

1. PROJECT INFORMATION

Project Title	Thurrock Diabetes Community Detection Pilot		
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2. PURPOSE OF THIS PROJECT

The purpose of the Thurrock Diabetes Community Detection Pilot is to act on the low case finding rates for diabetes mellitus (type 2) within Thurrock due to limited resources available within primary care.

The project aims to increase the detection rate of people living with diabetes (type 2) who are asymptomatic and are at risk of serious health implications if undiagnosed, such as stroke, sight loss, heart attacks, kidney failure, lower limb amputations and even death. Pre-diabetic range will also be considered and referred into the National Diabetes Programme for healthy lifestyle advice. Therefore, it is intended that the project will increase the number of people receiving the appropriate care and treatment to manage their condition at an earlier stage leading to better health outcomes, whilst reducing costs.

The project will utilise professionals such as dentists to undertake this work by the use of HbA1c, chair side, point of care testing to individuals who display early onset gum disease and use this as a risk factor to prompt testing along with a questionnaire based risk score.

The potential for a secondary work stream will be explored via testing within the new mobile dental unit for those who fall outside of traditional services such as the travelling community, homeless, those with disabilities or those with additional needs. This will be provided at various locations with days and times designed to meet the need of patients.

3. NEEDS ASSESSMENT

It is estimated that 10,589 people within Thurrock currently have diabetes both diagnosed and undiagnosed. The number of observed cases of diabetes in 2015-16 within Thurrock was 8,403, this equated to a prevalence of 6.4% compared to the England average of 6.6%. Based on the estimated prevalence of 7.9% it suggests that there are 2,186 individuals currently walking around undiagnosed. This is a modest estimate as with an increase in obesity projected for future years, it is expected there will be an increase in diabetes rising to 11,408 total cases by 2026 (1)

Due to Thurrock being the 4th most under-doctored area within the region and Patient V GP ratio being inconsistent across the borough this calls for more innovative ways to see patients outside of the GP setting. This will also ensure we utilise the skills of other professionals so that GPs only see patients who require their expertise.

The NHS Health Check programme and the National Diabetes Prevention Programme currently offer detection of diabetes and lifestyle advice. However despite high take up of health checks positivity remains low. The National Diabetes Programme also offered lifestyle advice and education programmes however rarely are the programmes filled. We are also aware through SystemOne reporting that despite some patients having high glucose readings within general practice they are not always put on the diabetes register which is an inconsistency across the borough. Therefore we do not feel this is always detecting potential diabetics and alternative methods of detecting is needed to address case finding and increase uptake of national programmes such as those above, particularly for those within the pre-diabetic range.

Diabetes is not equally distributed and it is known that those who are from a non-white ethnic background carry a disproportionate burden of the disease. Areas within the South of Thurrock have a higher concentration of those from BME groups than in other areas of the borough.

Thurrock has a higher than national average of those who are obese with 29.7% in comparison to 24.0%. Adults account for a large proportion of this as 70.4% are considered as overweight compared to the average of 64.6%. However, taking the numbers of obese patients recorded on the QOF register, this indicates a lower obesity prevalence; however there are known caveats around recording of this. Obesity still remains a priority due to the strong associations with many LTCs such as diabetes.

For this programme, it was felt best to select a few areas to pilot this initiative in, and these were based on areas of likely high need. Therefore, localities have been sought according to high deprivation, which is a risk factor associated with diabetes and with poorer health overall. Other factors such as levels of inactivity, smoking and those stated above are considered due to the strong associations with the disease. Therefore, it is likely that there are higher numbers of undiagnosed diabetics and pre diabetics in these areas which may be detectable via the dental pilot.

Table 1.1

Associated GP Locality	Reasoning
Chadwell St Mary (Dilip Sabnis surgery)	High recorded obesity prevalence, low levels of physical activity & high smoking prevalence
Tilbury (Tilbury Health Centre)	low levels of physical activity, low uptake of Health Checks (meaning they are not diagnosing through this mechanism), high smoking prevalence, and high rates of emergency admissions for diabetes (indicating that there could be an issue with identification)

	and management)
Tilbury (Dr Shehadeh)	High recorded obesity prevalence, high smoking prevalence and low levels of physical activity.
Grays (Dr Shehadeh)	Statistically similar to Tilbury branch, but with a higher ethnically diverse population which puts them at a disproportionate risk of the disease.
Chafford (Dr Abela)	Low levels of observed diabetes but high ethnically minority population which puts them at a disproportionate risk of the disease.
Grays (Acorns)	Low levels of observed diabetes, high smoking prevalence but high ethnically minority population which puts them at a disproportionate risk of the disease.

Dental Work Stream

There are currently 19 dental practices within Thurrock in various localities which can play a real part in detecting diabetes. This pilot will identify practices within the localities within Table 1.1 to seek uptake to participate. The assumption is that current level 1 appointments would not need to be extended in order to conduct both the survey and the HbA1c test as the survey can be completed whilst in the waiting area and the HbA1c test is a quick and easy method of testing (an additional 10 seconds). However, considerations for time to complete referrals will need to be considered and monitored.

Mobile Dental Unit PHE

There is the prospect of conducting point of care testing within the new mobile dental unit within various localities (launch date to be confirmed). Anyone can refer including the patients themselves where appointments will be made available. Patients need to give a place of residence (if homeless this can be a shelter or charity) and should there be health concerns patients can be referred to secondary care. Health advice and tooth removal can be completed on site or through a follow up appointment.

This is designed for individuals who fall outside of the traditional setting and would be an opportunistic way of point of care HbA1c testing for those who may be at risk and have not previously made contact with traditional services. Days and times of the service will be designed to meet the needs of the patients.

The pilot would only be offered to patients registered with dentists or GP practices within these localities who are also living within Thurrock.

4. EVIDENCE BASE

PHE Press Release (2016): 3.8 million people in England now have diabetes (5)

A prevalence of diabetes model produced by PHE estimates that 90% of those diagnosed with diabetes in England have type 2, whilst 1 in 4 individuals are unaware of their condition. Those of South Asian or from a black minority group are twice as likely to be at risk.

John Newton, Chief Knowledge Officer at PHE, said:

“The number of people with diabetes has been steadily increasing and tackling it is fundamental to the sustainable future of the NHS. Diabetes can be an extremely serious disease for those that have it and treating it and its complications costs the NHS almost £10 billion a year. Developing Type 2 diabetes is not an inevitable part of aging, we have an opportunity through public health to reverse this trend and safeguard the health of the nation and the future of the NHS”.

NICE (2012) Type 2 diabetes: prevention in people at high risk Public Health Guideline (PH38) (4)

NICE guidelines called for those working in professions such as dental practices to take action in the identification of patients at risk of developing type 2 diabetes. Those who do not engage with GP practices would also benefit from alternative venues. It recommended the use of HbA1c testing due to strong evidence supporting the method as appose to moderate support for fasting plasma glucose testing. The use of a validated self-assessment risk scored questionnaire (such as FINDRISC) particularly for those >40 from South Asian or Chinese descent aged between 25-39yrs was recommended to screen patients.

Diabetes and periodontal diseases: consensus report - Chapple (2013) (1)

The report highlights the strong evidence that supports direct associations between periodontitis (gum disease) and diabetes. It recommends that it would be prudent to identify individuals within dental practices and also to pursue the presence of periodontitis (gum disease) when a diagnosis of diabetes has been made within primary care.

European Federation of Periodontology (2012) The EFP Manifesto: Perio and General Health (3)

The published report called for diabetes to be identified within the dental setting through using a chair-side blood testing.

“The evidence for an association between Diabetes and Periodontitis is as follows:

- Plausibility – Type-2 diabetes is preceded by systemic inflammation, leading to reduced pancreatic β -cell function, apoptosis and insulin resistance. Increasing evidence supports elevated systemic inflammation (acute-phase and oxidative stress biomarkers), resulting from the entry of periodontal organisms and their virulence factors into the circulation, thus providing biologically plausible mechanisms underpinning the adverse impact of

periodontitis upon diabetes and its complications.

- Epidemiological data. Consistent and robust evidence is available which demonstrates that severe periodontitis adversely affects glycemic control in diabetes and glycemia in non-diabetes patients. In addition, in patients with diabetes, there is a direct and dose-dependent relationship between periodontitis severity and diabetes complications. Emerging evidence indicates an increased risk for diabetes onset in patients with severe periodontitis.
- Intervention studies. Randomised clinical trials consistently demonstrate that mechanical periodontal therapy associates with approximately a 0.4% reduction in HbA1C at 3-months, a clinical impact equivalent to adding a second drug to a pharmacological regime for diabetes

Teeuw *et al* (2017) Periodontitis as a possible early sign of diabetes mellitus BMJ Open Diabetes Research and Care 2017

The study conducted in Amsterdam looked at the correlation between periodontitis and early detection of diabetes via dentists. This included assessment of periodontitis and risk scoring questionnaire to identify individuals with risk factors associated with diabetes mellitus. This was conducted on 313 individuals who had no history of diabetes. Collection of bloods from HbA1c chair side blood glucose monitoring was conducted and over 60% who took part indicated values within the diabetic and in particular the pre-diabetic range (Teeuw *et al* 2017)

5. PROJECT OUTCOMES

The project outcomes are expected to ensure:

- Early detection of diabetes and increase referrals to lifestyle and education services for pre-diabetic range patients.
- Better management of the condition to prevent further serious life limited or life changing illness
- Reduce hospital admissions and avoidable A&E attendances through early diagnosis and management.

Annual Public Health Report (2016) – Financial Opportunities (1)

The pilot is also expected to support the achievement of 500 patients being referred into the National Diabetes Prevention Programme and encourage uptake of the SWEETS basic course to support newly diagnosed patients manage their condition.

Additional outcomes:

- Increase the number of people detected with diabetes and who understand their condition to receive the appropriate medication, advice and support;
- Reduced complications associated with uncontrolled diabetes
- Reduced health inequalities
- Increase quality of life
- Reduce pressure on secondary and social care;
- Reduce costs associated with the disease

The pilot is also expected to create better collaboration and working relationships between Public Health/Primary Care/Dentists to support a mixed work force model (1).

Should the pilot be successful this could be extended to other dental practices and potentially the detection of other LTCs such as CVD. As the dental work stream is a relatively new concept it could be adopted by other organisations as an alternative to other forms of delivery.

6. DELIVERY PLAN AND KEY MILESTONES		
Key Milestones (Key events indicating progress)	To be reached by (date)	Who is responsible for meeting the Milestone?
Dental Practice Work Stream		
Discuss with Local Dental Committee to confirm existing resources and agree on the terms of collaboration	Aug 2017	JP
Receive approval from Diabetes Network Group	July 2017 (Approved)	JP
Receive approval from TASC	Oct 2017	JP
Get a final list of Dentist who signed up	Oct 2017	JP
Producing/developing the proforma with PHE, to give the screening results to the GP	Oct 2017	JP
Sign agreement with local Dentists	Oct 2017	JP
Purchase equipment for detection (Table 1.1)	Oct 2017	JP
Deliver necessary trainings	Oct 2017	JP
Advertise service and obtain free literature from Diabetes UK for distribution (start Nov 2017)	Oct 2017	JP
Run 1 st evaluation (6 mos.)	May 2018	JP
Run 2 nd evaluation	Nov 2018	JP
Community Mobile Dental Unit Work stream		
Discuss with PHE to confirm existing resources and agree on the terms of collaboration	Sept 2017	JP
Receive approval from Diabetes Network Group	July 2017 (Approved)	JP
Receive approval from TASC	Oct 2017	JP
Sign agreement with PHE lead	Oct 2017	JP

Deliver necessary training	Oct 2017	JP
Advertise service and obtain free literature from Diabetes UK for distribution (Start Nov 2017 (TBC)	Oct 2017	JP
Run 1 st evaluation (6 mos.)	May 2018	JP
Run 2 nd evaluation	Nov 2018	JP

7. FINANCIALS: Costs, Resources, Cashable Benefits, Cost Avoidance, Return on Investment

Cost

This will be a 6 months pilot and the top 6 pilot localities will be selected based on highest likely prevalence of undiagnosed diabetes. Dental practices within localities identified will be offered to participate in the pilot with an allocated dentist at each practice.

Dentists

The number of patients was estimated from the practice population and number of appointments per day (estimates from Chief Nurse Suffolk GP Federation) this was estimates for Essex practices.

HbA1c Now+

Cost assumptions
based on:

Pts per week per practice	48
x 6 practices	288
10% cohort (those estimated as having gum disease)	29
26 weeks	754

Table no 1.1. – Costing and Assumptions for Dentistry

Costing input and Assumptions	
	Cost
76*Boxes of 10 machines @£93.00	£7,068
Single use Lancet £10 per box of 100 over 26 weeks	£80.00
Dentist payment @ £2 per test	£1,508

Advertising and Printing	£500
Total	£9,156

Table no 1.1.1 – Costing and Assumptions for Mobile Dental Unit – This is demand led, times and days will be dependent on need so figures are estimated.

Pts per week per – 1 Dental Unit	10
10% cohort (those estimated as having gum disease)	1
26 weeks	26

Costing input and Assumptions	
	Cost
3*Boxes of 10 machines @£93.00	£279
Single use Lancet £10 per box of 100 over 26 weeks	£10.00
Dentist payment @ £2 per test	£52
Advertising and Printing	£100
Total	£441

Return on Investment will be calculated as part of the evaluation of the pilot and will inform the justifications for continuation or expansion of the programme.

Evaluation outcomes of pilots:

- Number of patients identified within diabetic range and pre-diabetic range using the above method of screening.
- Number of patients referred to their GP for confirmatory testing.
- Number of patients seen by GP practice following referral.
- Number of patients receiving treatment or lifestyle advice with confirmed diabetes or pre-diabetes diagnoses.
- Patient satisfaction with outcomes of service using questionnaires
- Cost analysis with the inclusion of return on investment.

8a. NON FINANCIAL BENEFITS

Benefit Description	Measure to track realisation of benefit	Benefit realisation timescales:
Increase in lifetime and well-being of Thurrock population	Local Census	More than 5 years
Increase in QOF completeness	QOF reports	June 2020
Decrease pressure on secondary and social care	Mede Analytics, Social Care reports	June 2020

8b. POTENTIAL DIS-BENEFITS

Dis-benefit description	Measure to track realisation of dis-benefit	Dis-benefit realisation timescales and mitigation
Initial increase in GP workload	DNAs and waiting time	Annual reports April 2018, 2019 and 2020
Losing patients on the pathway and not treating them appropriately after diagnosis	QOF indicators	Annual reports April 2018, 2019 and 2020
Potential of additional workload for dentist	Monitor income Vs time taken for completion with the inclusion of referral process	Evaluation May 18 & Nov 18

9. KEY RISKS TO PROJECT DELIVERY

Risk Type, Risk Level and Risk Description	Risk Mitigation	Who will monitor this Risk?
Failure to follow-up with patients with a positive result	Track patient follow-up through good communication with Dentist	JP
False positives and false negatives	Continuous monitoring of rate of positive and negative screenings	JP
Poor communication between Dentist and GP	A communication system will be put in place to facilitate good collaboration between parties	JP

9. KEY ASSUMPTIONS AND CONSTRAINTS

ASSUMPTIONS

Assumption	What happens if assumption is no longer correct	Who will monitor the assumption
Those who are eligible agree to undertake the risk questionnaire	Patients aware of risk but refuse questionnaire	JP
Those who complete a risk score questionnaire accept HbA1c testing	Patient are aware of their risk however they refuse HbA1c testing and therefore are at risk	JP/MP
The current primary care workforce can cope with increased referrals	Increase referrals for confirmatory diagnosis putting a strain on current primary care resources. However, this is expected to be mitigated through a reduction in multiple appointments due to further illness as a result of late diagnosis.	JP
Patients consent to share details with GP	Patients do not consent and are aware of risk, but information cannot be shared for further follow up. (consent will be sought through the completion of risk score questionnaire)	JP

9. DEPENDENCIES

Inbound: This project is dependent on the delivery of these projects/activities

Project/Activity	What is the dependency?	Who will monitor the dependency?
Primary Care formal diagnosis	Patients with borderline or in range diagnostic have to be referred for further investigation via GP for confirmation testing. This is also dependant on dentists electronically entering information onto patient records – this is dependent on 1) the dentist entering it on, and 2) the GP practice entering it on	JP

Referrals to National Diabetes Prevention Programme	Patients with indicated pre-diabetes range are referred to NDPP for lifestyle advice.	JP
Secondary Care urgently sees patients with severe glucose level	Patients with a severe glycaemic measurement to be seen urgently by a specialist	JP

10. GOVERNANCE ARRANGEMENTS

- Thurrock CCG will review and amend the programme specs to ensure quality measures are met through the Diabetes Network (this programme is an action of the group)
- The Quality and Patient Safety Group will review prior to implementation and any issues will be raised through the group.
- Public Health Leadership Group will provide input regarding any governance arrangements needed.
- The Local Dental Committee will provide and support with terms and conditions of work for Dentist.

Bibliography

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3. **European Federation of Periodontology (2012)** *The EFP Manifesto: Perio and General Health*

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5. **Public Health England (2016)** *Press release: 3.8 million people in England now have diabetes*

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6. **Teeuw W et al (2016)** *Periodontitis as a possible early sign of diabetes mellitus BMJ Open*

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