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Headlines

James Lind Alliance Research Priorities special issue

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| Glucose variability and diabetes complications | The cognitive and psychological effects of living with type 1 diabetes |
| Monitoring of glucose: the technology moves on | Diet and exercise: adjuncts or alternatives to drugs in type 2 diabetes? |
| Do patient education programmes improve diabetes outcomes? | Diabetic neuropathy: too little, too late |

Artwork: (jpeg sent previously)



# Title: Logo of the James Lind Alliance. Reproduced

Caption: Logo of the James Lind Alliance. Reproduced with kind permission of the James Lind Alliance

Free articles

1. Livingstone R, Boyle JG, Petrie JR. How tightly controlled do fluctuations in blood glucose levels need to be to reduce the risk of developing complications in people with Type 1 diabetes? Diabet Med DME13911
2. Misra S, Mathieu C. Are newer insulin analogues better for people with Type 1 diabetes ? Diabet Med DME13891
3. Avari P, Reddy M, Oliver N. Is it possible to constantly and accurately monitor blood sugar levels, in people with Type 1 diabetes, with a discrete device (non-invasive or invasive)? Diabet Med. DME13942
4. Heller SR, Gianfrancesco C, Taylor C, Elliott J. What are the characteristics of the best type 1 diabetes patient education programmes (from diagnosis to long‐term care), do they improve outcomes and what is required to make them more effective? Diabet Med. DME14268
5. Van Duinkerken E, Snoek FJ, Wit M. The cognitive and psychological effects of living with type 1 diabetes: a narrative review. Diabet Med. DME14216
6. England CY, Andrews RC. Should diet and exercise be used as an alternative to drugs for the management of type 2 diabetes or alongside them? Diabet Med. DME14217
7. Javed S, Hayat T, Menon L, Alam U, Malik RA. Diabetic peripheral neuropathy in people with type 2 diabetes: too little too late. Diabet Med. 2020. DME14194

**Editorial**

**The James Lind Alliance Research Priorities for Diabetes revisited**

A quote, often incorrectly attributed to Einstein, states that ‘insanity is doing the same thing over and over again and expecting different results’, an aphorism that holds true in many areas of life where there is predictability of action and response. Self-management of type 1 diabetes is not one of those areas; complex inter-relationships between food, insulin, counter-regulatory hormones, sleep, alcohol, intercurrent illness, mood and a multitude of other factors mean that, for people living with type 1 diabetes, doing the same thing over and over again will almost always lead to a different result. This variability of insulin action leading to dynamic glucose changes, and occasional extremes of glucose, can be distressing and frustrating, and may be associated with adverse outcomes.

The recent shift of emphasis from HbA1c to assessing times spent in glucose ranges for people with type 1 diabetes [1] reflects the ability to accurately assess and interpret continuous glucose data, and the need for more accessible and intuitive ways to assess glucose self-management. International consensus guidance now includes routine reporting of glucose variability from continuous glucose data [2]. These additional metrics provide additional information for clinicians, researchers, and for people living with type 1 diabetes and the evidence base for interventions to optimise glucose time-in-range is growing but challenges remain for accurate, reproducible measurement.

In this issue of Diabetic Medicine we present the second series of James Lind Alliance reviews, addressing the research priorities of people with type 1 and type 2 diabetes. Livingstone et al review the evidence that glucose variability is associated with the development of complications in type 1 diabetes and conclude that, while the dynamics of glucose can be quantified and there is biological plausibility, little high quality evidence supports the hypothesis that variability is directly harmful [3]. As ever, more data are needed, including high quality intervention studies.

Central to addressing variability and optimising time in range for people with type 1 diabetes is the insulin administered. As we approach the centenary of the first use of exogenous insulin in humans, Misra et al review the impact of insulin analogue development and the evidence for newer insulins, addressing the question of whether clinical outcomes have improved [4]. The incremental gains, especially in matching insulin to food, and in reducing exposure to hypoglycaemia, are highlighted, along with the questions that remain unanswered and a glimpse of the future of insulins for type 1 diabetes.

Central to the concept of time in range and glucose variability is the ability to measure glucose with near continuous sampling. Real-time, and flash, continuous glucose technologies are available with increasing access for people with type 1 diabetes worldwide but barriers and challenges to their use and implementation remain. Avari et al review the future potential for a discrete device that is accurate and acceptable, describing the pathway to non-invasive devices and the improvements that might be seen in existing devices in the interim [5].

It is noteworthy that the James Lind Alliance research priority for continuous glucose monitoring includes the word ‘discrete’ highlighting that the everyday experience of living with type 1 diabetes is critical for research to meet the needs of the people affected by it. The impact of structured education on self-management and the cognitive and psychosocial burden of type 1 diabetes are described in two separate reviews by Heller et al and van Duinkerken et al [6,7]. These papers elegantly pull together the strands of self-management, monitoring, insulin dose decision making, and the neuropsychological impacts of type 1 diabetes, and highlight the research questions remaining to address the James Lind Alliance research priorities for type 1 diabetes.

In the type 2 diabetes research priorities, England et al address the question of whether lifestyle changes are adjuncts or alternatives to medications [8]. Diet and exercise can delay or reduce the requirement for medication and are associated with meaningful improvements in outcomes on their own but further work is required to unpick the interplay between lifestyle and pharmacology.

One of the most devastating complications of diabetes is painful neuropathy; sadly, this is too often poorly managed because of delays in diagnosis and a lack of understanding about its complex aetiology. Given the burden of this complication, it is unsurprising that The James Lind Alliance Priorities for type 2 diabetes included the question ‘What causes nerve damage in people with type 2 diabetes, who does it affect most, how can we increase awareness of it, and how can it be best prevented and treated?’. Javed at al elucidate the latest thinking about this subject and describe how management requires a detailed assessment and appraisal of treatment while taking account of the patient’s wishes, comorbidities, side effect profile and potential for abuse [9].

Enabling and empowering people with all forms of diabetes to self-manage effectively means doing the same thing over and over again in a way that is adaptive, and with minimum burden, in the hope that results become similar. The review series in this issue of Diabetic Medicine highlights the evidence to move towards this, the research questions that remain, and a vision of the future progress.

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**Competing interests**

None declared.

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