

# Improved clinical outcomes after embedding structured education for type 1 diabetes without additional manpower resource

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## Introduction

- Specialist adult type 1 diabetes services are not configured for the delivery of structured group programmes within the existing traditional format.
- Clinical outcomes for adults with type 1 diabetes are generally sub-optimal throughout the UK
- There is a widely held belief that structured education cannot be delivered without additional specialised staff resource. Attempting to 'bolt-on' structured education to existing care pathways is challenging.
- DAFNE (Dose Adjustment For Normal Eating) training reduces the cost of acute diabetes presentations by 63% within the first 12 months after a course, through a 72% reduction in severe hypoglycaemia (SH) and a 61% reduction in diabetic ketoacidosis (DKA)<sup>1</sup>.
- Here I describe the evolution of a DAFNE service across multiple clinical sites in the largest Health Board in Scotland, without any increase in specialist diabetes staff resource.

## Aim

- We set out to embed the principles and philosophy of DAFNE into our service with the hypothesis that some of the activities we were spending time on were ineffective and could be replaced by delivering DAFNE courses.
- In particular, we aimed to recruit some of our 'frequent flyers' to DAFNE where clinically appropriate, such as people with recurrent DKA and SH in the expectation of reduced demand for *ad hoc* and crisis visits.

## Method

- Job plans within the diabetes MDT were redesigned replacing some 1:1 diabetes follow-up with DAFNE course delivery at the index site in 2007. In 2009 and 2013 other sites took up DAFNE in a similar model.
- At the index site we altered our training for newly diagnosed type 1 patients and began teaching DAFNE principles from diagnosis. We used the same blood glucose targets and carbohydrate counting 'rules', and for non-acidotic presentations we used mealtime insulin alone initially<sup>2</sup>.
- We added a 1 day group Foundation Programme (based on the Leicester model<sup>3</sup>) at around 3 months after diagnosis and aim to deliver DAFNE 12 months after diagnosis.
- DAFNE educators work across clinical sites, challenging historic institutional boundaries to cover periods of leave and absence.
- Clinic population data are derived from SCI-Diabetes, the Scottish national diabetes database. Data from the national DAFNE database was used to assess the efficacy of DAFNE training. The number of clinical contacts in the case studies was derived from clinical notes and SCI-diabetes.

## Results – benefits for staff

- Consistency in clinical messages, philosophy, and service delivery across the Health Board area
- Improved cross-site working
- Access to training, quality assurance and peer review processes previously absent from the diabetes service
- Easy induction into type 1 diabetes for newly appointed DSNs and dieticians
- Access to regular CPD through regional network meetings and annual Collaborative meeting

## References

1. Elliott J et al. Substantial reduction in DKA and emergency treatment costs ...2014. *Diabetic Med* 31, 847-853
2. White A et al. Benefit of carbohydrate counting with variable dose prandial insulin from diagnosis... 2016. *Diabetic Med* 33 (S1), 93
3. Berkley H et al. Leicester Foundation Group: Successful Implementation of Structured Education for Newly Diagnosed Type 1 Diabetes. 2012 *Practical Diabetes* 29 (4).

## Results – benefits for patients

There are 4,526 adults with type 1 diabetes in GGC of whom 912 (20%) have completed a DAFNE course; of 687 attending the index site 268 (39%) have completed a DAFNE course. Outcomes from DAFNE training in the GGC service are consistent with national data showing mean HbA1c overall reduction of 4.9mmol/mol in those with baseline above 75mmol/mol and using twice daily basal insulin 12 months after DAFNE. Severe hypoglycaemia is reduced by 61% and diabetic ketoacidosis reduced by 50%.

At the index site overall mean HbA1c is improving regardless of whether DAFNE training has been undertaken (figure 1).

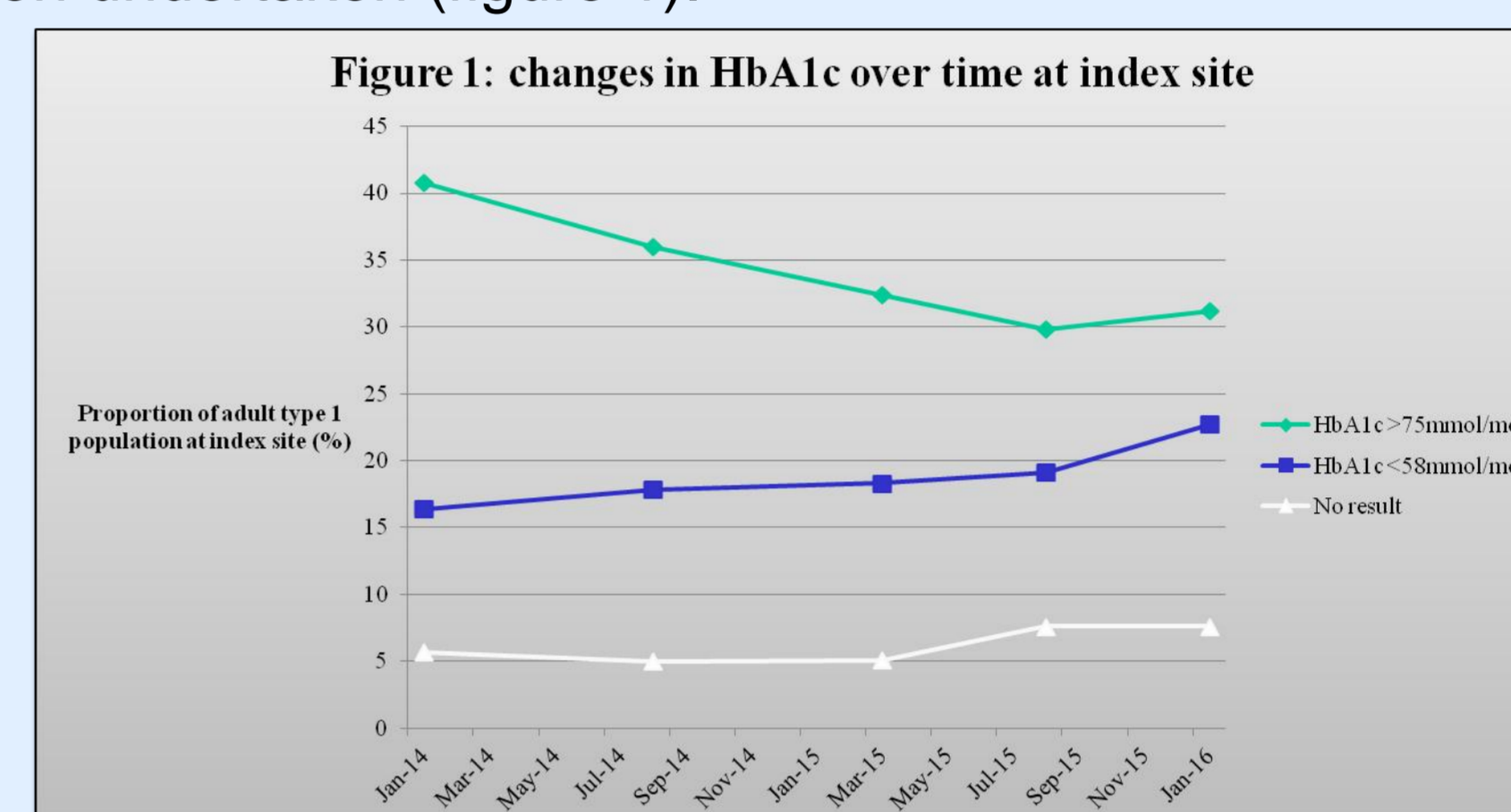


Figure 1. Run chart data for the index site showing ongoing improvement in HbA1c for the whole adult type 1 population (n = 687), not just those who have undertaken DAFNE training. The proportion with HbA1c above 75mmol/mol is falling, and the proportion with HbA1c below 58mmol/mol is rising.

In newly diagnosed patients, the mean HbA1c at 12 months after diagnosis has improved (figure 2).

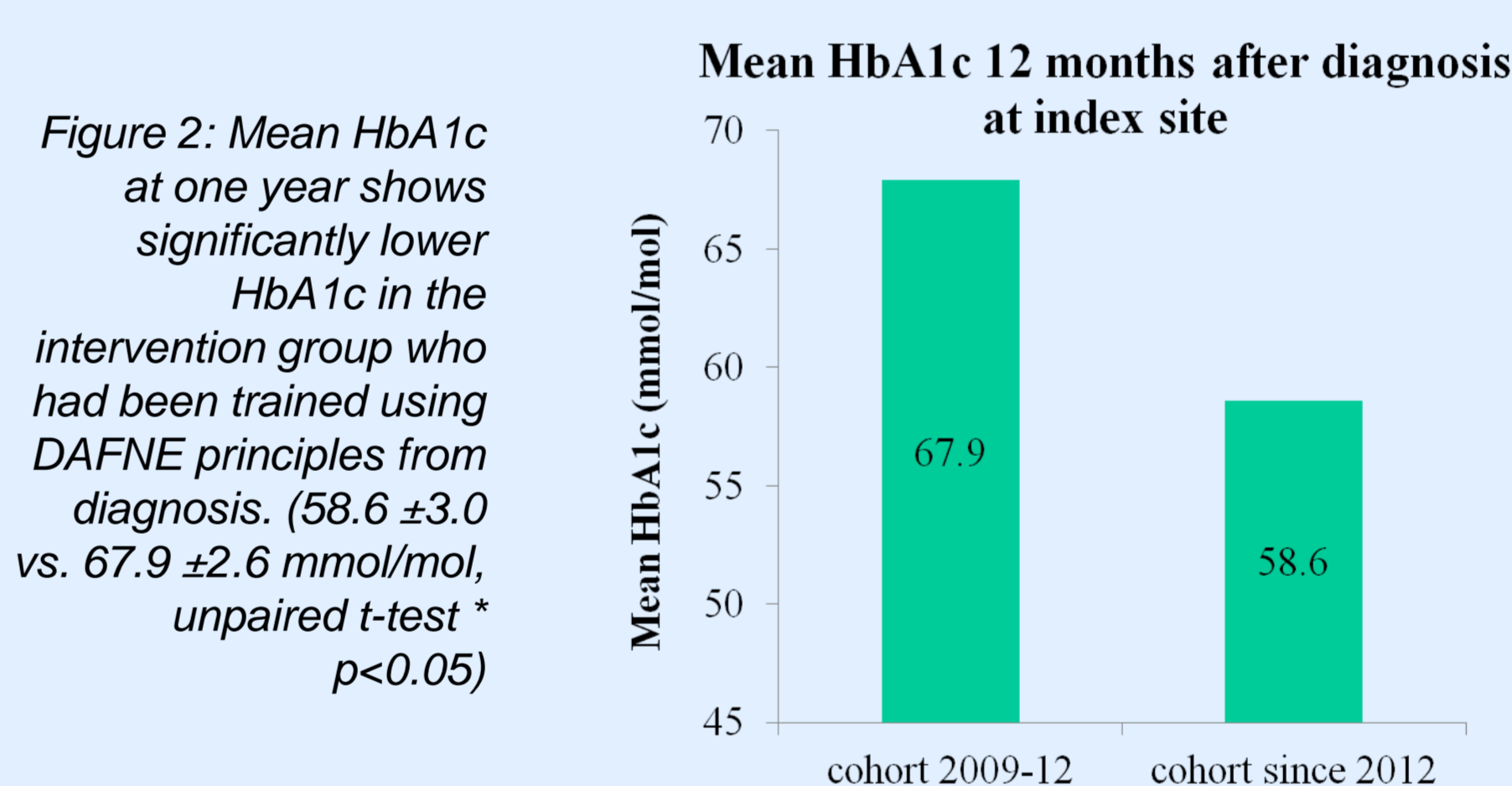


Figure 2: Mean HbA1c at one year shows significantly lower HbA1c in the intervention group who had been trained using DAFNE principles from diagnosis. (58.6 ± 3.0 vs. 67.9 ± 2.6 mmol/mol, unpaired t-test \* p < 0.05)

The change in pattern of hospital attendance in 'frequent flyer' patients after undertaking DAFNE training was remarkable and supports the hypothesis that delivering DAFNE courses is a valuable use of staff time (Figure 3A and B)

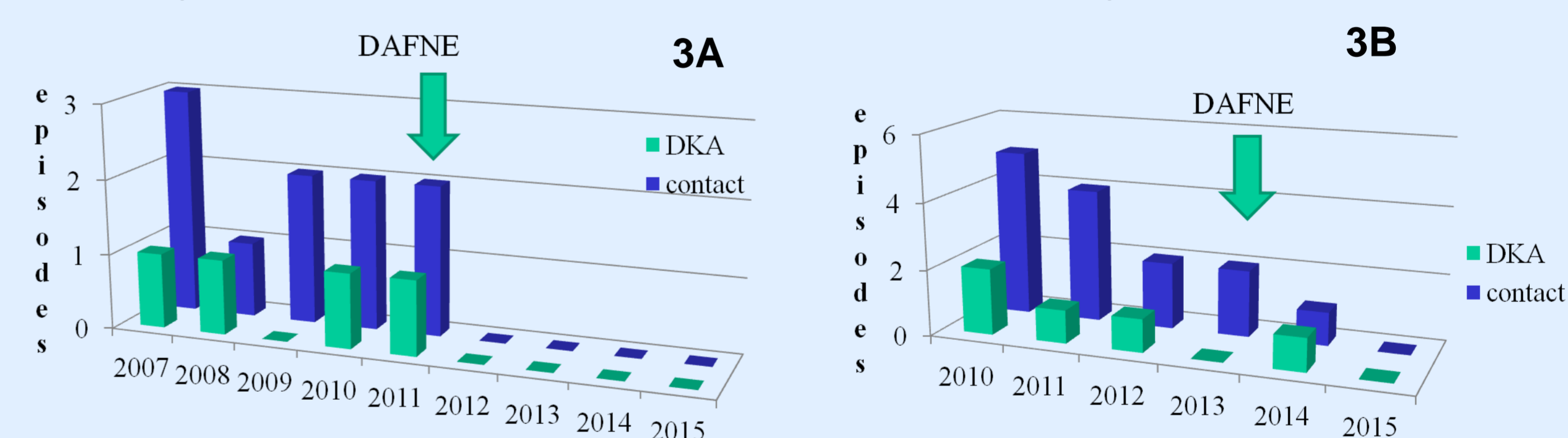


Figure 3A and B. Charts showing the reduction both in episodes of DKA and ad hoc hospital visits after DAFNE in 2 patients from the index site. Year of DAFNE course marked by arrow.

## Conclusion

DAFNE education can be provided by service redesign without additional staff resource. Reduced acute presentations after DAFNE justify service redesign to protect staff time for course delivery. Our experience suggests DAFNE provides a core of consistency underpinning the type 1 diabetes pathway from diagnosis. Uniform use of language and self-management philosophy with consistent treatment targets might generate benefits and improve outcomes in the whole population including the newly diagnosed, not just in people who have completed a DAFNE course.

## Acknowledgements

This work represents the achievements of the multi-disciplinary team not only at the Victoria, whose data is shown, but also at all 6 acute sites delivering DAFNE in GGC.

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