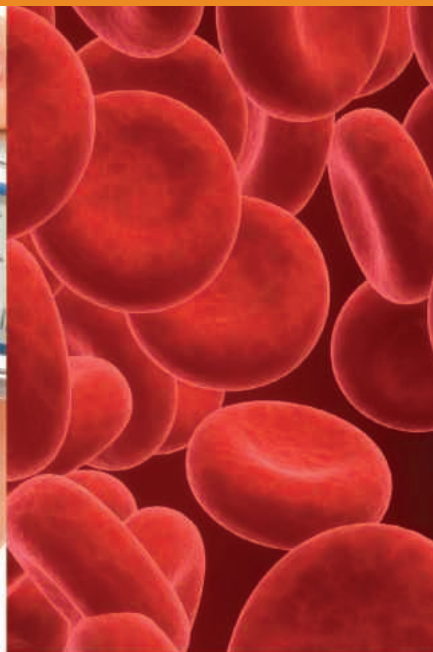


# Working together to find a cure for Diabetes

ANNUAL  
REVIEW

2016



Diabetes Research &  
Wellness Foundation

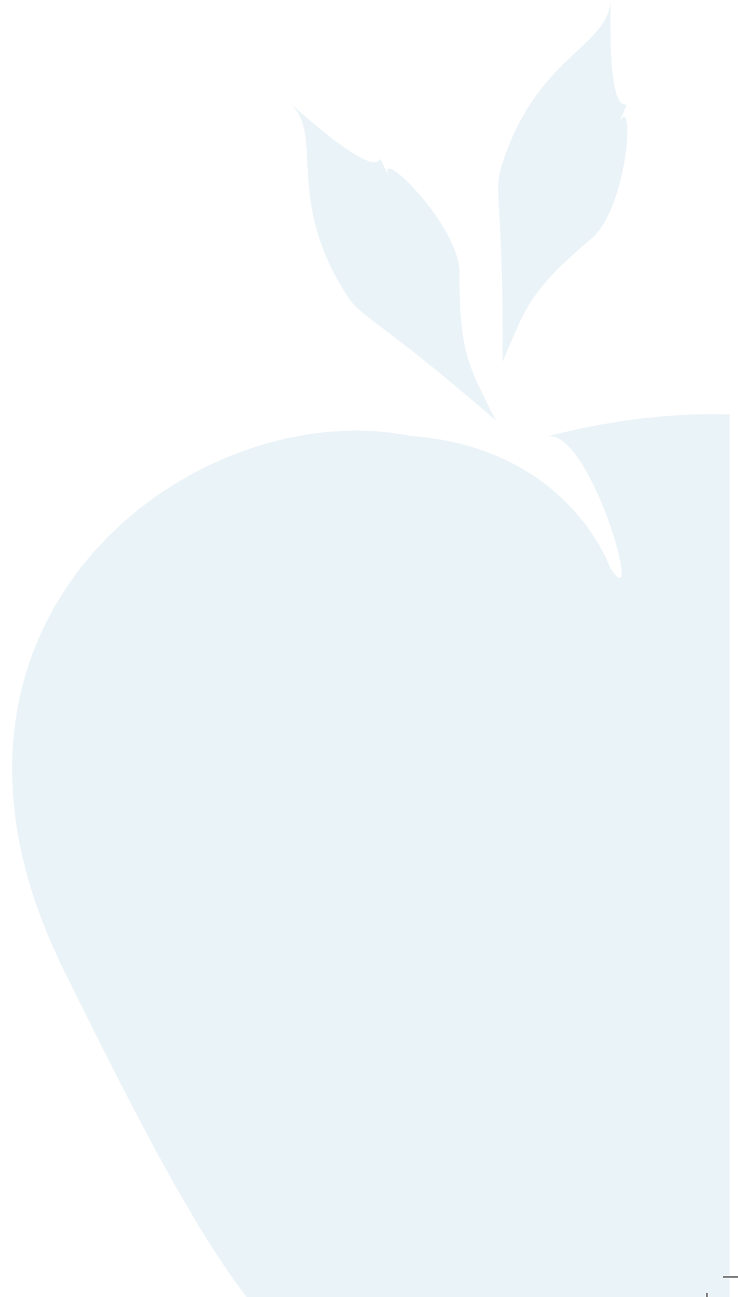


DRWF Research Advisory Board - World Diabetes Day November 2016.

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# Message from our **Chairman**



## **MICHAEL GRETSCHEL**

DRWF was first founded in 1993 to represent the diabetes patient community in the United States of America. DRWF UK was subsequently incorporated in 1998 and further groups established in France, Sweden and Finland. Whilst there is no legal connection between any of the groups, we have an overlap in board members to ensure a consistency of mission and to enable information sharing for awareness raising and research funding purposes. All groups are funding what we call 'fast-track research' which we believe will lead to benefits for people with diabetes in the shortest time-frame. Our long term multi-year funding commitments, such as Fellowships and Institutional awards, aim to find a cure for those who have battled this disease for many years.

Diabetes, and its associated health conditions, requires collective solution finding and working collaboratively with other DRWF groups around the world strengthens our financial commitment, builds capacity, and ultimately increases the potential for the work we fund to bear fruit.

Having been set up by parents of children with type 1 diabetes, medical practitioners and friends of people with diabetes, we know first-hand the challenges and burdens that this debilitating and increasingly prevalent condition brings not only to the person diagnosed, but to their family, friends and colleagues.

It is anticipated that by 2040 more than 642 million people will be affected by diabetes worldwide - around 80-90% of these having type 2.

In the UK, the NHS is spending about 10% of its annual budget on treating diabetes and its associated complications. That is a mind boggling £10 billion a year or £1 million an hour and much of this cost is attributed to treating complications that can often be prevented.

Our strapline of 'staying well until a cure is found...' underpins our research funding and delivery of our information and educational event programmes. Whilst we're funding in many cases "one of a kind" research in the UK and around the world, we are also providing authoritative, relevant and clinically evidenced patient information with the aim of supporting a pro-active approach to good self-management, which has been shown to reduce the risk of associated complications.

Our health and social care information has NHS England Information Standard accreditation. Around 90% of day to day care for people with diabetes is self-administered. It's a daunting and challenging prospect and ensuring that the right information and support is available is crucial to enabling people to take the best care of themselves whilst limiting the impact that diabetes has on physical and mental health and wellbeing.

I would like to thank our supporters for their continued commitment to our work. We exist largely on voluntary income and so individual donations and community fundraising initiatives play a crucial part in our income generation. It's sometimes hard to envisage how making a donation today can reap benefits for people with diabetes in the future particularly as research can take many years to come to fruition. But we are intent on maximizing potential and endeavour to support work that will provide clinical benefit in the shortest timeframe. We have certainly seen success in this respect from our commitment to supporting islet transplant and research at the Churchill Hospital, Oxford and within the UK Islet Transplant Consortium. More information can be found on this and all of our research funding commitments on our website [www.drwf.org.uk/funded-research](http://www.drwf.org.uk/funded-research).

The prevalence of both Type 1 and Type 2 diabetes continues to increase at an alarming rate and this makes us more determined to make our work count!

We are investing in a brighter future for people living with all forms of diabetes and have our supporters to thank for making this possible.

**W. Michael Gretschel**  
Chairman



**W. Michael Gretschel**

## The impact of diabetes

**Diabetes is a chronic, progressive disease that can have a debilitating impact on almost every aspect of life.**

Type 1 diabetes cannot be prevented. It occurs when the pancreas doesn't produce any insulin and is considered to be an auto-immune response in the body.

Type 2 diabetes is considered to be largely related to lifestyle factors. It can be prevented, or at least its onset delayed, in many cases by changing diet and exercise habits.



## The scale of the problem



More than 3.8 million people in the UK have diabetes and it is thought that around a further 500,000 adults have T2 but are yet to be diagnosed.



Diabetes is a global issue with more than 415 million people living with the condition around the world. This is expected to reach 642 million by 2040.



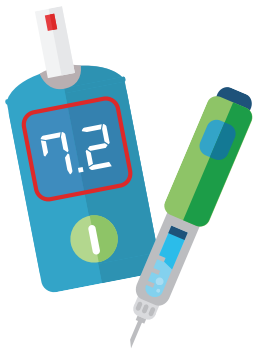
Diabetes, its care and treatment, is reported to cost the NHS almost 10% of its annual budget which is approximately £10 billion.

It is thought that around 80% of these costs is attributed to treating the complications of diabetes - many of which can be avoided.

Self-management is the cornerstone of diabetes care and to be effective, requires strong partnerships with health care providers and support networks.

We provide the information and tools to encourage and support a proactive approach to self-care.

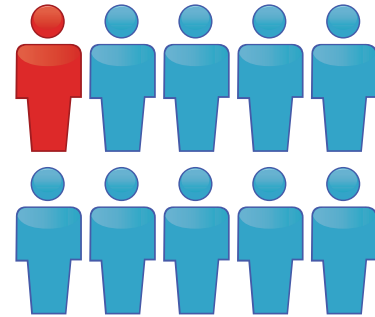
# There are 2 main types of diabetes



## Type 1

**cannot be prevented**

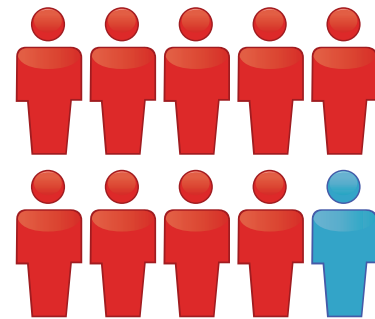
- Type 1 diabetes accounts for around 10% of those diagnosed with diabetes in the UK



## Type 2

**can be prevented**

- Type 2 diabetes accounts for around 90% of all those diagnosed with diabetes in the UK



Both Type 1 and Type 2 diabetes are associated with serious health complications, with an increased risk of cardiovascular disease, kidney disease, eye disease, nerve damage, amputation, poor oral health and sleep apnoea. People with Type 2 diabetes can sometimes go undiagnosed for many years whilst long term damage is being done because of the condition. It has been proven over time that good self-management can significantly reduce the risk of these complications.



## Running for DRWF



**DRWF supporter Jacqui Dodd, who has type 1 diabetes, and her husband Simon, ran the Great British London 10K Run on Sunday, 10<sup>th</sup> July in aid of the charity. They were part of a 19 strong team of fundraisers supporting DRWF on the scenic 10 kilometre (6.2 mile) route through the capital city. Jacqui explained why she decided to take up the challenge and how cauliflower has become an unexpected hit at meal times.**



2015 was a significant year for several reasons - I celebrated my 50<sup>th</sup> birthday and 10th wedding anniversary. And I learned how to transform the humble cauliflower from a simple white vegetable into a number of interesting and tasty recipes... But more of that later! At the time of my previous article (in the November 2014 issue of the wellness news) my 'diabetes garden' was starting to bloom again after a tough few months. My blood test results were back on track and I was in control of my type 1 diabetes. However, early in 2016 my blood tests and meticulous control started to wander off course. Despite trying a number of "tweaks" on my pump and administration of my insulin, things continued to go downhill rapidly.

My consultant asked if I was willing to try a low carbohydrate diet. By removing certain foods from my diet, it was hoped I could reduce the blood glucose spikes, which were starting to have a detrimental effect on my health. Foods I was advised not to eat included potatoes, rice, grains flour, certain fruit and vegetables. On bad days, this could feel like anything else worth eating.

I began researching and tried to find out as much information as possible to make meal times more interesting and avoid lettuce fatigue. I appreciate a good salad - particularly beef, blue cheese and balsamic roasted red onion, or charred grilled prawns, crispy smoked bacon and parmesan served with red cabbage, mixed leaves, cherry tomatoes and spring onion - but when salad ingredients make up a significant part of 14 meals out of 21, trust me - it can get very boring. Hence introduction of cauliflower to my diet. To date, I have tried cauliflower roasted and mashed, transformed into cous cous, rice and tortillas and - perhaps more impressively - chorizo and mozzarella pizza. Yes, I thought that too... But my advice is - give it a go! You may be pleasantly surprised. Although it can be a little time consuming and messy to create, it has become a firm favourite.

Through my recent ups and downs, I have received constant support from my Diabetes Team based in Newcastle, working together to find a solution that works for me, the person, rather than the person with type 1 diabetes.

### Why I support DRWF?

As a way to say thank you to DRWF, who were ultimately responsible for introducing me to my medical team I volunteered to run the British 10K London run.

As a non-runner, this in itself could prove to be enough of a challenge. But as a non-runner on a low carbohydrate diet and therefore a limited energy supply it would be an interesting few weeks.

*"It takes a bit more organising to run with type 1 diabetes but I have definitely seen that regular exercise has a beneficial effect. I have learned so much in the last few years and have a greater understanding of my diabetes control. Everyone is different and it really pays to improve your self-management skills so you control your diabetes and not the other way round."*

Jacqui and her husband raised **£1,000** for DRWF.



## Trustees

DRWF was born from a very personal connection with type 1 diabetes. Having two children diagnosed with the condition made for a commitment and dedication to the cause from Mike Gretschel and his business partner, John Alahouzos, that has never wavered and remains true to its original desire - to find a cure for diabetes.

The DRWF group was established in 1993 in the U.S. and in 1998, DRWF was incorporated and registered as a charity in the UK. Over the last 18 years we have become a recognised provider of awareness, educational support programmes and leading funder of diabetes research. The DRWF Board of Trustees are an engaged and committed group of individuals who bring a significant level of expertise to the governance of the charity in the fields of law, business strategy & management, international fundraising, psychology, healthcare and education.

### Michael Gretschel

#### Co-Founder Chairman of the Board

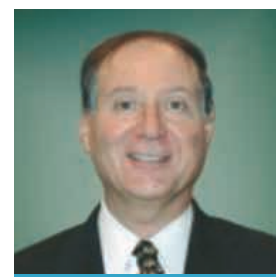
Volunteer fundraiser for diabetes research for over 30 years. Mike has a very personal interest in diabetes, with two children having Type 1. In 1993, Mike – along with others – founded the Diabetes Research & Wellness Foundation (DRWF). Since then, the DRWF International Network of charities has grown to include the Diabetes Research & Wellness Foundation (DRWF) in the UK; Association pour la recherche sur la diabeté (A-rd) in France; Diabetes Wellness Network Sverige (DWNS) in Sweden and a new group just starting out in Finland. All groups work autonomously, but with the same objective, and work collaboratively on international awareness and research funding campaigns. Collectively, the groups have committed more than £55 million in awareness, education and research funding since inception.



### John Alahouzos

#### Co-Founder Volunteer fundraiser for diabetes research since 1978

John Alahouzos is a marketing executive by profession and a volunteer for 'The Diabetes Cure' by choice. For almost 38 years he has worked alongside his friend Mike Gretschel to raise funds and awareness for the need to cure diabetes. After many years of volunteer fundraising for the Juvenile Diabetes Research Fund in the US, John, Mike and their wives founded the Diabetes Research & Wellness Foundation (DRWF) in 1993. John is the Chairman of the Board of Trustees of the Diabetes Research & Wellness Foundation in the US and serves as a trustee on the board of the Diabetes Research & Wellness Foundation in the UK, as well as their affiliates in France, Sweden, and Finland.



### Jeffrey Harab

#### Bachelor of Arts, Juris Doctor. Attorney-at-Law, 1979

Jeff has been a member of the Board of Trustees of the Diabetes Research & Wellness Foundation (DRWF) since 2001. He is also a board member of the Association pour la recherche sur le diabeté (A-rd) and is an alternate board member for Insamlingsstiftelsen Diabetes Wellness Network Sverige (DWNS). Each of these groups, along with DRWF in the UK, form part of the International Diabetes Wellness Network, and collaborate on global diabetes awareness campaigns, educational programmes and research funding initiatives.



### Valerie Hussey

#### Retired Nurse, Musgrove Park Hospital, Taunton

Val has been a member of the Board of Trustees of DRWF since 1999. She is also an alternate board member for Insamlingsstiftelsen Diabetes Wellness Network Sverige (DWNS). Having worked as a nurse within the NHS for many years, Val has a keen interest in ensuring that people with long-term conditions have the resources available to them to self-manage their condition as effectively as possible. She is a keen supporter of the charity's educational event programme.



### Rae-Marie Lawson

#### Retired Psychotherapist MA.Dip; CertEd., Warsaw College, West Midlands

Rae was diagnosed with Type 1 diabetes more than 30 yrs ago and experienced a debilitating lack of hypo awareness which impacted on all aspects of her life. She received two islet cell transplants at the Oxford Centre for Diabetes, Endocrinology & Metabolism (MODEM) in 2010 which houses the DRWF Human Islet Isolation Facility and has been insulin injection free since then.



## Chris shares healthy diabetes recipe tips



**DRWF supporter Chris Edwards has appeared in a new cooking film for Waitrose in which she helps prepare healthy recipes for people with type 2 diabetes.**

Chris, of Clanfield, Hampshire, has had type 2 diabetes for 15 years and in the video she joins Silvana Franco to make blueberry drop scones. The video is available to view now at the Waitrose website, as part of their series called *Love Life and Eat Well*.

Chris said: "I was asked if I was interested in filming a promotional film for Waitrose. As a person with type 2 diabetes, I was invited to do a cookery spot on their Love Life and Eat Well mini-series. It sounded interesting, so I agreed. "A week later, I had a phone interview with the producer, and was told that I was suitable for the programme, and then received several emails detailing the venue, and what they wanted me to wear (that included no bright colours, bold stripes or spots, no nail varnish or dangly earrings!)."

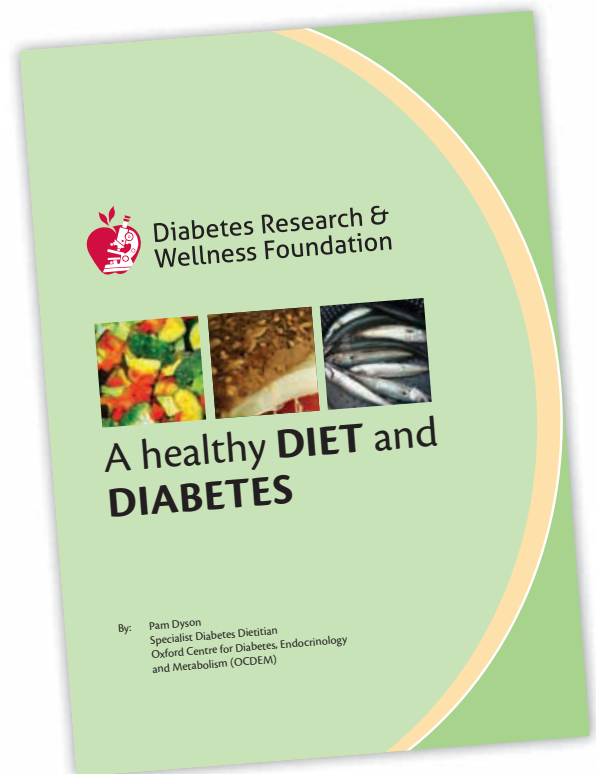
"One Thursday morning last November I got the 6am train to London Waterloo, and then made my way across London to the studio in Shoreditch, where the filming took place. I was made very welcome. I was introduced to the senior nutritionist from Waitrose, who was overseeing the filming, chef Silvana, and the film crew. There seemed to be at least 20 people involved in the production."

"The recipe we prepared was blueberry drop scones, and we filmed the cooking at least four times during the next three hours, with numerous 'cuts and takes', and during the filming I spoke about my experiences of having type 2 diabetes, how it had altered my eating patterns, and my choices of food. At the end everyone was tucking into the scones."

Chris added: "It was a very enjoyable day, and I am grateful to the DRWF for giving me this opportunity."

Sarah Tutton, DRWF Chief Executive, said: "We were approached by Malt Films at the latter part of last year to help them find a participant with type 2 diabetes. Chris has been a DRWF supporter for some time, she is articulate and informed and works tirelessly to support people with diabetes. I'm so pleased we were able to help and that Chris had such a wonderful day in the studio. It is also marvellous that Waitrose are demonstrating that eating well with diabetes does not have to be bland and boring."

Watch Chris in the kitchen preparing the blueberry drop scones recipe at: [http://www.waitrose.com/home/tv/healthy\\_eating/love-life-and-eatwellfordiabetes.html](http://www.waitrose.com/home/tv/healthy_eating/love-life-and-eatwellfordiabetes.html) The DRWF leaflet A healthy diet and diabetes can be read at <https://drwf.org.uk/diabetes-leaflets> and can be ordered by emailing [enquiries@drwf.org.uk](mailto:enquiries@drwf.org.uk) or calling 023 92636136.





# Editorial Advisory Board

## Dr Sarah Brewer

### GP, Health Journalist and Specialist in Nutritional Medicine

Dr Sarah Brewer MSc (Nutr Med), MA (Cantab), MB, BChir, RNutr, MBANT qualified from Cambridge University with degrees in Natural Sciences, Medicine and Surgery. After working in general practice, she gained a master's degree in nutritional medicine from the University of Surrey. As well as being a licensed doctor, Sarah is now also a Registered Nutritionist, a Registered Nutritional Therapist and an award winning health writer. Sarah is the author of over 50 popular self-help books, including *Overcoming Diabetes* (Duncan Baird) and *Natural Approaches to Diabetes* (Piatkus). Her latest books are *Live Longer Look Younger*, and *Eat Well, Stay Well*, published by Connections. Sarah is the editor of *YourWellness* magazine [www.yourwellness.com](http://www.yourwellness.com). Follow her occasional nutritional Tweets at [www.twitter.com/DrSarahB](https://www.twitter.com/DrSarahB).



## Dr Deborah Broadbent

### MRCOphth, Ophthalmologist / Director of Liverpool Diabetes Eye Centre

Deborah Broadbent MB ChB (Liverpool) DRCOG (London) DO (London) MRCOphth graduated from Liverpool University in 1976 and has been working as an ophthalmologist since 1978. In conjunction with colleagues she set up the Liverpool Diabetic Eye Study in 1991 and in 1996 she became the full-time Director of the Liverpool Diabetes Eye Centre.

Over the past 20 years she has developed an expertise in the epidemiology, diagnosis and management of diabetic eye disease, published many original papers and been an invited speaker at both national and international meetings. In September 2002 she was appointed as the Lead in Workforce, Training and Education to the English National Screening Programme for Diabetic Retinopathy, and has worked with Skills for Health, NHSU, the National Open College Network and City and Guilds to develop National Occupational Standards in retinopathy screening and a suite of mandatory national qualifications awarded by City and Guilds for all personnel involved in the identification of sight threatening diabetic retinopathy across the UK. She was appointed as Honorary Associate Clinical Professor with Warwick University, advising on the Masters in Diabetic Retinopathy programme, in 2010, and as Honorary Senior Lecturer in the Department of Eye and Vision Science at the University of Liverpool in 2013.



## Andrea Cameron

### Head of the School of Social and Health Sciences, Abertay University

Andrea has worked in Health Care since 1982. After qualifying as a nurse she specialised in Coronary Care Nursing before becoming a Nurse Teacher. She then moved to teaching Sports Science, but remains a registered nurse and qualified exercise instructor. She has undertaken doctoral studies examining the information given to patients with Diabetes by health professionals in the primary care sector and has published in the area of volunteering and employment skills. Andrea has also run for Scotland at international veteran events, and has been a contributor for DWRWF since 2004.



## Professor Edzard Ernst

### Professor in Complementary Medicine, Exeter

Professor Edzard Ernst is Chair in Complementary Medicine and Director of Complementary Medicine at Peninsula Medical School in Exeter. His expertise lies in acupuncture, autogenic training, herbalism, homeopathy, massage and spinal manipulation. He has published more than 1,000 articles in peer reviewed medical literature, 500 original research papers and has written, or been editor, of more than 40 books. Edzard is Editor-in-Chief and founder of two medical journals, and sits on the editorial board for 20 other journals, including DWRWF's *Diabetes Wellness News*.



**Azmina Govindji**

**Registered Dietitian and TV Nutritionist**

Azmina is a registered dietitian, consultant nutritionist, broadcaster and best-selling author. She is director of Azmina Nutrition [www.azminanutritions.com](http://www.azminanutritions.com) and shares daily tips at <http://on.fb.me/AzNutrition>. Azmina has written 15 books including the Gi Plan with Nina Puddefoot and The Diabetes Weight Loss Diet with Antony Worrall Thompson. She was Chief Dietitian to Diabetes UK from 1987-1995 and is currently a media spokesperson for the British Dietetic Association.



**Gwen Hall**

**DSN, Community Diabetes Services Portsmouth, Primary Care Team**

Gwen Hall, Independent Diabetes Specialist Nurse, trained as a Mental Health Nurse in Scotland and, having moved to England, completed her general training in Surrey. She worked for many years as a Practice Nurse/Nurse Practitioner, Practice Nurse Trainer and Diabetes Facilitator. Latterly she became a Diabetes Specialist Nurse in Primary Care and this year took up a post with the award winning Community Diabetes Team in Portsmouth.

Gwen is Associate Editor-in-Chief of Diabetes & Primary Care and on the editorial board of the *Journal of Diabetes Nursing* and *Diabetes Digest*. She has regularly published articles in these and other journals. In 2005 Gwen was elected Vice-Chairman of the Primary Care Diabetes Society. She was responsible for updating Mary MacKinnon's book *Providing Diabetes Care in General Practice* and was awarded the Mary MacKinnon lecture at Diabetes UK's Annual Professional Conference in 2008. She continues to lecture widely on diabetes nationally. She is an Associate Clinical Teacher for the University of Warwick and a past Visiting Fellow of the University of Surrey.



**Emma Howard**

**Community Diabetes Lead Podiatrist, Oxford Health NHS Foundation Trust**

Emma qualified with a BSc Hons Podiatry from the University of Brighton in 1997 and began working as a community podiatrist for the NHS in Shropshire. During this time she completed the Society of Chiropractors and Podiatrist Diabetic Foot Module and began working in acute diabetic foot clinics in Telford and Shrewsbury. After nearly 10 years she moved to work at Knowsley PCT on Merseyside as a Diabetes Team Leader in a community trust.

In 2009 she accepted a position for Oxford Health NHS Foundation Trust where she works as a Community Diabetes Lead Podiatrist. She specialises in the care of the diabetic foot and high risk wound care. The clinics run across community settings and within OCDEM (Oxford Centre for Diabetes, Endocrinology and Metabolism).

She has worked with DRWF since 2007 developing the foot care advice leaflet and has attended the Walking holidays and Wellness Weekends to give presentations and informal advice on foot care in diabetes.



**Dr Alison Kirk**

**Lecturer in Physical Activity for Health, University of Strathclyde, Glasgow**

Alison was appointed in January 2009 as a Lecturer in Physical activity for Health at Strathclyde University, Glasgow. She completed a BSc in Physiology and Sports Science at the University of Glasgow (1998) before undertaking a PhD through the same university (completed 2003). She was then appointed as Lecturer at Dundee University before moving to Strathclyde University. Alison currently teaches on the BSc Sport and Physical Activity degree course. She teaches various aspects of physical activity and health and clinical exercise science. Alison's specialist research area is in behaviour change of physical activity and sedentary behaviour with emphasis towards prevention and management of chronic disease. She has particular focus towards diabetes but with past and current funded research in breast and colon cancer, respiratory and cardiovascular disease. Alison has a drive towards implementation of research findings and knowledge exchange within community and clinical practice and has worked with a number of community and clinical groups on related projects and guidelines.

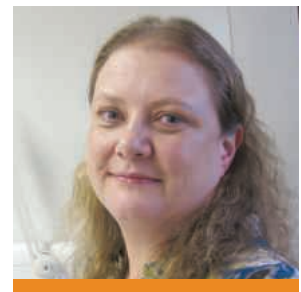


**Dr Alastair Leckie****MBChB DRCOG MRCGP FFOM, Consultant in Occupational Medicine, OHSAS**

Alastair is a consultant in occupational medicine and director of OHSAS, an NHS based service provider for occupational health. He graduated from Edinburgh University in 1986 and initially trained and worked as a general practitioner. He trained in occupational medicine at the Institute of Occupational Medicine before moving into his current role. Alastair is involved in postgraduate training for GPs, specialist trainees, and occupational health colleagues. He is an honorary senior clinical lecturer at the University of Glasgow. He frequently sees people in his clinic with diabetes to advise them and their employer regarding any work issues or work based assistance that may be required. Alastair is currently President of the Society of Occupational Medicine.

**Henrietta Mulnier****RGN MSc PhD, Lecturer in Diabetes Nursing/DSN, King's College London and Guy's & St Thomas' Trust**

Henrietta Mulnier RGN MSc PhD is a Lecturer in Diabetes Nursing at the Florence Nightingale School of Nursing and Midwifery, King's College London. She also works clinically as an Honorary Diabetes Specialist Nurse at St Thomas' Hospital London. She has been nursing for nearly 30 years; specialising in diabetes since 1995. Having completed a Doctorate in 2008 her current focus is on research to benefit patient care for those with diabetes. Henri has published widely and is a reviewer for several journals. She is a member of the current National Institute for Health and Clinical Excellence Guidance Development Group for type 1 diabetes and is also on the editorial board for Diabetes & Primary Care.

**Dr Mayank Patel****Consultant Physician in Diabetes, University Hospital Southampton NHS Foundation Trust**

Dr Mayank Patel has worked as a Consultant Physician in Diabetes and Acute Medicine at University Hospital Southampton since 2008. Since starting as a Consultant, he has overhauled and developed the trusts adult inpatient diabetes service and worked with commissioners to bring new adult multidisciplinary insulin pump and diabetic foot services to the trust. He co-developed 'DiAppbetes', the smartphone application to help healthcare professionals manage inpatients with diabetes. He also contributes to medical undergraduate and postgraduate diabetes training, as well as regularly delivering diabetes education to patients, public and other healthcare professionals in primary and secondary care.

**Professor Philip Preshaw****Specialist in Periodontics, University of Newcastle**

Philip Preshaw is Professor of Periodontology and Consultant in Restorative Dentistry at Newcastle University, UK. He received his Dental Degree from the University of Newcastle in 1991 and his PhD in 1997. He is a registered specialist in Periodontics and is a Fellow of the Royal College of Surgeons of Edinburgh. His main research interests are investigations of the pathogenesis of periodontal disease, and links between diabetes and periodontal disease. Professor Preshaw lectures frequently, and has numerous publications in peer-reviewed scientific journals. He has been awarded a UK NIHR National Clinician Scientist Fellowship, a Distinguished Scientist Award from the International Association of Dental Research, and a King James IV Professorship from the Royal College of Surgeons of Edinburgh for his contributions to research.

**Lay members**

DRWF engages lay users in the drafting and production of their health and social care resources.

# Awareness, Information & Support

Diabetes continues to escalate globally with around 415 million people currently affected by the condition, this equates to 1 in 11 adults. It is estimated that by 2040 1 in 10 adults will be affected, increasing to around 642 million people. Further, 1 in 7 births is affected by gestational diabetes and every 6 seconds, a person dies from diabetes.

In the UK, there are more than 3.8 million people diagnosed with diabetes and it is estimated that there are around a further 500,000 adults with type 2 diabetes, who don't yet know it. The treatment of diabetes in the UK costs the NHS around 10% of its annual spend, this is around £10 billion per year of which around 80% is spent on treating associated complications, many of which can be avoided.

The Public Accounts Committee found, in early 2016, that there was significant variation in diabetes care delivery in England with many not receiving the support necessary to manage their diabetes effectively and reduce the risk of avoidable, and costly, complications. Whilst there are structured education courses offered to people being diagnosed with all forms of diabetes, availability across the country is disparate and participation sporadic.

Diabetes has been placed firmly at the top of the health agenda and it remains to be seen how this will translate into action that addresses the physical and mental health of those affected, as well as the significant financial burden that diabetes places on the NHS.

- During the year, we continued to raise awareness via multi-media channels with consistent messaging to differentiate between type 1 and type 2 diabetes, helping people to understand that whilst type 1 diabetes cannot be prevented, much can be done to prevent or delay the onset of type 2.
- We distributed more than 782,000 direct mail campaigns in 2016 containing awareness information and calls to action. With a positive response from 11% of those mailed, we know that at least 82,000 people across the country read the information contained within the campaign. We know from years of experience that it is likely that many more opened and read the information, but chose not to make direct contact with us at that time. Historically, we have seen numbers of people respond to communications that have been distributed many months before, sometimes even years, as they have held onto the information provided for future reference. The volume of direct mail distributed in 2016 reduced by around 16% on 2015 however the response rate increased by 1%.
- Our Diabetes Awareness Necklace is distributed free of charge to people with diabetes and healthcare professionals for onward distribution. These necklaces provide emergency identification for those with diabetes should they be unable to alert the emergency services to their condition. They carry the wording 'I have diabetes, please test my blood before treating me'. They are distributed along with medical check-up cards which are used to record tests and results to inform self-management strategies. Around 4300 necklaces were distributed during the year to diabetes and related health care professionals and those living with diabetes. This represents a 28% decrease on the numbers distributed in 2015 however figures were skewed somewhat in 2015 due to the free necklace offer being picked up by a specific 'free offer' site which generated a high volume of requests.
- We publish a series of diabetes information leaflets which carry NHS England Information Standard accreditation. These resources are available to the public free of charge and can be accessed on our website as pdf or audio files. HCPs also request these leaflets in bulk to distribute within their clinics and surgeries. More than 44,100 leaflets were distributed during 2016. This is around 8% lower than the volume distributed in 2015. However, there were more than 8437 downloads of this information from our website during the year which represents a 41% increase on the previous year.



More than 137,567 copies of our monthly newsletter, Diabetes Wellness News, were distributed to subscribers and regular givers in our Partners for the Cure programme during the year. This is 4% decrease on the previous year with the majority of this reduction due to 'deceased' notifications. The newsletter is circulated to paying subscribers and on a complimentary basis to healthcare providers. It is available in large print, audio format or alternative on request. Healthcare professionals receive the newsletter each month and they share the information with their patient communities, therefore it is difficult to accurately predict the true readership of the newsletter. The number of healthcare professionals on our HCP database during the year decreased by 0.5% on 2015 – remaining fairly static at 4236 contacts at year end.

The newsletter also carries NHS England Information Standard accreditation which demonstrates that the information provided is relevant, clinically evidenced and up-to-date, and that a robust production process including peer review is performed on each publication. We were successfully audited on these processes to maintain accreditation in 2016. This also extends to the provision of health and social care information within the Living with Diabetes section of our website [www.drwf.org.uk](http://www.drwf.org.uk)



Diabetes Wellness educational events – We have been running an annual programme of Diabetes Wellness events since 2001. We work with diabetes and related healthcare professionals to facilitate workshops that provide relevant, up-to-date, evidence based information covering all aspects of diabetes and related health. Delegates choose the sessions and talks that they attend meaning that they create their own agenda for the day, improving engagement and supporting better outcomes. These events bring together a wealth of information and expertise under one roof.

The event programme is devised and delivered by experts and offers rotating workshops which focus on the day to day management of diabetes and also prevention and management of associated complications. An exhibition hall provides a central hub which is zoned by theme covering health, technology, social networking and community support to ensure that delegates are provided with a holistic range of support with lots of sign-posting to other service providers so that they can access support in a way that best suits their needs.

We know that managing diabetes is challenging and so effective coping strategies are crucial to support optimal health. These coping strategies are important not just to people living with diabetes but their family, friends and carers. Peer support plays an important part in emotional wellbeing and this in turn can have an obvious impact on the ability to self-manage effectively. For this reason, we feel it is important to include family, friends and carers in workshops and discussions which facilitates discussion around managing diabetes, perceptions and expectations, in an environment where everyone has experienced or is experiencing something similar. These events are relaxed and welcoming in approach. They are inclusive and provide for diverse needs. They also provide an amazing opportunity to spend time with a whole host of health care professionals asking the questions that really matter to the individual in an unhurried way.

National guidelines recommend that people living with diabetes should be offered structured diabetes education which involves a range of activities to increase knowledge and skills around self-management. Whilst we certainly don't feel that our Wellness events replace the need or conflict with structured education courses on offer via the NHS, we do believe that they are supportive of the ongoing need to refresh and gain

new knowledge throughout the lifetime of a long term chronic condition. We see a high volume of people that come back year on year for this reason as well as newly diagnosed who have been recommended to attend by their own healthcare professional. In 2016, we held 4 events across the country accommodating more than 350 delegates.

We worked with Barnard Health Research Ltd to conduct a study into the benefits of support events in a more formalized and robust way in terms of impact on facilitators and associations with improved diabetes outcomes in line with NICE guidelines that focus on provision of evidence based practical advice, the importance of education and diabetes related information including dietary advice, managing cardiovascular risk, managing blood glucose levels and identifying and managing long-term complications. Our view being, that providing an environment where the factors important to optimal diabetes outcomes are addressed in a relaxed, friendly and supportive way will result in increased awareness, improved knowledge and understanding about diabetes, improved self-efficacy and improved well-being. We used validated models such as the WHO-5 wellbeing index, the diabetes self-efficacy scale and the diabetes distress scale alongside questions specific to the event. The outcomes of this study have enabled us to see the positive effect that our Diabetes Wellness event programme has on participants and has supported development and change for the 2017 event programme.

The same evaluation programme will be conducted on all events throughout 2017 to increase representation and enable us to regroup with some of the participants from 2016 to see whether they have made and sustained any behaviour changes as a result of information learned at the DWDS in 2016.

### Support of external health and wellbeing events - DIABETES PROFESSIONAL CARE 2016



DRWF was invited to participate in #DPC2016 - a newly established professional conference for diabetes and related healthcare professionals. We were invited to be the registration sponsor which gave DRWF fantastic exposure right at the entrance of the event. With over 2000 attendees across the two-day programme, we met with many existing contacts and were able to reach out to new industry and healthcare professionals to promote the charity's patient information resources and educational event programme. A good relationship has been forged with the event organisers who have subsequently gone on to regularly engage with us both in supporting fundraising efforts and in making introductions which they believe will support the charity in its work. One such relationship is with HiCom Technology.

HC is the producer of a diabetes clinical management tool which is widely used within the NHS for recording medical information of diabetes patients. They are currently working on a patient portal module for this CRM to enable patients to access some of the medical data that is currently being held on them with a view to supporting good self-management and data sharing amongst multi-disciplinary teams. Within this module HC are keen to refer to DRWF patient information resources and as such we are helping them to run a focus group at one of our Wellness Events to gather information to find out what would be useful and how it could be used. HC are also supportive of the charity's fundraising events and are contributing both professional support in running our social media campaigns as well as providing volunteers and event sponsorship.

## Gifts in Kind

Gifts in Kind are non-cash donations made to the charity, such as medical supplies, which the charity is then able to redistribute to other organisations who may benefit, where these medicines may not otherwise have been available or are in short supply. In 2016, we received two donations of type 2 diabetes and related health medicines with a wholesale value of approximately £2.5 million. These medicines were gifted onwards to our programme partner, Dominican Republic Instituto Dominicana de Accion (IDAC) and subsequently enabled treatment of 481 children and adolescents (15-19 years) and 8821 (20+ years), 46% of which were over the age of 60. Treatment was delivered in city hospitals/clinics and the improved availability and access to these medicines, increased the opportunity for new patient treatment. The provision of these medicines also enabled the continuation of treatment (90 days) which may otherwise not have been possible.

The administration and distribution costs of these medicines were approximately £28,000 meaning that we were able to magnify the benefit of this cost, given the value of the original donation, almost 100 times over.



## A Few Kind Words...



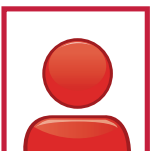
*"It is both an honour and privilege to support education events for people with diabetes. Access to high quality education, of an appropriate standard, in an appropriate setting is fundamental if we are to get successful patient engagement. Education is pivotal if we are to successfully support and empower patients to take charge of their diabetes as much as is possible."*

*The programmes and events that the DRWF organise and run have always been well received by patients and as long as I am needed, I am happy to support this worthwhile cause."*

**Dr Mayank Patel Consultant Physician in Diabetes, University Hospital Southampton NHS Foundation Trust – Outstanding Educator Quality in Care Diabetes (QiC) awards 2015.**

*"I joined DRWF last year and have learned so much from their publications and newsletters that my confidence in managing my health has increased enormously."*

**Jan Edwards**



*"Your necklace saved my aunt's life."*

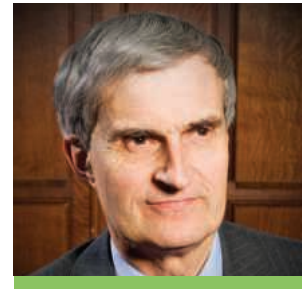
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## Research Advisory Board

Our Research Advisory Board comprises experts in a wide variety of research disciplines to ensure that all applications are assessed knowledgeably and fairly. As a member of the Association of Medical Research Charities we are committed to maintaining a rigorous peer review process for the assessment of research applications, for which the Advisory Board are responsible. This process ensures that only the highest quality research at the best institutions receives DRWF funding. When we are awarding a DRWF Fellowship, we are also intent on rewarding determined and committed individuals who have a proven track record in diabetes research and can display an intention to continue working in the field. It is our hope that a DRWF Fellowship can serve as a significant and fruitful step in the career of a bright, young and ambitious researcher.

### Chairman - Professor David R Matthews, MA, DPhil, BM, BCh, FRCP

Professor of Diabetes Medicine, University of Oxford. Medical Tutor and Vice Principal at Harris Manchester College, Oxford. Emeritus founding chairman of the Oxford Centre for Diabetes, Endocrinology and Metabolism. David's interests include mathematical modelling of insulin resistance, homeostatic model assessment of beta-cell function and insulin resistance. He is the author of the HOMA model; has a long-standing interest in new therapeutic agents for type 2 diabetes, and was a co-investigator of the UKPDS. A founding trustee of the Oxford Health Alliance, he was the first Executive Director of the Global Alliance for Chronic Disease; a world-wide association of six research councils collaborating in the fight against Chronic Disease. He is Co-Director of the UK Diabetes Research Network; has over 230 publications and is on the editorial boards of several professional journals.



### Dr Rob Andrews

Rob Andrews is an associate Professor of Diabetes and Endocrinology at the University of Exeter and an Honorary Consultant Physician at Musgrove Park Hospital Taunton.

At the University he leads a group that researches the role that exercise and diet can play in the prevention and management of Diabetes. Ongoing studies include the long term effects of diet and diet and exercise interventions in patients with newly diagnosed Type 2 Diabetes (ACTID follow up); the role that sedentary time has in the metabolic characteristics of patients with Type 2 diabetes (STAMP 2); how exercise can affect beta cell function in Type 1 diabetes (EXTOD). He is also leading a project that aims to develop and pilot an education programme for patients with Type 1 Diabetes and health care professionals to guide insulin and carbohydrate adjustment for safe and effective exercise.

At Musgrove park hospital as well as doing regular Diabetes and Endocrine clinics he runs specialist adult, adolescent and paediatric sports clinics to give advice to sports men, women and children who have Type 1 diabetes.



### Professor Kath Barnard

Health Psychologist / Visiting Professor, Bournemouth University.

Professor Katharine Barnard, Chartered Health Psychologist, specializes in the psychosocial impact and management of diabetes. She has a longstanding research interest in the psychosocial issues associated with diabetes and its management. Through this research, a greater understanding has been gained of the factors that contribute to therapy choices and quality of life; and the impact that diabetes and its' treatment has on both the individuals with the condition and their family members.

The effect of diabetes, both medically and psychologically in terms of everyday coping, psychosocial impact, functional health status and psychological burden, is a multifaceted and complex area and Professor Barnard's research to date has made significant advances in unravelling some of these complexities. Professor Barnard has published extensively, is often invited to speak both nationally and internationally and leads cutting edge postgraduate training.

Professor Barnard's currently leading on psychosocial aspects within several multi-centre RCTs evaluating diabetes technologies such as closed-loop, insulin pump therapy and bolus calculators. She is the PI of the INSPIRE study into psych aspects of artificial pancreas devices; the UK psychological lead on global diabetes attitudes wishes and needs research; Principal Investigator in a programme of research to minimise alcohol associated risks for young adults with T1DM; is engaged in ongoing research in co-morbid depression and diabetes; health technology assessment; and patient-professional communication to support enhanced self-management and motivation. Professor Barnard is a recent Chair of the Diabetes UK Annual Professional Conference, Expert Advisor to NICE, Associate Lecturer at a number of UK universities and sits on the editorial boards of several journals and funding bodies.



**Professor Peter Jones**

Peter Jones is Professor of Endocrine Biology in the Diabetes Research Group at the Guy's campus of King's College London. Peter obtained his PhD at the National Institute for Medical Research (London) studying peptide hormones in the central nervous system. He started working on beta-cell function in diabetes as a postdoctoral fellow at Queen Elizabeth College in 1984. He was awarded an R.D. Lawrence Fellowship by the British Diabetic Association, followed by a Medical Research Council Senior Research Fellowship, after which he took up an academic position as Lecturer in Physiology at King's. He was awarded the British Diabetic Association R.D. Lawrence Lecture for 1997 and the Diabetes UK Dorothy Hodgkin Lecture for 2015 in recognition of his work on beta-cell function. His research interests remain with the beta-cell, with current focus on cell-cell interactions within islets of Langerhans, strategies for improving islet transplantation therapy for Type 1 diabetes and novel therapeutic targets for Type 2 diabetes.

**Professor Paul Squires**

Paul Squires is Professor of Biomedical Science at the Joseph Banks Laboratories, University of Lincoln. He was previously a Reader in Diabetes & Endocrinology and Course Director for Biomedical Science at the University of Warwick and a Diabetes UK, RD Lawrence Research Fellow (King's College London). With 25yrs experience researching diabetes, including placements at the University of British Columbia in Canada and Uppsala University, Sweden, he has published 70+ papers and contributed to Research Advisory Boards for Diabetes UK, the European Foundation for the Study of Diabetes and DRWF. Prof. Squires studies sub-cellular mechanisms that regulate insulin secretion and action and his group is currently involved in determining how cell adhesion, cell-coupling and cell-to-cell communication synchronize activity and function within the renal nephron and pancreatic islet.

**Dr. Ian Salt PhD**

Senior Lecturer at the Institute of Cardiovascular & Medical Sciences, University of Glasgow  
Ian graduated as a biochemist at the University of Bristol prior to gaining his Ph.D. in beta-cell biochemistry from the University of Dundee in 1997. He held fellowships from the British Heart Foundation and Diabetes UK before taking up his current academic post at the University of Glasgow. Ian is currently a senior lecturer in the Institute of Cardiovascular and Medical Sciences at the University of Glasgow. His principal research interests are the molecular mechanisms that link diabetes, insulin resistance and the risk of developing cardiovascular disease.

**Professor Anna Gloyn DPhil**

Anna's research is focused on using naturally occurring mutations in humans as tools to identify critical regulatory pathways and insights into normal physiology. Her early post-doctoral research led to the identification a new genetic aetiology for permanent and transient neonatal diabetes due to KCNJ11 mutations and resulted in one of the first examples of the determination of the molecular genetic aetiology leading to improved treatment options for patients. Current research work focuses on the translation of association signals for T2 diabetes and glycaemic traits into molecular, cellular and physiological mechanisms and clinically useful tools. Anna is a member of several international consortia, including DIAGRAM (Diabetes Genetics Replication and Meta-analysis), MAGIC (Meta-analysis of Glucose and Insulin traits Consortium) and the Genetics of Type 2 Diabetes (GoT2D).





### Dr Rory McCrimmon

Dr Rory McCrimmon underwent his basic medical training at the University of Edinburgh and completed his clinical training in the South-East of Scotland before becoming an NHS Consultant Physician in Diabetes and Endocrinology at University Hospital Aintree, Liverpool, in 2000. In 2002, he left his NHS position and joined the faculty at Yale University, Connecticut, to further develop his basic research in the central regulation of glucose homeostasis. In 2009 he returned to the UK to join the University of Dundee and is currently a Clinical Reader in Translational Medicine.



### Professor Luigi Gnudi

Professor Luigi Gnudi of Diabetes & Metabolic Medicine, King's College London School of Medicine, Cardiovascular Division, Waterloo Campus, London, UK obtained his MD with Honours from the University of Parma (Italy) in 1988. He subsequently joined the residency programme in Diabetes and Endocrinology at the University of Padua Medical School - Italy (1989-1993). During 1992-1995 he worked as a postdoctoral fellow with Prof Barbara B Kahn at Beth Israel Hospital, Harvard Medical School in Boston. In 1999 he obtained a PhD in Endocrinological Sciences from the University of Milan and in 2005 he became a Fellow of both the Royal College of Physicians and the American Society of Nephrology.

In 1997 Luigi Gnudi was appointed Senior Lecturer in the Unit for Metabolic Medicine within the Cardiovascular Division of King's College London School of Medicine, and in 2011, was promoted to Professor of Diabetes & Metabolic Medicine. He has been Head of the Unit for Metabolic Medicine since 2010. He is an Honorary Consultant Physician in Diabetes, Endocrinology and Metabolic Medicine at Guy's and St. Thomas' Hospital NHS Foundation Trust in London.

He is an active researcher, clinician, and teacher with major research interests in the study of diabetic nephropathy and diabetic vascular complications in man. He has published more than 70 original papers, books and monographs and meeting proceedings on these topics.



### Professor Angela Shore

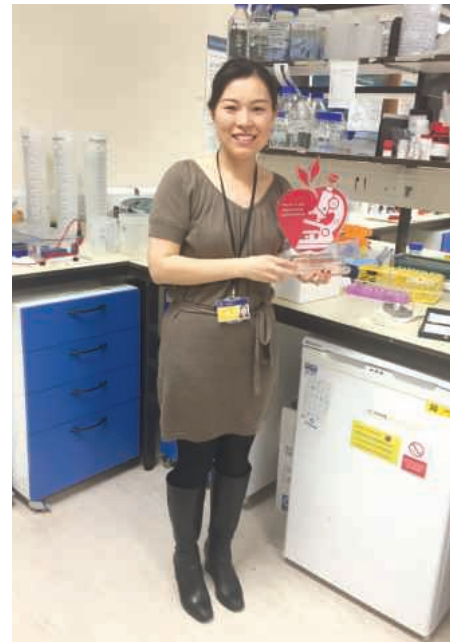
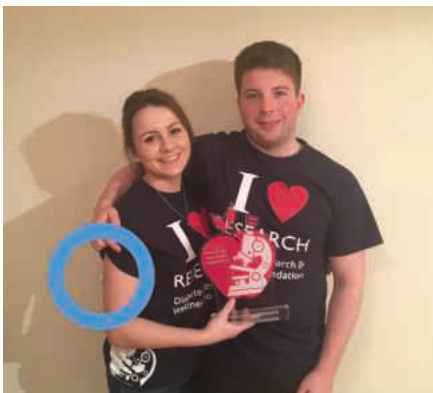
Professor Angela Shore is the inaugural Vice-Dean Research for the University of Exeter Medical School, and was previously Interim Vice-Dean Research for the Peninsula College of Medicine and Dentistry since 2009. She is the Scientific Director of the NIHR Exeter Clinical Research Facility for Experimental Medicine and Associate Director for Experimental Medicine for the UKCRN diabetes research network.

Professor Shore graduated in Physiology from the University of Newcastle and was awarded her PhD for an investigation of the vascular mechanisms underlying fluid homeostasis in patients with Liver Disease. Following postdoctoral positions at the University of London where she expanded her research into the vascular aspects of hypertension, Professor Shore moved to the Postgraduate Medical School Exeter in 1987 to establish the clinical microvascular research unit funded by the Wellcome Trust. Currently Professor Shore's work which is funded by the British Heart Foundation, Diabetes UK, European Union IMI JU and NIHR investigates novel approaches to the identification of early vascular complications and patient stratification for cardiovascular risk.

She was appointed Professor of Cardiovascular Science in 2000.



# DRWF Funded researchers proudly display their DRWF plaques on World Diabetes Day.



## Research Funding Programme

We provide research grants to researchers whose work we consider to offer the best hope and most expedient path to improved understanding of T1 and T2 diabetes; new and improved treatments and management strategies and ultimately a cure. Awards are offered as a 3-year Clinical and Non-Clinical Fellowship and 1 year Pump Priming project awards. Institutional awards are available on a multi-year basis. Contract funding of key personnel within the DRWF Human Islet Isolation Facility at the Churchill Hospital, Oxford is provided on a 2-3 year basis dependent upon results.

We are a member of the Association of Medical Research Charities (AMRC) and as such support the use of a rigorous peer review procedure in the allocation of our research funding. Our Research Advisory Board (RAB) is a multi-disciplinary panel of clinicians and scientists who assess applications for funding. Our processes are audited every 5 years by AMRC, the last time being 2015, when once again, we successfully passed this independent evaluation.

### Islet Cell Research & Transplant in the UK and around the world

DRWF has made a considerable contribution to the funding of islet cell research and transplant in the UK and the US. The DRWF Human Islet Isolation Facility at Churchill Hospital, Oxford plays a pivotal role in providing islets for research and transplant as part of a national treatment programme, the clinical element of which is funded by the NHS.

Three personnel are funded within the facility. In 2015, we secured funding from a major donor via New Philanthropy Capital (NPC) to cover the contracts of 2 of these positions, the Laboratory Manager and the Post-Doc researcher for 3 years and 2 years respectively. The second report on progress was submitted to the major donor in November 2016 and demonstrated the following -

- 3 successful transplants were performed using islets isolated and transported from the facility in Oxford to Edinburgh, Newcastle and Kings College, London.
- 2 islet preparations were transplanted in Oxford patients.
- >90% of patients achieved resolution of hypoglycaemia unawareness.
- As part of the commitment to broaden the donor pool, a significant number of pancreases from marginal donors were processed.
- Eleven out of 32 pancreases processed resulted in an islet yield of >250,000 IEQ. This outcome matches the leading isolation centres world-wide for this range of donors.
- 26 islet preps were distributed to a wide-range of research groups throughout the UK.
- Novel research continues into optimising islet culture, including co-culture with mesenchymal stem cell media, development of physiological islet scaffolds, and design of a novel islet culture.
- The Oxford centre is a key partner in a Horizon 20/20 European Grant and continue to be central to the Oxford Biomedical Research Centre (recently re-awarded).

The Oxford team is working to address the current challenges presented in terms of availability of organs for transplant; improving islet isolation techniques in order to increase the number of insulin producing cells isolated from donor organs to improve function and survival of cells post-transplant.

Whilst there are clearly many challenges to the wider availability of human-to-human islet cell transplants which are being addressed in the UK and around the world, we have continued to fund work based in the US which is spear-headed by Professor Bernard Hering, of the Schultz Diabetes Institute Minnesota, a leading expert in the xeno-transplant field, who seeks to find an alternative, sustainable supply of islet cells for human transplant. This work has gained much ground since its original success was published in Nature magazine in 2006 and edges closer to FDA approval of clinical trial.

The islets for these studies are provided by the non-profit organisation Spring Point Project (SPP). Spring Point's primary aim has been to be the pre-eminent source of medical grade porcine tissue utilised to cure diseases—with a primary commitment to cure diabetes. To this end, SPP operates the Diabetes Research and Wellness Islet Resource Facility, which was made possible due to substantial financial support from the DRWF International Network of organisations. The SPP team has unique experience producing "medical grade" pigs and viable pig materials under the current Good Manufacturing Practices (cGMP) required by the U.S. Food and Drug Administration (FDA). The "medical grade" tissues from Spring Point's pigs are a key resource for the development of suitable, viable materials for a variety of medical applications including islet cell replacement therapies to reverse diabetes in the clinic.

Working with industry and academic partners the SPP team has now established the capability to produce isolated islet cells with the consistency and scale required to enable clinical trials. The team is currently producing millions of islets a month which are being used for research in the US and around the world. In 2016, the SPP team produced over 32 million islets. Research and development on final islet replacement products remains to be done before clinical trials, but with the critical supply of islets in place, they are now on the fast track to begin.

In 2017, SPP plans to renovate part of the Diabetes Research and Wellness Islet Resource Facility to establish an on-site cellular manufacturing facility. This new manufacturing space, complete with its state of the art cleanrooms and controls, will be used to produce the cGMP quality islet replacement products to be used in future clinical studies. SPP recently discussed these plans with the FDA resulting in confidence that, once established, the islets produced in the cellular manufacturing facility will indeed be readily acceptable for clinical studies.



# 2016 Research Grant Awards

Two calls for applications were advertised in 2016 - A 3-year Non-Clinical Fellowship and a 1-year Pump Priming round with the following awards being allocated -



**2016 NON-CLINICAL FELLOWSHIP – 2 awards were made from a total of 39 first stage applications, 11 second stage full applications and 4 interviews totalling £359,763**

**Institution:** University of Bristol

**Recipient:** Dr Jody Ye

**Project:** Epigenetic changes in multi-generation type 1 diabetes families

**Amount:** £179,774



**Summary:** The aetiology of type 1 diabetes (T1D) is multifactorial, approximately 40% is genetic while the environment contributes to the remainder. The incidence of T1D increases at a rate of 3% annually with the most rapid rise occurring in children under 5 years. This increase is too rapid to be explained by an evolving gene pool. A number of environmental risk factors have been postulated to cause this increase but the critical interplay between external insults and islet autoimmunity is not understood. Epigenetic regulation such as DNA methylation at the cytosine-phosphate-guanine (CpG) dinucleotides is a potential mechanism that mediates environmental exposures to increase phenotypic plasticity, which may explain the 'missing heritability' enigma and the increasing incidence in T1D. The team of my collaborative mentor Dr. Yaron Tomer, has recently identified 109 differentially methylated DNA regions (DMRs) in affected monozygotic twins with T1D, strongly pinpointing epigenetic alterations in T1D.

I propose that in a unique cohort of multi-generation families, methylation levels of certain genomic regions have changed over time and are more distinctive in the recent generations of T1D patients. Acting alone or in concert with susceptible genetic variants, they may lead to increased phenotypic plasticity and immunological challenges in response to environmental interferences.

I will address this hypothesis in three specific aims. Aim1: in whole blood, I will assess whether T1D specific DMRs will be different in the most recent generation of diabetic children compared with their parents and grandparents using genome-wide methylation microarray and targeted pyrosequencing; Aim2: I will verify these specific changes in fresh isolated immune cell subsets from a group of newly diagnosed patients and controls; Aim3: at a functional level I will dissect the molecular mechanism(s) of candidate DMRs on several important immune regulatory elements and T1D associated genes in vitro and ex vivo



*"The commitment to strong peer review practice demonstrates the high standards of quality and scientific rigour adopted by DRWF both as an organisation and reflected in the dedication and commitment of every single team member."*

**Professor Katharine Barnard, a member of the DRWF RAB**



We are a member of the Association of Medical Research Charities (AMRC) and as such support the use of a rigorous peer review procedure in the allocation of our research funding. Our Research Advisory Board (RAB) is a multi-disciplinary panel of clinicians and scientists who assess applications for funding. In 2015 we underwent an AMRC peer review audit and successfully passed this independent evaluation.

**Institution:** University of Edinburgh

**Recipient:** Dr Maria João Marques de Lima

**Project:** Epigenetic and transcriptional mechanisms of pancreatic exocrine to beta cell reprogramming for the treatment of type 1 diabetes

**Amount:** £179,989



THE UNIVERSITY  
of EDINBURGH

**Summary:** This application underpins the development of a safe and effective cell therapy for diabetes – which affects more than 350 million people worldwide. This project will enhance the development of protocols to provide a replenishable supply of mature islets/beta-cells, thereby overcoming the current shortage of donor islets for transplantation. I will address the key issue - the molecular mechanisms that drive the maturation of functional insulin-secreting beta-cells during exocrine cell reprogramming.

I recently showed that exocrine cells of the human pancreas can be reprogrammed towards functional beta-cells that secrete insulin in a glucose-dependent manner, and rescue diabetes in mice. However, these cells only express insulin levels at ~15% of adult beta-cells. My data suggest that the transcriptional and epigenetic landscapes of the partially reprogrammed beta-cells must be modulated to achieve full maturation into adult beta-cells.

Therefore, the overall aim of this proposal is to define the molecular mechanisms that drive the ex vivo conversion of human exocrine cells towards mature beta-cells. Comprehensive transcriptomic and epigenetic analyses of cells during the reprogramming process will reveal key molecular targets associated with beta-cell maturation. These targets will then be manipulated in order to improve the generation of fully mature beta-cells. The phenotype of these newly reprogrammed mature cells will be assessed by in vitro functionality studies (diagnostic gene expression, glucose-dependent insulin production and secretion) and by rapid in vivo rescue of diabetes in mice.

This work will contribute towards the fundamental understanding of reprogramming and developmental plasticity, which will translate into improved cell therapies for diabetes. These mechanisms are likely to be shared by other reprogramming systems and may have a broader impact in regenerative medicine.

### **PUMP PRIMING AWARDS - A total of 31 applications were received with 7 awards being made totalling £128,443**

**Institution:** Imperial College London

**Recipient:** Dr Ben Almquist

**Project:** Reprogramming Diabetic Foot Ulcers to Heal

**Amount:** £20,000

Imperial College  
London



**Summary:** Diabetic ulcers (DFUs) are a far too common complication of diabetes. Many times these wounds are unable to heal because there are changes in how cells respond to the instructions to repair damaged tissue. This research aims to understand how small molecules called microRNAs (essentially one form of a cell's version of computer code), work together to alter how cells respond to external signals from their environment, and their potential use as a therapeutic. These microRNAs are unique because they work similar to a conductor in an orchestra, finely tuning and co-ordinating many players in the machinery that interprets how cells respond to stimuli. The hypothesis of this work is that these microRNAs, when combined with each other, provide therapeutic benefits that exceed their individual contributions. Due to the fact that many times cells within DFUs display changes to the way they respond to instructions to repair damaged tissue, microRNAs present a potentially powerful strategy for altering their behaviour and promoting timely wound repair.

**Institution:** University of Dundee

**Recipient:** Professor Michael Ashford

**Project:** Is plasma amyloid a useful biomarker for metabolic syndrome?

**Amount:** £19,664



University  
of Dundee

**Summary:** The alarming increase in type 2 diabetes is primarily owing to the growing prevalence of obesity and aging. Metabolic syndrome (MetS) is a clustering of cardiovascular disease risk factors, including obesity, diabetes and high blood pressure, that affects 1 in 4 adults in the UK. It is associated with increased risk of heart disease, cancer and dementia (including Alzheimer's disease) and death. Therefore there is a growing need for new targets in order to develop novel therapies and provide earlier diagnosis in order to provide the most effective treatment. Excessive Abeta peptide production underlies the development of Alzheimer's disease and our recent work in mice has demonstrated a clear connection between increased Abeta production, notably the species Abeta42, and metabolic dysfunction. The major question now is whether this process is also happening in humans? Therefore we aim to determine whether serum Abeta levels can be a bio-marker for the severity of metabolic syndrome and the associated cardiovascular complications.

**Institution:** St James's University Hospital Leeds

**Recipient:** Dr Aruna Asipu

**Project:** Development of novel biological inhibitors for ketohexokinase - a target for anti-diabetic drugs

**Amount:** £19,998



UNIVERSITY OF LEEDS

**Summary:** The prevalence of diabetes is increasing world-wide. Dietary studies have shown that one of the contributing factors is foods rich in fructose and sucrose, including corn syrup. How fructose increases the risk of diabetes has recently been illuminated by studies in several research laboratories. A protein (enzyme), found primarily in the liver, known as ketohexokinase, is responsible for the breakdown (metabolism) of the dietary fructose and generation of harmful products. Excessive production of these products leads to pathological changes in the body, leading to diabetes. Thus, recent research has led to the idea that blockade of ketohexokinase should help prevent high fructose diet induced diabetes. However, developing a selective small molecule drug against this enzyme is proving difficult, because KHK proteins share structural features found in a number of other important proteins in the human body. Without selectivity, small molecules are likely to cause side effects when used clinically. Here, we aim to develop new, highly specific biological molecules that may prove useful for preventing high fructose induced diabetes.

**Institution:** University of Dundee

**Recipient:** Dr Li Kang

**Project:** Role of adipose tissue ECM-integrin signalling in inflammation and insulin resistance

**Amount:** £19,859



University  
of Dundee

**Summary:** Cells use glucose as fuel and the hormone insulin increases their use and removal of glucose from the blood. In Type 2 diabetes, cells do not respond normally to insulin and this causes increased blood glucose levels. We aim to develop a completely new way of improving cells response to insulin in people with diabetes. Up to now, work in this area has focused on studying how insulin affects mechanisms INSIDE cells. What makes our work different and exciting is that we study molecules OUTSIDE cells, the levels of which are increased when cells stop responding properly to insulin. This outside structural change is detected by proteins on the cell surface and so alters how insulin works. In this project, we will study a pathway that we believe is key to connecting the outside structural molecules to the cells response to insulin and so glucose removal from blood in fat tissues. We hope to develop these exciting results into new ideas for drugs for the benefit of people with diabetes.

**Institution:** University of Cambridge, Addenbrooke's Hospital

**Recipient:** Dr Lisa Nicholas

**Project:** The role of microRNAs in transducing the programming actions of maternal obesity on beta-cell dysfunction in the offspring and exploring their use as biomarkers

**Amount:** £19,860



**Summary:** The current global epidemic of obesity and type 2 diabetes (T2D) has been partly fuelled by the propagation of these diseases from parent to child across one or more generations. T2D develops when the function of insulin-secreting cells in the pancreas is impaired. Very few studies, however, have investigated underlying mechanisms within these cells that may explain transmission of T2D from mother to child. In recent years, there has been increasing interest in the role of epigenetics, which is the study of biological mechanisms that establish and maintain whether genes are switched on or off, in the development of T2D. This is largely due to the fact that unlike the genome of an individual, which is largely stable, the epigenome can be reversibly modified by exposure to nutritional and environmental factors e.g. obesity. The aim of this project is, therefore, to determine the impact of maternal obesity on the transmission of T2D risk to the offspring and to characterise epigenetic changes that may provide a mechanism for this event.

**Institution:** Cardiff University

**Recipient:** Dr Lowri Phillips

**Project:** Pregnancy outcomes in women diagnosed with type 1 diabetes mellitus in childhood: a national population-based study

**Amount:** £9,089



**Summary:** Pregnancy in women with type 1 diabetes (T1D) is associated with an increased risk of problems, especially if blood sugar levels are not well controlled before and during pregnancy. Blood sugar control is often poor during teenage years, putting teenage and young adult pregnancies at particular risk. The Brecon Register contains data regarding all women diagnosed with T1D before the age of 15 in Wales, since 1995. We will use anonymised data from this register and other national healthcare registers, to establish the number of pregnancies and pregnancy complications that have occurred in women in Wales with T1D diagnosed in childhood, compared with non-diabetic women. We will define how the age of the mother, and time from diagnosis prior to pregnancy, affects pregnancy outcomes. Ultimately, we hope to use this information to understand which patients with T1D might have better pregnancy outcomes if treated with new immune therapy treatments, which maintain the body's own ability to produce insulin and regulate blood sugar levels in the first years after diagnosis.

**Institution:** King's College London

**Recipient:** Dr Attilio Pingitore

**Project:** Comparison of metabolic coupling and insulin secretion mechanisms in mouse, pig and human islets

**Amount:** £19,973

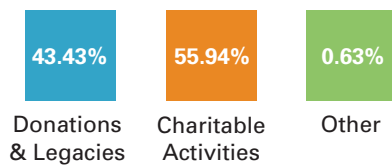
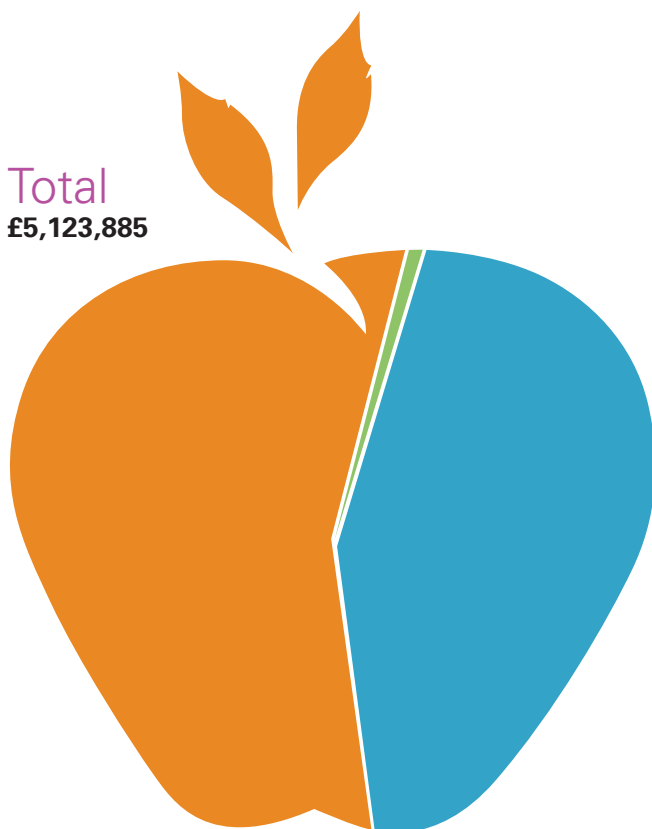


**Summary:** Diabetes arises from the inability of the beta cells of the islets of Langerhans to secrete adequate amount of insulin to keep blood glucose low. Researchers have focused their attention to understanding the physiology of beta cells in order to identify new pharmacological tools or opportunities for intervention to treat diabetes. Unfortunately only a limited amount of biological islet material of human origin is available for research, thus alternative models to study human physiology are needed and they are represented mainly by islets isolated from other mammals such as mice and pigs. We will compare islets of these three species (human, pig, mouse) to identify what differences exist in terms of the mechanisms that allow increases in glucose to stimulate insulin secretion. We aim to understand what the best conditions are to work with these models in order to be able to fully translate the data obtained with Islets from mice and pigs onto human physiology.

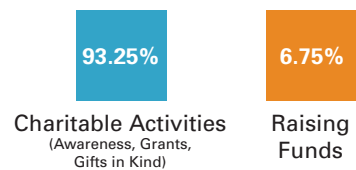
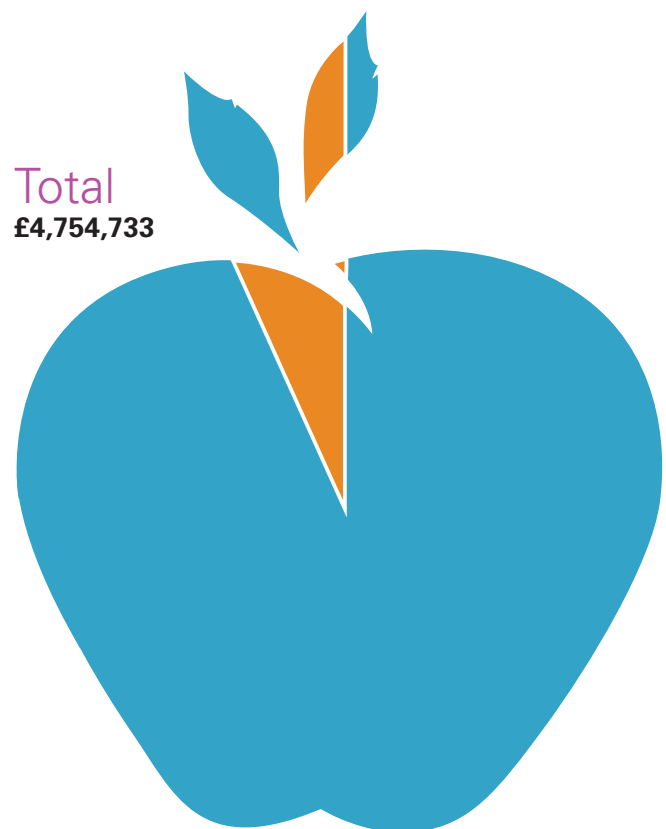
# Income: Expenditure Profile 2016

The information presented here is not the full statutory accounts but a summary of the information which appears in the full accounts for financial year ending 2016. This summary information may not contain sufficient information to allow for a full understanding of the financial affairs of the Diabetes Research & Wellness Foundation (DRWF). The full statutory accounts can be supplied on request or accessed via the Charity Commission website by entering the charity registration number 1070607 in the search box.

## Income



## Expenditure





## Highlights from 2016



### **Jamie Jordan - Tough Mudder**

Jamie completed the Tough Mudder 10-mile obstacle course in West London and he also undertook the South London edition of the event. The Tough Mudder events feature around 20 obstacles, as competitors have to run, climb and navigate multiple tough challenges along the way. Jamie said: "These are amazing events which challenge competitors with acres of overgrown woodlands, gruelling trails and gritty mud and 10,000 volts of electricity."

"I am delighted to fundraise for DRWF, a charity I work very closely with and I get to see the amazing work they do supporting people living with diabetes and funding research into new treatments and ultimately a cure."



### **2016 Vitality London 10 000**

The charity was delighted with the 2016 team of London 10K runners who took part in the 2016. We had 18 runners and one of the runners, Jacqui Dodd volunteered to be filmed by our Swedish colleagues for a video about living with type 1 and exercise. The video is on the DRWF website.

The total raised by all the runners was **£2983**.



### **Andy Austin Pembroke Walk**

Andy and his brother Geoff have supported the charity for a number of years. Andy lives with type 1 diabetes and has found his walking a really useful way to keep fit and helps with his diabetes. In 2016 they walked the Pembrokeshire Coastal Path for Diabetes Research & Wellness Foundation to raise money for DRWF and his Scout Group.

Andy raised **£378**.

# Highlights from 2016

**Diabetes Research & Wellness Foundation**

PLEASE HELP **ETHAN AND CALLUM** RAISE MONEY FOR DIABETES RESEARCH & WELLNESS FOUNDATION!

CHUBBY BUNNY CHALLENGE

ICE BATH CHALLENGE

CHECK OUT THEIR JUST GIVING PAGE AND **DONATE NOW!**

CRACKER CHALLENGE

CHECK OUT THEIR YOUTUBE CHANNEL WHERE THEY UPLOAD THE CHALLENGES THEY ARE COMPLETING TO RAISE MONEY FOR DIABETES RESEARCH & WELLNESS FOUNDATION.

TO DONATE PLEASE GO TO [www.justgiving.com/tracy-johnson12/](http://www.justgiving.com/tracy-johnson12/) OR SCAN HERE

## Ethan and Callum

Ethan and Callum's mum Tracy was diagnosed with type 1 diabetes and it really affected the two brothers. They decided they wanted to 'do something' to help and their mum suggested they contact the charity to support diabetes research. The boys have taken on a number of challenges and have raised **£555.95** so far.



## Russell & Kirsty Vernalls

Brother and Sister Russell and Kirsty Vernalls took on three amazing challenges from May to July 2016 and fundraised for Diabetes Research & Wellness Foundation. Their families have been affected by type 1 and type 2 diabetes and they want to raise awareness of this chronic condition and try to help the charity with its work funding essential research and educational support. They did a Zip Wire, 5K Gung Ho and a 5K Colour Run as well as organising a charity cricket match. They raised **£2049**.



## Keith Scott Duke of Edinburgh raised over £1000

Keith was diagnosed with Type 1 Diabetes and he made it a personal challenge to match the fitness levels of the other people taking part in a charity hike. This included his son who is currently serving in the Royal Navy. Keith doesn't intend letting Diabetes stop him from completing a physical challenge in aid of a good cause.

The four hour hike at night in winter conditions was to the summit of three peaks, Back Tor, Loose Hill & Kinder Scout (the highest point in the Peak District) to raise money for two charities: The Diabetes Research & Wellness Foundation (DRWF) & the Duke of Edinburgh's (DofE) young person's charity. This charity challenge will also complete my Duke of Edinburgh Diamond Award.

# Highlights from 2016



### Dragon Boat Race

DRWF has been taking part in the annual Portsmouth and Southsea Rotary Dragonboat race for several years. It's always very well organised and great fun to take part. This year we were very well supported by some Langstone gig rowers, mostly ladies, who proved a strong match for the all men's teams. We didn't make it through to the final, however everyone enjoyed themselves and raised **£227**.

### Pat Armstrong "Meet and Mingle"

Pat has been a loyal and long standing supporter of the charity, she organises and takes part in a number of events every year. She always sends us photos of the artwork from their art shows. This Mix and Mingle was a new event and raised **£200**.

### Charlies Ben Nevis Trek

In September 2016 Charlie climbed Ben Nevis to raise money for DRWF. She has seen the devastating impact diabetes can have on someone's life and health she said: "I am not the kind of girl who climbs mountains for fun and there aren't many reasons I would do so but this is a worthy one." Charlie raised **£640**.



### Ride London Surrey picture

There were 7 riders in the 2016 Ride London-Surrey 100, between them they raised a total of **£1008**. Gwyndaf Davies, Paul Bailey, Phil Plant, Andrea Cameron and her sister, Julie Keough took part as well as Daryll Brown, Simon Rose and Ian Mahoney who formed Team Hilti and took part for a second time. They raised a total of **£705** for the charity.

### Molly's sober for October

Molly created her own event, SOBER FOR OCTOBER to raise money to hopefully one day see a cure for people living with Diabetes. This was something close to her heart in memory of a good friend Ben Mckeever, but she also has many family members living with Diabetes and she also lost her God Mother and Auntie Debbie Montgomery to the condition at a young age. Molly raised **£110**.

## Get Involved

### Your generosity can help our dreams become a reality

Diabetes Research & Wellness Foundation continues to fund vital research into finding a cure for diabetes, while supporting growing numbers of people living with Type 1 and Type 2 diabetes in the UK. We ensure that only the highest standard of research receives DRWF funding and endeavour to reach as many people as possible living with the condition and in need of our support.

We rely on individual donations to enable our work to continue. We know that researchers are getting ever closer to finding a viable cure but now, more than ever, we need to inject time and money to accomplish the break-through. We hope that the lives of millions of people in the future will be dramatically improved thanks to our work today - and they will have YOU, the supporters of DRWF to thank!

### Making a donation

Your generosity can help the dreams of many become a reality. Please consider making a donation today either online or by cheque or credit card by calling 02392 637808, or by becoming a 'Partner for the Cure' with a regular direct debit contribution.

Please take the time to consider how best you would like to show your support - perhaps you would like to consider the longer-term option of 'leaving a legacy of hope'.

However you choose to contribute, you should be assured that your gift will be put to the best use and that your philanthropy is hugely appreciated, not just by DRWF, but by those people that we aim to ensure are 'Staying well until a cure is found...'

### Volunteering

We need volunteers to join the DRWF family and support our small team of full time staff. The roles are varied and range from; helping us in the office to keep up to date with our administration, helping us to run our national Diabetes Wellness Days around the country, to representing the charity and manning our stall at the many smaller events we attend.

The more volunteers we have to call on the more events we can support and get our message out there! Whether you have a few hours you can spare occasionally or you would like to be more involved as a volunteer representative of the charity we would be delighted to hear from you.

If you really want to float our boat contact us about taking part in our annual dragonboat race, or for other ideas about community fundraising contact [karen.scott@drwf.org.uk](mailto:karen.scott@drwf.org.uk) or visit the website!

If you are interested, please do contact us on **023 92 637808** or email [steve.lille@drwf.org.uk](mailto:steve.lille@drwf.org.uk)

### How to Donate

We don't receive any government funding and rely almost entirely on voluntary income. If you would like to make a donation to support our work you can do so in a variety of ways.

### Cheque or credit card

Payable to DRWF and sent to DRWF 010-012 Northney Marina, Hayling Island, Hants. PO11 0NH or call **023 92 636136** to give over the phone.

### Direct debit

Become a 'Partner for the Cure' by setting up a regular monthly/quarterly/annual donation direct from your bank account. Please call for further details on 023 92 636136 or set up a 'regular donation' [www.drwf.org.uk/donate](http://www.drwf.org.uk/donate)

### Online

You can also donate online via the DRWF payment gateway - by following the on-screen instructions you can make a secure one-off donation. [www.drwf.org.uk/donate](http://www.drwf.org.uk/donate)

### Donate through Charities Aid Foundation (CAF) or Charity Choice

Please visit the Charity Choice website [www.charitychoice.co.uk/charities](http://www.charitychoice.co.uk/charities) for further details.

**However you choose to support our work, we are extremely grateful. Every penny really does count!**

## Thank You



## 2016 Charitable Trusts Received

We are very grateful to the charitable trusts who have so generously invested in the Diabetes Research & Wellness Foundation, facilitating the expansion and continued development of our education and research programmes.

**Constance Travis Charitable Trust**

**The Thomas C Maconochie Trust**

**The Coulthurst Trust**



## Legacies received in 2016

Legacies are vital to our charity as they provide the bedrock financial support we rely upon to look ahead and progress effectively. We are grateful to those who made the decision to include a gift of hope in their will. This support will help DRWF continue to help people with diabetes and finance ground breaking diabetes research.

**Mrs Barbara Adams**

**Mr Alfred Brown**

**Mrs Hilda Chapman**

**Mr Francis Cheshire**

**Mrs Eileen Christie**

**Mrs Joyce Codling**

**Mr Ernest Cross**

**Mr George Davies**

**Mr David Frost**

**Miss Joyce Goddard**

**Mr Dennis Greenslade**

**Ms Marjorie Greenwood**

**Mrs Margaret Hayward**

**Mrs Gladys Hewitt**

**Mrs Joy Jones**

**Mr Frederick Knight**

**Mrs Margaret Machin**

**Mr William Prentice**

**Mr Keith Simpson**

**Mrs Margaret Sowter**

**Ms Sybil Steel**

**Mr Vivian Thomas**

**Mrs Una Walton**

**Miss Dilys Wigglesworth**

## Gifts given in memory of a loved one

Donations given in memoriam are a valuable and positive way of celebrating a life; a distinctive way to remember another whilst also thinking of a cause close to their heart. Money raised will help fund vital research into diabetes and provide essential support to those living with diabetes daily. In 2016, those who have supported us in the past were remembered in this special way.

Mr Percival Austen

Mr Frederick Giles

Mrs Barbara Partt

Mrs Kathleen Barton

Mrs Gloria Gonsalves

Dr Robin Priscott

Miss Hilary Bavage

Mr James Hallam

Mr Alan Robbins

Mr Michael Beeson

Mr David Henderson

Mr Dennis Sadler

Mr Norman Blackburn

Mr William Holliday

Mrs Agnes Skyner

Mr Robert Bond

Mr Bernard Holmes

Mrs Joyce Southworth

Mrs Annette Bremner

Mr Chris Hook

Mr Steven Spencer

Mrs Margery Bryant

Mrs Jean Howard

Mrs Gladys Spencer

Mrs Janet Bunton

Mr Les Howlett

Mrs Maisie Spiers

Revd Canon

Mr Luke Jones

Mrs E Sprules

Margaret Clarke

Dr Neil Kitching

Mr Mark Tiller

Mr Leslie Crowther

Mrs Ida Laaksonen

Mrs Stephanie Truscott

Mr James Day

Ms Edna Lambert

Mrs Alice Viner

Mr Keith Day

Mr Stewart Malcolm

Mr &amp; Mrs D Whyman

Mrs Stella Dennis

Miss Mary Martin

Mr Jason Williams

Mr Anthony Eades

Mr Surendra Mohan

Mr A C Wright

Mrs Christabel Evans

Mr Craig Murray

Cindy

Miss Elizabeth Fermoy

Ms Margaret Ogilvie

Peter

Mr William Ford

Mrs Carol Parker

Mum and Dad

Mr Ivor Gearing

Our work is made possible only through our supporters' commitment and generosity for which we say a heartfelt **THANK YOU!**

## Plans for future periods



We are mindful of many changes which may impact on our current fundraising methods. We acknowledge the importance of exploring all avenues of income to support our activities and are looking at ways in which to develop our current major donor and legacy campaigns; increase income via grants and trust applications and seek out possible corporate relationships. We have a relatively small, but reasonably successful, community fundraising programme and are looking at ways in which this might be replicated around the country by regional fundraisers and volunteers.

Whilst our direct mail campaigns still generate a significant percentage of our income we know that the supporters of the future also want choice in how they interact with us and are more likely to be users of the latest technology. With this in mind, we will be exploring cost effective ways in which to invest in technology and our online presence to optimise engagement and increase ways in which the public can interact with us.

In the last year or two we have increased our reach of a wider and younger audience particularly via social media channels. Whilst the majority of our audience has for some time been the more mature person with type 2 diabetes, we are now seeing increasing interest in our information and educational events programme from younger people and parents of children with type 1 diabetes. Keeping our beneficiaries at the heart of all we do, we will endeavour to involve them in the diversification of our activities to ensure that we are aligned in expectation of what is appropriate.

We also plan to develop our current evaluation processes in order to demonstrate that events such as our Diabetes Wellness Days are supportive of the ongoing education and information need to effect and sustain behavioural change, improving positivity and confidence in managing a complex long-term condition, and ultimately improving health outcomes.

We have been working closely with groups within the International Diabetes Wellness Network, particularly in Sweden and Finland, for the last year or two to develop our network of diabetes and related health experts in support of our peer review processes. This has proven very successful and has given us much wider access to experts for external review processes for all groups. We will continue to share information and expertise in this way going forward as it is a cost effective way of sharing resources with a common goal in mind.

We are a small, committed, group of just 10 staff all of whom are working at capacity to deliver an ever-growing portfolio of support activities. As awareness of DRWF and the work we carry out continues to grow, we are mindful of the need for infrastructure investment and additional staff.

We encourage people living with all forms of diabetes and their immediate support networks to talk to us about what we can do to provide support and inspiration to ensure that our beneficiaries are **'staying well until a cure is found...'**

Through our awareness raising, information provision and educational support programmes, we enable people with Type 1 and Type 2 diabetes to learn more about their condition. We provide the tools to motivate, empower and engage people to take a positive approach to their self-care. Through supported self-management they can reduce the risk of associated complications, improve quality of life and control their diabetes effectively.

Don't let diabetes control you!

We fund some of the best and brightest diabetes researchers in the UK and around the world. We support Fellowships, Open Funding Projects, Institutional grants and Studentships. We fund peer-reviewed work that we believe will help us to understand the causes; find new treatments; provide insight into effective therapies and management strategies and ultimately, find a cure for diabetes.

You help us to achieve these objectives -

THANK YOU!

## to find out more...

Diabetes Research & Wellness Foundation,  
The Roundhouse, 010-012 Northney Marina,  
Hayling Island, Hampshire, PO11 0NH



[www.drwf.org.uk](http://www.drwf.org.uk)

Registered Charity in England & Wales,  
Registration no: 1070607  
Company No 3496304  
Company Limited by Guarantee

Statistics/ Figures stated correct at FYE 2016

# Staying well until a cure is found



## Diabetes Research & Wellness Foundation