Empowering and Engaging Children and Young Adults with Type 2 Diabetes to Participate in Sports and its Impact on Diabetes Health

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About Me

Paediatric Dietitian specialising in diabetes

On the Diabetes UK Research Steering Group for Young People with Diabetes

Triathlon coach

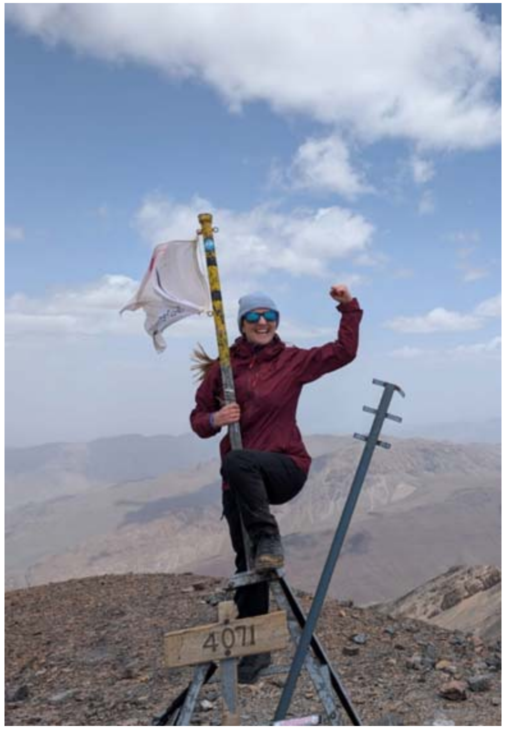
Chair of BDA Diabetes Sports and Exercise Sub-Group

Jointly lead a sports team for teens/adults with TID (Enhance-d Club)

Live with T1D myself

Passionate about benefits of keeping active for all ages

Enjoy climbing mountains!



Background

Spend 2 days a week in diabetes care

Total of 130 patients aged 2 -19 years

6 with Type 2 diabetes

Regular new referrals for pre-diabetes in children

Joint largest cohort in our Wessex Network

Set up a dedicated Type 2 clinic in 2024

NPDA
National Paediatric Diabetes Audit

Results at a glance
Cumulative results from 01 April 2024 to 30 September 2024

- Home
- At a glance
- Health checks
- HbA1c median
- Treatment targets
- Insulin Pump
- CGM
- Closed loop system
- DKA at diagnosis
- DKA post diagnosis
- DKA per 100 children

England and Wales | England | Wales

please select a diabetes type:

Type 1 Diabetes | Type 2 Diabetes

Total number of children and young people with selected type of diabetes	Number of new diagnoses	Health Check Completion rate (%)	Median HbA1c (mmol/mol)
1,082	113	56.4	50.0

Insulin Pump use (%)

Not reported for Type 2 Diabetes

CGM use (%)

Not reported for Type 2 Diabetes

Closed Loop System use (%)

Not reported for Type 2 Diabetes

DKA per 100 CYP

Not reported for Type 2 Diabetes

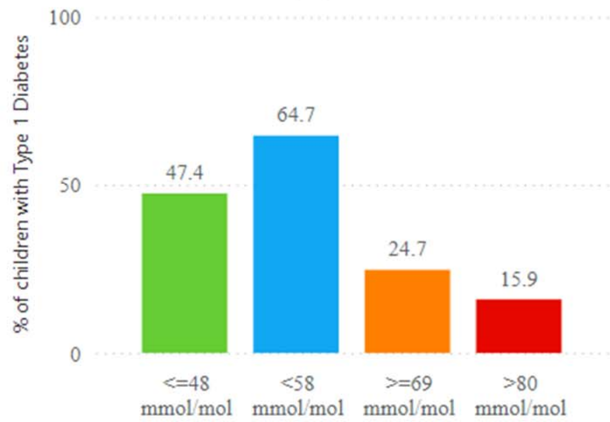
DKA at Diagnosis (%)

Not reported for Type 2 Diabetes

DKA post Diagnosis (%)

Not reported for Type 2 Diabetes

Percentage of children and young people achieving/exceeding each HbA1c treatment target (%)



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- DKA per 100 children
- Benchmarking PDUs

Total number of children and young people with selected type of diabetes	Number of new diagnoses	Health Check Completion rate (%)	Median HbA1c (mmol/mol)
1,431	302	80.0	49.0

Insulin Pump use (%)

Not reported for Type 2 Diabetes

CGM use (%)

Not reported for Type 2 Diabetes

Closed Loop System use (%)

Not reported for Type 2 Diabetes

DKA per 100 CYP

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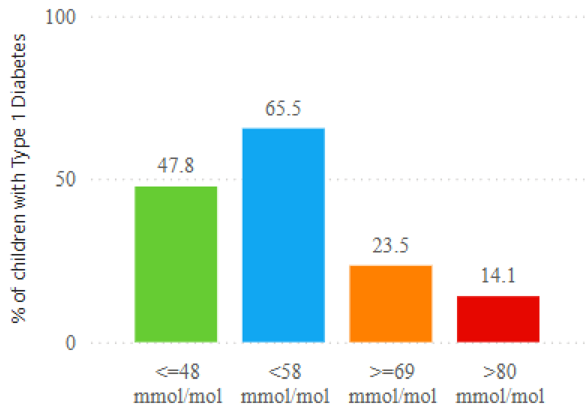


Benefits of a Dedicated Type 2 Clinic

Focus on care processes and treatment targets

Hba1c	Urine Albumin
Blood pressure	Retinal screening
Cholesterol	Foot surveillance
Serum Creatinine	BMI and smoking

- Dedicated paperwork
- ‘new patient’ booklet and annual review forms
- MDT mind-frame
- Psychology presence

Focus on weight management and exercise

Our Type 2 Diabetes Cohort

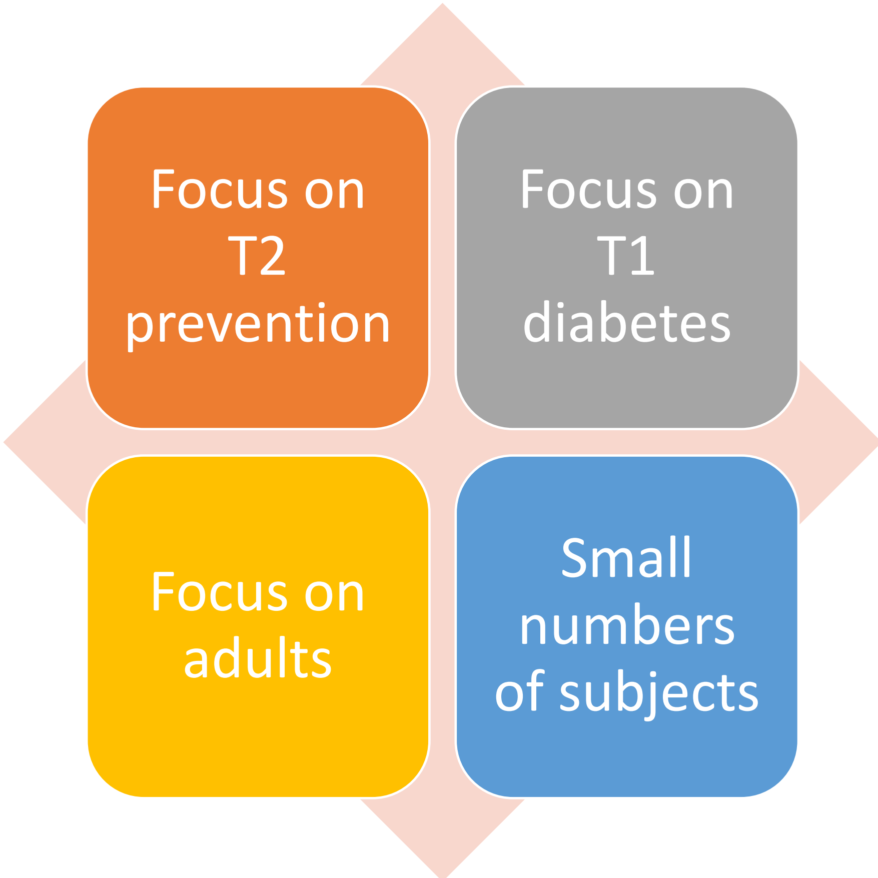
Patient	Age in years	Length of Diagnosis	BMI	Family history	Treatment	Ethnicity	Latest Hba1c
1 EE	16	2 years	33.2	Both parents type 2	Metformin Dulaglatide	Black African	73
2 GH	8	10 months	27.9	1P36 microdeletion syndrome	Metformin	White Irish	44
3 EJ	14	2 years	35.8	Mother and gran type 2	Metformin	White British	44
4 ZG	16	2 years	36	None	Metformin Dulaglatide	White British	65
5 EA	15	3 years	36.2	None	Diet only	White British	43
6 IM	19	5 years	29.5	Both parents type 2	Tresiba, Fiasp Metformin	White British	69

ISPAD Clinical Practice Consensus Guidelines 2022: Type 2 Diabetes in Children and Adolescents
Exercise advice

Encourage	Reduce	Address	Promote	Encourage
Encourage youth to participate in at least 60 min of moderate to vigorous physical activity daily with muscle and bone strength training at least 3 days a week.	Reduce sedentary time, including watching TV, computer-related activities, texting, and video games to less than 2 h a day.	Address sedentary time spent doing schoolwork and identifying ways to incorporate physical activity.	Promote physical activity as a family event, including daily efforts to be physically more active, such as using stairs instead of elevators, walking or bicycling to school and to shop, and doing house and yard work.	Encourage positive reinforcement of all achievements and avoidance of shaming.

Current Research

There is very little published data regarding the impact of physical activity and exercise training in adolescents with established type 2 diabetes



Exercise training improves vascular function in adolescents with type 2 diabetes

Louise H. Naylor, Elizabeth A. Davis, Rachelle J. Kalic, Niru Paramalingam, Mary B. Abraham, Timothy W. Jones, Daniel J. Green
17 February 2016

Study Design

13 adolescents aged 13-21 with T2D

Standard Care vs Standard Care plus 12 weeks of personalised gym-based exercise

Followed up at 12 weeks and 24 after another 12 with no additional exercise.

Data suggested that exercise training interventions can improve both large and Small blood vessel health in adolescents with type 2 diabetes.

Detraining data imply that continuous training is likely to be necessary to maintain these clinically important benefits.

We conclude that personalised and intensive exercise
training may be effective in reducing the detrimental clinical impacts of T2D and may decrease the future risk of cardiovascular complications in this very high-risk cohort.

These changes are independent of any weight reduction

SEARCH for Diabetes in Youth Study

A multicenter study of the prevalence, incidence and classification of diabetes mellitus in youth.
Control Clin Trials. 2004 Oct;25(5):458–471

For youth with type 2 diabetes, nearly 20 percent developed a sign of kidney disease by the end of the study, compared to about 6 percent of youth with type 1 diabetes.

For youth with type 2, about 18 percent developed nerve disease, versus about 9 percent with type 1.

For youth with type 2, about 9 percent developed eye disease, compared to about 6 percent of youth with type 1.

Measures for two risk factors for heart disease (hypertension and arterial stiffness) were greater for youth with type 2 but close to equal for a third risk factor (cardiovascular autonomic neuropathy).

Findings from the TODAY clinical trial

Treatment Options for Type 2 Diabetes in Adolescents and Youth

TODAY Study Group; Zeitler P, Hirst K, Pyle L, et al. "Long-Term Complications in Youth-Onset Type 2 Diabetes." *N Engl J Med.* **2021;385:416–426.** DOI: 10.1056/NEJMoa2100165 .

"Experience to date indicates that these complications and comorbidities are similar to those seen in adults but occur on an **accelerated timeline**.

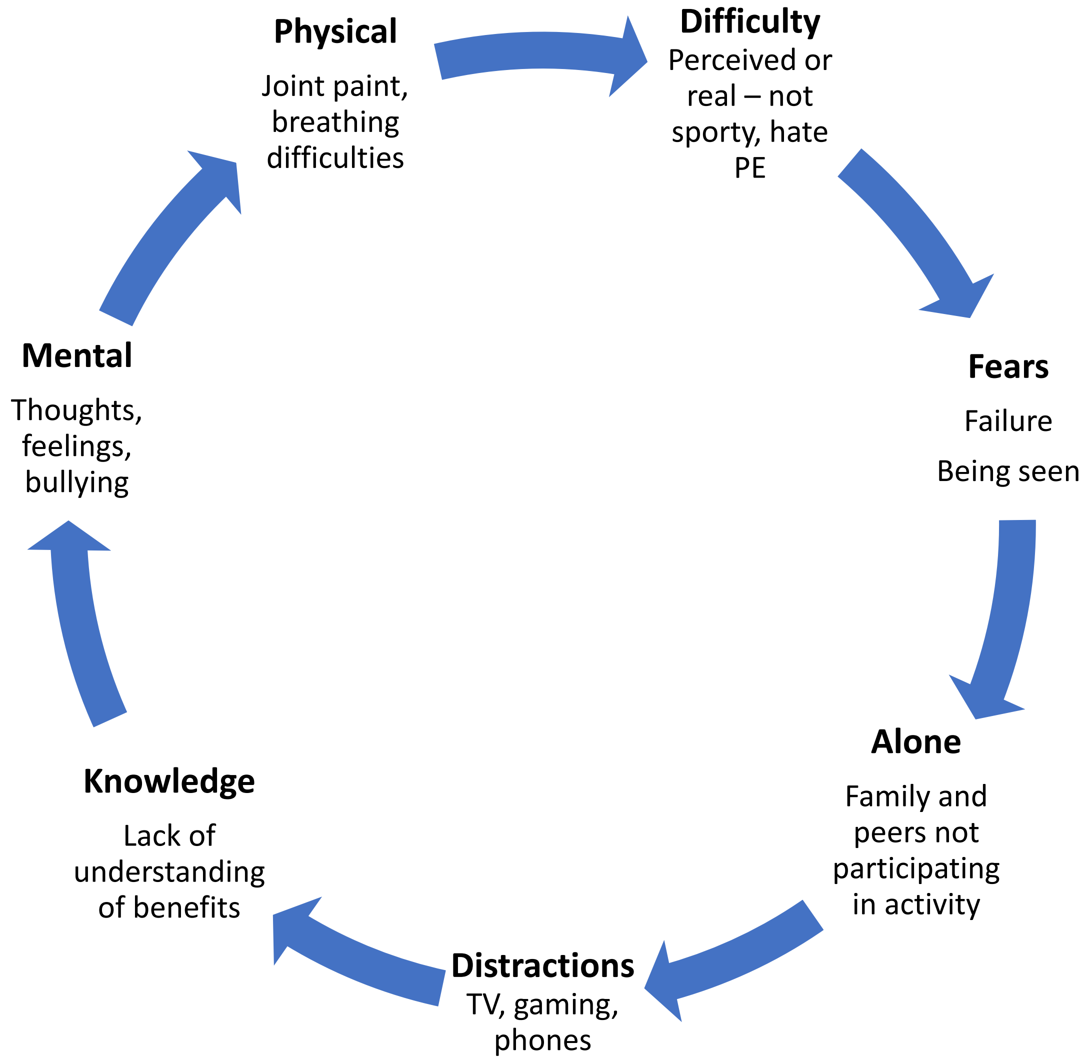
The early manifestation of diabetes complications in youth-onset T2DM suggests that this group will be burdened with the tangible consequences of cardiovascular disease, nephropathy, and retinopathy in the **third and fourth** decades of life.

It is hoped that through an **early, aggressive** approach to treatment and prevention, we may be able to curb the onset and progression of these potentially devastating outcomes."

Empower and Engage

- Mental wellbeing - improves mood and sleep, relives stress, anxiety and boosts self esteem
- Improves muscle strength and bone mass
- Lowers cholesterol and blood pressure
- Improves heart and blood vessel health
- Maintains or achieves a healthier body weight
- Improves glycaemia – insulin sensitivity, muscle glucose uptake
- Improves immunity

Barriers to Exercise



Role of the Dietitian

- Advising on dietary needs alongside the sport or activity
- Behaviour modification skills – motivation
- Experts in realistic goal setting
- Providing ideas and building confidence
- Help with planning their routine to accommodate activity. Diet and activity go hand in hand.
- Providing resources

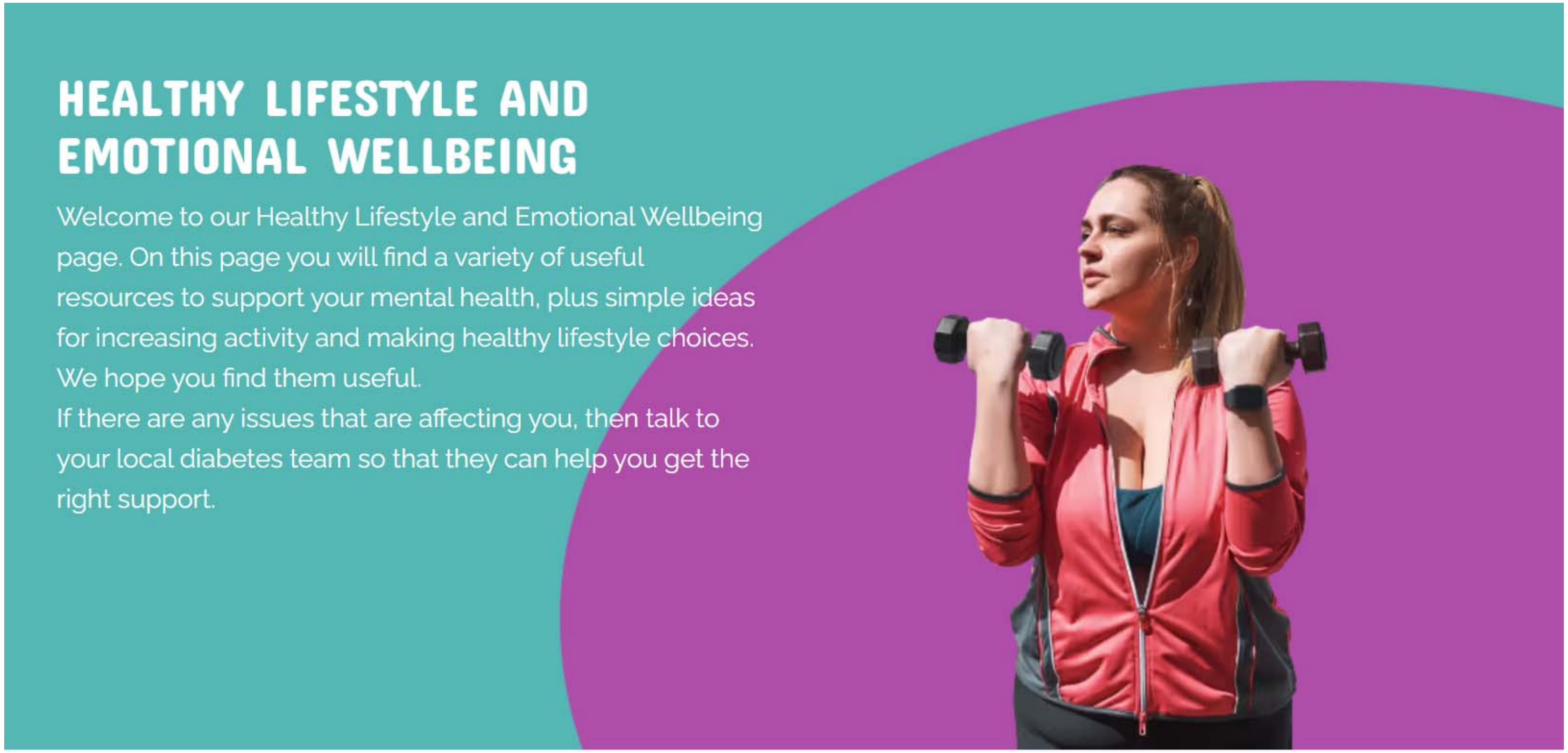
Practical Tips

- Help then to find something they enjoy
- Discuss daily routine - what can change
- Family involvement
- Support with ideas - instil confidence
- Knowledge of where they live - green spaces, sports clubs and facilities, distance from school
- Free opportunities
- Indoor and outdoors options
- Suggest equipment
- Realistic and achievable goals
- Get to know them, show interest, offer social events
- Tracking progress - e.g. Enhance-d

In Addition..

Dose matters	20–40 min/day of aerobic exercise yields significant metabolic gains
Exercise type	Mixed and intermittent sports may better stabilise blood glucose
Family and school involvement	Supports adherence and long-term habit formation
Preventive potential	Exercise alone can improve insulin resistance, even without weight loss
Daily light activity	Reducing sedentary time is also beneficial

[YoungType2]


HEALTHY LIFESTYLE AND
EMOTIONAL WELLBEING
Welcome to our Healthy Lifestyle and Emotional Wellbeing page. On this page you will find a variety of useful resources to support your mental health, plus simple ideas for increasing activity and making healthy lifestyle choices. We hope you find them useful.
If there are any issues that are affecting you, then talk to your local diabetes team so that they can help you get the right support.

Just Move More

NHS e-Learning

About the Managing Type 2 Diabetes in Children and Young People Programme

This elearning aims to enhance care for children and young people (CYP) with type 2 diabetes, which should help improve their longer-term health. It will help increase healthcare professionals' awareness of how best to care for CYP with type 2 diabetes and help them to keep up to date with the latest treatments and guidance.

Diagnosis and initial management

Glycaemic targets

General lifestyle, weight management and psychological interventions

Pharmaceutical interventions

Walking Apps

NHS Active 10 Walking Tracker – Apps on Google Play

- The Active 10 app anonymously records every minute of walking you do.
- The app tracks your steps, sets goals, show achievements and tips to boost activity.

Walking App - Go Jauntly
Discover walks, curate your own and share outdoor adventures

MapMyWalk

Running Apps

Zombies Run -[ZRX - Transform your workout into an adventure!]
(age 12 plus)

Couch to 5K

NHS Couch to 5K app

- A running programme for absolute beginners
- has a choice of 5 trainers, works with your music player, tracks your runs
- connects you with other Couch to 5K runners

Nike Run Club

STRAVA

[Nike Run Club App. Nike UK]

Workout apps

Sworkit Health | On-Demand Fitness, Mindfulness, Recovery, and Nutrition

JUST DANCE NOW

FitOn – #1 Free Fitness App, Stop Paying for Home Workouts

Johnson & Johnson Official 7 Minute Workout App Now Available For iPhone, iPad, iPod touch and Android Smartphones and Tablets

References

- Youth with type 2 diabetes develop complications more often than type 1 peers | National Institutes of Health (NIH)

- Complications and comorbidities of T2DM in adolescents: findings from the TODAY clinical trial - ScienceDirect

- ISPAD Clinical Practice Consensus Guidelines 2022: Type 2 diabetes in children and adolescents – PubMed

- The SEARCH for Diabetes in Youth Study: Rationale, Findings, and Future Directions – PMC

- Effects of Regular Physical Activity on the Immune System, Vaccination and Risk of Community-Acquired Infectious Disease in the General Population: Systematic Review and Meta-Analysis - PubMed