15.4±1.4 years).

Conclusion: PAD significantly shortened the time to both amputation (by 9.0 years) and death (by 7.4 years) while patients with neuropathy showed a decreased time to death (by 5.5 years) but not significantly shorter time to amputation. Amputation showed to increase the risk of death and participants who died during follow-up had a higher risk of amputation. Also, amputation history and death during follow-up decreased the times to death (by 5.5 years) and amputation (by 4.3 years) respectively. The reciprocal relationship between amputation and death indicates that to decrease mortality, reductions in amputations are required. Decreasing the delay attending appointment after ulcer is an important factor that needs to be considered to decrease amputation risk, hence the mortality rate associated with diabetic foot ulcers.

OP12 ANXIETY AND DEPRESSION AMONG ADULT PATIENTS WITH DIABETIC FOOT ULCER ATTENDING A MULTIDISCIPLINARY FOOT CLINIC

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Aim: Diabetic foot ulcers (DFU) are linked to morbidity, decreased mobility, and feelings of isolation, powerlessness, and sadness. The aim of this study was to explore the prevalence of anxiety and depression symptoms in adult patients with DFU.

Method: Patients with DFU attending our multidisciplinary diabetic foot clinic from February 14th to March 14th, 2022 were invited to complete a questionnaire which included socio-demographic questions, the Patient Health Questionnaire-9 (PHQ-9) scale to assess depression and the Generalized Anxiety Disorder scale (GAD-7) to assess anxiety. For each scale a cut off total score of 10 was used to identify those who met the criteria for anxiety and depression.

Results: 60 patients completed the questionnaire. 83.25% of the participants reported their diabetes foot care had not been affected by the COVID-19 pandemic. 25% reported moderate to severe anxiety symptoms, 10% reported mild anxiety symptoms while 65% reported no or minimal anxiety symptoms. Regarding depression, 30% reported moderate to severe depressive symptoms, 10% reported mild depressive symptoms, while 60% reported no or minimal depression (Figure 1). Patients with other co-morbidities were 3 times more likely to report depression compared to those without other co-morbidities (OR=3.2; 95% CI: 1.10-10.26). Patients younger than 50 years were nearly 9 times more likely to report anxiety compared to those aged 60 years or more (adjusted OR=8.9; 95% CI: 1.01-86.41) taking into account other variables.

Conclusion: The prevalence of depression and anxiety in this cohort of patients with DFU was low, but the severity was moderate to severe in those who were affected. Patients with other co-morbid conditions and those younger than 50 years have worse mental health status. This finding needs to be taken into account in the management of patients with DFU. Attempts to reduce anxiety and/or depression could improve the quality of life of DFU patients.

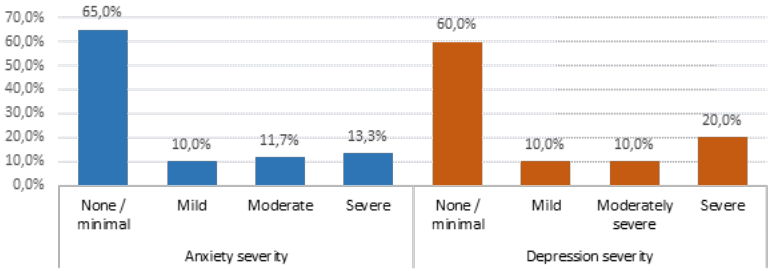

Figure 1. Psychological health of patients with DFU attending a multidisciplinary diabetic foot clinic

OP13 HEALTH-RELATED QUALITY OF LIFE IN PATIENTS WITH DIABETIC FOOT ULCER ACCORDING TO DIABETIC FOOT ULCER SCALE-SHORT FORM IN SPANISH SUBJECTS

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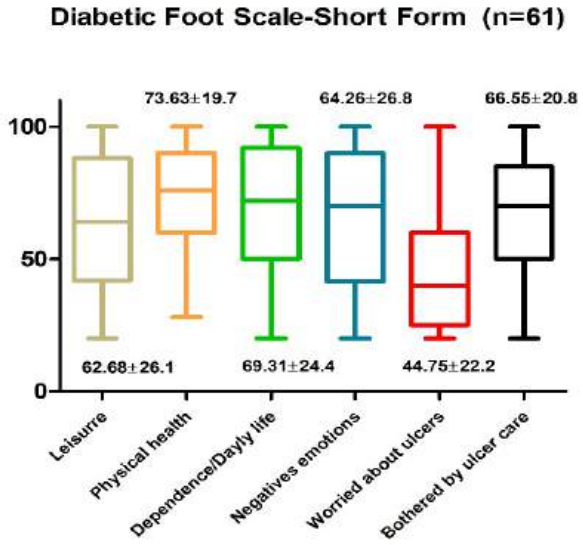
Aim: To investigate the health-related quality of life (HRQoL) of Spanish outpatients with diabetic foot ulcers (DFUs).

Method: We have performed a cross-sectional study including 61 outpatients with DFUs. The Diabetic Foot Ulcer Scale-Short Form (DFS-SF) was used by personal interview to assess the HRQoL. DFS-SF contains 29 items based in 6 subscales: leisure, physical health, dependence/daily life, negative emotions, worried about ulcers/feet and bothered by ulcer care. Response to each item is rated on a 5-point Likert-type scale ranging from 1 (not at all or none of the time) to 5 (a great deal or all the time or extremely). Individual items on the instrument were reverses coded, and high scores on the DFS-SF indicate a high (good) HRQoL. The score of each subscale was calculated based on a scale from 0 (poorer HRQoL) and 100 (higher HRQoL).

Results / Discussion: The majority of our patients were men (n=55, 90.2%), with a mean age of 64.90 ± 9.9 years.

Eighty-three patients (95.2%) had type 2 diabetes with a mean HbA1c of 7.4 ± 1.7%. Twenty-seven patients (44.3%) had neuropathic DFUs, 6 patients (9.8%) had ischemic DFUs and 28 patients (45.9%) had neuroischemic DFUs. Figure depicts the scores for the HRQoL in the six domains of our study population.



In the multivariate analysis of factors associated with quality of life we found that previous amputations were significant associated with lower quality of life based in the domains leisure (74.37±22.03 vs 53.41±25.67, p=0.001), dependence/daily life (77.18±19.55 vs 63.05±26.2, p=0.019), negative emotions (72.34±25.73 vs 57.84 ±26.2, p=0.035) and worried about ulcers (51.6 ±19.2 vs 39.26± 23.2, p=0.029).

A significant negative correlation among Sinbad DFUs classification system and two domains of DFS-SF was observed [Dependence/daily life (r=-0,335, p<0.019), and bothered by ulcer care (r=-0,421, p=0,01)

Conclusion: The presence of previous amputations was the main factor associated with lower quality of life in our patients with DFUs, specially in the domains: leisure, dependence/daily life, negative emotions and worried about ulcers. Patients with higher scores of Sinbad classification system had lower quality of life in the domains dependence/ daily life and bothered by ulcer care.

OP14 STANDARD OF CARE AUDIT IN PEOPLE WITH DIABETES ON PERITONEAL DIALYSIS HIGHLIGHTS CONTINUED LACK OF MONITORING OF FOOT RISK

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Aim: The number of people with diabetes on renal replacement therapy (RRT) is increasing annually. There is limited information on the standards of diabetes care received by people with diabetes on peritoneal dialysis (PD). Unlike the haemodialysis environment, those receiving PD do not receive the same acuity of access of health monitoring on a regular basis.

Method: We audited the care of all PwD on PD at 3 large university hospital trusts in the United Kingdom between December 2021-January 2022 against the standards set in the UK Diabetes in Haemodialysis guidance (as no guidelines for PD are available), which are: 100% of people should have annual review of glycaemic control by a diabetes specialist, annual eye screening, annual foot risk assessment, target HbA1c 58-68mmol/mol.

Results / Discussion: 65 participant records (type 1 diabetes n=15) were examined, and their demographics were broadly similar across the sites except for ethnicity. The percentage of people with diabetes on PD seen at least annually varied between 63% and 94%. Only 77% had at least an annual foot review, which was broadly similar across the three sites, in contrast to 92% were in a retinal screening program. HbA1c results in a clinically 'acceptable' range of 58-80mmol/mol was observed in 32% of people and 9% had poor control (defined as >80mmol/mol). Of the 58% of people who had HbA1c <58mmol/mol, 66% were on a treatment that could be associated with hypoglycaemia.

Conclusion: We found that PwD on PD, uniformly receive suboptimal monitoring of their foot risk in comparison to the other standards. Although foot guidelines recommend that regular monitoring through a foot protection service should be considered all individuals receiving RRT – in practice, those on PD seem to easily 'fall through the net'. Specific monitoring advice for specialist teams providing PD care is urgently needed and should be harmonized with NICE NG19 guidance to avoid confusion and duplication.

OP15 VIBRATING INSOLES: INVESTIGATING THEIR INFLUENCE ON DYNAMIC BALANCE AND GAIT QUALITY IN PEOPLE WITH DIABETIC PERIPHERAL NEUROPATHY

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Aim: Studies have shown that wearing vibrating insoles can improve standing balance by enhancing peripheral sensation in people with diabetic peripheral neuropathy (DPN). However, the capacity of this intervention to improve dynamic balance and gait in people with DPN remains unknown. Therefore, we investigated the effects of vibrating insoles on balance and gait during level and stair walking in people with DPN.

Methods: Participants (n=16; age: 69±9 years; Vibration Perception Threshold, 27±10 Volts) were recruited from Greater Manchester. Gait kinematics and balance during level walking and stair negotiation were assessed using a 3D motion capture system and force plates. Gait velocity, step length and the mediolateral extrapolated centre of mass (XCoM) were quantified for each participant with (Vibration, V) and without (Control, C) mechanical vibration applied through insoles. Repeated measures test conditions (V and C) were randomized, and participants were blinded to the condition.

Results/Discussion: Gait velocity increased significantly during level walking with vibration (V: 1.11±0.16m/s vs. C: 1.01±0.17m/s, p=0.009), while there was only a slight improvement in step length (V: 0.63±0.07m vs. C: 0.61±0.9m, p=0.059). Similarly, gait velocity increased during stair ascent (V: 0.46±0.04m/s vs. C: 0.40±0.06m/s, p=0.015) and descent (V: 0.44±0.05m/s vs. C: 0.38±0.06m/s, p=0.014). We detected no changes in XCoM during level walking or stair ascent. However, a decrease in XCoM was observed (V: 0.29±0.04 vs. C: 0.32±0.032, p=0.058) during stair descent, indicating improved dynamic balance.

Conclusion: Although this work is ongoing and these data should be considered preliminary, vibrating insole systems appear effective for improving gait quality and partially improving dynamic balance during specific tasks in people with DPN. We are conducting further work to investigate the effects of vibrating insoles on a wider spectrum of gait parameters and balance and to explore whether these changes translate to a lower frequency of falls.

OP16 CUMULATIVE PLANTAR TISSUE STRESS AND ITS ASSOCIATION WITH FOOT ULCER RECURRENCE IN PEOPLE WITH DIABETES

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Aim: We aimed to understand the biomechanical mechanisms of recurrence of plantar foot ulcers, which are common in people with diabetes. We focused on repetitive mechanical stress as causative factor for ulcer development, which consists of multiple components: plantar pressures during walking barefoot and shod and the amount of weight-bearing activity, such as with walking and standing. When these components are modelled together, the cumulative plantar tissue stress (CPTS) can be estimated. We investigated the association between CPTS with its underlying components and plantar foot ulcer recurrence in diabetes.

Method: We monitored 44 participants with diabetes and neuropathy (all IWGDF risk 3) for 12 months. At baseline, we objectively assessed barefoot and in-shoe plantar pressures during walking and standing (Emed-X and Pedar-X), type and extent of weight-bearing activities during 7 days (MoveMonitor), and footwear adherence (Orthotimer). Our CPTS model included barefoot and in-shoe pressure-time integrals (PTI) for walking and standing. We used Student's t-tests in univariate analyses to compare people with and without a recurrent plantar foot ulcer during follow-up.

Results / Discussion: During a median 9.5 months follow-up, 9 out of 44 participants (21%) developed a foot ulcer. CPTS was lower in people with than without an ulcer, although not statistically significant (Table 1). People who ulcerated had significantly higher barefoot and lower in-shoe peak pressure while walking. Standing duration was longer and variation in day-to-day number of steps higher, and average daily number of steps and adherence were lower in those who ulcerated, although none significantly.

Conclusion: Peak plantar pressures during barefoot and shod walking seem to be factors in plantar foot ulcer recurrence, but the interaction between CPTS components in ulcer development is complex and requires more investigation in larger populations. Also, other components not investigated may play a role, such as tissue properties and shear stress.

Table 1 – Cumulative plantar tissue stress and its underlying components in people with and without a recurrent plantar foot ulcer.

	People with recurrent plantar ulcer (N=9)	People without recurrent plantar ulcer (N=35)	p-value
Cumulative plantar tissue stress (MPa·s/day)[a]			
- **Barefoot + In-shoe**	858.5 (271.2)	1082.1 (687.6)	0.379
- **Barefoot**	356.1 (358.1)	568.5 (600.0)	0.346
- **In-shoe**	502.4 (301.2)	513.6 (366.6)	0.937
Weight-bearing activity (per day)			
- **Number of steps**	4917 (3007)	5924 (3921)	0.479
- **Day-to-day variation in steps**	2089 (2339)	1772 (1118)	0.560
- **Standing duration (h)**	2.1 (0.7)	1.8 (0.8)	0.385
Barefoot peak plantar pressure (kPa)			
- **Walking**	904.7 (249.9)	733.5 (206.7)	0.040*
- **Standing**	174.9 (110.2)	185.6 (111.0)	0.799
In-shoe peak plantar pressure (kPa)			
- **Walking**	199.8 (43.7)	255.9 (73.3)	0.034*
- **Standing**	93.6 (25.9)	95.3 (22.9)	0.853
Adherence (%)			
- **Walking**	68.1 (36.0)	73.1 (19.5)	0.715
- **Standing**	66.8 (36.7)	68.3 (19.2)	0.909

*a = Cumulative plantar tissue stress model: (in-shoe walking PTI * total strides adherent to wearing footwear) + (barefoot walking PTI * total strides non-adherent to wearing footwear) + (in-shoe standing PTI * total time spent standing adherent to wearing footwear) + (barefoot standing PTI * total time spent standing non-adherent to wearing footwear).*
** = significantly different (p<0.05).*

OP17 DIABETIC FOOT ULCER PREVENTION THROUGH FOOTWEAR SENSING TECHNOLOGY: A LITERATURE REVIEW

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Aim: Over 30% of people with Diabetes Mellitus (DM) will develop Diabetic Peripheral Neuropathy (DPN), an incidence increasing with age and a central risk factor for the development of Diabetic Foot Ulcers (DFU). According to the Practical Guidelines of the International Working Group on the Diabetic Foot (IWGDF), patients with Loss of Protective Sensation (LOPS) must be encouraged to wear appropriate footwear at all times. This study provides a literature review for such footwear, enhanced with emerging smart sensing technologies.

Method: Online search was performed in: Google Scholar, SCOPUS, PubMed and IEEEXplore, using the terms of Table 1, resulting in a total of 42 papers, 13 of which are literature reviews.

Results / Discussion: Three categories of contributions were identified in literature: Insole Sensing and Interactive Technologies (A), Data Models & Interactive Patient/Doctor Apps for eHealth/Foot (B) and Guidelines, Practices, Clinical Trials (C), corresponding to 14, 11 and 17 papers respectively, as shown in Figure 1. Moreover, types of sensors identified include: resistive, capacitive, inductive, piezoelectric, fibre-optic and wireless sensors, and the types of analysis for DFU prevention include: barefoot analysis (whole-foot and location-specific) and in-shoe pressure analysis.

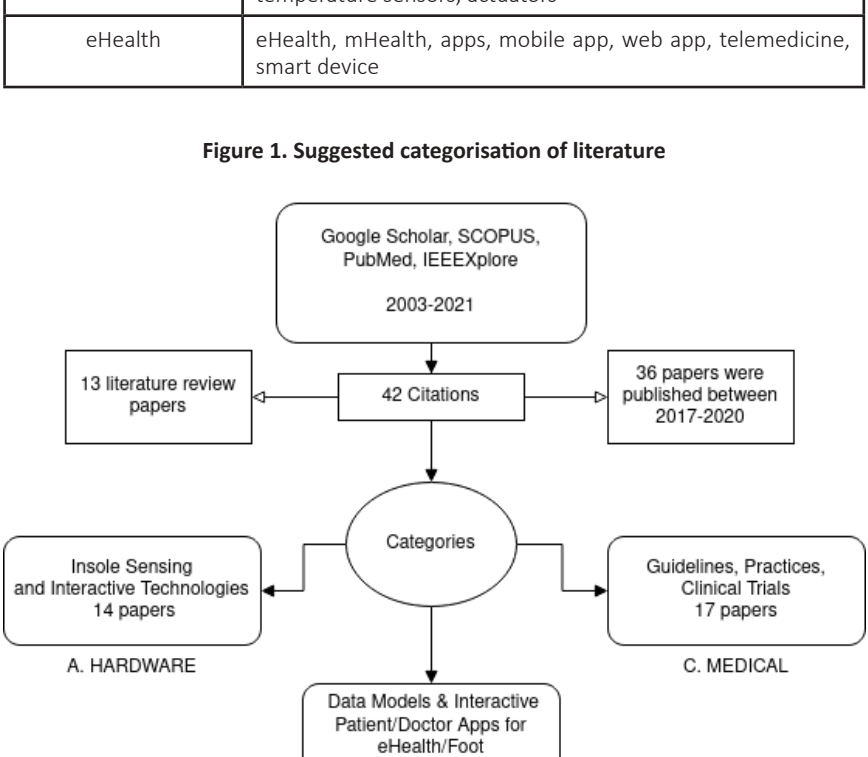
Conclusion: This thematic literature review identified several emerging technologies in footwear sensing technologies for diabetic ulcer foot prevention, including sensors, apps, types of analysis and pertaining clinical studies. Meanwhile, interactive apps and actuators for dynamic off-loading, are yet limited.

Table 1. Search terms for the review according to field of study

Field	Search Terms
Medical	diabetes mellitus, diabetes, diabetic, diabetic neuropathy, diabetic ulcers, diabetic foot, niddm, iddm, t2dm, t1dm, prediabetes, prediabetic, pre-diabetes, pre-diabetic, impaired glucose

Measurements	pressure, foot pressure, foot pressure distribution, plantar pressure, shear plantar pressure, temperature, foot temperature
Sensors	IoT, sensors, pressure sensors, plantar pressure sensors, thermometer, infrared thermometer, humidity sensors, temperature sensors, actuators
eHealth	eHealth, mHealth, apps, mobile app, web app, telemedicine, smart device

Figure 1. Suggested categorisation of literature



Acknowledgement

This research has been co-financed by the European Regional Development Fund of the European Union and Greek national funds through the Operational Program Competitiveness, Entrepreneurship and Innovation, under the call RESEARCH – CREATE – INNOVATE (project code: T2EDK-01103)

OP18 FLEXOR TENDON TENOTOMY TREATMENT OF THE DIABETIC FOOT: A MULTICENTER RANDOMIZED CONTROLLED TRIAL

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Aim: The aim of this study was to evaluate effects of needle flexor tendon tenotomy treatment of the diabetic hammertoe deformity.

Method: A multicenter randomized controlled trial of individuals with diabetes and ulcers or impending ulcers associated with hammertoes, performed between 1st of November 2019 and 31st of March 2021. Participants were stratified on the presence of ulcer, into individuals with ulcers and individuals with impending ulcers. Participants were randomized to tenotomy and standard non-surgical treatment ***or*** standard non-surgical treatment alone. Primary outcomes were time to ulcer healing and progression from impending ulcer to active ulcer.

Results / Discussion: Of 224 screened individuals with diabetes, 95 (59.0% male) were included. The mean follow-up was 291 (±70) days, 28 (29.5%) had type 1 diabetes, mean diabetes duration was 20 (13-26) years, and mean age was 67.7 (±9.8) years. Of the included participants 16 had ulcers, of whom eight were randomized to intervention. Of the remaining 79 individuals with impending ulcers, 39 were randomized to intervention.

For participants with ulcers, healing rates favored tenotomy (100% vs 37.5%, p=0.026) as did time to ulcer healing (p=0.04). For individuals with impending ulcers, incidence of progression to an active ulcer was lower (1 vs 7, p=0.028) and number of ulcer-free days were higher (p=0.043) in the tenotomy group. No serious adverse events were recorded.

Conclusion: This randomized study showed that the simple procedure of needle flexor tendon tenotomies was effective and safe when treating and preventing ulcers associated with the diabetic hammertoe deformity.

OP19 HOW DO WE OBJECTIVELY ASSESS DIABETES FOOT SURGERY: A SYSTEMATIC REVIEW & DOMAIN DRIVEN ANALYSIS TO IDENTIFY CRITICAL DIABETES FOOT SPECIFIC OUTCOMES

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Aim: Diabetes-foot-disease (DFD) leads to a significant negative impact on the patients' quality of life. Patient reported outcome measures (PROMS) are utilized to objectively evaluate functional and surgical outcomes, using both generic and condition specific tools. The purpose of this study was to identify foot and ankle PROMS tools in diabetic foot disease and evaluate the relevance of their domains to patients with DFD.

Methods: A systematic review of MEDLINE (PubMed), EMBASE based on the PRISMA guidelines was undertaken. Search terms included "foot & ankle outcomes", "diabetes", "PROMS", "objective assessment tools", alone and or in combination. The principal domains identified were assessed by DFD patients requiring surgery using specific questions and answered on a 5-point Likert scale.

Results: 3024-papers were identified, 53-met our inclusion criteria, 24-PROM's scoring tools were identified, but only 4 were tested and designed with diabetes patients in mind. The most described scoring tools were the SF-36 (n=25), AOFAS (n=16), FAOS (n=14), most commonly assessing pain (n=16), function (n=11), mobility (n=8) social interaction (n=5) domains. Cconstruct validity was evaluated in 1-study assessing the FAAM and SF-36 in DFD patients, whilst the AOFAS-DQ was the only tool tested for its reliability in DFD patients. The FAAM responsiveness and sensitivity was found to be significantly lower in Charcot Neuropathic (CN) patients. Two distinct pathological DFD populations (chronic diabetic feet leading to ulceration (Grp1) vs. Charcot neuroarthropathy (Grp2) were tested using a formulated domain specific questionnaire: Grp1 rated limb loss as their greatest fear, the following outcomes of priority were mobility, social interaction, and admission to hospital. For Grp2 mobility and social domains were equally major priorities.

Conclusions: Current foot and ankle PROM's are rarely designed for DFD. Critical analysis suggests weighting amputation, tissue loss and shifting the emphasis away from common domains such as pain would better capture patient experience.

OP20 META-ANALYSIS OF RANDOMISED CONTROLLED TRIALS TESTING THE EFFECT OF AT-HOME FOOT TEMPERATURE MONITORING AND REDUCTION OF AMBULATORY ACTIVITY IN RESPONSE TO HOTSPOTS ON THE INCIDENCE OF DIABETES-RELATED FOOT ULCERS

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Aim: The aim of this study was to perform a systematic review and meta-analysis of randomised controlled trials testing the efficacy of at-home foot temperature monitoring and reduction of ambulatory activity in response to hotspots on reducing the risk of a diabetes-related foot ulcer.

Method: We performed a systematic review according to PRISMA guidelines. The Medline, PubMed, Web of Science and The Cochrane Library databases were searched from inception to 14th July 2021. Risk-of-bias was assessed using the Cochrane risk-of-bias ***tool***. Meta-analyses were performed using random effects models. Leave-one-out sensitivity analyses and a sub-analysis excluding trials considered at high risk-of-bias assessed the consistency of findings. The certainty of the evidence was assessed with GRADE.

Results / Discussion: Five randomised controlled trials involving 772 participants meeting the IWGDF risk category 2 or 3 were included. All trials reported instructing participants to measure skin temperature at-home at six or more sites on each foot using a hand-held infra-red thermometer at least daily and reduce ambulatory activity in response to hotspots (temperature differences >2.2°C on two consecutive days between similar locations in both feet). One, one and three trials were considered at low, moderate and high risk-of-bias respectively. Participants allocated to at-home foot temperature monitoring had a reduced risk of developing a DFU (relative risk 0.51, 95% CI 0.31 to 0.84) compared to controls. Sensitivity and sub-analyses suggested that the significance of this finding was consistent. The GRADE assessment suggested a low degree of certainty in the finding.

Conclusion: This meta-analysis provides promising but low certainty evidence that daily at-home foot temperature monitoring and reduction of activity in response to hotspots is effective at reducing the risk of a diabetes-related foot ulcer in at-risk people. Effective, user-friendly and affordable intervention systems are needed for foot temperature monitoring and the necessary thresholds of action in response to identifying hotspots, for widespread adoption of this preventative intervention.

OP21 TISSUE AVAILABILITY OF INTRAVENOUSLY ADMINISTERED ANTIBIOTICS IN PATIENTS WITH INFECTED DIABETIC FOOT ULCERS IN THE CONTEXT OF PAD AND MICROCIRCULATION STATUS – PILOT DATA (DFIATIM STUDY)

Vladimira Fejfarova[1], Radka Jarosikova[2], Jitka Husakova[2], Veronika Woskova[2], Martina Fialová[3], Lenka Krupičková[3], Jakub Mrázek[4], Ivana Nováková[5], Petr Tůma[6], Jan Polak[7], Alexandra Jirkovská[2], Michal Dubský[2], Robert Bem[2], Věra Lánská[2]

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Aim: To assess ATB availability in patients with infected DF ulcers (iDFU) in the context of micro- and macro-circulation status.

Method: Fifteen patients (mean age 61.4±6 years; HbA1c 64.8±17.6 mmol/mol, BMI 29.8±4.5kg.m-2) with iDFU of WIfI (2-3)-(0-3)-(2-3) indicated for intravenous ATB therapy were enrolled in the study. Patients were treated with boluses of amoxicillin-clavulanic acid (AMC;8 patients) or ceftazidime (CTZ;7 patients) according to the microbial sensitivity of the causative agent. The total duration of ATB therapy was 6-7 days. After induction of a steady ATB state, microdialysis was performed with the insertion of a microdialysis cannula into the peripheral soft tissue near iDFU followed by the application of a sixth ATB bolus intravenously. Tissue fluid samples were taken from the foot within the next 6 hours. Simultaneously, blood samples were taken from peripheral blood for detection of ATB serum levels. ATB serum and tissue concentrations were determined by electrophoresis. The presence of PAD was assessed by triplex ultrasound and the ankle-brachial index (ABI; mean ABI 0.89±0.4) and toe-brachial index (TBI; mean TBI 0.68±0.28) tests; microcirculation status was evaluated by transcutaneous oxygen pressure (TcPO2; mean TcPO2 48±11.2 mm Hg).

Results / Discussion: Serum AMC levels after bolus administration reached a maximum of 79.6±45.2 ug/mL, with CTZ reaching 165.5±82.5 ug/mL. AMC concentrations in peripheral tissue reached approximately 11-33% of serum levels (from 1.1±1.1 to 7.7±5.5 ug/mL; p=0.0002 - 0.027) and 15-20% for CTZ (from 3.7±1.9 to 13.7±2.8 ug/mL; p=0.001-0.007). Serum ATB levels did not correlate with weight, BMI or parameters of macro-/micro-circulation. Tissue ATB concentrations significantly positively correlated with TcPO2 (r=0.52-0.56; p=0.032-0.048),but did not correlate with other patient characteristics.

Conclusion: Our preliminary results showed that tissue ATB concentrations in patients with iDFU were relatively satisfactory, reaching up to 33% of serum AMC and 20% of serum CTZ concentrations. These findings seem to correlate with microcirculation parameters.

NU20-01-00078

OP22 THE MAJOR AMPUTATION RISK STRATIFICATION USING DIABETIC FOOT ULCER CLASSIFICATIONS IN PATIENTS WITH CRITICAL LIMB-THREATENING ISCHEMIA AFTER AUTOLOGOUS STEM CELL THERAPY

Jitka Husakova[1 2], Robert Bem[1], Alexandra Jirkovská[1], Veronika Woskova[1], Radka Jarosikova[1 3], Vladimíra Fejfarová[1 3], Michal Dubský[1 2]

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Aim: Autologous cell therapy (ACT) represents the last therapeutic option for patients with diabetic foot ulcers (DFU) and no-option chronic limb-threatening ischemia (NO-CLTI). The ACT aims to reduce the risk of major amputation (AMP) in these patients. Despite the effort to safe limb, presence of other comorbidities and presence of NO-CLTI, some patients undergo AMP early after ACT. The aim of our study was to assess the risk of high AMP in these patients using the classification systems.

Method: One-hundred thirteen patients were retrospectively divided in two groups, the AMP group (n=37) who progressed to AMP during the 2-year period after ACT and a group of patients without AMP (non-AMP; n=76). The ulcers were assessed before ACT by Wagner, WIfI, PEDIS, and SINBAD classification systems.

Results / Discussion: Patients in both groups were without a significant difference in baseline demographic parameters. In AMP group, the AMP was performed 11±18 months after ACT, 49% of the AMP were performed for progression of infection. Wagner grade 3 and 4 was significantly different higher in AMP in comparison with non-AMP groups ($p=0.004$). Also, the finding of Wagner grade 4 was significantly higher in AMP before ACT compared to the non-AMP group (both $p=0.004$). The presence of infection evaluated by the PEDIS was significantly more present in AMP ($p<0.005$). Presence of ischemia assessed by WIfI was the same in AMP before ACT as in the non-AMP group. The ulcer infection evaluated with WIfI before ACT was similar. The worsening of infection was the most common reason for AMP after ACT. In the SINBAD was observed surprisingly higher score at baseline ($p=0.2$).

Conclusion: The retrospective study showed that patients with AMP after ACT had severe DFU at baseline. To assess the risk of AMP after ACT, the Wagner and PEDIS classification would be significantly better. ACT is an effective therapeutic method of NO-CLTI especially in patients with lower infection grades and therefore should be referred for ACT earlier.

OP23 ULTRASOUND-ASSISTED WOUND (UAW) DEBRIDEMENT IN THE TREATMENT OF DIABETIC FOOT ULCER: A SYSTEMATIC REVIEW AND META-ANALYSIS

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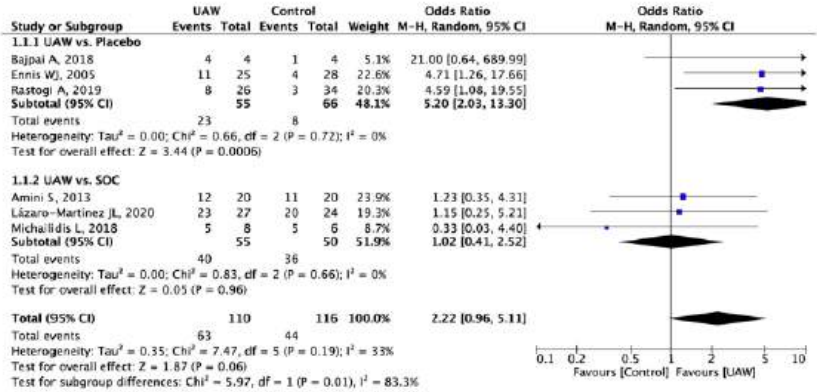
Aim: to assess the effect of ultrasound-assisted wound (UAW) debridement on cure rates, time to healing, and wound area reduction in patients with Diabetic Foot Ulcers (DFUs).

Method: a systematic review and meta-analyses have been performed following the general guidelines and recommendations of preferred reporting items for systematic reviews and meta-analyses (PRISMA). The PubMed and Web of Science databases were systematically searched in October 2021. The keywords used for the search were: (((ultrasound) OR (ultrasonic)) AND (debridement)) AND (diabetic foot ulcer). All selected studies were evaluated using the Cochrane risk of bias tool to assess the risk of bias for randomized controlled trials. RevMan v5.4. was used to analyze the data with the Mantel–Haenszel method for dichotomous outcomes. The articles included in the systematic review were divided into two groups, one comparing UAW debridement versus placebo and the other UAW debridement versus standard of care (SOC).

Results / Discussion: A total of 8 RCT met our inclusion criteria, with 263 participants. Figure depicts Forest plot of UAW debridement versus control (placebo and SOC) for complete healing rate.



Concerning the healing rate comparing UAW versus the control group, a meta-analysis estimated the pooled OR at 2.22 (95% CI 0.96-5.11, p = 0.06), favoring UAW debridement, with low heterogeneity (x2 = 7.47, df = 5, p = 0.19, I2 = 33%). Time to healing was similar in both groups: UAW group (14.25 ± 10.10 weeks) versus the control group (13.38 ± 1.99 weeks, p = 0.87). Wound area reduction was greater in the UAW debridement group (74.58% ± 19.21%) than in the control group (56.86% ± 25.09%), although no significant

differences were observed between them (p = 0.24).

Conclusion: UAW debridement showed higher healing rates, a greater percentage of wound area reduction, and similar healing times when compared with placebo (sham device) and standard of care in patients with DFUs, although no statistically significant differences were observed between groups.

OP24 DOES THE ADDITION OF ANTISEPTIC IRRIGATION WITH INSTALLATION IMPROVE OUTCOMES OF THE DIABETIC FOOT COMPARED TO TRADITIONAL NEGATIVE PRESSURE WOUND THERAPY? A SYSTEMATIC REVIEW AND META-ANALYSIS

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Aim: This systematic review and Meta-analysis aims to investigate the difference between traditional negative pressure wound therapy (NPWT) and negative pressure wound therapy with irrigation (NPWT-I) on clinical outcomes.

Method: A search of current literature was performed in March 2022 across PubMed, Scopus, Embase, and Medline for relevant literature limited to prospective randomized clinical trials of the diabetic foot with keywords “negative pressure wound therapy” AND “Instillation” OR “Irrigation.” The following inclusion and exclusion criteria were used for article selection. All citations must have been written in English, be of full-length, published between January 2012 and March 2022, and have a prospective, randomized trial design. All study cohorts must consist of adults (>18 years), be based in North America, and have outcomes specific to total surgeries, wound closure, length of stay, and adverse events.

Results / Discussion: A total of 521 (NPWT n=279 and NPWT-I n=249) patients across four studies were incorporated into the meta-analysis. No difference was observed between the two groups for number of total surgeries (SMD=0.115 [CI: -0.064-0.294] p=.21), wound closure (OR=1.1 [CI: 0.76-1.60] p=.60), length of stay (SMD=0.69 [CI: -0.105-0.242] p=0.44) and adverse events (OR=1.09 [CI0.714-1.670] p=0.69.

Table 1: Total Surgeries During Admission

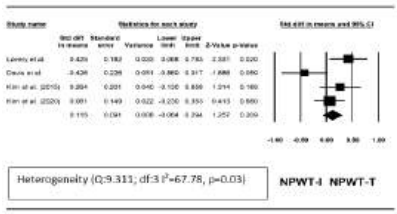


Table 2: Wound Closure

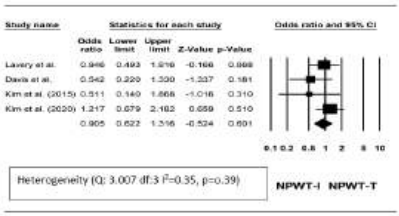


Table 3: Length of Admission

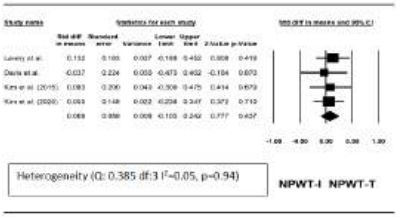
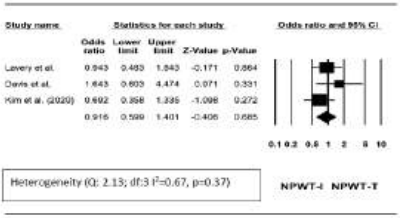


Table 4: Adverse Events



Conclusion: This study suggests NPWT-I fails to show a difference in the total surgeries, wound closure, length of stay, or adverse events compared with traditional NPWT.

OP25 MICROCIRCULATION IMPROVEMENT IN DIABETIC FOOT PATIENTS AFTER THE TREATMENT WITH SUCROSE OCTASULFATE IMPREGNATED DRESSINGS

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Aim: Sucrose octasulfate impregnated dressing (TLC-NOSF) showed an increase in local Transcutaneous Oxygen Pressure ($TcPO_2$) in patients with neuroischaemic Diabetic Foot Ulcers (DFU). The aim of this study was to demonstrate the patient´s microcirculation improvement after the treatment with a sucrose octasulfate impregnated dressing.

Methods: Fifty patients with neuroischaemic DFU treated with TLC-NOSF dressing were included in a prospective study between July 2019 and February 2022. $TcPO_2$ values were measured using TCM400 device (Radiometer, Copenhagen) on the dorsalis pedis or tibial posterior arteries angiosome according with ulcer location (forefoot or rearfoot, respectively). $TcPO_2$ values were assessed at day 0 and every four weeks during 20 weeks of follow-up or until wound healing. $TcPO_2$ values were analyzed in the total sample and in patients according microcirculation impairment and ulcer location.

Results: $TcPO_2$ values showed, all patients together, an increase between day 0 and the end of study, 33.04 ± 12.27mmHg and 40.89 ± 13.06mmHg respectively ($p < 0.001$), after TLC-NOSF dressing application. At baseline, the 20 patients (40%) with impaired microcirculation showed an increase of $TcPO_2$ values from day 0, 20.20 ± 5.38mmHg to the end of the study 31.28 ± 13.74mmHg, ($p=0.02$). Additionally, 13 patients (65%) of those patients achieved at the end of the study, a normal microcirculation values ($p < 0.001$).

Indeed, 30 (60%) patients with normal microcirculation, also shown an increase from 41.60 ± 6.80 mmHg at inclusion to 46.73 ± 8.53 mmHg at end of study ($p=0.007$).

Furthermore, a significant increasing in $TcPO_2$ values at forefoot DFU between day 0 32.85 ± 12.76mmHg and wound closure 41.34 ± 12.02 mmHg ($p =0.001$) was found. Likewise, rearfoot DFU were observed a microcirculation improvement between day 0 33.80 mmHg ± 10.66 mmHg and wound closure 39.25 ± 17.21 ($p=0.203$), although without statistical significance. Increasing of $TcPO_2$ values at wound closure were similar in both locations ($p=0.694$).

Conclusion: Local treatment with TLC-NOSF dressing improved microcirculation in patients with DFU regardless vascular status at baseline and in forefoot location.

OP26 COST-EFFECTIVENESS OF TLC-NOSF DRESSINGS IN THE MANAGEMENT OF DFUS, CONSIDERING DIFFERENT HEALTH CARE SYSTEMS WORLDWIDE: AN OVERVIEW ANALYSIS

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Aims: Diabetic foot ulcers (DFUs) are challenging wounds associated with delayed healing, high risk of infection and lower-limb amputation.

TLC-NOSF dressings have proven their significant efficacy from a randomized, double-blind clinical trial, EXPLORER, when compared with neutral dressings in France, Spain, Italy, Germany, and UK. The aim is to report the economic impact of using TLC-NOSF dressing in Europe, Asia and North America.

Methods: In Europe, the studies introduced a Markov-model cost-effectiveness design, involving seven health status. From the study endpoint of 20 weeks, extrapolation to a base-case time horizon of one year was adopted in the UK and French models and 100 weeks in German.

Deterministic and probabilistic sensitivity analyses were conducted to assess the robustness of the model parameters. In China and Canada, 2 independent studies involving a Markov model were conducted respectively on 10 000 and 1000 patients with DFU.

Results: In the UK the NICE Guidance supported the use of TLC-NOSF in the DFU treatment and reported an average annual cost-saving of £342 per patient; this treatment was also highly cost-effective in Germany (€3,767 cost savings) and in France. The main cost driver was the time to heal. Furthermore, the earlier the use of TLC-NOSF dressing, the higher the efficacy and cost savings and a better quality of life. In China, after 20 years of modelling, survival rate of non-NOSF dressing group was 24.59%, while TLC-NOSF dressing group was 27.42%. In Canada, compared to conventional dressings, adding TLC-NOSF dressings resulted in an expected increase of 0.16 quality-adjusted life years (QALYs) and an expected $5,878 decrease in health care costs over 5 years.

Conclusions: TLC-NOSF dressing compared to neutral dressings is the dominant treatment strategy in the management of DFUs, resulting in significant annual cost savings in European, Asian and North American Healthcare systems.

Poster Abstracts

PP02 WOUND BLUSH AS AN INDICATOR FOR LIMB SALVAGE AMONG PEOPLE WITH TYPE 2 DIABETES WITH PERIPHERAL ARTERIAL DISEASE: AN OBSERVATIONAL STUDY FROM SOUTH INDIA

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Aim: Treatment of ischemic wounds improve the outcomes and prevent or minimize lower limb amputations. We aimed to assess the role of wound blush (contrast opacification of vessels around wound in digital subtraction angiogram (DSA) immediately after revascularization) as an angiographic endpoint in revascularization procedure among people with type 2 diabetes (T2DM).

Method: T2DM individuals with active foot ulcers, who had monophasic flow in colour doppler were referred for DSA between October 2020 and December 2021 were followed up for a minimum of 3 months in a tertiary centre for diabetes in Chennai, South India. Status of DSA, angioplasty (if undergone), basic demographic, clinical details, wound grade and outcomes were recorded.

Results / Discussion: A total of 130 participants had undergone angiography during the study period and outcome data was available for 86 participants. Mean age and duration of diabetes were 63.8 ± 8.6 and 16.1 ± 8.8 years (Table 1). Among 86 participants, 34 (38.2%) had wound blush positive (WBP) on angiography, in which 20 (58.8%) (Healed-11, Ray amputation-2, and Toe amputation-7) limbs were saved and 6 (17.6%) (Below knee (BK)-5, Above knee (AK)-1) limbs lost (Figure 1). The remaining 8 individuals had undergone angioplasty, in spite of wound blush in the DSA along with the wound blush negative group (WBN) (n=35). Among participants with WBN, 17 refused to undergo angioplasty (BK-9(53%), AK-2(11.7%), Toe amputation-5(29.5%) and non-healing ulcer-1(5.8%)). Wound blush was demonstrated in all participants who had undergone angioplasty (n=43) (Figure 2). Post-angioplasty, lower-limb amputation was prevented in 83.7% (n=36) (Limbs lost-n=7 (BK). The overall limb salvage rate was 72.1%.

Conclusion: Wound blush was significantly associated with better limb salvage and can be considered as an angiographic endpoint.

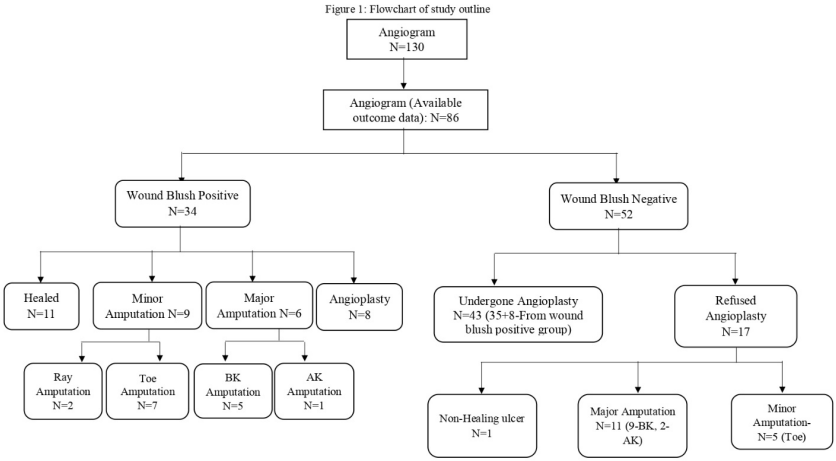

Figure 2: Outcomes of study participants who had undergone Angioplasty

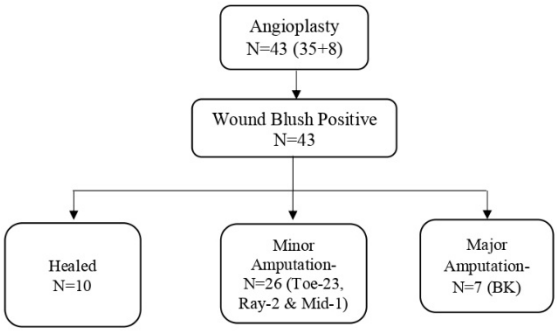

Table 1: Basic demographic and clinical profile of the study participants

	Study participants N (%) (n=86)
Male	70 (86.4)
Age*	63.8 ± 8.6
Duration of Diabetes*	16.1 ± 8.8
HbA1c*	9.7 ± 2.1
Hypertension	59 (68.6)
Dyslipidemia	17 (19.6)
CVD	33 (38.4)
CKD	38 (44.2)

*-Mean ± Standard deviation

PP03 ANEMIA AT ADMISSION IS NOT ASSOCIATED WITH A WORSE PROGNOSIS IN DIABETIC FOOT INPATIENTS

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[1]Pisa University Hospital, Diabetic Foot Section, Pisa, Italy

Aim: Anemia is a marker of severity in patients with diabetes mellitus, associated with a higher mortality. Aim of this study was to test if this was true also for diabetic foot (DF) inpatients.

Method: we retrospectively searched all consecutive patients admitted for DF in our Department between July and December 2021 (Group A) and compared them with all patients consecutively admitted in the same period in Diabetology Department for diabetes-related diagnosis different from DF (Group B). We compared groups for demographic and clinical characteristics focusing on blood crasis: mean (HB) or maximum (HHB) haemoglobin concentration, Mean Corpuscular volume (MCV), Mean Corpuscular hemoglobin content (MCH), Mean Corpuscular hemoglobin content (MCHC) and Red blood cell count (RBC) and Hematocrit (HCT) were extracted from patients charts at admission. Length of admission and in-hospital mortality were compared between groups.

Results / Discussion: We studied 211 patients: 106 in Group A and 105 in Group B. No differences in age while patients of Group A had a longer duration of disease (19.4±11.3 yrs vs 7.96±10.4 yrs, $p<0.05$). We observed a higher level of actual or former smoker in Group A (62.3% vs 32.1%, $p<0.02$). Anemia was more prevalent in Group A (72.6%) than B (52.3%): $p<0.01$. HB (10.34±2.0 g/dl vs 11.1±2.2 g/dl, $p<0.05$) was significantly lower in Group A with no difference in HHB (12.5±2.1 g/dl vs 12.4±1.9 g/dl, p=ns). MCV, MCH and MCHC were within normal ranges and superimposable in the groups. HCT was significantly lower in Group A (32.3±5.7% vs 36.5±7.3%, $p<0.05$) as well as RBC ($3.7±0.7x10^6$/microl vs $4.2±0.810^6$/microl, $p<0.05$). Group B showed a longer duration of admission (13.8±9.6 days vs 7.6±4.9 days, $p<0.001$) and higher mortality rate during admission (8.58% vs 0.94%, $p<0.01$).

Conclusion: Despite its high prevalence anemia is not associated with a worse short-term prognosis in DF inpatients.

PP04 AMBULATORY NEGATIVE PRESSURE WOUND THERAPY IN PATIENTS WITH DIABETIC FOOT

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Aim: Previous studies showed that negative pressure wound therapy (NPWT) is an effective method for the treatment of patients with diabetic foot. The aim of our study was to assess the effect of ambulatory NPWT on diabetic foot healing and identify factors contributing to failure of this method.

Method: 148 patients with diabetic foot hospitalized in our Diabetes Department were treated by NPWT. 60 patients continued with NPWT on ambulatory basis and were enrolled in the present study. The median length of NPWT was 23 days (7-98). The success of NPWT was defined as a complete wound healing during 6 months follow-up; the unsuccess as a premature termination of NPWT (worsening of the wound/no effect), non- healing, major amputation or intolerance of the treatment by patient during 6 month follow-up. In all patients, factors which could influence wound healing were evaluated: age, type of diabetes, duration of diabetes, diabetes control (HbA1C), presence of infection, ischemia, Charcot foot, renal failure and other comorbidities, but also local factors (wound localization, size, exposed bone etc.). Uni- and multivariate analyses were used to identification of factors contributing to failure of ambulatory NPWT.

Results / Discussion: During follow-up period, 47/60 (78.3%) patients were completely healed after ambulatory NPWT, in 13/60 (21.7%) patients was not NPWT successful. In univariate analysis, the unsuccess of NPWT was influenced especially by poor diabetes control (HbA1C in unsuccess vs. success; 77.2±19 vs. 62.5±18.6 mmol/mol; p=0.01). Potential factors of NPWT failure should be also exposed bone in the wound (76.9% of patients with unsuccess vs. 46.8% with success; p=0.1) and haemodialysis (23.1% vs. 4.2%; p=0.1 resp.). There were no significant differences in other factors assessed in univariate analysis. Logistic regression showed that HbA1C (OR 1.05; 95% CI 1.01-1.09; p=0.01), haemodialysis (18; 1.6-208.3; p=0.02) and exposed bone (7.8; 1.3-48.1; p=0.03) were significant factors for failure of ambulatory NPWT, other followed factors were not significant.

Conclusion: Ambulatory NPWT was effective in majority of patients, but poor diabetes control, haemodialysis or exposed bone in the wound may contribute to the failure of this method.

PP05 NOVEL TOPICAL ESMOLOL HYDROCHLORIDE FOR DIABETIC FOOT ULCER: RANDOMIZED, DOUBLE-BLIND, PLACEBO-CONTROLLED, MULTICENTRE PHASE 1/2 STUDY

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Background: Pre-clinical study with esmolol suggest its role in wound healing . We evaluated the safety and efficacy of novel topical formulation of esmolol for diabetic foot ulcer (DFU).

Methods: This is phase 1/2, multicentre, randomized, double-blind, vehicle-controlled study. Based on preclinical results, 14% and 20% gel preparation of esmolol (Galnobax) was used for dose-finding in patients with neuropathic UTS 1B or 2 DFU of size 1.5 cm^2-10 cm^2 of at least 4 weeks duration. Included participants were randomized to receive Galnobax 14% BID (group 1), Galnobax 20% BID (group 2), Galnobax 20% SID + Vehicle SID (group 3) and Vehicle gel BID (group 4). Typically, 0.4 centimetres of gel was applied for every cm^2 of ulcer area. All groups received a uniform standard of care. Pharmacokinetic (PK) sub-study was performed on 16 subjects. Participants underwent screening phase (1-week), treatment phase (12-week) and follow-up phase (12-week). The primary efficacy endpoint was the reduction in ulcer area and volume from baseline to week 12.

Results: Forty-four of 59 screened participants were included for analysis. The percentage ulcer area reduction with Galnobax 20% and 14% groups were 95.80% and 86.56%, respectively, compared to 80.67% and 82.58% in the group 3 and 4, respectively. Maximum percentage ulcer volume reduction was seen in the Galnobax 14% group (99.40%); comparable between the Vehicle and Galnobax 20% groups (84.57% versus 83.36%); and lowest in the Galnobax 20% + Vehicle group (55.41%). The median time to ulcer closure was 35 days with Galnobax 14% gel compared to 64 days in Vehicle gel. Overall, 29 adverse events (AEs) were observed in 19 subjects in the study, and only two were treatment-related. The C_{max} for esmolol acid was 340 ng/mL (14% Galnobax) and AUC for single dose was 2.99±4.31 hr*ug/mL highlighting that systemic concentrations is significantly lowered.

Conclusions: Topical esmolol (14%) is safe and efficacious novel treatment modality for chronic non-healing DFU.

PP06 PREDICTIVE VALUES OF FOREFOOT PLANTAR PRESSURE ASSESSMENT TO IDENTIFY A REULCERATION EVENT IN PATIENTS AT HIGH RISK

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Aim: The aim of this study was to analyze a cut-off point for diabetic foot reulceration beneath the metatarsal heads in patients with previous forefoot amputation.

Method: A 1 year-prospective study was conducted between May 2018 to February 2022. A total of 105 patients who were at high risk for foot ulceration and without ulcer at inclusion were included. Peak plantar pressure (PPP) and pressure/time Integral (PTI) in the entire foot, the forefoot region and on each metatarsal head (MTH) separately were registered. For selecting the optimal diagnostic cut-off points on the scale of pressure measurement, ROC curves were used. Patients were follow-up monthly based on the IWGDF recommendations during 1 year after the inclusion or until the development of an ulcer event.

Results / Discussion: A total of 52 (49,5%) patients developed a reulceration. Baseline PPP at the forefoot (74.59 ± 35.91 vs. 61.63 ± 28.42 9 N/cm^2) and in the entire foot (104.94 ± 38.63 vs. 94.43 ± 30.70 N/cm^2) were significantly higher in patients who suffered a reulceration, $p < 0.001$, respectively. Using ROC analyses for PPP in the full-foot and in the forefoot, area did not predict reulceration beneath the metatarsal heads (AUC: 0.561, p=.284 95% CI [0.45-0.67] and 0.592, p=.103 95% CI [0.48 – 0.7] respectively. Analyzing separately each metatarsal head we found and optimal cut-off point for PPP as shown in figure 1. Optimal cut-off points were 20.58 N/cm^2 (sensitivity of 95.2% and specificity of 71.4%) for 1st MHT, 18.62 N/cm^2 (sensitivity of 90% and specificity of 62.8%) for 2nd MHT, 18.85 N/cm^2 (sensitivity of 90% and specificity of 63.2%) for 3rd MHT, 17.88 N/cm^2 (sensitivity of 87.5% and specificity of 82.5%) for 4th MHT and 12.2 N/cm^2 (sensitivity of 100% and specificity of 83.2%) for 5th MHT. PTI showed the same trend as PPP.

Conclusion: Barefoot pressures beneath the metatarsal heads should be analyzed separately to predict the specific region at risk of reulceration. General foot and forefoot PPP did not predict reulceration. Clinicians must evaluate PPP beneath each metatarsal head due to the optimal prediction model found.

PP07 CLINICAL EFFICACY OF A 3D FOOT SCANNER APP FOR THE FITTING OF THERAPEUTIC FOOTWEAR IN PERSONS WITH DIABETES IN REMISSION: A RANDOMIZED AND CONTROLLED CLINICAL TRIAL

Raúl Molines Barroso[1], Francisco Javier Álvaro Afonso[1], Yolanda García Álvarez[1], Esther Garcia Morales[1], Marta García-Madrid Martín de Almagro[1], José Luis Lázaro Martínez[1]

[1]*Complutense University of Madrid, Diabetic Foot Unit, Madrid, Spain*

Aims: Patients with diabetes at high risk of ulceration require a perfect fitting shoe to avoid high shear and pressure forces. Neuropathy skews sensory perceptions and can alter the proper selection of the therapeutic footwear (TF). The aims of study were to evaluate the ability of high-risk patients with diabetes in remission to select the proper TF and to validate a novel 3D foot scanner app for selecting the proper fitting TF.

Method: a RCT in 30 patients with a previous healed diabetic foot ulcer was carried out in a specialized diabetic foot unit, between December 2021 and March 2022. All patients were recommended to TF with extra depth volume and rocker sole. Control group could acquire the TF size and model according to aesthetic preferences; while experimental group had to acquire a specific size and model according to result of a novel mobile app 3D feet scan (smart-fitting by Podiapp - Podartis s.r.l Unipersonale—Crocceta del Montello (TV), Italy). Validation of proper TF fitting was performed by a specialized podiatrist after acquisition of shoes in both groups. TF was recommended to change when following ill fitting reason were found: excessive length or tight, or compromise with toes. The primary outcome measure was the requirement of TF change after prescription because ill fitting.

Results/Discussion: A total of 7 patients required TF change, one of them (6.7%) in the experimental group and 6 patients (40%) in the control group (p=0.031, 95% CI [0.011-1.04]). Reasons for ill fitting were as follow: 4 patients due to excessive length and 3 patients due to toe compromise. The relative risk reduction for the need to change the TF via the use of the foot scanner compared to the control group was 83% and number needed to treat was 20.

Conclusion: High-risk patients with diabetes trend to select TF with inadequate fitting in length or capacity and they should be guided hand to hand to acquire proper TF. A 3D foot scanner app is a reliable device to measure the feet shape and leads high-risk patients with diabetes in remission to select the optimal fitting.

PP08 DIFFERENT PATTERN OF FOOT STRUCTURAL CHANGES BETWEEN DIABETIC AND NON DIABETIC PATIENTS AS A CONSEQUENCE OF WEIGHT LOSS IN SEVERE OBESITY

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[1]Pisa University Hospital, Diabetic Foot Section, Pisa, Italy, [2]Pisa University Hospital, Bariatric Surgery Unit, Pisa, Italy, [3]Pisa University Hospital, Neuro-rehabilitation Unit, Pisa, Italy

Aim: To evaluate modifications in foot structure and shape in obese patients affected from type 2 diabetes mellitus (DM) after weight loss.

Method: we studied all patients admitted for bariatric surgery in our Hospital between January and March 2019 with body mass index (BMI) between 40 and 48 kg/m^2 before and after the planned weight loss dividing them into two groups according to presence (Group 1) or absence (Group 2) of DM. We compared between groups changes in: skin temperature (ST) at first (ST1) and fifth (ST5) metatarsal joint, ultrasound skin and subcutaneous (US) and fascia (F) thickness and anthropometric measures, in particular dorsal circumference (DC) and ankle circumference (AC).

Results / Discussion: We enrolled 46 patients: 19 in Group 1 (M/F 11/8; mean age 48.2±10.3 yrs) and 27 in Group 2 (M/F 10/17, mean age 46.8±10.0). Time requested to reach expected weight loss was longer in Group 2 (461.5±131.3 days vs 334.2±106.4, p=0.0011). Foot and leg volumes were significantly reduced in both groups, but reduction was greater in Group 2: ΔDC 1.9±1.6 cm vs 0.7±1.4 cm (p=0.02), ΔAC 2.8±1.9 cm vs 1.2±1.7 cm (p=0.01). Also the amount of reduction of ST was greater in Group 2: ΔST1 3.7±3.1°C vs 1.9±3.1°C (p<0.05) and ΔST5 4.8±3.6°C vs 1.8±3.8°C (p<0.02). On the contrary ultrasound US reduction was significantly greater in Group 1 both dorsally (0.16±0.14 cm vs 0.04±0.14 cm, p=0.009) and plantarly (0.10±0.18 cm vs 0.06±0.19 cm, p<0.05) as well as F (ΔF 0.05±0.01 cm vs 0.02±0.08 cm, p=0.02).

Conclusion: our data confirm structural changes induced by weight loss in severely obese patients, but point out different patterns in patients affected from DM compared to non diabetic ones: a more important involvement in tissue decrease in the former and a greater volume reduction in the latter, probably related to different patterns of oedema reabsorption.

PP09 THE JOINT-VENTURE OF DIABETES AND OBESITY ON HUMAN WALKING STRATEGY

Elisabetta Iacopi[1], Nicola Riitano[1], Rosario Bellini[2], Caterina Tramonti[3], Carlo Moretto[2], Carmelo Chisari[3], Alberto Piaggesi[1]

[1]Pisa University Hospital, Diabetic Foot Section, Pisa, Italy, [2]Pisa University Hospital, Bariatric Surgery Unit, Pisa, Italy, [3]Pisa University Hospital, Neuro-rehabilitation Unit, Pisa, Italy

Aim: Diabetes Mellitus (DM) and Obesity (OB) represent pathologies conditioning human motion strategy. Our study aimed to identify differences in biomechanical aspects of gait determined by DM and OB.

Methods: we recruited all patients admitted for bariatric surgery in our Hospital with body mass index (BMI) between 38 and 47 kg/m^2, stratified them according to presence (Group 1) or absence (Group 2) of DM and compared them with non obese diabetic patients (Group 3) and healthy volunteers (Group 4). Subjects performed, before bariatric surgery, 3-D Gait Analysis walking barefoot at self-selected speed. Spatio-temporal and kinematic data were compared.

Results: We consecutively enrolled 100 patients: 25 in Group 1 (M/F 14/11; mean age 49.7±9.1 yrs BMI 42.6 ± 2.7 kg/m^2), 25 in Group 2 (M/F 8/17; mean age 45.1±8.7 yrs, BMI 42.2 ± 2.3 kg/m^2), 25 in Group 3 (M/F 18/7; mean age 54.9±5.1 yrs BMI 23.4 ± 1.6 kg/m^2) and 25 in Group 4 (M/F 12/13; mean age 49.7±9.1 yrs, BMI 22.8 ± 2.0 kg/m^2). Group 1 compared to Group 4 showed increased in stance duration (0.85±0.20 vs 0.70±0.09 s, p=0.04), double support time (10.63±4.5% of gait cicle (GC) vs 7.21±3.0, p=0.02) and step width (0.19±0.04 vs 0.13±0.03 m, p<0.01) and reduction in step length (0.45±0.09 vs 0.55±0.17 m, p<0.001), stride length (0.93±0.17 vs 1.18±0.13 m, p<0.0001), cadence (88.62±15.42 vs 98.7±10.50 step/min, p=0.015) and walking velocity (0.68±0.19 vs 0.98±0.17 m, p<0.01). Group 1 compared to Group 3 showed increased stride time (1.40±0.3 vs 1.17±0.24 s, p=0.04). Step width in Group 1 was increased also compared to Group 3 (0.19±0.04 vs 0.13±0.04 m, p<0.01). Kinematics data in Group 1 compared to Group 4 showed a significant reduction in ankle plantarflexion during push-off (6.24±9.91° vs 12.16±5.22°, p<0.02), knee (46.54±16.05° vs 62.45±9.76°, p<0.001) and hip peak flexion during swing (35.48±9.64° vs 42.63±8.95°, p=0.001) and knee dynamic excursion during normal walking (0.96±6.86° vs 4.28±6.95°, p<0.001).

Conclusions: Our data point out that diabetic-obese subjects presents gait features typical of both conditions. The specific worsening of dynamic joint impairment provides evidence of a synergistic effect on human ambulatory function.

PP10 THE ACCURACY OF BIOMECHANICAL MODELS TO ESTIMATE CUMULATIVE PLANTAR TISSUE STRESS IN PEOPLE WITH DIABETES AT HIGH RISK OF FOOT ULCERATION

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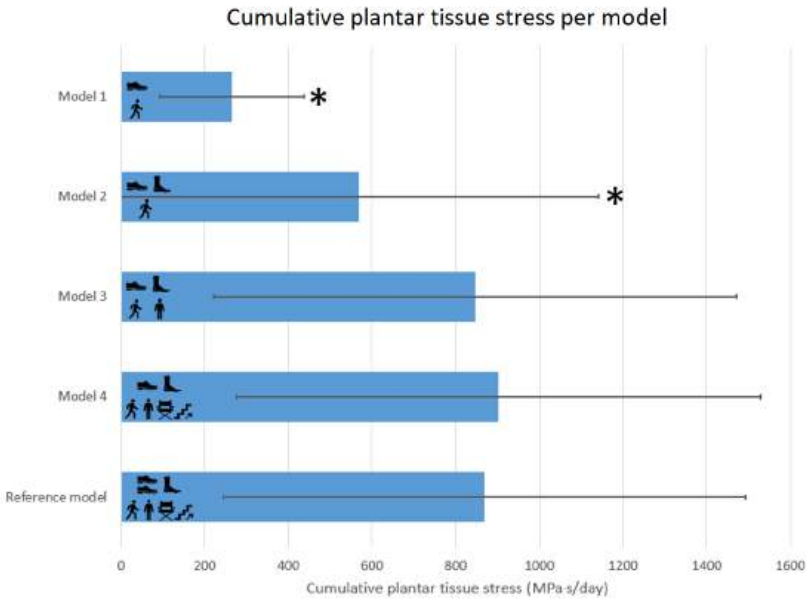
Aim: Cumulative plantar tissue stress (CPTS) on the foot from bearing weight is an important causative factor in plantar diabetic foot ulcers. CPTS can be estimated by combining data on dynamic and static barefoot and in-shoe plantar pressures, weight-bearing activities and footwear adherence. Multiple biomechanical CPTS models exist, but these have never been directly compared. We investigated the accuracy of different biomechanical models to estimate CPTS in high-risk patients.

Method: We assessed 31 participants with diabetes and neuropathy (all IWGDF risk 3) for barefoot and in-shoe plantar pressures during walking, standing, sit-to-stand and stand-to-sit transfers, and stair ascending and descending using Emed-X and Pedar-X systems. Type and extent of weight-bearing activities were measured over seven days using an inertial sensor (MoveMonitor), along with objective assessment of footwear adherence (Orthotimer). As reference standard, we used the most extensive CPTS model available, including barefoot and in-shoe pressure-time integrals (PTI) as determined for all different weight-bearing activities and for up to four pairs of footwear possessed by participants (both custom-made and regular footwear). We compared four CPTS models (from simple (Model 1) to extensive (Model 4); Figure 1) for accuracy with the reference model, using independent samples t-tests and Pearson's correlation.

Results/Discussion: Estimated CPTS for models 1&2 (264.1±172.1 and 567.0±573.8 MPa·s/day, respectively) was significantly lower compared to the reference model (868.4±623.9 MPa·s/day, Figure 1), while estimates from models 3&4 did not differ significantly (846.5±625.0 and 902.2±627.0 MPa.s/day, respectively). The associations with the reference model were moderate (for model 1: r=0.742) and strong (for models 2-4: r≥0.952).

Conclusion: For a sufficiently accurate representation of daily CPTS, in-shoe and barefoot plantar pressures during both walking and standing are needed, as well as weight-bearing activity and adherence measurements. Differentiation in pressures between shoe pairs or within weight-bearing activities is not required.



Legend: Blue bars represent the mean outcomes of each cumulative plantar tissue stress model, lines represent the standard deviation. * = p<0.01 in comparison with the reference model. Models are calculated as presented with the pictos, and with the following formulas:

- Model 1: in-shoe PTI * total strides;
- Model 2: (in-shoe PTI * total strides adherent to wearing footwear) + (barefoot PTI * total strides non-adherent to wearing footwear);
- Model 3: (in-shoe walking PTI * total strides adherent to wearing footwear) + (barefoot walking PTI * total strides non-adherent to wearing footwear) + (in-shoe standing PTI * total time spent standing adherent to wearing footwear) + (barefoot standing PTI * total time spent standing non-adherent to wearing footwear);
- Model 4: (in-shoe mid-gait walking PTI * total strides adherent to wearing footwear) + (in-shoe sit-to-stand PTI * total sit-to-stand transfer adherent to wearing footwear) + (in-shoe stand-to-sit PTI * total stand-to-sit transfers to wearing footwear) + (in-shoe stair ascending PTI * total stair ascending strides adherent to wearing footwear) + (in-shoe stair descending PTI * total stair descending strides adherent to wearing footwear) + (barefoot walking PTI * total strides non-adherent to wearing footwear) + (in-shoe standing PTI * total time spent standing adherent to wearing footwear) + (barefoot standing PTI * total time spent standing non-adherent to wearing footwear);
- Model 5: as model 4, but all in-shoe PTI measurements specified for up to 4 different pairs of footwear, and with the specific pair of footwear used specified during each weight-bearing activity.

PP11 THE EFFECTIVENESS OF AN AFFORDABLE TOA UZITO (OFFLOADING) DEVICE FOR IMPROVING PLANTAR DIABETIC FOOT ULCER OUTCOMES IN THE DEVELOPING WORLD

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Aim: Diabetic foot ulcer (DFU) disease is common in Sub-Saharan Africa (SSA). Callus formation delays healing and can be prevented by offloading devices. However, prohibitive costs often preclude this therapeutic option in SSA. Therefore, we devised an offloading device that requires no special training to use, easy to implement, and is affordable (10 US cents each). We named this device Toa Uzito (Swahili translation for off loading) and carried out this study to ascertain its utility and effectiveness in the management of DFU management in Africa.

Method: We carried out prospective study of persons with plantar DFU who attended diabetes clinic in Dar es Salaam, Tanzania. During Feb 2021 – Nov 2021 (study period), after informed consent, we identified DFU patients (cases) whose management included application of the Toa Uzito off-loading device. Controls were randomly selected patients with plantar DFU, but without the off-loading device. Aggregated data included initial DFU size, duration of diabetes, and time to complete healing. Data analyses were performed using SAS 9.4 Statistical Software (SAS Institute Inc., Cary, NC, USA). Cox proportional hazards regression was used to relate various exposures, considered simultaneously, to time taken for complete healing.

Results / Discussion: During the study period 92 patients were managed with the Toa Uzito off-loading device; 1518 controls were randomly selected. Cases and controls were similar for sex, diabetes, type, and continuous variables (age, BMI, diabetes duration) and site of DFU. Initial DFU size was higher in case patients (3,166 vs. 999 mm^2: $p < 0.0001$). The mean number of days to total healing for persons on off-loading was 117 days versus 161 days for persons not treated with offloading ($p=0.08$). On multivariate analysis, the p-value for offloading was 0.0055 (Hazard Ratio= 0.74), indicating a strong association between Toa Uzito and decreased time to complete DFU healing, a significance underscored by higher initial DFU size among cases and a device that cost just 10 cents.

Conclusion: Toa Uzito is an affordable off-loading device and effective adjunct to DFU management. It renders instant offloading that would be adaptable at the grass roots level anywhere in the developing world.

PP12 FIF!-MOBIL, A NEW, IRREMOVABLE OFFLOADING METHOD DESIGNED FOR WALKING

Mira Mertens[1], Dirk Hochlenert[1 2], Timo Tromp[3], Can Bogoclu[4], Dominik Ludmann[3], Lars Gierschner[3], Kevin Cremanns[3], Annika Weggen[3], Hubert Otten[3]

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Aim: We have standardized the simple and quick fabrication of a sole made of felt and cast-material at the patient's bedside and called it FiF!-mobil. Felt provides a pressure-redistributing interface between the sole of the foot and the fibreglass sheet. The fibreglass sheet provides rigidity with a specified curvature that is impressed by a mold. After 30 min. of curing this mold can be removed. The FiF!-mobil-sole is attached to the sole of the foot using adhesive fleece. This stiffened, non-removable, reusable offloading sole can be easily re-padded if necessary.

Method: We investigated the feasibility and offloading properties in a case series using sensor control. Patients had diabetic plantar pressure ulcers on the sole, heel or IP joint of D1. They were advised to walk as much as they usually did before the DFU episode. We compared patients with FiF!-mobile sole and those using other offloading techniques.

Results / Discussion:17 people were observed (10 FiF!-mobil, 6 TCC, 1 felt alone). 15 of 80 inter-visit intervals showed deterioration with no significant difference between patients wearing the FiF!-mobil-sole or an alternative device (11/48 versus 4/32, p = 0,24). The median time to closure of half the wound area didn't differ (median 16.2 / 14.9 days, p=0.35). At the same time, the number of steps per day was significantly higher with the FiF!-mobil-sole (1247 SD 677 / 2603 SD 1225, p=0.05).

Conclusion: The FiF!.mobil sole may be a useful option to offload diabetic plantar ulcers and allow mobility.

PP13 THE IFOOT-PROJECT - A COMPLEX INTERVENTION INTEGRATING E-HEALTH TO PRESERVE MOBILITY OF PEOPLE WITH DIABETIC PLANTAR PRESSURE ULCERS

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Aim: We developed and evaluated a complex e-health integrating intervention to optimize diabetic foot ulcer therapy with the main goal of maintaining patients' mobility. The solution includes A) sensors to monitor pressure, temperature, humidity and steps, B) custom-made, non-removable offloading devices (made at the bedside from felt or felt plus fiberglass or a TCC) and C) a server-based web application that alerts patients and therapists when pressure limits exceed and triggers immediate action.

Method: We conducted a randomized, controlled, multicenter feasibility trial comparing an intervention group using the whole system to a control group that used the system but neither patients nor therapists received information or alerts. Patients were advised to walk as much as they usually did before the DFU episode. Eligible patients at age 18-85 had diabetic plantar pressure ulcers of the sole, heel or IP-joint of D1. If necessary, PAD must have been corrected and the ulcer surgically debrided in advance. The inter-visit intervals (14 days) were judged as deterioration if wound area increased.

Results / Discussion: 20 people entered the study (12 intervention, 8 control). 3 had to be excluded because they didn't use the system within the first 2 weeks (2 intervention, 1 control). 15 of 80 inter-visit intervals showed deterioration, significantly less in the intervention group (4/42 versus 11/38, p = 0.026). The median time to closure of half the wound area was reduced in a clinically meaningful measure (19.1 to 10.2 days, p=0.2). The individual average of steps per day (mean 2,146, SD 1,427) was consistent with independent living and normal activity for many patients.

Conclusion: Integrating optimized offloading, sensor control and alerts for patients and staff may allow the rapid closure of plantar foot ulcers without limitation of steps made. Sensor information may contribute to limit inter-visit intervals with deterioration.

PP14 FREEZE-DRIED HUMAN AMNIOTIC MEBRANE ALLOGRAFT IN THE THREATMENT OF DIABETIC FOOT ULCER

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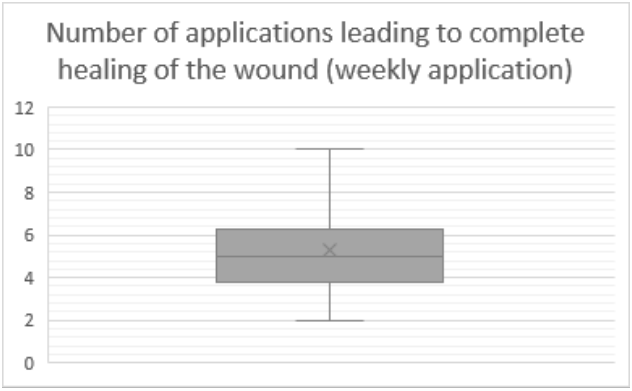
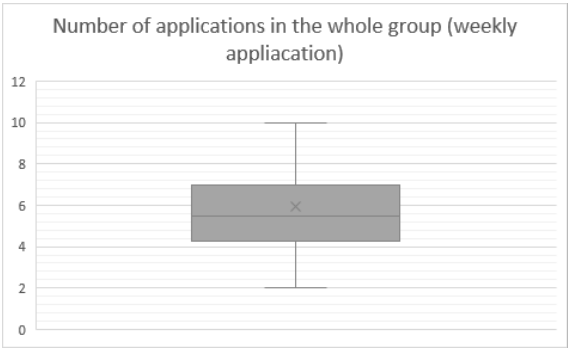
Aim: The diabetic foot ulcer (DFU) is a serious complication associated with diabetes that often leads to major amputations. Our presentation shows the effect of a freeze-dried human amniotic membrane allograft on wound healing allowing chronic wounds to effectively move out of their non-healing state and progress into epithelization.

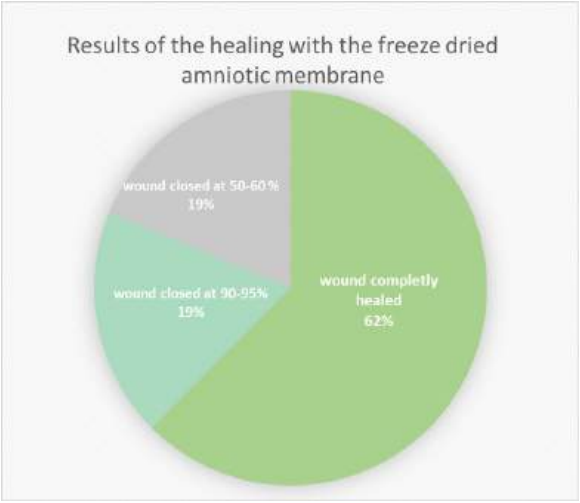
Method: A retrospective study was conducted from July 2020 to March 2022 by analyzing patients, which have been treated with a freeze-dried human amniotic membrane. Twelve patients with non-healing DFUs with wound-age in the range of 64-1540 days treated at the podiatry clinic have been applied with a freeze-dried human amniotic membrane allograft. From this group, each patient had verified neuropathy. Out of 33.2% of patients were after repeated revascularization, 33,3% had wound after the previous amputation and 58% of the patients had chronic kidney disease. Out of the observed group of twelve patients, nine have achieved complete wound closure, and three patients experienced partial healing in the range of 51-91% of the surface area. Number of applications per wound has ranged from 2-10 applications, average count of applications per wound was six.

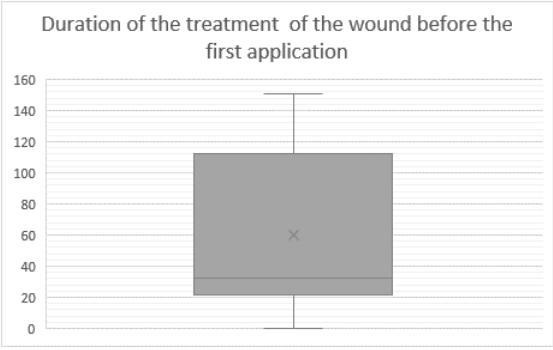
Results / Discussion: Freeze-dried human amniotic membrane allograft is easy to use in routine podiatry. Presented results show very good healing odds if indication criteria are respected. Mainly the limit of application is correct offloading or infection in the wound. A total of 12 patients were treated with 16 wounds. Wound surface area was reduced in 9 wounds (56,3%) by 100%, in 6 wounds (37,5%) by 51-95%. Wounds that have not reached complete healing were mainly in the cases of patients who had multiple wounds.

Conclusion: Due to the data gathered from treatments where the freeze-dried amniotic membrane was used, it is possible to conclude that freeze-dried human amniotic membrane allograft can yield significantly positive results when applied to stagnant wounds resistant to available Standards of Care.


Number of applications leading to complete healing of the wound (weekly application)
12
10
8
6
4
2
0


Number of applications in the whole group (weekly appliacation)
12
10
8
6
4
2
0


Results of the healing with the freeze dried amniotic membrane
wound closed at 50-60 %
19%
wound closed at 90-95%
19%
wound completly
healed
62%


Duration of the treatment of the wound before the first application
160
140
120
100
80
60
40
20
0

PP15 LYOPHILIZED ALLOGRAFT OF THE HUMAN AMNIOTIC MEMBRANE IN THE TREATMENT OF PATIENTS WITH DIABETIC FOOT ULCERS

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Lyophilized preparation of human amniotic membrane (HAM) is the source of many complex bioactive molecules such as growth factors (EGF, HGF, TGF-β, bFGF, NGF, VEGF, PDGF, PIGF, TGF-α), interleukins (IL-10, IL-4, IL-8, IL -6), metalloproteinase inhibitors, laminin, fibronectin and others. The collagen structure creates "scaffold", which plays an important role in cell migration and proliferation. We are presenting a group of patient -cases with HAM application who have long-term non-healing neuropathic ulcers, in whom previous conventional treatments could not bring any improvement. In our clinic HAM treatment has been used to treat chronic non-healing ulcers on the foot of diabetics for almost three years. During this time, HAM was applied more than 267 times on 53 ulcers in 42 patients with type 1 or type 2 diabetes mellitus. HAM has showed to be a safe and effective way of treatment. No side effects, complications or local reactions were observed during its use. This product has shown a stimulating effect on epithelization, even in patients with chronic long-term non-healing ulcers dependent on epithelization, in whom there was no reponse to common procedures. It is also possible to anticipate antibacterial effect, which may have contributed to maintaining a clean, nondeposited base, as well as an analgesic effect, as indicated by patient data on relief in the area of the ulcer after aplication of HAM. A reduction in the size of the area of the wound after 2-5 applications was achieved in more than 90% of patients. Complete closure of the wound after 2-5 applications or continued healing after > 5 applications according to the size of the wound was achieved in more than 80% of patients. The favorable results of individual case reports led us to prepare and conduct an international randomized clinical trial to determine if in patients with long-term non-healing neuropathic and neuroischemic ulcerations ,treatment with HAM brings better results than the common usual procedures.

PP16 DGH EXPERIENCE OF USING COLD PLASMA MEDICAL DEVICE AS AN ADJUNCT THERAPY TO ANTIMICROBIALS IN TREATING CHRONIC NON HEALING INFECTED DIABETIC FOOT ULCERS

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Aim: To review the utility of argon cold plasma therapy (ACPT) as a treatment for patients with chronic non healing infected DFUs when standard care has failed.

Method: A retrospective review 2 patients treated with ACPT who were given once weekly treatment with a treatment time of 3 minutes/area. ACPT was delivered through the Adtec SteriPlas medical device. Information was gathered via medical notes and results reporting systems following ACPT. Other Individual metrics explored were: frequency of antimicrobial use, HbA1c and microbiology results pre and post ACPT. Vascular, offloading and metabolic risk factors had been already optimized.

Patient 1: 71yr male with a right trans metatarsal amputation (March 2020) and an angioplasty (November, 2019). ACPT commenced for a non-healing wound in July 2021 with a total treatment time of 192 minutes over 22 once weekly sessions.

Patient 2: 74yr male with a right calcaneal DFU probing to bone (July 2021). The patient had a partially successful angioplasty (August 2021). ACPT commenced in November 2021 to present date with a total treatment time of 129 minutes over 16 once weekly sessions.

Results / Discussion: Both patients received 15–17 weeks of appropriately tailored antimicrobial therapy within a year prior to ACPT with both wounds remaining static. Neither patient received antibiotics for the wounds treated during ACPT. For patient 1, failure of the ACPT would have meant that further angioplasty/orthopedic surgery would need exploring as the only alternative was a major amputation. The wound has completely healed with no antimicrobial needs. Patient 2 was also looking at a major amputation prior to ACPT but to date has nearly healed without antimicrobial therapy.

Conclusion: During ACPT, CRP and WBC reduced for both patients and no microbial growth was cultured. The results suggest that the use of ACPT was highly effective in defending/eradicating against infection whilst healing two different types of non-healing DFUs without continued use of antimicrobial therapy, no admissions and no side effects. An RCT is anticipated and highly awaited to support greater use of this adjunct antimicrobial therapy that could prove to be a game changer in antibiotic stewardship in general.

PP17 THE IMPACT OF TOTAL CONTACT CASTING (TCC) IN CONJUNCTION WITH BOHLER IRON ON A COHORT OF PATIENTS WITH CHRONIC NON HEALING DIABETIC FOOT ULCERS

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[1]Kettering General Hospital, United Kingdom, [1]Kettering General Hospital, United Kingdom

Aim: These patients had extended lengths of inpatient stay, and this was not ideal but during the beginning of 2020 the reduction in the outpatient fracture clinic activity combined with the significantly increased mortality of individuals with diabetes inspired us to pursue an alternative offloading intervention, with the aim to achieving earlier discharge from hospital and faster healing. The gold standard of offloading TCC, has its disadvantages to completely offloading a plantar wound. The addition of a Bohler iron attached to the cast provides ambulation without load bearing.

Method: Ambulatory patients with non-resolving plantar diabetic foot ulcers were selected. They already had their vascular supply optimised as well as acute infection treated. Glycaemic control if not optimised was improved during this time also. Offloading conversely was a scotch cast boot (SCB) which is patient removable and can take 2 weeks to make. An MDT clinic was set up based in the fracture clinic under a newly appointed orthopaedic surgeon supported by plaster technicians, diabetes specialist podiatrists (DSPs), footwear specialist and diabetologist.

Results / Discussion: The results have been overall very positive. The average/median healing time was 7 weeks. The percentage of patients needing antibiotics for their foot ulceration was nil. The length of stay reduced from an average of 66 days to 0 days admittance for their foot ulcer. The net financial impact was £154,453. The patient experience questionnaire was globally positive and there were also no clinical concerns either.

Conclusion: The Bohler iron is an effective enhancement tool to the TCC in our armoury against diabetic foot ulceration. However, it is important to recognise that its full potential is realised within a full MDT including DSPs, footwear specialists, plaster technicians, orthopaedic and diabetes doctors.

PP18 OUTCOMES OF TREATING HIND FOOT ULCERS AT A UK DIABETES FOOT CLINIC

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Aim: To determine the outcomes of treating hind foot ulcers in people attending a Multi-professional Diabetes Foot Ulcer Clinic (DFC) in the UK. The primary aim was to determine overall outcome at 12 months after first DFC appointment of wound healing. The secondary aims were to compare: contributary factors; number and length of hospital admissions; surgical intervention; and instances of infection related to the hind foot ulcer between healed and non-healed at 12 months.

Methods: A retrospective analysis was conducted using hospital and community databases for 129 eligible wounds in 122 people referred to DFC in 2017 and 2018 with hind foot ulceration. In a multi-wound scenario, the largest wound was identified as the index ulcer. 111 wounds were included in the final analysis, 12 months from the presentation

Known complicating factors present at first assessment were noted, including CKD status, presence of PAD and neuropathy, wound planar location, SINBAD score, depth of wound and infection status.

Results / Discussion: Average age of the patients was 70.3 years. Overall, 78% of wounds had healed at 12 months. 5 people (4.5%) had an amputation; all were alive at 12 months. There were 39 admissions for 26 people, totaling 387 bed days (3.5 days per person) {see picture}

	Healed (87)	Not healed (19)	Amputation (5)
Average duration prior to 1st Appointment (weeks)	9	19	3
SINBAD scores:			
Lower (1-2)	24	3	0
Higher (3-6)	59	15	5
Unknown	4	1	0
Average	3.1	3.4	4.2
PAD	39.1% (34)	68.4% (13)	100% (5)
Superficial	12.6% (11)	89.5% (17)	100% (5)
Plantar location	18.4% (16)	47.4% (9)	60% (3)
Pressure primary cause	29.9% (26)	57.9% (11)	40% (2)
Infection:			
Soft tissue	20.7% (18)	47.4% (9)	60% (3)
OM	2.3% (2)	15.8% (3)	40% (2)
Interventions:			
Vascular	8.0% (7)	21.1% (4)	40% (2)
Average weeks to vascular intervention	9	25	5
Surgical debridement	2.3% (2)	5.3% (1)	20% (1)
IV antimicrobials	4.6% (4)	15.8% (3)	60% (3)
Average bed days per person	1.4 (124)	3.6 (69)	38.8 (194)

Conclusion: Hind foot diabetes foot ulcers occur more commonly in older individuals. The average healing time for those healed within 12 months was 13 weeks. Out of the 7 people with OM, 2 needed amputation. People who had an amputation had shorter duration of the ulcer, yet were more likely to have high SINBAD score, PAD and neuropathy and more commonly needed interventions such as surgical debridement, IV antibiotics and vascular surgery. 36 month follow up data will be available.

PP19 EFFECTIVENESS OF THE FAST-TRACK PATHWAY FOR THE MANAGEMENT OF PATIENTS WITH DIABETIC FOOT THROUGH THE NETWORK BETWEEN SECOND AND THIRD LEVEL CENTERS

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[1]Hospital San Camillo de Lellis, UOSD Diabetologia , Rieti, Italy, [2]Hospital Tor Vergata Roma, Diabetic Foot Unit, Department of Systems Medicine, Roma, Italy

Aim: The aim of this study is to evaluate the effectiveness of the Fast Track Pathway (FTP) between level I, II and III diabetes centers in the Lazio Region for the treatment of diabetic patients with foot ulcers in order to reduce the rate of amputation and mortality.

Method: A retrospective observational study was performed from January 2020 to December 2020. We enrolled 23 diabetic patients presenting Diabetic Foot Ulcers (DFUs) belonging to a level I and II diabetic foot care center and were divided according to the type of DFUs into uncomplicated, complicated and severe; and when necessary, sent to a specialized center for the care of level III diabetic foot. The following outcomes were evaluated: healing, healing time, minor amputation, major amputation, and survival.

Results / Discussion: Healing occurred in 15/23 patients (65.2%). Healing time averaged approximately 7 ± 5 weeks. The minor amputation rate was 17.4%. The major amputation rate was 0. The survival rate was 95.6%.

Conclusion: The preliminary data collected allow us to state that the FTP guarantees excellent management of the diabetic patient with DFUs between the territory and a second and third level diabetes center.

PP20 HEALING OF A 10-YEAR-LASTING CHRONIC DIABETIC NEUROPATHIC DEFECT USING A DEHYDRATED HUMAN AMNIOTIC MEMBRANE ALLOGRAFT - A CASE REPORT

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Background: Since 4/2021 certified foot clinics in Czechia are entitled to reimbursement by health insurances for treatment of patients with non-healing diabetic foot ulcers (DFUs) by means of dehydrated human amniotic membrane (DHAM) allograft. The treatment is convenient for DFUs that have not healed by a complex therapy comprising standard wound treatment, appropriate off-loading, infection check-up and revascularisation in case of ischaemia.

Case history: in 2011 a patient (male, 64y) was referred to foot clinic with plantar DFUs on R foot (toe, area under head of the 1st metatars). History included type 2 diabetes since 6/2000, diabetic neuropathy and retinopathy, amputation of 2nd to 4th fingers with gangrene on right R foot in 2014, hypertension, prostate hypertrophy, non-smoker. Because of R ankle deformity scintigraphy was performed to confirm Charcot foot (CHOAP), in 2014 CHOAP was confirmed also in L foot. Although complex podiatric therapy healed the ulcer on the toe, plantar ulcer has persisted ranging in size from 4x4 cm to 2x2 cm. The ulcer was clinically without infection, with exception of a short period in 2017, however microbiological investigations showed chronic persistent polymicrobial colonization. In 2017 the patient was treated with ATB for osteomyelitis. In the course of ten years of treatment we used 15 different of types of moist dressings, incl. outpatient negative pressure therapy, but without success.

In 10/2021 we decided to apply DHAM. At that time the size of ulcer was 2.8x1.8 cm with granulating base and fibrin rims, W2, with no clinical signs of infection. After surgical debridement DHAM was applied in sterile conditions. Re-dressing was done weakly, DHAM was applied 5x in total. Having finished DHAM application standard local treatment continued and after 14 weeks (since DHAM application) the defect was completely healed.

Conclusion: A chronic diabetic neuropathic ulcer, persistent for 10 years, was healed within 14 weeks after application of DHAM. The efficacy of DHAM in long-term non-healing DFUs can reduce the overall cost of treatment despite its higher cost. Healing of an ulcer means a significant improvement of the patient´s quality of life.

PP21 ANTIPHOSPHOLIPID SYNDROME (APS) - A CLINICAL POSSIBILITY FOR THE ISCHAEMIC FOOT

Gill Lomax[1], Jennifer Buxton[2], Ravi Judgey[3], Peter Reston[1], Emma Bolton[1], Arif Adam[1], Furat Wahab[1]

[1]Blackburn Royal Hospital, Diabetes, Lancs, United Kingdom, [2]Blackburn Royal Hospital, Vascular Surgery, Lancs, United Kingdom, [3]Blackburn Royal Hospital, Trauma and Orthopaedic, Lancs, United Kingdom

Introduction: We present a case of Antiphospholipid Syndrome (APS), sometimes known as Hughes disease in a Type 2 diabetic patient (AJ), ultimately leading to bilateral below knee amputation.

APS is an auto immune disease producing antiphospholipid antibodies which attach to fat molecules (phospholipids) causing a greater likelihood of clotting. Diagnosis is by blood analysis and biopsy and is often misdiagnosed due to the nature of the disease which causes generalized symptoms often mimicing established diagnosed conditions. Treatment is with anticoagulation or an antiplatelet and can lead to stability of disease. However, some patients continue to develop clots despite therapeutic interventions. This was the case for AJ.

Case study: We describe a 56 yr old Caucasian with T2DM, COPD, CCF, anaemia and previous recurrent DVT's x 3 and a TIA. He presented initially to the Diabetic foot clinic in 2017with left leg ulceration and foot ulceration with osteomyelitis. Over a 12-month period the patient healed following angioplasty, great toe amputation which was non-healing followed by forefoot amputation.

In 2020 AJ presented with further left foot wounds, and vascular pathologies of stenosis and occluded peroneal artery. All wounds had livedo reticularis (LR) appearance, cold ischaemic skin, severe pain, and gangrenous tissue. Following successful angioplasty AJ developed worsening wound and retiform purpura on thigh. No bone involvement, minimal infection and 3 vessel inflow. Working diagnoses included cutaneous ischaemia, secondary to post op emboli. Dermatology was involved and blood films including cardiolipin antibodies and punch biopsies diagnosed APS.

Results / Discussion: Despite extensive anticoagulation AJ continued to experience clots – uncontrolled APS. Amputation of left leg was undertaken, and a new lesion developed on the right great toe. Within 18 months, AJ had revision of left amputation and loss of right leg due to uncontrolled APS.

Conclusion: APS was likely to have been undiagnosed for 10 years. It is difficult to control in some patients. APS mimics' other disease processes. APS should be considered in a diabetic pt with cold, gangrenous, necrotic lesions often with reticular striations yet adequate blood supply.

PP22 INFRARED THERMOGRAPHY FOR MONITORING SEVERITY AND TREATMENT OF DIABETIC FOOT INFECTIONS

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Aim: Exploration of monitoring of thermal asymmetry (difference between mean plantar temperature of the affected and unaffected foot) for the assessment of severity of diabetic foot infections.

Method: We prospectively investigated patients who were hospitalized due to moderate or severe diabetic foot infections (International Working Group on the Diabetic Foot infection-grades 3 or 4). In these patients, we measured thermal asymmetry with an advanced infrared thermography setup during the first four to five days of in-hospital treatment. Besides measuring thermal asymmetry, we performed clinical assessments and tests of serum inflammatory markers (white blood cell counts and C-reactive protein levels). We assessed the change in thermal asymmetry from baseline to final assessment, and investigated its association with infection-grades and serum inflammatory markers.

Results / Discussion: In seven patients, thermal asymmetry decreased from median 1.8°C [range: -0.6-8.4] at baseline to 1.5°C [range: -0.1-5.1] at final assessment (p=0.625) (Figure 1). In three patients who improved to infection-grade 2, thermal asymmetry at baseline (median 1.6°C [range: -0.6-1.6]) and final assessment (1.5°C [range: 0.4-5.1]) remained similar (p=0.285). In four patients who did not improve to infection-grade 2, thermal asymmetry decreased from median 4.3°C [range: 1.8-8.4] to 1.9°C [range: -0.1-4.4] (p=0.197). No correlations were found between thermal asymmetry and infection-grades, (r=- 0.347; p=0.445), CRP-levels (r=0.321; p=0.482) or white blood cell counts (r=-0.250; p=0.589) during the first four to five days of in-hospital treatment.

Conclusion: Based on these explorative findings, infrared thermography seems to have limited value for monitoring diabetic foot infections during in-hospital treatment.

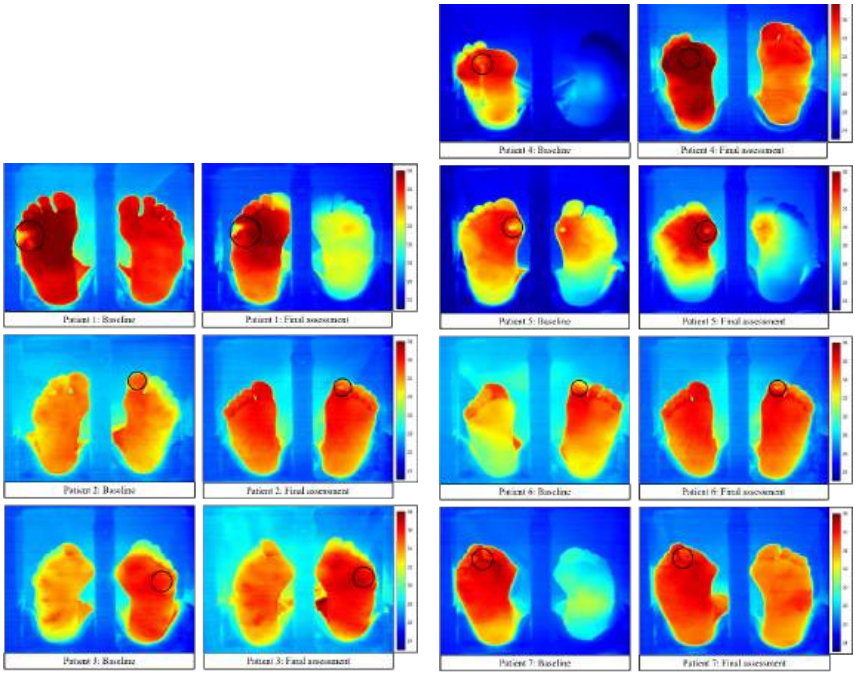

Figure 1: Infrared thermography of plantar aspects of both feet of each patient at baseline (left) and final assessment (right). The areas of the infected diabetic foot ulcers are indicated by the black circles. The colored reference bar represents the temperature (°C).

PP23 DIAGNOSIS OF OSTEOMYELTITIS: INVESITGATION OPTIMISATION IN DIABETIC FOOT ULCERS – THE DOMINO-DFU STUDY

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Aim: 20% of diabetic foot ulcers (DFU) are complicated by osteomyelitis (OM), increasing the risk of morbidity and amputation. Clinician threshold for OM diagnosis is variable and guidelines are inconsistent. DOMINO-DFU aims to: describe current diagnostic practice; investigate concordance between "remote" and "through-the-wound" bone sampling for microbiology and histology; develop a diagnostic prediction model for diabetic foot osteomyelitis.

Method: A cohort of new diabetic foot ulcers from 3-5 UK diabetic foot MDT clinics will be recruited over 3 years. From this cohort, a subgroup of patients exhibiting high-risk features for OM will be studied over 3 phases: Phase 1 (n=225) will collect information on clinical criteria for diagnosis of OM, treatment/clinical outcomes to 12 months; Phase 2 (n=192) will have dual bone biopies for concordance; Phase 3 (n=450) will have optimal bone biopsy technique, blood tests and X-rays. Clinical and investigation results from phase 2/3 will be analysed against bone histology and microbiology to develop a diagnostic prediction model for OM. Cost-effectiveness modelling of the new diagnostic model versus current practice will be performed.

Results / Discussion: The study is funded by NIHR Academy.

Conclusion: The study aims to inform guidelines and reduce variation in diagnosis of diabetic foot OM.

PP24 THE QUALITY OF LIFE AND COST BENEFITS OF DOMICILIARY 24-HOUR PIPERACILLIN/TAZOBACTAM 13.5G INFUSION IN PATIENTS WITH DIABETIC FOOT DISEASE

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Aim: *To evaluate patient satisfaction and cost benefit of using domiciliary piperacillin/tazobactam 13.5g administered with infusion pump in patients with a diabetic foot infection (DFI). DFIs with osteomyelitis often require 6-weeks of antibiotics.[i] This can result in a prolonged admission to treat* ***Pseudomonas aeruginosa*** *because thrice daily piperacillin/tazobactam is logistically difficult to administer at home and alternatives e.g., ciprofloxacin and ceftazidime carry a* ***Clostridioides difficile*** *risk. These patients could be managed in a domiciliary setting if the antibiotic is administered once daily.*

Methods: Since March 2019 to present, we surveyed eight patients (7 males, 1 female aged 57 to 81 years) who received domiciliary intravenous antibiotics for a DFI with confirmed osteomyelitis. On completion, patients filled in a validated patient satisfaction questionnaire (Glasgow Benefit Inventory - GBI).[ii]

Results: The GBI scale ranges from -100 (maximal negative benefit) to 0 (no benefit), to +100 (maximal benefit). Data collected suggested that domiciliary intravenous antibiotics for a DFI have a positive impact on total, general, social, and physical health.

Table 1 GBI scores for domiciliary versus hospital antibiotic treatment

	Total	General health	Social	Physical health
Range	8.3 to 30.6	8.3 to 41.7	0 to 33.3	-33.3 to 33.3
Median	19.1	24.5	10.4	6.25

The financial cost was compared to a 6-week stay in hospital for intravenous antibiotic therapy. 6-weeks in-patient care equates to £10,500 per patient. Piperacillin/tazobactam given thrice daily for 6-weeks costs £989.

Domiciliary treatment using the piperacillin/tazobactam 13.5g infusion device for 6-weeks costs £4,122 per patient. Once-daily domiciliary nursing visits cost £5,040 for 6-weeks. Treatment using a piperacillin/tazobactam as a 13.5g intravenous infusion in a domiciliary setting potentially saves £2,327 per patient.

Conclusion: This case series demonstrates patient satisfaction as well as cost effectiveness for domiciliary treatment of a DFI in a cohort of patients who would have historically required a prolonged admission.[iii] All patients preferred to be treated at home, and there were no safety concerns raised. With domiciliary rather than in-patient therapy, a potential saving of £2,347 per patient can be obtained.

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PP25 POSSIBLE ADVANTAGES OF BIOACTIVE GLASS IN THE TREATMENT OF SEPTIC OSTEOARTHRITIS

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Aim: The aim of the study was to compare the outcomes following ulcerectomy with segmental resection of the infected joint and bone with and without added Bioactive Glass.

Method: Retrospective analysis of patient data treated for plantar or marginal-medial ulcers and with osteomyelitic involvement of the first MTP joint. All 22 included patients were previously treated according to the latest Guidelines from the International Working Group on the Diabetic Foot but failed to heal. Osteomyelitis was confirmed by a positive probe-to-bone test and X-ray of the foot. Ten patients in study group were treated with segmental resection of the first MTP joint and periarticular bone, stabilization with an external fixator, and a local application of Bioactive Glass. Twelve patients in control group were treated with segmental resection, temporary application of 10 beads of antibiotic into the void and stabilization with an external fixator. The main outcome measure was complete resolution of septic osteoarthritis and osteomyelitis after the described procedure that results in complete healing without any additional procedure.

Results / Discussion: In 12 months follow up successful healing with a complete resolution of osteomyelitis was achieved in all 10 patients from the study group and in 9/12 patients from the control group ($p = 0.221$). In the control group two patients developed infection that led to amputation of the great toe and the third patient from the control group had an uneventful postoperative course until 11 months after surgery but later developed valgus deformity of the great toe and recurrent ulcer.

Conclusion: During the one-year follow-up, patients with Bioactive Glass needed no additional antibiotic therapy or surgical intervention. Bioactive Glass, when applied to the diabetic foot, showed itself to be a safe bone substitute biomaterial.

PP26 WHICH FACTORS INFLUENCE IN HEALING TIME IN PATIENTS WITH DIABETIC FOOT OSTEOMYELITIS?

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Aim: To compare the healing time in patients with diabetic foot osteomyelitis (DFO) according to the presence or absence of clinical signs of infection, the variation, if observed, of blood parameters, the presence of different radiological signs and the treatment received for management DFO.

Method: A prospective observational study was carried out in a specialized Diabetic Foot Unit, between November 2014-November 2018. A total of 116 patients with DFO were included in the study. All patients were treated by either surgical or medical approach to address DFO. During baseline visit, we assessed the following items: diagnosis of DFO, demographic characteristics and medical history, vascular and neurological examination, presence of clinical signs of infection, increase blood parameters (leukocytes, neutrophils, lymphocytes, monocytes, eosinophils, basophils, erythrocyte sedimentation rate, glycaemia, glycosylated haemoglobin, C-reactive protein, alkaline phosphatase, albumin and creatinine), radiological signs (affected bone marrow, active periosteal reaction, sequestrum, cortical disruption and other type of signs) and the treatment to management DFO. We analysed the association between the presence of clinical signs of infection, variation of blood parameters, presence of radiological signs and treatment received for management osteomyelitis with the healing time in patients with DFO.

Results/Discussion: Ninety-six (82.8%) were male, with a mean age of 62.9±10.1 years. Ninety-six patients (82.8%) received surgical treatment, and 20 (17.2%) received medical therapy. The mean time to ulcer healing was 15.8±9.7 weeks. With regard to healing times, we did not find association with the presence of clinical signs of infection, nor with the increase in blood parameters, except in the case of eosinophils, which with higher values appear to increase the healing time U=66, z=-2.880, p=0.004. Likewise, no relationship has been found between healing time and the appearance of the different radiological signs of DFO and nor depending on the treatment administered for the management of osteomyelitis.

Conclusion: High levels of eosinophils are associated with longer healing time of diabetic foot ulcers complicated with osteomyelitis, finding no other factors related to increased healing time.

PP27 DALBAVANCIN: DOES COSTING MORE ACTUALLY COST LESS?

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Aim: The aim of this analysis is to explore the direct and indirect costs of Teicoplanin versus Dalbavancin.

Dalbavancin is a glycopeptide antibiotic and belongs to the same class as Teicoplanin and Vancomycin. Both Dalbavancin and Teicoplanin are appropriate for outpatient parenteral antibiotic therapy (OPAT) in treating diabetic foot ulcers (DFUs). However, Dalbavancin is a viable alternative to Teicoplanin due to its long half-life, thereby requiring less visits for administration. Conversely, there is significant drug cost difference between the two.

Method: A retrospective analysis of costings and clinical information of 22 patients who received intravenous (IV) Dalbavancin for DFU/osteomyelitis was undertaken between May 2020 and February 2022, through coding, finance and medical notes. A cost comparison was made between a 6 week daily regimen of IV Teicoplanin versus IV Dalbavancin, normally administered in 2 doses of 1.5g each administered 1 week apart. This included cost of the drug itself, patient attendance to ambulatory care unit and specialist community nurses (intermediate care and KGH care at Home teams) to attend a patient's home to administer daily IV Teicoplanin as well as accessing midline/PICC line access services. Patients were identified based on clinical need/microbiology.

Results / Discussion: Dalbavancin regime total cost = **£3363.62**

Teicoplanin regime total cost:

- Via ICT **£6234.57**
- Via KGH Care at Home **£7554.57**

The current calculations suggest at least a two-fold increased cost of using Teicoplanin per patient. Therefore over the 22 patients reviewed there was total potential cost saving of £62,000-92,000 depending on the provider used. Dalbavancin becomes an even more attractive option when one considers patient experience as well as the Covid isolation challenges. There was no clinical difference in the outcomes observed or expected had they been offered Teicoplanin instead.

Conclusion: Without compromising on DFU clinical care, less money was spent. There were added benefits of improved patient experience, less time/exposure to medical staff and freeing up of community specialist nurses time. These benefits cannot be underestimated, although consideration regarding antibiotic stewardship will also need to be factored in.

PP28 PERFORMANCES OF TLC-AG DRESSINGS* ON DIABETIC FOOT ULCERS AT RISK OR WITH CLINICAL SIGNS OF LOCAL INFECTION: RESULTS OF A MULTICENTRE, PROSPECTIVE, OBSERVATIONAL STUDY

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Aim: To assess the performances of TLC-Ag dressings in the local management of wounds at risk or with clinical signs of local infection under real-life settings.

Method: A large, prospective, multicentre observational study with two TLC-Ag dressings* was conducted in 39 centres across Germany between May 2020 and May 2021. Main outcomes included a description of the treated patients and their wound management, changes in wound infection, wound healing outcomes over a maximum period of four weeks of treatment, and overall clinical assessment of the performance, local tolerance and acceptability of dressings. This report will focus on the results achieved in patients with a Diabetic Foot Ulcer (among the 728 patients included in this study).

Results/Discussion: Ninety patients were treated with the dressings for 28±18 days, with an intermediate visit conducted after 13±8 days. At baseline, risks of wound infection were present in all patients, clinical signs of wound infection in 93.3% and a wound infection established in 80.0%, while antibiotic therapy was prescribed to 31.1%. Throughout the study period, all parameters of wound infection continuously decreased, the most rapidly being surgical sepsis wounds, wound deterioration, pus and exudate-related clinical signs, resulting at the final visit in a reduction by 84.7% of local wound infections and by 78.6% of wounds with clinical signs. Concurrently, in terms of healing process, 92.2% of the wounds healed or improved, 3.3% remained unchanged and 1.1% worsened (3.3% missing data). Both dressings were predominantly 'very well tolerated' and 'very well accepted' by patients and assessed 'very useful' by physicians.

Conclusion: These results are consistent with previous clinical evidence on TLC-Ag dressings. They support the good efficacy, tolerance and usefulness of these antimicrobial dressings in this indication, used in association with appropriate standard of care.

* UrgoTul™ Ag/Silver and UrgoTul™ Ag Lite Border, Laboratoires Urgo, France

PP29 DOES MULTIDRUG-RESISTANT ORGANISM IMPACT IN CLINICAL OUTCOME OF DIABETIC FOOT ULCERS OSTEOMYELITIS TREATED SURGICALLY?

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Aim: The aim of this study was to determine clinical outcomes influence of multidrug-resistant organism (MDRO) in diabetic foot ulcers osteomyelitis treated surgically.

Method: A retrospective study between January 2018 and December 2021 was carried out involving 60 patients who underwent surgery for the treatment of diabetic foot osteomyelitis. Osteomyelitis was established through a combination of the probe-to-bone test and a plain X-ray examination. studies. Antibiotic-free period was standardized 72 hours before surgery to avoid false negative cultures. Bone samples were taken intraoperatively and sent for microbiology study. Patients were divided into two groups according to the presence (+) or absence (-) of MDRO.

Results: Of the entire population, 23 (38,3%) cultures were MDRO – and 37 (61,7%) were MDRO +. Median duration of the ulcer were 10 IQR [24-4] weeks for MDRO + and 8 IQR [24 -4] weeks for MDRO – (p=.970).

Staphylococcus aureus was the most prevalent organism isolated in both groups, 10 (43,5%) for MDRO - and 13 (35,1) for MDRO +. Polymicrobial infection showed to be more prevalent in MDRO + cultures 23 (62.2%) vs. 7 (30.44) in MDRO – (p=.017).

Clinical outcomes of diabetic foot osteomyelitis and treated surgically showed to be similar in both groups as shown in Table 1.

Variables	MDRO + cultures	MDRO - cultures	P value
Healing, n (%)	34 (91.9%)	19 (82.6%)	0.276
Minor amputation, n (%)	6 (16.2%)	5(21.7%)	0.591
Mayor amputation, n (%)	1 (2.7%)	2 (8.7%)	0.300
Death, n (%)	2 (5.4%)	2 (8.7%)	0.619
Time to healing, Median [IQR] (weeks)	9 IQR [18.50 – 5.50]	13 IQR [21 – 7]	0.614

Table 1. Clinical outcomes of diabetic foot ulcers complicate by osteomyelitis with and without BMRO.

Conclusion: Multidrug-resistant organism showed to be irrelevant in the clinical outcomes of patients with diabetic foot osteomyelitis treated surgically.

PP30 IS TAZOCIN INDUCED AKI A GENUINE PROBLEM IN DIABETIC FOOT INFECTIONS?

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Aim: This retrospective review aims to explore if there is a correlation between the use of Tazocin and the risk of developing AKI during treatment for DFU with/without osteomyelitis. Locally we have noticed an increase in its use empirically as well as to target resistant gram negative bacteria and ***Pseudomonas*** species where treatment options are limited and carry a risk of ***C.Difficile*** diarrhoea.

Method: Retrospective review of outpatient clinical notes of patients that received Tazocin for DFU in the last 12 months. Creatinine and eGFR from the preceding one month prior to starting tazocin was regarded as the baseline provided there was no acute intercurrent illnesses at the time. This was compared to creatinine and eGFR throughout treatment and any detrimental change including AKI was recorded. Patient's medications were also reviewed for any nephrotoxic properties as well as pre-existing CKD as confounders.

Results / Discussion: A total of 30 patients records were reviewed that received Tazocin for DFU in an outpatient setting. Eight patients were excluded as they had been an inpatient in an acute hospital in the preceding month for a concurrent illness. Duration of treatment ranged from 13 to 77 days. 4 patients out of 22 developed a reduction in their renal function and elevation of creatinine. This included 2 patients that developed AKI 1. Renal function returned to baseline once the antibiotics were stopped.

Conclusion: The small number of cases is a limiting factor. However, we are unable to exclude Tazocin as an independent cause of AKI from this case series. An important unanswered question therefore remains that we feel warrants more interrogation considering the increasing use and need of Tazocin as a first line empirical but also targeted choice due to the ongoing increasing resistance to other antimicrobials (eg amoxicillin and co-amoxyclav) and the risk of ***C.Diff*** with ciprofloxacin and cephalosporins.

PP31 EVALUATION OF THE DIAGNOSTIC ACCURACY OF THE COMBINATION OF BONE PROBE, PLAIN RADIOGRAPHY AND ERYTHROCYTE SEDIMENTATION RATE IN THE DIAGNOSIS OF DIABETIC FOOT OSTEOMYELITIS

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Aim: to compare the diagnostic accuracy between the combination of probe to bone test (PTB) and globular sedimentation rate (ESR) versus PTB and plain radiography for the diagnosis of diabetic foot osteomyelitis.

Method: thirty-one patients were collected with clinical suspicion of forefoot diabetic foot osteomyelitis undergoing PTB, plain radiography and bone biopsy in a diabetic foot unit during the period from february 2021 to february 2022. All patients underwent blood tests at the time of diagnosis of osteomyelitis and values more than 40ml/h of ESR were considered elevated. The sensitivity, specificity, PPV and NPV were evaluated for the combination of PTB and radiography vs. PTB and ESR vs. bone biopsy.

Results / Discussion: Ninety-three percent of the patients were male and all of them have diabetes type 2. All the patients were neuropathic and 67.7% had moderate peripheral vascular arterial disease. Twenty nine percent of the patients had the ulcer located in central metatarsal heads, 12,9% under 1st metatarsal head, 16,1% under 5th metatarsal head and 22.6% in the lesser toes.

Sixty seven percent of the patients had positive bone biopsy, 58% had radiological signs compatible with osteomyelitis, and 32% of the patients had elevated ESR.

Combination of PTB and radiography vs. bone biopsy had 86% of sensitivity, 50% of specificity, 92% of PPV and 33% of NPV. On the other hand, combination of PTB and ESR vs. bone biopsy had 78% of sensitivity, 50% of specificity, 78% of PPV and 50% of VPN.

The value of diagnostic accuracy is similar when the combination of PTB test is with radiological signs or with ESR values.

Worldwide, the combination of PTB and radiography is a standard diagnosis of diabetic foot osteomyelitis and clinically provide information about the ulcer. Nevertheless, is interesting to know the blood parameters of the patients with osteomyelitis to add general information of the patient.

Conclusion: diagnostic accuracy of the combination of ESR and PTB is similar to the diagnostic accuracy of the combination of PTB and plain radiography for the diagnosis of diabetic foot osteomyelitis.

PP32 THE ACCUMULATING EVIDENCE SUPPORTING THE USE OF CYCLICAL PRESSURIZED TOPICAL OXYGEN THERAPY FOR HEALING CHRONIC WOUNDS

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Aim: Diabetic Foot ulcers are a common sequela in the diabetic patient. They have proven to increase the morbidity and mortality of those diabetic patients with this condition. Healing the diabetic foot ulcer, as quickly as possible, with limited hospitalization and amputation is always the goal of therapy.

Method: Data continues to accumulate on the increasing role that topical oxygen therapy (TOT) has in healing Diabetic Foot Ulcers. In just the past few years, there have been no less than 6 peer reviewed RCT's published, as well as several meta-analysis completed of the available data, all demonstrating success in using TOT for the heling of Diabetic Foot Ulcers.

Results / Discussion: At this point, the studies reveal that using TOT can decrease healing time, can decrease the re-occurrence rate for DFU's, can decrease the rate of hospitalization when this modality is used and, most importantly, can decrease the rate and number of amputations that occur in these patients.

Conclusion: The data will be reviewed as well as discussing the new ADA guidelines that speak to the effectiveness of this modality.

PP33 RAPID IMPROVEMENT OF WOUND HEALING AND HEALTH-RELATED QUALITY OF LIFE IN PATIENTS WITH DFUS TREATED WITH TLC-NOSF POLYABSORBENT DRESSINGS* - RESULTS FROM A PROSPECTIVE, MULTICENTRE REAL-LIFE STUDY

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Aim: This clinical evaluation aimed to assess the performances of TLC-NOSF dressings with polyabsorbent fibres in the local management of chronic wounds in an unselected patient population under real-life settings. The results for patients with diabetic foot ulcers (DFUs) are presented here.

Methods: A large, prospective, multicentre observational study with three different TLC-NOSF poly-absorbent dressings* was conducted in 55 centres across Germany between January 2019 and June 2020. The main endpoints included wound healing rate and progression, health-related quality-of-life (HrQoL) evaluation (Wound-QoL questionnaire), and tolerability and acceptability of the dressings.

Results: Altogether 217 patients with a DFU were treated with the evaluated dressings for a mean duration of 63±30 days. By the final visit, 57.6% of the ulcers healed, 32.3% improved, 4.1% were stabilized, and 4.1% worsened. In DFUs ≤ 1 month duration, wound closure reached 71.3%. A substantial improvement was reported in the majority of the patients on all HRQoL parameters, in particular regarding frustration due to long-healing time, fears of wound deterioration, pain, disturbing discharge, patients' mobility, limitation of leisure activities, and dependency on help from others. The dressings were 'very well' tolerated (88.9%) and 'very well' accepted (83.4%) by the large majority of the patients.

Conclusions: These results show the good performance of these dressings in rapidly improving wound healing and HRQoL of patients with DFUs treated in real-life. They are consistent with previous clinical evidence on TLC-NOSF dressings, supporting current guidelines recommending their use for local treatment of DFUs and confirming that optimal outcomes are achieved when used as first-line treatment.

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PP34 EFFECTIVENESS OF SUCROSE OCTASULFATE DRESSING IN THE TREATMENT OF NEURO- ISCHAEMIC DIABETIC FOOT HEEL ULCERS: A RETROSPECTIVE SINGLE ARM STUDY

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Aim: Neuroischaemic diabetic foot ulcers ulcers (peripheral neuropathy and peripheral artery disease – PAD - both involved) are estimated to be present in more than half the patients with diabetic foot ulcers (DFUs) in high-income countries. Because of their PAD involvement, those DFUs are associated with the most severe outcomes (lower probability of healing, longer healing times, greater risk of amputation, and potentially higher mortality). Recently, sucrose octasulfate impregnated dressings (TLC-NOSF [Technology Lipido-Colloid-Nano-OligoSaccharide Factor] have provided positive outcomes in the local management of those non-infected DFUs when introduced in a Standard of Care protocol (double-blind RCT, Explorer), for which however the posterior part of the heel location was excluded as a target, to avoid any confusion with a pressure ulcer.

Method: We performed a study to evaluate the effectiveness of the use of this primary dressing in the management of consecutive patients who referred for an active neuro-ischaemic heel DFU belonging to grade IC (superficial) or IIC (deep to tendons, muscle or capsule) according to Texas University Classification were included, all managed by a pre-set limb salvage protocol in the respect of International guidelines.

Primary outcome was the rate of complete wound healing after 24 weeks of follow-up (any 2 to 4 weeks assessments) with healing time, the rate of wound regression and safety profile as secondary outcomes.

Results: On the 30 included patients, 22 (73.3%) healed by Week 24 in a mean time of 84±32 days, 28 (93.3%) had wound regression >50% from baseline, 2 (6.7%) had mild infection and one patient reported major amputation. No adverse event (local or serious) related to TLC-NOSF dressing was reported.

Conclusion: This current study provides similar outcomes than those reported in Explorer when considering the different locations of the DFUs, supporting the benefit of sucrose-octasulfate for treating neuro-ischaemic heel DFUs when introduced in the standard of care.

PP35 CLINICAL AND HISTOPATHOLOGICAL EFFICACY OF DAILY APPLICATION OF NEGATIVELY CHARGED POLYSTYRENE MICROSPHERES VERSUS THREE TIMES APPLICATION IN HARD-TO-HEAL DIABETIC FOOT ULCERS: A RANDOMIZED BLINDED CONTROLLED CLINICAL TRIAL

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Aim: We aimed to analyze the safety and efficacy of a new dose regimen in the treatment of hard-to-heal diabetic foot ulcers (DFUs) with negatively charged polystyrene microspheres (NMC).

Method: An RCT were performed included 30 patients with DFUs at specialized diabetic foot unit between May 2019 to February 2021. DFUs stage IA, IIA, IIIA, IC, IIC, or IIIC, according to the University of Texas Diabetic Wound Classification with duration between 1 and 24 months were included. Patients were randomized and allocated to receive topical application of a water-based sterile NCM suspension daily (control Group, CG) or three times weekly (experimental group, EG) for 4 weeks. Soft tissue punch biopsies were taken at patient enrollment, and every second week during 4-week treatment period (0/2/4) for cellular proliferation analysis by studying CD31-positive vessels, Actin and Masson's trichrome staining. The Wollina wound score (WWS) was used to evaluate wound conditions. Patients were followed-up for 3 months after inclusion.

Results/Discussion: 15 patients were included on CG and 15 on EG. WWS improved significantly in both groups [3.27±1.84 on day 0 to 5.81±1.72 on day 28 in control group (p=0.000) vs. 4.00±2.07 on day 0 to 6.00±1.00 on day 28 in experimental group (p=0.000)], without any statistically significant differences among groups, p=0.848. Median wound area in the experimental group was (day 0: 3.54±3.13cm^2 vs. day 28: 1.47±2.32cm^2; p=0.000) and control group (day 0: 3.90±5.54cm^2 vs. day 28: 2.45±4.51cm^2; p=0.000), without differences between groups (p=0.497). Cell proliferation was not significantly improved in the experimental group compared to the control group (see table). Complete epithelization was achieved 5 patients (33.3%) in the experimental group versus 3 patients (20%) in the control group; p=0.409.

Histology findings	Control-Group Day 0/Day 28	Experimental-Group Day 0/Day 28	P-value inter group
CD31 (arterioles)	2,20±1,03/2,20±0,91	1,55±1,50/1,44±1,50	0.239
CD31 (yolks)	1,30±0,48/1,30±0,48	1,88±1,05/1,66±1,00	0.322
Actin staining	0,60±0,84/0,60±0,96	0,66±1,11/0,66±1,32	0.958
Masson's trichrome staining	1.40±0,69/0,60±0,69	1,00±0,70/0,55±0,88	0.016

Conclusion: NCM treatment third a week showed similar efficacy that daily application in the treatment of hard-to-heal DFUs. Both dose regimen demonstrated significant improvement of granulation tissue formation, wound area reduction and same rates of healing during the treatment.

PP36 THE EFFECT OF TRANSCUTANEOUS CO2 ON CHRONIC WOUND HEALING, MICROCIRCULATION AND DIABETIC SYMMETRICAL NEUROPATHY IN DIABETIC PATIENTS

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Aim: The aim of double blind randomized clinical trial was to evaluate the effect of transcutaneous gaseous CO_2 application on chronic wound healing, microcirculation and diabetic symmetrical neuropathy in diabetic patients compared to placebo treatment in the control group.

Method: Sixty consecutive patients with diabetes with a unilateral chronic wound were randomized into a study group that received transcutaneous CO_2 therapy or a control group that received placebo treatment with air. Main outcome measures were: the size and volume of the wound, microcirculation of the skin on the wound evaluated with laser Doppler Flux and evaluation of the neuropathy with vibration and using Semmes–Weinstein monofilament test.

Results / Discussion: Transcutaneous gaseous application of CO_2 showed to be effective in chronic wound treatment compared to placebo control. Results showed significantly faster healing in the study group: 20 of the 30 wounds in the study group were healed compared to none in the control group. Mean wound surface and volume in the study group was reduced significantly (surface: 96%, p=0.01, volume 99%, p=0.003) compared with a small reduction in the control group (surface: 25%, p=0.383, volume: 27%, p=0.178). Laser Doppler measurements showed increased mean relative powers of LD flux signals related to NO-independent endothelial (0.07 ± 0.055 vs. 0.048 ± 0.059, p = 0.0058), NO-mediated endothelial (0.154 ± 0.101 vs. 0.113 ± 0.108, p = 0.015) activity compared to no statistically significant changes observed in the placebo group. Vibration, monofilament sensation, and temperature of the big toe improved significantly in the study group ($p < 0.001$, for vibration sensation, monofilament test), but not in the control group (p = ns for all evaluated outcomes)

Conclusion: Considering our results, transcutaneous gaseous CO_2 application shows promising results in improvement of microcirculation, treating chronic wounds and diabetic symmetrical peripheral neuropathy.

PP37 THE POWER OF TWO2: THE HEALTH AND ECONOMIC BENEFITS OF THE REAL WORLD USE OF CYCLICAL PRESSURIZED TOPICAL OXYGEN THERAPY IN THE HEALING OF DIABETIC FOOT ULCERS

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Aim: Diabetic Foot ulcers are a common sequela in the diabetic patient. They have proven to increase the morbidity and mortality of those diabetic patients with this condition. Healing the diabetic foot ulcer, as quickly as possible, with limited hospitalization and amputation is always the goal of therapy.

Method: A Multi-site study, using retrospective data, was collected from the clinical records of Diabetic foot ulcer patients. These patients were followed for at least one year. The main outcomes include wound closure, limited hospitalizations, and limited amputations as they relate to medical resource utilization and costs.

Results / Discussion: Significant differences are noted between the control group receiving good standard of care wound care and the group receiving both Cyclical Pressurized Topical Oxygen Therapy (TWO2) and good standard of care wound care.

Conclusion: The analysis indicates significant benefits attributable to using TWO2 as compared to not using this treatment modality. There is a notable decrease in the economic burden of healing diabetic foot ulcers when TWO2 in employed as part of the healing protocol.

PP38 COMPRESSION BANDAGE - IS IT A BOON FOR VENOUS ULCERS IN DIABETICS?

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Background: Venous insufficiency secondary to longstanding venous hypertension affects approximately 30 % of the population. Nonhealing venous ulcers are one of the most common forms of lower extremity ulcers in the present population. It is cumbersome to treat and is associated with high-morbidity, recurrence rate and immense treatment expenses.

Aim: The aim of the study is to compare the healing rate and area of healing in chronic venous ulcer with usage of silver impregnated foam along with regular four layer compression bandaging as versus four layer compression bandaging alone.

Materials and methods: A Prospective, open label, randomized, comparative, hospital based, single centered study was conducted among 130 subjects attending Diabetic foot surgery dept OPD, SL Raheja hospital (Fortis), Mahim, Mumbai meeting the inclusion and exclusion criteria over a period of 24 months from May 2019 to May 2021. All diagnosed cases of chronic venous ulcer were included for the study. Venous ulcers subjects with arterial insufficiency(ABPI < 0.8) and all other causes of chronic ulcers such as trophic, arterial ulcers, DVT were excluded from the study. Descriptive statistics, Chi-square test and Student-t-test were used to analyse the results.

Results and conclusion: The mean age group of the study subjects was 41.43+7.436 years in foam group and 44.86+10.341 years in four layered dressing group alone. The gender distribution showed 113(86.92%) males as compared to 17(13.07%) females. The foam along with regular four layer compression bandaging group was very effective as there was faster ulcer healing when compared to regular four layered dressing.

PP39 CONTINUATION OF CARE DESPITE COVID-19 PANDEMIC RESULTS IN STABLE OUTCOMES: A NATIONWIDE COHORT STUDY IN BELGIUM

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Aim: A national COVID-19 lockdown from March 14th until May 3rd 2020 allowed only urgent out- and inpatient care. The first phase of this study already showed that diabetic foot clinics (DFC) remained accessible to patients and the impact of the lockdown on DFU severity was limited to slightly larger lesions. This second phase investigates the impact of the lockdown on DFU treatment and outcome.

Method: Within the national care quality improvement initiative (IQED-Foot), a prospective cohort study was conducted among 21 DFC. 910 consecutive patients with DFU of Wagner grade ≥ 2 were included between January 1st and September 30th 2020. Patients were divided based on their first contact into the pre-lockdown (A, n=324), lockdown (B, n=94) or post-lockdown group (C, n=492). Groups were compared with each other and with 2018 data. Competing risks for healing, major amputation or death as first event were assessed by Cox proportional hazards regression.

Results: Revascularization rates of patients with (sub)critical ischemia were similar, but during lockdown a huge drop in open vascular surgery (A:10%, C:18%; B:3% vs. 31% in 2018, p<0.001) and a shift to endovascular surgery was detected. Also a temporary shift from offloading around the ulcer towards more ankle-high offloading (B:60% vs. C:42%, p<0.05) occurred. No differences were observed in surgical debridement, minor or major amputation rates. Healing after 6 months was similar between the 3 groups. The overall probability of DFU healing (HR=1.03, 95%CI:0.88-1.21), major amputation (HR=0.77, 95%CI:0.58-1.01) or death (HR=1.26, 95%CI:0.79-1.99) as a first event did not differ from 2018.

Conclusion: Belgian DFC guaranteed continued access and delivery of care during the COVID-19 crisis. Differences in offloading and revascularization treatment were observed. These might be explained by the necessity to reduce in-patient treatment or patient reluctance to long-term hospitalization. Nevertheless, similar outcomes were obtained compared to the 2018 results.

PP40 IMPACT OF THE COVID PANDEMIC ON DIABETES FOOT CARE SERVICE IN A TERTIARY SETTING

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Aim: The covid pandemic had a significant detrimental effect on service provision in all aspects of life including healthcare. Challenges posed during the pandemic required service reconfiguration. Diabetes foot clinic was one of the services which ran throughout the pandemic to ensure limb salvage. We aim to assess the impact of the Covid pandemic on diabetes foot care services based on the procedures in a tertiary care hospital.

Method: Data of 287 diabetes patients who underwent procedures for foot disease during a 3-year period (one-year pre-covid and 2 years during covid) from 2019-to 2022 were extracted retrospectively. They were analyzed based on age, gender, ethnicity, treating department, type of procedures, and duration of hospital stay.

Results / Discussion: There was a gradual increment in hospital admission for diabetes surgical foot procedures during Covid, especially among females. 75% of admissions were males and 25% were females during the second year of covid compared to 84% and 16% respectively during the pre-covid year. White British patients constituted 86% of patients who received treatment during the pandemic period of which 90% were older than 50 years which was comparable to pre-covid numbers. Vascular surgery admitted 80% of patients for treatment and 20% were admitted through other specialties during the pandemic similarly to the pre-covid period. The number of major procedures increased during the pandemic from 16% to 20 % which reflected the delay in delivering care at the early stages. Duration of hospital stay after the procedure remained stable before and during the pandemic with less than 2 weeks stay in 60% of patients.

Conclusion: Tertiary care hospitals strived hard to withstand the challenges during the pandemic to ensure limb salvage. The review of our data showed that deficits in health care delivery during pandemic restriction were reflected in increased female admissions and increased limb loss through major amputations.

PP41 TRENDS IN LOWER-LIMB MAJOR AND MINOR AMPUTATION IN PEOPLE WITH DIABETES IN THE FRIULI VENEZIA GIULIA (NORTHERN ITALY) DURING THE COVID-19 PANDEMIC

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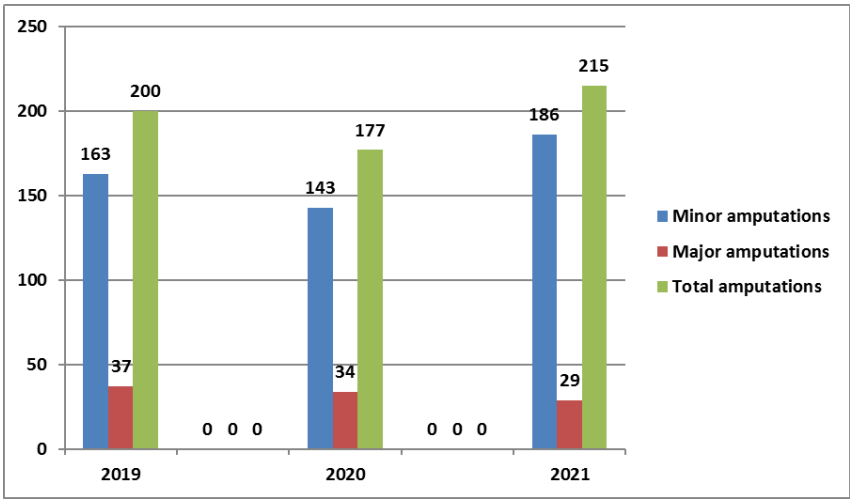
Aim: The impact of the coronavirus disease 2019 (COVID-19) pandemic on amputation incidence in whole Italian population with diabetes is unknown. Previous reports are restricted to small cohorts from single specialist centers showing different outcomes. We aimed to carry out a population-based assessment of lower-limb major amputation and minor amputation during period 2020-2021, compared with year 2019 in the Friuli Venezia Giulia (Northern Italy).

Method: In Friuli Venezia Giulia near 90.000 people have diabetes. We analyzed amputee and hospitalization rates for low extremity amputations (LEAs) in diabetic people, using the National Hospital Discharge Record database for the period 2019–2021.Lower limb amputations were classified according to their level: a minor amputation refers to any LEA below the ankle joint (ICD9-CM: 84.11–84.12);a major amputation refers to any LEA above the ankle joint (ICD9-CM: 84.13–84.19).

Results/Discussion: During 2019, 200 total amputations, 37 major amputations and 163 minor amputations were performed on people with diabetes in Friuli Venezia Giulia. During 2020,177 total amputations,34 major amputations and 143 minor amputations were performed while the numbers of procedures performed in 2021 were respectively 215 total amputations, 29 major amputations and 186 minor amputations. Compared with year 2019, major amputations were lower (-14,7% in 2020, -21,6% in 2021).

Conclusion: This whole-population study in the Friuli Venezia Giulia suggests significant reductions in rates of major amputation during the COVID-19 pandemic compared with those in the previous year. Lower rate of major amputation may have resulted from lower ulcer incidence due to reduced mobility in the context of home confinement, although no reliable data on ulcer incidence for the whole of Friuli Venezia Giulia are available. Furthermore, we think that the data relating to minor amputations may be underestimated in 2020 , because during the first wave of the pandemic we performed many outpatient surgical procedures.


250
200
150
100
50
0
163
37
200
0 0 0
143
34
177
0 0 0
186
29
215
2019
2020
2021
Minor amputations
Major amputations
Total amputations

PP42 THE IMPACT OF COVID-19 PANDEMIC IN AMPUTATIONS OF DIABETIC PATIENTS IN VASCULAR DEPARTMENT

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Aim/Background: It is undeniable that the COVID -19 pandemic has affected the clinical practice. Had a major impact on the care of non-communicable diseases across the world and diabetes mellitus is no exception. From the beginning of pandemic era until today many changes took place in our hospital. For a couple of months, the schedules appointments of our patients cancelled due to restrictive measures of our Government for COVID - 19. So many patients with diabetic foot ulcers didn't have the proper treatment and follow -up. A further problem among patients with diabetes has been an understandable and real element of fear. The majority of our patients frightened to attend to the hospitals and outpatient clinics.

Methods: We reviewed retrospectively the medical reports of diabetic patients who underwent minor and major amputations in vascular department of our hospital among two periods, from April 2019 to March 2020 (before COVID- 19 pandemic) and from April 2020 to March 2021 (COVID- 19 era).

Results: Before Covid -19 pandemic, 22 patients underwent major amputation and 12 patients' minor amputation, but at Covid-19 era 27 patients underwent major amputation and 41 patients minor amputation.

Conclusion: The percentage of major and minor amputation among diabetic patients during the pandemic has rise up. This was a global phenomenon. The fear and the measures to prevent the spread of the virus resulted in the delayed arrival in our department.

PP43 LOWER LIMB AMPUTATIONS IN SLOVENIA BETWEEN 2015 AND 2019

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Aim: Lower limb amputations are a significant quality marker of diabetes care in general and diabetic foot care in particular. The aim of our study was to explore the trend of lower limb amputations in Slovenia in the period 2015 – 2019.

Method: The data from the national study on hospital admissions between January 1st, 2015 and December 31st, 2019 were analyzed. The overall diabetes prevalence in the country was estimated from the number of recipients of antidiabetic drugs (oral agents, insulin and non-insulin injectables).

Results / Discussion: Within the observed period, 1232 major and 4055 minor amputations were performed, among them 670 (54.4%) major and 2370 (58.4%) minor in persons with diabetes. The absolute number of major and minor amputations per year increased from 123 and 455 in 2015 to 149 and 573 in 2019, but the relative number calculated on the number of recipients of antidiabetic medications remained stable with major and only increased in minor amputations. The detailed data are shown in the table.

Year	N of recipients of antidiabetic medications	Major amputations (N)	N of major amputations / 1000 recipients of antidiabetic medications	Minor amputations (N)	N of minor amputations / 1000 recipients of antidiabetic medications
2015	106318	123	1.2	455	4.3
2016	108549	124	1.1	409	3.8
2017	111346	137	1.2	444	4.0
2018	113793	137	1.2	489	4.3
2019	116374	149	1.3	573	4.9

Conclusion: Amputation registry in Slovenia does not exist. Our study was the first systematic data collection on amputations in the country and provides a good basis for future planning of health services.

PP44 CLINICAL CHARACTERISTICS, MANAGEMENT AND OUTCOME OF HOSPITALIZED PATIENTS WITH DIABETIC FOOT PROBLEMS IN VASCULAR SURGERY DEPARTMENT

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Aim/Background: Hospitalizations are common in patients with diabetes mellitus and especially in patients with diabetic foot problems. In this study, we examined the clinical characteristics, management and outcome of patients who have been admitted to our vascular surgery department.

Methods: We reviewed retrospectively the medical records of 148 patients admitted in the surgical department of our hospital for two years (January 2020 until December 2021) with diabetic foot problems.

Results: The mean age of the patients was 72.4± 10.3 years; 129 (87,1%) had type 2 and 19 (12.9%) had type 1 diabetes; 65 (43.9%) were females and 83 (56,1%) were males, 33 had severe soft tissue infection (22,2%)and 115 had critical ischemia or gangrene (77,8.%). 45 had only one diabetic foot infected ulcer (30,4%) and 79 had multiple diabetic foot infected ulcers unilateral or bilateral (53,37%).

A total of 31 patients (20,9%) had only surgical debridement or conservative therapies such as VAC, 69 underwent minor amputation (46,6%), 41 underwent major amputation (27,7%), 7 had bilateral major amputations (4,7%) and 20 patients died (13,51%). Surgical reperfusion interventions of lower limbs had 40 patients (27%). 83 patients admitted to our department more than twice (56%).

Conclusion: Critical ischemia and gangrene are the main reasons for hospitalization and amputation in diabetic patients. Less patients had surgical reperfusion interventions of lower limbs compared to pro Covid -19 pandemic era in our hospital.

PP45 MICROBIOLOGICAL DATA AND COMORBIDITIES OF HOSPITALIZED PATIENTS WITH DIABETIC FOOT PROBLEMS IN VASCULAR SURGERY DEPARTMENT

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Aim/Background: Patients with diabetic foot problems often hospitalized in vascular surgery wards. It is already known that diabetic patients have many comorbidities. As far as it concerned the microbiology of infected diabetic foot ulcers (DFU) is changing during the years. In this study, we examined the microbiological data and comorbidities of patients who have been admitted to our vascular surgery department.

Methods: We reviewed retrospectively the medical records of 148 patients with diabetic foot problems who admitted in our hospital for two years (January 2020 until December 2021).

Results: The mean age of the patients was 72.4± 10.3 years; 129 (87,1%) had type 2 and 19 (12.9%) had type 1 diabetes; 132 patients had hypertension (74.6%), 126 had dislipidaemia (39.3%), 97 had coronary heart disease (61.5%), 33 had COPD (16.4%), 7 had liver disease (2.5%), 18 had thyroiditis Hashimoto (0.8%). 39 patients had stage II-IV chronic kidney failure (13.1%), 13 underwent hemodialysis (4.1%) and 10 had renal transplantation (4.9%).

From soft tissues cultures 79.3% were positive; from them, the most frequent pathogens isolated in cultures were Gram-negative aerobic bacilli (62.7%). E. coli (29.5%) was predominant followed by Ps. Aeruginosa (17.3%) and Kl.pneumoniae (11.1%). Among Gram-positive aerobic bacteria (35.5%), Methicillin-resistant ***Staphylococcus aureus*** (MRSA) was the predominant pathogen (15.1%), followed by Methicillin-susceptible Staphylococcus aureus (MSSA) (11.2%) and Enterococcus species (9.2%). Fungi is the less common pathogen (1.8%). Multiple drug resistant (MDR) strains were isolated in 22.4% of all cultures.

Conclusion: Hypertension is the most frequent comorbidity in our patients. Enterobacteriaceae species and the non - fermenters gram negative bacteria were the most common isolated germs followed by MRSA. MDR strains remain high in recent years in our clinic.

PP46 CAN THE DURATION OF HOSPITALIZATION BE RELATED TO MAJOR OR MINOR AMPUTATIONS IN PATIENTS WITH DIABETES?

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Aim: The aim of our study was to determine the association between the duration of hospitalization of patients with diabetic foot and major and minor amputations during 15 years in the tertiary foot centre.

Method: Between 2006 and 2020, a total of 2,637 patients with diabetic foot with a mean age of 61 ± 0.8 years, 75% of men, were recorded in our hospital's registry. An average of 176 ± 16 patients were hospitalized annually with no significant difference between years. Associations of major and minor amputations with a median duration of hospitalization in each year were evaluated statistically in both absolute number and percentages of patients hospitalized each year during the 15-year follow-up.

Results / Discussion: Major amputations were performed in 185 cases in 169 (6.4%) patients; minor amputations were performed in 1067 (40%) patients. In the follow-up period, a significant trend of decreasing duration of hospitalizations was demonstrated ($r = -0.899$, $p < 0.01$, with a median of 10 (7-14) days). However, there was also a significant increase in the absolute number of major amputations ($r = 0.587$, $p < 0.05$); but as a percentage of the number of hospitalized patients with diabetic foot, this trend was not significant. In contrast to major amputations, the trend of minor amputations was significantly decreasing ($r = -0.713$, $p < 0.01$), even in percentage numbers. The median duration of hospitalization correlated significantly negatively with the absolute number of major amputations $r = -0.578$, $p < 0.05$) and conversely significantly positively with the number of patients with minor amputation ($r = 0.526$, $p < 0.05$).

Conclusion: Our results show that it is necessary to pay attention to the optimal time of hospitalization of patients with diabetic foot. In particular, treatment criteria must be met, but cost-benefit ration is also taken into account.

This study was supported by Ministry of Health, Czech Republic - conceptual development of research organization („Institute for Clinical and Experimental Medicine – IKEM, IN 00023001").

PP48 EVALUATION OF EXTERNAL AUDITS OF FOOT CLINICS IN CZECH REPUBLIC

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Aim: One marker of good quality of podiatric practice is to pass an external audit performed by Podiatric Section of Czech Diabetes Society. The last one was provided during the last year (2021).

Method: A questionnaire was sent to all out-patient departments that take care of diabetic foot (DF) patients.

Results / Discussion: Since the last audit in 2019 three new clinics started to work, totally we have 36 foot clinics. The mean working time was 24.5 hours a week for physicians and 26.9 hours a week for podiatric nurses. Mean number of treated DF patients with active diabetic ulceration was 29.2 a week and 6 Charcot foot patients a month. Preventive screening for DF risk provided by physician was in 35 foot clinics (13.6 patients a week). Podiatric nurses are able to provide treatment of pre-ulcerative lesions in 31 foot clinics (14.3 patients/week). Nurses perform podiatric education in all clinics. Screening of neuropathy is provided sufficiently in patients with new DF ulcer in all clinics. Different situation is in screening of peripheral arterial disease (PAD). In 6 foot clinics only palpation of peripheral pulses is provided, additionally in next 9 clinics only ABI are measured. Only 21 clinic are able to measure toe pressures or TcPO2 (or both) in daily routine. In addition, 10 clinics are able to provide duplex ultrasound scan for detection of PAD during patients visits. DF ulcer local therapy including sharp debridement is performing in all clinics. In 8 clinics the biomechanical examinations including podoscopy or pedobarography is available. Offloading is routinely used in all clinics, 7 of them are able to make total contact casts additionally.

Conclusion: In comparison to audit in 2019 plus 3 new clinics started to work. In comparison to 2019 audit we did not observed increase in working time and number of treated patients (but should be influenced by pandemic situation). Screening of neuropathy is sufficient. We observed a slightly increasing number of clinics thar are able to screen PAD sufficiently but still the screening of ischemia is insufficient in more than 1/3 of clinics.

PP49 IMPACT OF FLASH GLUCOSE MONITORING ON GLYCAEMIC CONTROL IN HIGH RISK DIABETIC FOOT PATIENTS

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Aim: To determine whether the use of flash glucose monitoring in diabetic foot patients aid in improving glycaemic control.

Method: 12 patients who regularly attend the high risk foot clinic for the management of complex diabetic foot ulcers, were provided with flash glucose monitoring (FGM) devices (FreeStyle Libre-2). All the selected patients were switched to basal- bolus insulin regime, if not already on it, prior to starting FGM. 11 of these patients had T2DM. Appropriate training in the use of the device was provided. The patients were reviewed in the foot clinic on a weekly to bi-weekly basis depending on the severity of foot ulcers and glycaemic control reviewed at each visit. HbA1c was checked just before and 3 months after the start of FGM.

Results:

The average HbA1c improved from 85.92 mmol/mol prior to starting FGM to 60.92 mmol/mol 3 months after. The greatest improvements were noted in those who had higher HbA1c at baseline. The best HbA1c attained was 49 mmol/mol compared to 95 mmol/mol at baseline, whilst the greatest improvement was of 55 mmol/mol (132 mmol/mol at baseline to 77 mmol/mol at follow-up). Conversely, 2 patients who had relatively good glycaemic control at baseline (59 mmol/L or less) showed no improvement in glycaemic control with FGM.

Discussion:

The utility of FGM in improving glycaemic control is well known and is currently widely used in T1DM and pregnancy. Its use in T2DM so far, according to the NICE guidelines, is restricted and not yet recommended for high risk diabetic foot patients.

Conclusion:

This study showed significant improvement in glycaemic control with the use of FGM, which is well known to have positive influence on wound healing. Further follow- up and larger scale studies are need to validate the findings and to observe the impact on wound healing.

PP50 ASSESSING DIABETIC PERIPHERAL NEUROPATHY IN PERSONS WITH DIABETES AND FOOT ULCERS HAS LIMITED USE IN CLINICAL PRACTICE

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Aim: The aim of this cross-sectional study was to evaluate the diagnostic performance of different diagnostic tools in persons with newly diagnosed foot ulcer at a tertiary diabetes treatment facility.

Method: Forty-eight individuals with T1DM and T2DM with newly diagnosed foot ulcers attending the foot clinic in 2020-2021 were assessed by neuropathy measurement: Bio-Thesiometer, monofilament (10g), pinprick, DPNCheck, Rolltemp™ and Sudoscan™. Bilateral abnormal measurement in one or more measure constituted neuropathy. Foot ulcer was classified with Texas Grading scale and the place and size of foot ulcer were identified.

Results: A total of 40 persons had T2DM (83.3%), 85.4% were male with a mean (SD) age 65.9±10.3 and diabetes duration of 23.2±12.8 years, BMI 30.7±6.0 kg, HbA1c 62.5±14.1 mmol/mol and eGFR (median (IQR) 77.5 (40.0-93.0) ml/min. Forty persons (83.3%) had a previous foot ulcer and 12 persons (25%) had an amputation.

Thirty-two (66.7%) persons had a Texas grading scale A1. A total of 28 (58.3%) persons had a toe ulcer, 15 (31.3%) had a forefoot ulcer and five (10.4%) had a hindfoot ulcer.

Forty-five (93.8%) persons had symmetrical neuropathy by Bio-Thesiometer (>25V) 21 (43.8%) by monofilament (10g), 18 (42.9%) by pinprick, 48 (100%) by Rolltemp™, 24 (50%) by Sudoscan™ on hands and 34 (79.1%) by Sudoscan™ on feet, and 15 (31.3%) by DPNCheck. In total 29 (60.4%) persons had an inconclusive result with DPNCheck.

Conclusion: In this study, we showed difficulties getting useable results assessed by DPNCheck. VPT measures and Rolltemp™ showed neuropathy in all persons. The use of these modalities does not allow for stratification of people with diabetic foot ulcers. Monofilament, pinprick and Sudoscan™ showed different neuropathy results. Further studies are needed to investigate whether these modalities can be used for risk stratification of persons with diabetes and foot ulcers.

PP51 THE USE OF A TOTAL CONTACT CASTING (TCC) ENHANCED WITH THE BÖHLER IRON TO PROMOTE HEALING AND AID SURGICAL INTERVENTION FOR CHRONIC DIABETIC FOOT ULCERS (DFU)

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Aim: DFUs can be difficult to heal with risk of relapse, often in high-risk individuals and where surgical intervention is not without risk. An established gold standard treatment for offloading active Charcot neuroarthropathy and neuropathic ulcers is the TCC.

The aim of this study was to explore the effectiveness of using the TCC with the Böhler iron prior to surgical correction of foot deformities to prevent risk of infection and relapse for a long-term solution.

Method: A retrospective study involving 7 patients, with ulceration to a metatarsal site and/or midfoot. 6 were male and 1 female with a mean age of 59yrs and a mean HbA1c of 60 mmol/mol. All patients included had been diagnosed with T2DM presenting with poor progression and relapsing neuropathic ulceration, who used a TCC and Böhler iron to aid healing and then underwent surgical treatment secondary to foot ulceration, over 2020-22 period. 5 of the ulcerated sites had shown a total of 10 previous relapses, each with a mean duration of over 2years.

Results / Discussion: 5 patients (71%) healed in the TCC and Böhler iron in a mean time of 11 weeks. 2 patient (29%) didn't complete the full duration of TCC due to an acutely infected DFU. 5 had good biphasic pulses and 2 required an angioplasty pre-surgery. On removal of the TCC due to total healing, pre surgery and transfer into customized insoles with therapeutic footwear, 3 had an ulcer relapse, so were recasted, until healed. All 7 patients had osteomyelitis radiologically and had a surgical procedure with implanted antibiotic loaded absorbable calcium ***stimulan*** biocomposite. 4 remain healed at 12 months duration with 3 healed but not reaching this timeline yet. The net financial saving of £63,000. The author acknowledges the limitations if this case due to small numbers

Conclusion: The management of non-healing and relapsing ulcers complicated by osteomyelitis are challenging. The use of TCC and Böhler is an important adjunct to aid healing pre surgery. This pathway suggests improved long-term management with less antibiotic therapy, fewer outpatient appointments and improved patient quality of life.

PP52 MINIMUM INVASIVE TECHNIQUE IS USEFUL OF DIABETIC FOOT DEFORMITY

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Aim: Minimum invasive therapy is effective treatment for correcting foot deformity. Especially, diabetic foot is a complex deformity and difficult to heal after surgery. Therefore, surgical invasive is the lower the better.

Method: A 78-year-old man had diabetic foot deformity (tailor's bunion) and he felt the pain of the left lateral fifth metatarsal head. His comorbidity is chronic obstructive pulmonary disease, and he always uses home oxygen therapy.

He used orthosis first, but he kept feeling pain. So he took minimum invasive therapy toward tailor's bunion.

Results / Discussion: The skin incision was 10mm and three area. Select the 12mm burr for the osteotomy. Fixation is achieved using a single screw.

A rigid flat shoe is worn on the operated foot for 4 weeks. His tailor's bunion was corrected, and he don't feel pain anymore. There is no adverse event.

Conclusion: Minimum invasive therapy is an effective method for diabetic foot deformity.

Figure: pre-operative(Lt) post-operative(Rt)

PP53 FOOT REVASCULARIZATION AVOIDS MAJOR AMPUTATION IN PATIENTS WITH ISCHAEMIC DIABETIC FOOT ULCERS

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Introduction: In the last years, diabetic persons with ischaemic foot ulcers showed a different and more severe pattern of peripheral arterial disease with an increased involvement of below-the-ankle (BTA) arteries. Therefore, BTA arterial disease in patients with ischaemic diabetic foot ulcers (DFUs) is a common challenge for clinicians involved in diabetic foot care. The current study aims to evaluate the effectiveness of foot revascularization in persons with DFUs and BTA arterial disease.

Methods: Consecutive patients who were referred for a new active ischaemic DFU requiring lower limb revascularization were considered for the study. Among those, only those with a BTA arterial disease were included. Revascularization procedures of included patients were retrospectively analysed: in the case of successful foot revascularization defined by angiographic features (recanalization of pedal artery, plantar arteries or both and presence of blood perfusion below-the-ankle documented by post-revascularization angiograms) or not, patients were respectively divided in two groups: successful foot revascularization (SFR) and failed foot revascularization (FFR). Healing and minor and major amputation after 12 months of follow-up were evaluated and compared between groups.

Results: Eighty patients (80) were included. The mean age was 70.5±10.9 years, 55 (68.7%) were male, 72 (90%) were affected by type 2 diabetes with a mean duration of 22±11years. Overall, 45 (56.2%) patients healed, 47 (58.7%) had minor amputation and 13 (16.2%) major amputation. Forty-seven (58.8%) patients had SFR, while 33 (41.2%) had FFR. Outcomes for SFR and FFR were respectively: healing (89.3 vs. 9.1%, $p < 0.0001$), minor amputation (44.7 vs. 78.8%, $p = 0.0001$), major amputation (2.1 vs. 36.3%, $p < 0.0001$). Successful foot revascularization was proved to be an independent predictor of healing [OR 8.5 95%CI (1.8-15.8), p=0.0001], foot salvage (protection from minor amputation) [OR 2.1 95%CI (1.3-7.1), p=0.001], and limb salvage (protection from major amputation) [OR 9.8 95%CI (1.2-16.6), p=0.0001].

Conclusions: Foot revascularization is mandatory to achieve healing and avoid major amputation in patients with ischaemic DFUs and BTA arterial disease.

PP54 IMPROVED OUTCOMES IN PATIENTS WITH DIABETIC FOOT ULCERS DESPITE OF DIFFERENCES IN BASELINE CHARACTERISTICS

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Aim: The incidence of diabetes is increasing worldwide with concomitant raising number of patients with diabetic foot disease. Diabetic foot disease treatment has received more attention in the past decades, culminating in the creation of multidisciplinary outpatient clinics, but at the same time, complexity of patients seems to have increased. The aim of this article is to study differences in patient characteristics and outcomes (ulcer healing and ulcer-free survival days) in patients with a diabetic foot ulcer in two prospective cohorts with 15 years in between.

Method: Prospective cohort study of all patients in one diabetic foot centre of expertise in 2003-2004 and 2014-2018. Clinical outcomes were determined after a follow-up period of 12 months. Outcomes were differences in baseline characteristics and comorbidities, and differences in ulcer-related outcomes between both cohorts.

Results / Discussion: We included all consecutive diabetic foot ulcer patients from our centre for the period 2003-2004 (n = 79) and 2014-2018 (n = 271). Age (67.0 ± 14.3 vs. 71.6 ± 11.5, p = 0.003) and prevalence of end-stage renal disease (1.3% vs. 7.7%, p = 0.036) were significantly higher in the more recent population. The more recent population had higher healing rate (53.2% vs. 76.4%, p < 0.001), higher median ulcer-free survival days once an ulcer had healed [173 days (IQR 85.3-295.5) vs. 257.0 (IQR 157.0-318.0), p = 0.026], and fewer minor amputations (20.3% vs. 8.1%, p = 0.002).

Conclusion: People with diabetic foot ulcers treated in 2014-2018 were older and more frequently diagnosed with ESRD, compared to this population in 2003-2004, while other characteristics were similar; ulcer-related outcomes were better.

PP55 FIRST ULCER INCIDENCE IN CORRELATION TO PAIN PERCEPTION IN NEWLY PRESENTING DIABETIC PATIENTS WITH NEUROPATHY IN A PROSPECTIVE OBSERVATIONAL STUDY

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Aim: Loss of protective pain (LOPP) is strongly associated with diabetic foot ulceration but pain perception assessment is not part of routine foot checks. PinPrick stimulator (512 Nm) has been shown to be able to detect LOPP (1).

The aim of this study was to explore the association between newly diagnosed LOPP detected by pinprick perception and a first diabetic foot ulceration.

Method: Between March 2017 and September 2018 we included all patients newly presenting in a specialised diabetes outpatient unit without any previous diabetic foot ulcer who were diagnosed with sensory neuropathy.

One hundred and one patients were included in the study and were followed up by routine foot checks, by phone interview or by letter until occurrence of a first ulcer, death, end of the observation period or loss to follow-up.

Results: After a median of 48month follow-up results of 82 of 101 patients were available. Among the 82 patients available for follow-up analysis, 46 had loss of pinprick perception at baseline on both sides, while six had sensory loss on one foot. Pain perception was normal in 30 patients.

Eighteen patients had developed a first ulcer during follow-up and 64 patients had remained ulcer free.

Among the 46 patients with lost pinprick perception at presentation, 12 experienced a first ulcer (26 %) during follow-up. A first foot ulcer occurred in 4 patients (13%) with normal pinprick perception at presentation.

Conclusion: First ulcer incidence was higher in patients with LOPP detected by PinPick stimulator. Further research in larger cohorts is needed to confirm the results as well as to compare the predictive value of different tests. If confirmed, these data indicate the likelihood of the onset of first ever ulceration in people either with and without loss of pain perception at first presentation.

(1) A Novel Diagnostic Test for End-Stage Sensory Failure Associated With Diabetic Foot Ulceration: Proof-of-Principle Study; E.A. Chantelau; Journal of Diabetes Science and Technology 1-8; DOI:10.1177/1932296819900256

PP56 ASSESSMENT OF THE EFFECTIVENESS OF THE CURRENT NUTRITIONAL SUPPORT IN REACHING THE DAILY ENERGY REQUIREMENTS OF PATIENTS HOSPITALIZED FOR A DFU

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Aim: Malnutrition is linked to impaired clinical outcome. Nutritional support has proven its usefulness in chronic wounds such as venous ulcers. However, only few studies have evaluated the effects of nutritional supplementation in patients with a diabetic foot ulcer (DFU).

Method: Patients were recruited when admitted for a DFU at the Antwerp University Hospital from May 2020 to October 2021. Body impedance analysis and anthropometric examinations were performed at admission and at discharge. The GLIM criteria were used to identify malnutrition. The individual nutritional need was determined, based on the Mifflin-St Jeor equation, enhanced by 30%. Enriched- and supplementary feeding was offered by nutritionists based on patient prefence. During hospitalization, a weekly nutritional intake registration was performed. DFU outcome was assessed at discharge and after 6 months.

Results / Discussion: The study population consisted of 49 patients, with a median age of 75 and median BMI of 26.9kg/m^2. Statistical analysis was performed on 215 nutritional intake registrations. Total energy requirements were reached in 65% of the population, regardless of the presence of malnutrition at admission. During the hospital stay, a gradual increase was seen in intake and in the proportion of patients reaching their nutritional needs. The group not reaching their nutritional needs had significantly higher CRP levels (45.8 vs 8.7 mg/L) but presented less frequently with osteomyelitis (50% vs 84%) and included all patients on dialysis (n=3). There was no significant difference in outcome of the DFU between patients reaching their nutritional needs or not.

Conclusion: The nutritional protocol was effective to cover the nutritional needs in the majority of DFU patients during hospitalisation, regardless of their nutritional status ad admission. The DFU outcome didn't differ between malnourished and well-nourished patients. Future research is needed to determine the possible causative role of nutritional support in this equal outcome.

PP57 A NEW DFU DESCRIPTION FOR PRIMARY CARE: A SIMPLE AND SMART MODEL TO ASSESS WOUND SEVERITY AND AVOID LATE REFERRAL

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Aim: Delayed referral to specialized diabetic foot services (DFS) is a common problem in diabetic foot ulceration (DFU). International Diabetic Foot Care Group (IDFCG) and D-Foot International developed a fast-track DFU to easily identify the ulcer severity and protocolize referral to DFS from Primary Care. Validate fast-track DFU based on the potential outcome for each grade of DFU severity was aimed.

Method: This retrospective study included consecutive patients with a new DFU who referred to a tertiary level DFS since January 2019 to July 2021. Pre-set limb salvage protocol following IWGDF guidelines was performed (using if needed revascularization, antibiotics, surgery, offloading, ulcer debridement and local wound care). DFU were classified into: ***uncomplicated***: superficial, not infected and not ischemic; ***complicated:*** ischemic, infected, deep or any ulcer in patients on dialysis or with heart failure; ***severely complicated***: abscess, wet gangrene, necrotizing fasciitis or fever or clinical signs of sepsis. Ulcer healing, healing time, minor and major amputation, hospitalization and survival were evaluated.

Results / Discussion: 291 patients were included, 30 (10.3%) with uncomplicated DFUs, 168 (57.7%) with complicated DFUs, 93 (32%) with severely complicated DFUs. 235 (80.7%) patients healed, mean healing time was 10±7 week, 94 (32.3%) minor amputation, 23 (7.9%) major amputation, 169 (58.1%) were hospitalized and 17 (5.9%) died during the follow-up. The outcomes for uncomplicated, complicated and severely complicated DFUs were respectively: healing 96.7%, 85.7%, 66.7% ($p<0.0001$), healing time (weeks) 4.4±3.3, 9.7±6.4, 13.3±8.3 ($p<0.0001$), minor amputation 3.3%, 17.9%, 67.7% ($p<0.0001$), major amputation 0%, 3.6%, 18.3% ($p<0.0001$), hospitalization 13.3%, 50.6%, 86% ($p<0.0001$), death 0%, 3.6%, 11.8% ($p=0.006$).

Conclusion: The study shows a linear correspondence between the grade of DFU

description severity and outcomes considered. The fast-track DFU may be a useful and simple clinical tool to be used in primary care to define the ulcer' severity and avoid late referral.

PP58 SKIN ADVANCED GLYCATION END PRODUCTS AS INDEPENDENT DETERMINANTS OF DISTAL SENSORIMOTOR POLYNEUROPATHY IN SUBJECTS WITH TYPE 2 DIABETES MELLITUS

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Introduction: Skin advanced glycation end products (AGEs) may be increased in diabetes mellitus.

Aim of the study: To examine whether skin AGEs are independent determinants of distal sensorimotor polyneuropathy (DSPN) in type 2 diabetes mellitus (T2DM).

Materials and methods: Overall, 132 subjects (88 men) with mean age of 64.57 years and median T2DM duration of 14.50 years were included. Skin AGEs were measured with AGE reader mu connect (Diagnoptics) on the dominant arm. DSPN was diagnosed by the neuropathy disability score (NDS). Small nerve fibre dysfunction was evaluated by temperature and pinprick sensation on the foot. Large nerve dysfunction was evaluated by ankle reflexes and vibration sensation. Vibration perception threshold (VPT) on the hallux was measured with a neurothesiometer (Horwell Scientific Laboratory Supplies). Multivariate logistic analysis was performed after adjustment for potential confounders (age, gender, BMI, HbA_{1c} and T2DM duration).

Results: In multivariate analysis, AGEs (continuous variable) were significant determinants of overall DSPN (aOR [adjusted odds ratio]=5.57, 95% CI [Confidence Interval]=2.66-11.65, p<0.001), of large nerve fibre dysfunction (aOR=3.91, 95% CI=1.98-7.69, p<0.001), of small nerve fibre dysfunction (aOR=5.19, 95% CI=2.47-10.90, p<0.001) and of VPT (aOR=3.53, 95% CI=1.87-6.65, p<0.001). When AGEs measurement was used as a dichotomous variable based on optimal cut-offs identified by Receiver Operator Characteristics (ROC) analysis, it remained a significant determinant of overall DSPN (aOR=6.94, 95% CI=2.98-16.21, p<0.001), of large nerve fibre dysfunction (aOR=5.30, 95% CI=2.13-13.16, p<0.001), of small nerve fibre dysfunction (aOR=6.77, 95% CI=2.89-15.85, p<0.001) and of VPT (aOR=4.56, 95% CI=2.07-10.04, p<0.001).

Conclusions: In T2DM, skin AGEs appear to be independent determinants of DSPN, both of small and of large nerve fibre dysfunction.

PP59 RESULTS OF A UK RESEARCH PRIORITY SETTING PARTNERSHIP IN DIABETIC FOOT DISEASE

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Aim: Diabetic foot disease is a life-changing event for patients, associated with high burdens of cost, mortality and morbidity. The Vascular Society Diabetic Foot Specialist Interest Group (VSDFSIG), in partnership with the James Lind Alliance (JLA), aimed to identify and develop key research priorities for preventing and managing diabetic foot disease.

Method: A modified JLA Priority Setting Partnership was undertaken. Two separate modified Delphi processes were undertaken with a) healthcare professionals and b) patients and carers. The final workshop was attended by patients, carers and healthcare professionals involved in diabetic foot care. Participants ranked research priorities in order of importance.

Results / Discussion: >100 research questions relating to diabetic foot disease prevention and treatment were submitted. This was narrowed to 23 questions in the second round of prioritisation, condensed into 12 research priority questions. These related to diabetic foot disease prevention (including recurrence and amputation), improving foot outcomes (treatment, risk assessment, blood flow, health promotion) and determining factors that affect healing time (delays in referral, foot infection, antibiotics, maggot therapy).

Conclusion: These top 12 research priorities in the prevention and management of diabetic foot disease will inform researchers, clinicians, and funders on the direction of future research.

PP60 A NOVEL ADJUNCT TO SIMULATION TO ENHANCE LEARNING

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Aim: To increase clinician's awareness, confidence and competence in identifying and managing severe and limb threatening diabetic foot ulcers (DFU) at Kettering General Hospital using clinical simulation.

Method: A realistic simulation scenario involving limb-threatening DFU was designed. The patient becomes septic and, upon correct assessment, participants discover an avascular limb. To enhance uptake into long term memory, the gangrenous diabetic foot was baked as a cake and was central to the post-scenario debriefing, led by the Trust's diabetic foot lead consultant. During the debrief the case was discussed and key messages shared while demonstrating various types of amputation. Pre and post scenario questionnaires were used to collect quantitative and qualitative data on confidence, perceived competence and knowledge around DFU management. The scenario was run for both doctors and advanced clinical practitioners.

Results / Discussion: On a 10-point-scale, participants felt an increased confidence by 3.82 points (2.68-5.00), and an increased perceived competence by 3.33 points (1.94-4.72). Before the session, 18% of clinicians were aware of a guideline for investigating and assessing the severity of a DFU. This increased to 91% following the session. Qualitative data was collected to analyze participants' take on important aspects of the early examination and time-critical interventions and referrals required. Post-session, participants picked up life and limb threatening features, reporting concerns such as radiological gas gangrene, crepitus and acute limb ischemia.

Conclusion: This novel idea used the unexpected incorporation of a life like, edible cake baked as a limb with a DFU. This provided a memorable simulation designed to increase awareness of the features of limb and life threatening DFUs. Our results suggest participating clinicians had greater confidence and perceived competence in recognizing and managing this condition. The use of cake provided an unforgettable lesson on a subject all grades of clinician can find daunting.

PP61 AN APPLICATION OF SNM FOR THE PROMOTION OF PHYSICAL ACTIVITY IN PATIENTS AT RISK OF DIABETIC FOOT

Piergiorgio Francia[1], Alessandra De Bellis[2], Anna Tedeschi[1], Ugo Santosuosso[3], Roberto Anichini[1]

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The knowledge and appropriate management of daily physical activity (DPA) is important for the treatment of patients with a history of foot ulcers, foot deformity, peripheral neuropathies and / or peripheral vasculopathies (at risk). The analysis of the social network map (SNM) could provide useful information for the management of these patients and the prevention of ulcers.

The aim of this study was to evaluate the relationship between the characteristics of the perceived SNM and the DAP in addition to the metabolic control maintained in patients with diabetes at risk of foot ulcer. Twenty-seven people were interviewed: 10 patients: (males/females:6/4), mean age 56,2±16,7 years, duration of diabetes 18,3±10,3 years, mean HbA1c 8,0±1,1%, body mass index (BMI) 27,0±4,1 kg/m^2, and in 17 nondiabetic controls matched for age, sex and BMI. Participants were asked to fill in an egocentric SNM, which was divided into 5 areas: leisure and DPA, family, job, health care, and other. It was assigned a value ranging from 0 (none) to 5 (maximum) to define the importance and frequency of the relationships reported. DAP was evaluated by the International Physical Activity Questionnaire-Short Form (IPAQ). In the patient group the duration of the disease was directly correlated with the health area ($r = 0.83$, $p < 0.1$) while the level of physical activity reported was inversely correlated with the family area ($r = -0.74$; $p < 0.01$). The importance of friendly societies reported was lower in the patient group (1.0 ± 2 vs. 3.8 ± 1.5; $p < 0.01$) while the area of leisure activities was inversely correlated with metabolic control ($r = -0.65$; $p < 0.05$) and directly correlated with disease duration ($r = 0.75$; $p < 0.01$).

The results of this pilot study showed that the analysis of patients' SNM could improve self-awareness and therefore provide additional information useful for better management of these patients.

PP62 FOOT EXAMINATION IN PEOPLE PRESENTING WITH FALLS, WITH AND WITHOUT DIABETES

Susan Mathew[1], Htet Oo Khine[1], Wynmyat Thu[1], Derek Farnham[2], Edward Jude[1 2]

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Aim: To assess the prevalence of peripheral neuropathy amongst patients admitted to hospital with falls

Method: Data of 223 patients admitted to hospital with falls were collected. Data of 78 patients were retrospective. The remaining 145 were prospective, including foot examination for peripheral neuropathy using 10 gram monofilament, toe touch test, vibration perception (128Hz tuning fork) and peripheral circulation (palpation of dorsalis pedis and posterior tibial artery).

Results: Of the 223 patients, only 1 had foot examination performed by the admitting team. Subsequently, all patients seen prospectively, had detailed foot assessment by the diabetes team.

33/ 145 (22.76%) patients had absent 10 g monofilament test indicating peripheral neuropathy. Assessment was not possible in 34 (23.45%) patients due to confusion. Vibration perception was impaired or absent in 42 patients (28.97%) and unable to perform in 37 patients (25.51%).

45 patients had T2 (8 on insulin, 32 on oral hypoglycaemics, 5 diet controlled) and 1 had T1 diabetes. Peripheral neuropathy was observed in 32.61% (15/46) of the diabetic cohort, being notably higher in this group than in the non-diabetic patients (18.18%).

28 patients (19.31%) had bilaterally absent pulses; 14 (50%) of whom had diabetes. It was unilaterally absent in 2 patients and unable to examine in 8 patients due to confusion/ aggressiveness.

Discussion: Peripheral neuropathy can cause an impairment in sensation, balance and coordination which can increase risk of falls. However, foot examinations are not routinely carried out in falls patients. Identification and management of peripheral neuropathy can reduce falls risk by providing education, appropriate orthosis and footwear, providing upper body strengthening exercises, use of canes etc.

Conclusion: Our study demonstrated that there is a high incidence of peripheral neuropathy and peripheral arterial disease in patients admitted with falls, especially in the diabetic cohort. This may be an important contributor to the aetiology of falls. Incorporation of foot examination into local falls protocols is advisable.

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- Reduced Hospitalizations and Amputations in Patients with Diabetic Foot Ulcers Treated with Cyclical Pressurized Topical Wound Oxygen Therapy: Real-World Outcomes; *Advances in Wound Care*; 2021

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  Diabetic Foot Unit. University of Tor Vergata, Rome,Italy
- Pr. José Luis Lázaro-Martínez
  Tenured Professor & Clinical Director of the Diabetic Foot Research Group, Complutense University & Health Research Institute at San Carlos Teaching Hospital, Madrid, Spain
- Dr. Claas Lüdemann
  Evangelisches Waldkrankenhaus Spandau, Berlin, Germany

BIOHEALING
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Session title: Advanced treatment of chronic resistant diabetic ulcerations by using 100% biological dressing.

Session chair: Assoc. Prof. Emil Martinka

Speakers:
- Assoc. Prof. Emil Martinka (Slovakia)
- Miroslav Koliba, MD (Czechia)

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Saturday 17 September 15:05 - 15:20

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- Dane Wukich, MD (USA)
  Professor and Chair of the Department of Orthopedic Surgery, University of Texas Southwestern Medical Centre
- Robert Frykberg, DPM, MPH (USA)
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