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National Institute for Health Research

Collaboration for Leadership in Applied Health Research and Care (CLAHRC) for Greater Manchester

IGT Care-Call Project 2011 Evaluation Report

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NIHR CLAHRC for Greater Manchester is a collaboration of Greater Manchester NHS Trusts and the University of Manchester, and is part of the National Institute of Health Research

Evaluation of the NHS Salford IGT Care-Call Project

Contents

1.0: Executive Summary

- A twelve month project was undertaken by the Collaboration in Leadership in Applied Research and Care (CLAHRC) for Greater Manchester and NHS Salford. The aim of the project was to provide patients diagnosed with Impaired Glucose Tolerance (IGT) a service offering lifestyle advice and structured support via a telephone based Care-Call service that assisted them in achieving lifestyle and behaviour changes and could ultimately reduce their risk of developing type 2 diabetes.

- The overall conclusion of the evaluation is that this six month project was a success in achieving the project aims.

- The project was a modified version of NHS Salford's highly successful Care-Call service for patients who have already developed diabetes. The IGT project engaged with 55 patients from seven practices across Salford. Patients agreed an overall goal to be achieved over the six month programme of care, setting smaller goals at each telephone appointment with their health advisor. Scripts and resources for IGT were developed by the diabetes team. Patients received their own blood results which they discussed with a health care professional supporting their ability to self manage. The focus was on behavioural change tailored to each person's individual action plan.

Quantitative Outcomes

- 51% (n=21) of patients reverted to normal fasting glucose and oral glucose tolerance test (OGTT) levels on completion of the six month programme. 9.7% (n=4) reduced their risk to impaired fasting glucose (IFG), a lesser risk category for the development of type 2 diabetes.

- 74% (n=35) of patients had a confirmed weight loss on completion of the six month project, an average of 4.9kg (5.4%) per person.

- 63% (n=41) of patients reduced their BMI by an average of 3.02 points per person. Further breakdown of this group shows:

    - Twenty five patients had an initial BMI >30 (obese) and of these 72% (n=18) reduced their BMI scores by an average of 2.14 points on completion, with 24% (n=6) reducing to the BMI 25-30 category (overweight).
    - Fifteen patients had an initial BMI 25-30 (overweight) and reduced their BMI score by an average of 1.25 points and of these 13% (n=2) reduced to <25 (healthy weight).

- 65% (n=30) patients reduced their FINDRISC score by an average of 2.03 points per person. Of this group 16 (53%) patients reduced their risk enough to move to a lower risk category.

- 77% (n=48) of patients achieved their overall lifestyle goal.

- 87% (n=36) of patients reported an increased understanding of their OGTT and FBG results.

- 78% (n=32) of IGT patients reported they definitely felt more confident about understanding how they could reduce their own risk of developing type 2 diabetes.

Qualitative Outcomes

- Two focus groups were held, each with five patients, in August 2010 and March 2011. These showed that the service was very well received. Only one patient felt that face to face intervention would be more suitable to her lifestyle. Patient feedback during the project enabled service improvements to be made throughout the period of the project.

- A patient questionnaire was sent to all 55 patients. Forty one (74.5%) completed questionnaires were returned. Results from the questionnaire showed that 38 people (92.7%) discussed their goals regularly with their health advisor helping them achieve their overall six month goal. 39 patients (95.1%) agreed a plan to achieve their goal prior to the next telephone appointment and 37 patients (90.2%) felt their health advisor gave relevant up to date advice on how to reduce their risk of developing type 2 diabetes.

- Questionnaires were also given to the primary care teams in the 7 pilot practices. Twelve replies were received, equating to a 92% response rate. Results from the questionnaire showed that there were high levels of confidence in the motivational ability of care call in assisting people to make positive behaviour changes (average score 8.6 out of 10). Practice staff were very satisfied with the supporting patient information leaflets and resources used during the project (average rating 9.2 out of 10) and they felt confident that care call provided their patients with up to date, evidence based dietary and lifestyle advice (average rating = 9.2 out of 10).

Financial Implications

- An initial cost benefit analysis has been undertaken by Professor Ruth Boaden, Deputy Director, NIHR CLAHRC for Greater Manchester. This will be developed further with finance colleagues from NHS Salford. At a time when the NHS is under considerable financial pressure, using band 4 health advisors to deliver the service frees up capacity in the specialist team, and offers an effective use of resources.

Conclusion

- This Report is submitted to NHS Salford with an invitation to consider the findings and to explore the potential and benefits to the health economy and to patients of rolling the service out to all practices.

2.0: Background

2.1 Prevalence of diabetes

In 2010, 2.26 million people in England were registered with a diagnosis of diabetes, equating to 5.4% of the population. Type 2 diabetes accounts for 85-95% of all people with diabetes[1]. An additional 850,000 people are believed to have the condition but are not aware of it[2]. Prevalence of diabetes in England among adults is predicted to rise to 8.5% by 2020 and 9.5% by 2030[3]. In 2009/10 there were 10,744 people aged 17 years and older on the diabetes register in Salford. There is also an estimated 2060 people in Salford with undiagnosed diabetes[4].

Type 2 diabetes can present at any age, although prevalence increases with advancing age. More recently type 2 diabetes has been diagnosed in young people and even children, due to changes in society that include reduced activity levels and increased weight. This is particularly evident in westernised countries where obesity levels are rising. As the prevalence of obesity increases so too does type 2 diabetes. The overall result of this is that the number of patients with diabetes and consequent need for health care is increasing at an alarming rate. In Salford it is estimated that there are currently 39,000 adults and 5,500 children categorised as obese and 68,000 adults and 5,700 children categorised as overweight. Analysis carried out at NHS Salford estimated that obesity currently costs the city at least £10 million per year and can cost the Salford economy £5,834,314 per year in sickness absence from work[5].

2.2 Economic and health implications of diabetes

Diabetes UK recently estimated that 10% of the total NHS budget is spent on diabetes care [6]. In 2010 the NHS spent about 9 billion pounds a year - approximately £1 million an hour - treating diabetes[6]. Routine care for people with diabetes is itself expensive, but a far greater economic burden is the hospital care required to treat serious complications of the condition. Complications of diabetes are due to prolonged exposure to raised blood glucose levels which damage the macro and micro vasculature. More than one in ten deaths of adults in England are diabetes related and reflect the vascular nature of the disease[7]. Adults with diabetes are 2-4 times more likely to suffer a stroke[8] and heart attacks are three times more likely in people with diabetes. Heart disease accounts for over half of deaths in type 2 diabetes[9]. Approximately 30% of people with type 2 diabetes will develop kidney disease with kidney failure accounting for 11% of deaths in these patients[1]. Diabetes is the single largest cause of blindness among people of working age in the UK, and 60% of people with type 2 diabetes will have some level of retinopathy within 20 years of diagnosis[1]. It is estimated that during 2005 in Salford PCT there were 157 deaths due to complications of diabetes. Without diabetes there would have been 12.1% fewer deaths between the ages of 20 and 79 years[4].

In addition to the individual cost to quality of life, people with diabetes also face significant personal financial costs, estimated at £500 million a year. This includes lost working time, the cost of travel for medical treatments, having to take early retirement and the cost to family in the event of early death. This figure is estimated to rise to £780 million in 2026[6]. Social services are often involved in the management of diabetic patients at a cost of £230 million per year and it has been estimated that diabetes doubles the chance of requiring admission to nursing or residential care[10].

2.3 Impaired Glucose Tolerance (IGT)

The term IGT was first introduced in 1979 to replace 'borderline' diabetes and other categories of hyperglycaemia that were then not thought to carry a risk of micro vascular complications [11]. It was considered a clinical class of its own by the World Health Organisation in 1985 [12]. IGT is an asymptomatic condition not usually associated with functional impairment, but known to be a precursor for the development of type 2 diabetes and clearly associated with increased cardiovascular risk [13]. There is strong evidence, including randomised control trials, that demonstrate the onset of type 2 diabetes can be prevented or delayed, by positive changes related to healthy nutrition, adequate physical activity and weight reduction in people with IGT[14,15,16]. By improving glucose control, these lifestyle interventions have also been shown to improve hypertension, dyslipidaemia and have therapeutic effects on mild to moderate depression[17].

In the absence of any intervention, 50% of people with IGT will develop type 2 diabetes over a period of ten years[13,18].

2.4 Economic and health implications of IGT

In addition to the risk of developing type 2 diabetes, there is evidence to suggest that both prevalence of and mortality from cardiovascular disease is higher in patients with IGT[19,20]. Middle aged men diagnosed with IGT have double the risk of death from cardiovascular disease[21]. IGT has been found to be an independent risk predictor for the incidence of CHD and premature death from CVD which was not confounded by the development of clinically diagnosed diabetes. Evidence also suggests that the higher the glucose levels the poorer the CVD risk profile[22]. In most populations studied, 60% of people who develop type 2 diabetes have either IGT or IFG five years or so before, with the remaining 40% having a normal glucose tolerance at that time[23].

In Salford the assumed prevalence of patients with IGT is 10% or 6,942 people[24]. Over a 5-10 year period this could result in an increase of 3,471 patients. This is shown in table 1 below:

Table 1: Estimated prevalence of IGT in Salford

Timeframe	Progression rate (percentage)	Estimated Salford numbers (based on 10% prevalence amongst 45-74 population age group)
1 year period[11]	5-12%	347 – 833
3-5 year period[12]	25%	1,736
5-10 year period[13,14]	50%	3,471

A recent systematic review of the literature clearly states that intense lifestyle interventions to prevent type 2 diabetes among people with IGT are very cost effective = $25,000 per life year gained or QALY (quality adjusted life year)[25].

2.5 Diagnosing IGT

Most people are diagnosed with IGT opportunistically, either as an in-patient following an acute illness, gestational diabetes or at the GP surgery following further testing to investigate a high random glucose test. Diagnosing IGT requires a two hour oral glucose tolerance test (OGTT) to be performed. This can be time consuming and inconvenient for both practice nurse and patient due to the two hour wait for the second blood sample to be taken. As part of the process for diagnosing IGT, a fasting blood glucose sample is also taken. The results of the fasting blood glucose can indicate that a patient has glucose levels higher than normal but not high enough to be diagnosed with type 2 diabetes. If they additionally have a normal OGTT result, people in this category are diagnosed as having Impaired Fasting Glucose (IFG). This is shown in table 2 below. Although IGT and IFG are two separate risk categories for developing type 2 diabetes, having combined IGT and IFG represents a greater, more advanced risk of pre-diabetes and carries a higher risk of developing type 2 diabetes (15-20%) after one year[26]. The potential of using HbA1c to improve prediction of diabetes beyond simple risk scores is a topic currently being widely debated due to its simplicity and ability to be measured in non-fasting samples[27].

Table 2: Classification of IGT and IFG

		OGTT (mmol/l)		
		<=7.7	7.8-11	>11
Fasting (mmol/l)	<=6	Normal	IGT	type 2 diabetes
	6.1-6.9	IFG	IGT	type 2 diabetes
	>=7			type 2 diabetes

Diagnosing IGT early is essential as it is known to have significantly improved outcomes. Once diabetes is established, attempts to control blood glucose concentrations have limited effect on reducing CVD risk [28].

2.6 Predicting the risk of developing type 2 diabetes

Once identified with IGT it is possible to further assess the patient's risk of developing type 2 diabetes using the FINDRISC diabetes self assessment tool. The FINDRISC tool, developed and validated in Finland, assesses an individual's 10 year absolute risk of developing type 2 diabetes using eight simple questions [29]. The score places the person into one of five risk groups: low, slightly elevated, moderate, high and very high (Appendix 1). Although the FINDRISC tool was designed to predict the development of diabetes it has also been shown to be strongly associated with identifying CVD risk factors, metabolic syndrome and as a predictor of CHD, stroke and total mortality[29]. Each one point increase in the FINDRISC score is associated with a 16-23% increase in the likelihood of CVD and mortality[29].

2.7 The evidence for using lifestyle behaviour change to prevent type 2 diabetes in people with IGT

The National Service Framework for Diabetes (2007), Standard 1 states:

"The NHS will develop, implement and monitor strategies to reduce risk of developing diabetes in the population as a whole and so reduce the inequalities in risk of developing diabetes"[30]

Current healthcare provision lacks capacity to meet the increasing needs for preventative care. Simply providing information at a one-off doctor's appointment is seldom sufficient to promote behaviour change. Helping people to change their behaviour is difficult, but studies show that a lifestyle intervention to modify dietary intake and activity levels in patients with IGT is warranted. Randomised control trials have shown that relatively modest lifestyle changes can delay or prevent the onset of type 2 diabetes in patients with IGT [14,15,16]. Both the International Diabetes Federation and Diabetes UK recommend lifestyle interventions as first choice therapy for people at risk of developing type 2 diabetes. Lifestyle changes and behaviour change can be delivered by a range of methods, for example face to face with health trainers on an individual basis, in education groups, by email and by telephone.

2.8 Goal setting

Behaviour change is more effective if people are engaged in thinking about their own solutions and setting their own goals on the basis of these. Motivational Interviewing is a proven method of promoting this behaviour change[31]. Each patient discusses their own lifestyle, areas of concern and decides what they would like to change and how they would best achieve this. The detailed process of planning these changes is referred to as 'action planning'. An overall goal is set when a clear vision of what they want to achieve in six months has been decided by summarising and prioritising. Each six month goal (the overall goal) is broken down in to smaller, monthly, 'mini' goals. Completion of these 'mini' goals leads to the achievement of the overall goal.

Randomised control trials have highlighted the links between IGT and dietary modification, weight loss and physical activity [14,15,16]. Based on this evidence IGT Care-Call used these three categories for patients choosing their overall goal. Healthy eating and activity were the two categories used to assess the method of achieving the overall goal.

Some patients will not be ready to change at the initial stage and will prefer to digest more information before taking the goal setting step. As the emphasis is on the patient being in control and making their own decisions, the health advisor must be flexible and adapt their approach to ensure these preferences are met whilst at the same time providing support to be responsive when the patient is ready to make the change.

2.9 NHS Salford Care-Call

Care-Call is a telephone based service offered to patients diagnosed with type 2 diabetes. This service was developed following the successful 12 month PACCTS (Proactive Call Centre Treatment Support) trial[32,33]. This randomised controlled trial, undertaken at Salford's Hope Hospital, aimed to determine whether glycaemic control in patients with type 2 diabetes could be effectively improved, using two trained non-medical telephonists supported by specially designed software and a diabetes specialist nurse. Outcomes of the trial demonstrated that proactive telecarer support was able to improve glucose control; compared to the control group receiving usual care at that time, people with a baseline HbA1c greater than 7% showed a statistically significant improvement of 0.5% after twelve months intervention. Of particular importance was that this improvement in glucose control appeared to be through changes in lifestyle behaviour rather than increasing medication.
The PACCTS approach was also found to be an efficient method of providing education and motivation enabling the patient to self manage their condition more appropriately[33].
Since 2007, patients diagnosed with IGT in NHS Salford, have been invited to attend a single three hour group education session delivered by two band 7 diabetes educators. In addition to the relatively high

staff cost to provide this service, the sessions are sometimes inconvenient to the younger population in employment, suitable rooms can be difficult to source, and increasing numbers of patients being diagnosed with diabetes as well as IGT have caused considerable workload increase to the specialist diabetes team. NHS Salford wished to investigate whether a more efficient method of service delivery was achievable.
Following discussions with CLAHRC, NHS Salford and the community diabetes team it was decided to utilise and adapt the already successful Care-Call service, extending it to people with IGT. This service would be piloted and evaluated.

3.0: Project methodology

This report covers the period of twelve months from 18th March 2010 when the service was provided and evaluated.

For a patient to be eligible for the IGT Care-Call project a diagnosis of IGT was required. (See table 2)
For this project, patients who could not use a telephone, or did not have a telephone were excluded. As the IGT Care-Call project was an extension of the already successful and evidence based Care-Call service, and was simply providing an alternative method of care delivery, patient consent was not sought.

3.1 The IGT Care-Call project - aims and objectives

The Greater Manchester CLAHRC and NHS Salford worked together over a twelve month period to develop a six month telephone based, lifestyle intervention programme for people diagnosed with IGT to help prevent or delay the onset of type 2 diabetes. The IGT Care-Call service provides a structured six month programme of proactive educational support, offering lifestyle advice by a dedicated trained health advisor. Rather than teaching patients in a directive manner, health advisors engage in motivational discussions with patients, identifying key areas of their lifestyle that could be improved such as weight loss and healthy eating, and by a series of goal setting. Following discussion with CLAHRC and NHS Salford the project aim was agreed as follows:

1. To deliver a telephone-based support service for people with IGT in which 75% of service users achieve and sustain one or more lifestyle goals by March 2011
2. To deliver a telephone-based support service for people with IGT that 75% of service users rate as assisting them in achieving one or more lifestyle goals by March 2011

3.2 Setting up the project

NHS Salford Care-Call is a well established telephone based service with staff trained in motivational interviewing techniques. However, new scripts specifically for people with IGT were required which involved input from the specialist diabetes team. NHS Salford's self care team supported the project by allocating two health advisers to the project. NHS Salford and CLAHRC both contributed to funding a band 7 health care professional (Care-Call Development Manager). The CLAHRC service improvement and information analyst designed a computer database to record patient progress during their enrolment on the project, as well as a database to enable recording of FINDRISC in General Practice. CLAHRC provided the training in how to use this. This information allowed evaluation of the project.

Monthly meetings were held with the health advisors, the Care-Call Development Manager and the CLAHRC Knowledge Transfer Associate (KTA).
GP practices involved in the project were visited by the Care-Call Development Manager and the KTA.
An initial workshop to launch the project was held in March 2010 where all practices participating were invited and given the opportunity to discuss and address any issues or concerns.

3.3 NHS Salford GPs invited to participate on the IGT Care-Call project

One of the initial challenges was being able to identify the target IGT population in Salford. Unlike the diabetes population, GPs are not required to maintain a register of people with IGT, nor are there any QOF indicators associated with it. It is hoped that implementation of the national 'NHS health check' programme and the publication of NICE guidance 'Prevention of type 2 diabetes: preventing pre-diabetes in adults' (expected June 2011) and 'Prevention of type 2 diabetes: preventing pre-diabetes among high risk groups' (currently at public health guidance draft scope phase) will go some way to resolving this. The GP practices approached to participate in this project were all known to maintain an IGT register.

Whilst the IGT registers of four GP practices initially appeared to be sufficient to recruit 100 patients onto IGT Care-Call, uptake into the service was slow. It became apparent at month three that additional practices would be required to increase patient numbers. Three further practices expressed an interest to participate in the project following a presentation at the Diabetes primary care education event in July 2010. These practices also had some existing knowledge of their IGT population. These practices enrolled late August 2010 and began referring patients approximately one month later.

A bulletin was sent each month from the Care-Call Development Manager to update each practice on their referrals and how the project was progressing. A second workshop was held in September 2010 to provide interim results and feedback to participating practices. This workshop included patient representatives.

Towards the end of the project, each practice was visited by the Care-Call Development Manager and the CLAHRC KTA to discuss the end of the project and to gain valuable feedback. A final workshop was arranged in May 2011 to present results from the IGT Care-Call project.

3.4 The IGT Care-Call pathway

The IGT Care-Call pathway (shown in Figure 1) commenced at the GP practice. The practice nurse was responsible for identifying appropriate patients, performing the fasting glucose and OGTT tests required to diagnose IGT. In addition to these tests, the practice nurse also calculated the risk of the individual developing type 2 diabetes, using the FINDRISC assessment tool. This information was provided to the IGT Care-Call service as a referral.

On receipt of the referral the initial assessment information was input into the database (with patient identification removed) to allow evaluation of the project. All participants received an initial introduction call from a health advisor to outline the Care-Call service and the six month programme. This health advisor would become the dedicated health advisor. Following this call a 'patient pack' was posted in advance of the next telephone appointment so the patient could prepare for the goal setting and action planning.

All patients received the same starter pack of information containing:

- A personalised letter containing their recent fasting and OGTT results, together with a diabetes diagnosis table (Appendix 2)
- IGT patient information leaflet (specifically designed for NHS Salford and this project and approved by their patient information group (PING)
- A fridge magnet to allow recording of weekly goals
- Eat Well booklet (free booklet published by the Food Standards Agency 2010)
- Your Weight, Your Health (free booklet published by DH 2006)
- DVD 'Sensible portions for healthy eating' (this resource was specifically designed for and by NHS Salford diabetes team, IGT Care-Call and CLAHRC as it was recognised that people needed visual representation of what correct food portion sizes look like and a search of nationally available resources did not find anything suitable).

The 'action planning call' was delivered by a qualified health professional. This was the longest call duration at approximately 40 minutes. This call aimed to ensure the person understood their IGT diagnosis, their blood glucose results, the importance of preventing type 2 diabetes and how they may be able to reduce their risk. Dietary and activity history were examined together and the individual then identified an area of their lifestyle they wished to change that would help reduce their risk of developing type 2 diabetes. An overall six month goal was set at this call, together with an initial mini goal that would begin to help them achieve this.
The remainder of the programme was delivered by the patient's dedicated health advisor. Calls were made at two weeks post action planning, four weeks and monthly thereafter for a total of six months. Calls were approximately 15-20 minutes duration and used motivational interviewing and behaviour change techniques.
The starter pack of patient information was built up over the six month programme as health advisors sent out supporting literature, as required, following each call. This allowed people to receive individually tailored advice appropriate to their needs and their lifestyle goal, as well as developing in to a resource that could be referred to in the future.
Health advisors recorded all details on the electronic patient record (iSOFT) which is viewable by health care professionals in Salford across primary and secondary care. For the purposes of this project a database has been kept to record success in achieving goals, with patient identifiers removed.

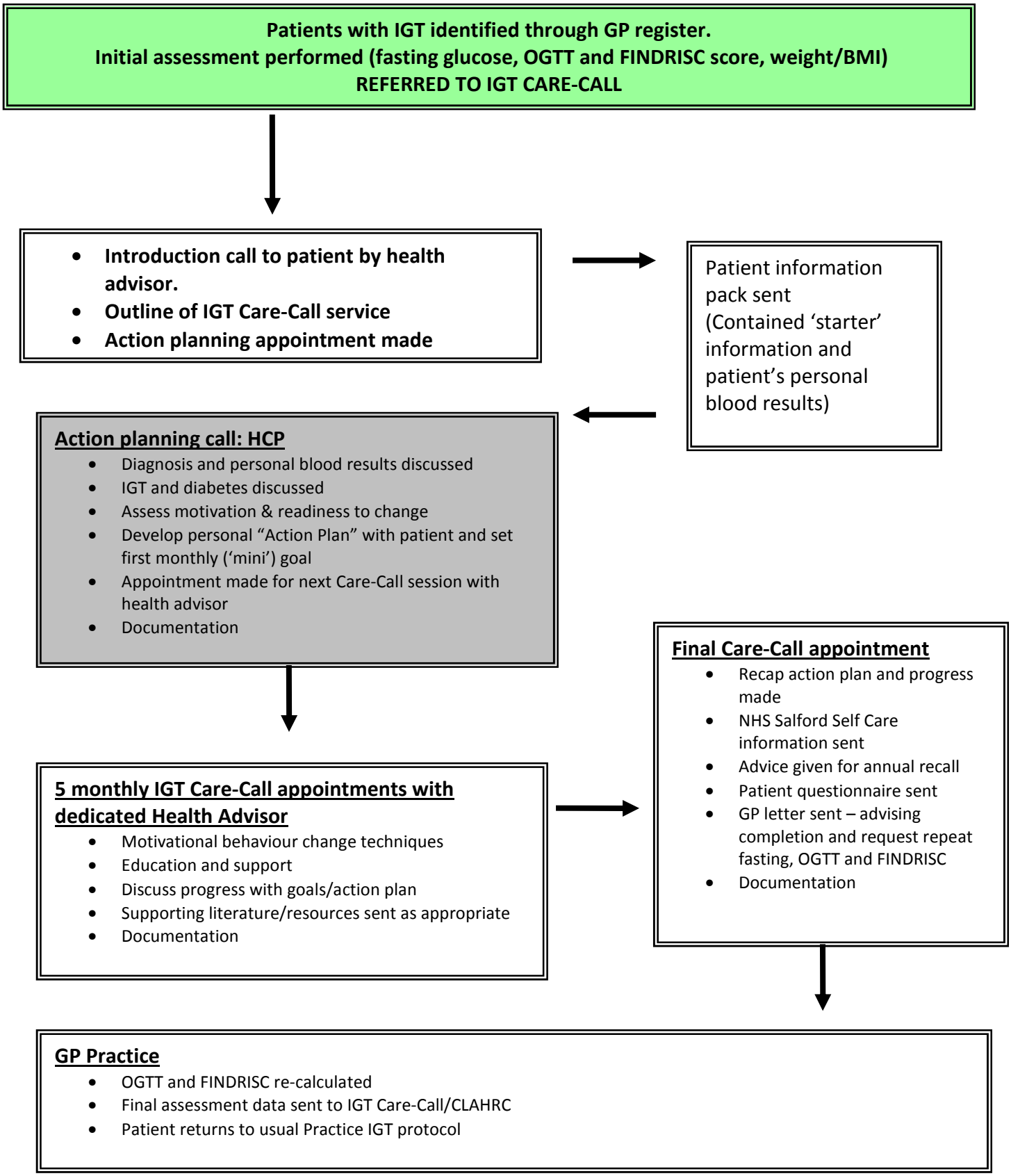
On completion of the six month programme the GP practice was advised, and repeat fasting, OGTT and FINDRISC calculation performed. IGT Care-Call was informed of these results to allow comparison with initial assessment data, allowing evaluation of the project.

3.5 Signposting to other NHS Salford services

Throughout the six month programme, health advisors referred and signposted people to NHS and community services as appropriate. This provided additional support and advice to help achieve a healthy lifestyle in addition to the individual goal.

All participants received NHS Salford's 'Guide to Self Care'. This booklet contains information on the range of self care programmes currently available in Salford as well as information on how to access the online Salford Health Guide. Signposting and referral information is shown in appendix 3.

Figure 1: The IGT Care-Call pathway



4.0: Demographics of patients enrolled in IGT Care-Call

A total of 61 patients were referred appropriately and enrolled onto the IGT Care-Call project from April 2010 to October 2010.

4.1 Age

Age groups of patients were recorded using the FINDRISC scoring system and banded into four groups. Age distribution of participants by gender is shown in table 3 below. The majority of patients fall into the >64 age band which is not unexpected given that IGT risk rises with age[1]. There is an equal split between male and females.

Table 3: Age and gender of enrolled patients

Age band	Male	Female	Total no.
Under 45	2 (3.2%)	3 (4.9%)	5 (5.4%)
45-54	4 (6.4%)	1 (1.6%)	5 (5.4%)
55-64	8 (19.6%)	6 (9.6%)	14 (22%)
Above 64	17 (27%)	20 (32%)	37 (60%)
Total	**31 (51%)**	**30 (49%)**	**61 (100%)**

4.2 Ethnicity

Salford's population is predominantly white with only 3.9% from the non-white groups[34].
Ethnicity of patients enrolled is shown in table 4 below.

Table 4: Ethnicity of enrolled patients

Ethnicity	Total number	Percentage
Black	1	2%
Asian	3	5%
White	56	91%
Other	1	2%
Total	61	100%

4.3 BMI scores

Baseline BMI scores of the patients enrolled is shown in table 5 below. Of the patients referred the largest group of patients (n = 34,55%) were classed as obese, having a BMI score >30. There were more females in the obese classification than males.
Twenty patients (34%) were classed as overweight with a BMI score of 25-30. Only seven (11.4%) patients were classified as having a normal BMI score of <25.

Table 5: Baseline BMI of enrolled patients

Start BMI	< 25	25-30	>30
Male	4 (6.5%)	13 (21.3%)	14 (22%)
Female	3 (5%)	7(11.4%)	20 (32%)
Total	7 (11.4%)	20 (32%)	34 (55%)

4.4 FINDRISC assessment score

The FINDRISC risk assessment score calculates if a person has a low risk, slightly elevated risk, moderate risk, high risk, or very high risk of developing type 2 diabetes.

Nineteen (31%) patients had an initial FINDRISC score of >20 indicating very high risk of developing type 2 diabetes, of these 14 (73%) also had a BMI score of >30.
The majority of patients (n=36,59%) had an initial FINDRISC score in the high risk category. Four (6.5%) patients had moderate risk and two (3%) fell into the slightly elevated risk. There were no patients in the low risk category.

Table 6: Initial FINDRISC scores of enrolled patients

FINDRISC Score	Risk of developing type 2 diabetes within ten years is	Male	Female
0-6	**LOW**: estimated 1 in 100 will develop disease	**0**	**0**
7-11	**SLIGHTY ELEVATED:** estimated 1 in 25 will develop disease	**2 (3%)**	**0**
12-14	**MODERATE:** estimated 1 in 6 will develop disease	**3 (4.9%)**	**1 (1.6%)**
15-20	**HIGH:** estimated 1 in 3 will develop disease (4 Withdrew)	**18 (29%)**	**18 (29%)**
>20	**VERY HIGH:** estimated 1 in 2 will develop disease (2 withdrew)	**8 (13%)**	**11 (18%)**
Total n = 61		**31 (51%)**	**30 (49%)**

4.5 Diagnosis of IGT with IFG

All patients enrolled on the IGT Care-Call had a positive diagnosis of IGT.
36 patients (59%) enrolled on IGT Care-Call had a diagnosis of IFG in addition to IGT and were at a higher risk of developing type 2 diabetes. Both males and females showed an equal split.

Table 7: Patients with combined IGT and IFG at baseline

IGT OGTT range (7.8-11.0 mmol/l)	No of IGT pts with additional IFG (fasting range 6.1-6.9mmol/l)	
7.5-8.0	3	(4.9%)
8.1-8.5	10	(16%)
8.6-9.0	9	(14%)
9.1-9.5	0	(0%)
9.6-10.0	7	(11%)
10.1-10.5	4	(6.5%)
10.6-11.0	3	(4.9%)
Total	36	(59%)

4.6 Withdrawals

Out of the 61 referrals to the project, there were six withdrawals. Three patients were diagnosed with a serious illness around the time of referral which then became their priority and meant they were unable to commit to IGT Care-Call. One patient was not contactable, despite extensive efforts from the GP practice. One patient had started a new job which involved long distance travel abroad. One patient was hard of hearing, but requested trying the service to see if he could manage. This patient was referred to the usual group education session when it became apparent he could not use the telephone as required.
From this point onwards these six patients are not included in the results as although all these patients were appropriately referred and enrolled, none reached the action planning stage. Therefore, the total number of patients who completed the pathway was 55.

5.0: RESULTS

5.1 Overall goals

Project aim 1:
'To deliver a telephone-based support service for people with IGT in which 75% of service users achieve and sustain one or more lifestyle goals by March 2011'

Fifty five patients (n=55) participated in the IGT Care-Call project. At the time of data collection for this report, 48 (87%) patients had completed the IGT Care-Call pathway, with seven patients approaching their final call. Of the patients who had completed, 37 (77%) did achieve their overall goal set at the action planning session and 11 (22%) patients did not. These results demonstrate the IGT Care-Call service has been successful in delivering a telephone based support service that has allowed a lifestyle goal to be achieved and sustained over a six month period.

Overwhelmingly, 50 (90%) patients chose weight loss as their overall goal and this accounted for 35 (94%) of the 37 goals that were achieved.

Four patients (7.2%) chose healthy eating as their overall goal. These patients had a BMI score of <25 and were not classed as overweight.

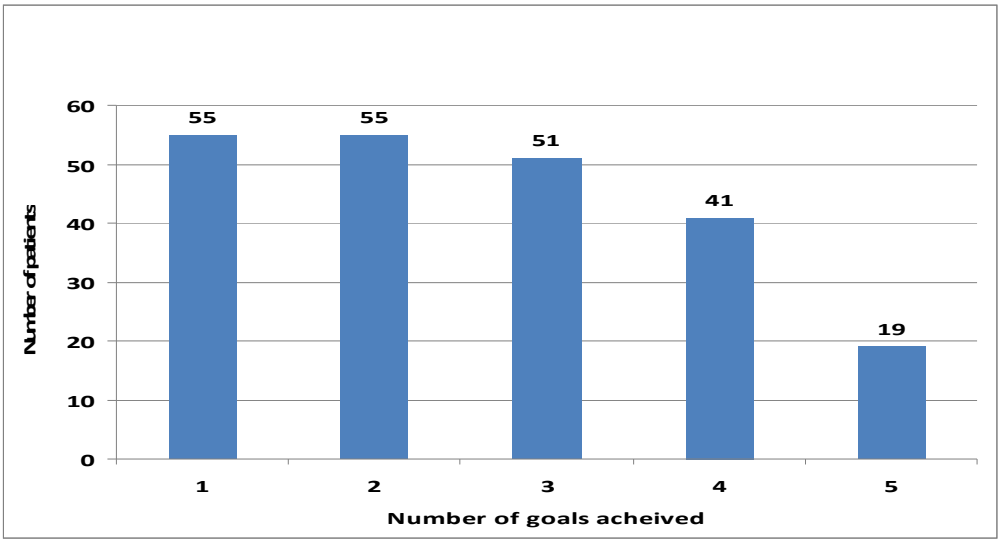
Table 8 below shows 43 (78%) patients chose healthy eating as the method to achieving their overall goal, demonstrating that participants were able to identify that changing to a healthier diet could reduce their risk of developing type 2 diabetes.
Eleven patients (22%) wanted to achieve their overall weight loss goal by increasing their physical activity levels, suggesting that they recognised both obesity and physical inactivity as risk factors in their development of type 2 diabetes.
Only one patient (1.7%) did not feel ready to set a goal at the action planning stage.

Table 8: Method chosen to achieve overall goal

Overall Goal	Goal set at action planning session	Method chosen to achieve overall goal		
		Activity	Healthy Eating	No Goal Set
Weight Loss	50 (91%)	11 (22%)	39 (78%)	0
Healthy Eating	4 (7.3%)	0	4 (100%)	0
Physical Activity	0 (0%)	0	0	0
No Goal Chosen	1 (1.7%)	0	0	1 (100%)
TOTAL	**55 (100%)**			

5.2 Mini goals

Figure 2: People achieving a number of goals



On the IGT Care-Call pathway, patients received five calls at monthly intervals where they would set small mini goals leading to the achievement of the overall goal. Figure 2 shows that all 55 (100%) patients have achieved at least two goals, 51 (93%) patients achieved three goals, 41(74%) patients

achieved four goals and 19 (34%) patients have achieved all five goals. At the time of data collection, seven patients had yet to complete their fifth goal.

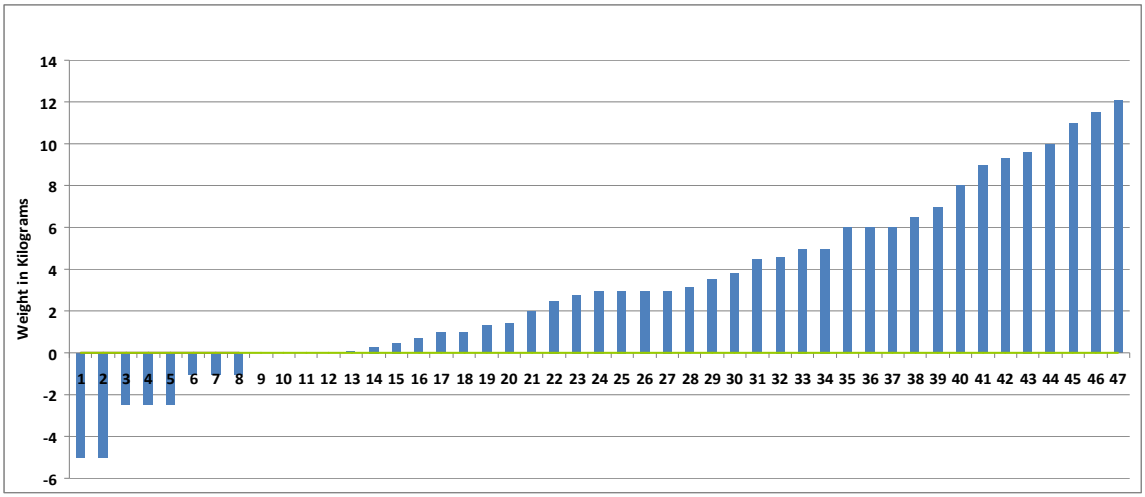
In total 243 (88%) mini goals have been totally or partially achieved out of a possible 275 (100%). 17 mini goals (6.2%) have not been achieved. On eight (3%) occasions the patient did not feel at the correct stage of change to choose a goal, this was due to an illness or family circumstance at the time of the call. Seven mini goals (2.5%) have yet to be completed.

5.3 Changes in weight

Forty seven patients (85%) had a confirmed weight recorded at the end of the project.
Figure 3 below shows the weight of each of these patients. Of these, 35 (74%) had achieved a significant weight loss. A total combined loss of 172.1kg was recorded for these 35 patients amounting to an average of 4.9kg (5.4%) per person.
Eight (17%) patients increased their weight. The total combined weight gain was 16kgs amounting to an average of 2kg (2.6%) per person.

Four patients (8.5%) had no change in weight recorded and remained weight neutral.
Three of these patients had chosen weight loss as their overall goal and so this was recorded as overall goal not achieved. However other positive changes had been made to their dietary intake resulting in a reduction in their FINDRISC score. One patient with no reported change in weight had chosen healthy eating as the overall goal but stressed that weight loss was not wanted.

Figure 3: Ordered difference of weight loss



5.4 Changes in the FINDRISC score

At the time of data collection, 46 (83%) patients had a final re-calculation of FINDRISC score available. In total, 30 (65%) patients reduced their FINDRISC score by an average of 2.03 points per person. Of this group, 16 (53%) patients reduced their FINDRISC score to result in moving to a lower risk classification.

Out of fourteen (30%) patients with an initial FINDRISC risk score in the very high (>20) classification, nine (64%) had a reduction in their final score and of this cohort, eight patients reduced their FINDRISC score enough to drop them to a lower classification of risk. Five patients (36%) remained the same.

Twenty nine (63%) patients were initially in the high risk (15-20) FINDRISC classification.
Of these, 20 patients (69%) reduced their score with eight patients reducing enough to drop to a lower classification. Nine (31%) patients remained the same.

Two patients (4.3%) were in the moderate risk classification (12-14) and final scores remained the same as baseline.

One patient (2.1%) was in the slightly elevated risk classification (7-11) and final score remained the same as baseline.

There were no increases in final FINDRISC scores. This information is summarised in table 9.

Table 9: Reduction in FINDRISC scores

FINDRISC Score	Risk of developing type 2 diabetes within ten years	Initial	Final
0-6	**LOW**: estimated 1 in 100 will develop disease	**0**	**0**
7-11	**SLIGHTY ELEVATED:** estimated 1 in 25 will develop disease	**1**	**2**
12-14	**MODERATE:** estimated 1 in 6 will develop disease	**2**	**9**
15-20	**HIGH:** estimated 1 in 3 will develop disease	**29**	**29**
>20	**VERY HIGH:** estimated 1 in 2 will develop disease	**14**	**6**
Total		**46**	**46**

5.5 Changes in BMI scores

41 BMI results were available at the time of data collection.

In total, 26 (63%) patients reduced their overall BMI score by an average of 3.02 points per person. Six (14%) patients remained the same and nine (21%) patients increased their BMI by an average of 0.8 points per person.

BMI score is recorded and placed into one of three categories for calculating the FINDRISC score (see table 5).

Twenty five (60%) had a BMI category >30 (obese). Of these 18 (72%) patients reduced their BMI, achieving an average reduction of 2.14 points per person. Furthermore, six of this group (33%) resulted in moving to a lower risk category on the FINDRISC assessment tool.
One patient (4%) in the BMI > 30 category had no change in their BMI Score. Six (24%) patients in the >30 category increased their BMI an average total increase of 0.42 points per person.

Fifteen (36%) patients were initially in the BMI range 25-30 (overweight). Eight (53%) of these patients reduced their BMI achieving an average total reduction of 1.25 points per person. Two of this group of were able to move to a lower risk category on the FINDRISC assessment tool.
Five (33%) had no change in their BMI score

Two (13%) patients increased their BMI an average total increase of 0.4 points per person. One patient (2.4%) had an initial BMI score in the <25 (normal healthy weight). This patient increased their BMI score by 0.6 points, and increased their FINDRISC score by moving to a higher point category.

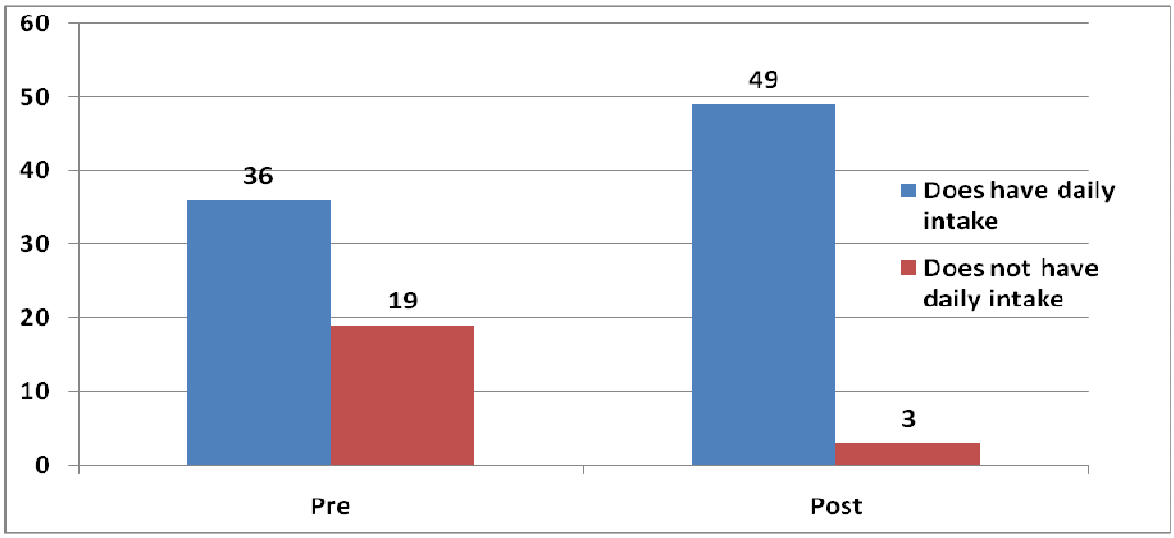
5.6 Changes in healthy eating

Results were available for 52 (n=52) patients.
Dietary advice from scripts developed by the specialist diabetes team and the associated risks of IGT were discussed at every call on the pathway to reinforce key messages and encourage motivation.
33 (60%) patients reported having daily fruit and vegetables on referral to the IGT Care-Call service and this continued throughout the programme.
Eighteen patients (35%) initially reported not having daily fruit and vegetable intake on referral. Of these, 15 patients (83%) increased to daily fruit and vegetable intake following their participation in the project. Three (16%) patients still did not include daily fruit and vegetables in their diet on completion of the programme.

Adopting fruit and vegetable consumption as part of a healthy lifestyle change improves FINDRISC score by one point.

This information is summarised in figure 4 below.

Figure 4: Changes to healthy eating



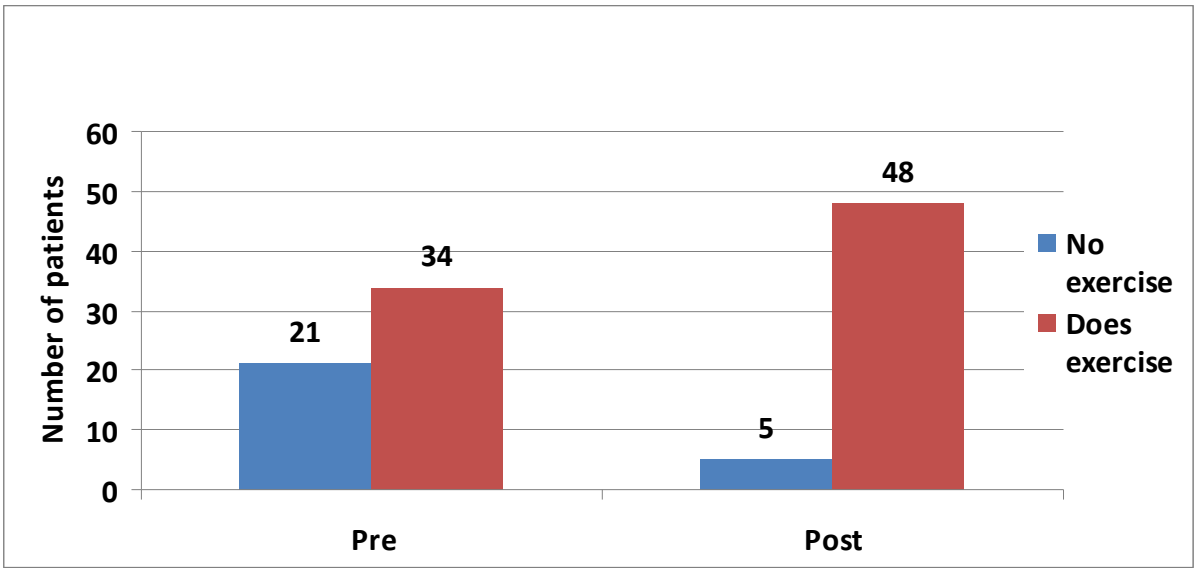
5.7 Changes in activity levels

Results were available for 53 (n=53) patients and shown in figure 5 below.

32(61%) patients reported taking exercise on referral to IGT Care-Call and this continued throughout the programme.
20 patients (38%) initially reported not having regular activity. Of these, 15 patients (75%) reported participation in regular activity on completion of the programme.
Five (25%) patients still did not take any form of regular activity on completion of the programme.

Adopting activity as a healthy lifestyle change improves FINDRISC score by two points.

Figure 5: Changes in participation activity



5.8 Changes in blood results

41 patients who completed the IGT Care-Call had a repeat OGTT performed.
31 patients (75%) showed a reduction in their 2 hour OGTT. On average, a reduction of 2.81 mmols per person was achieved.

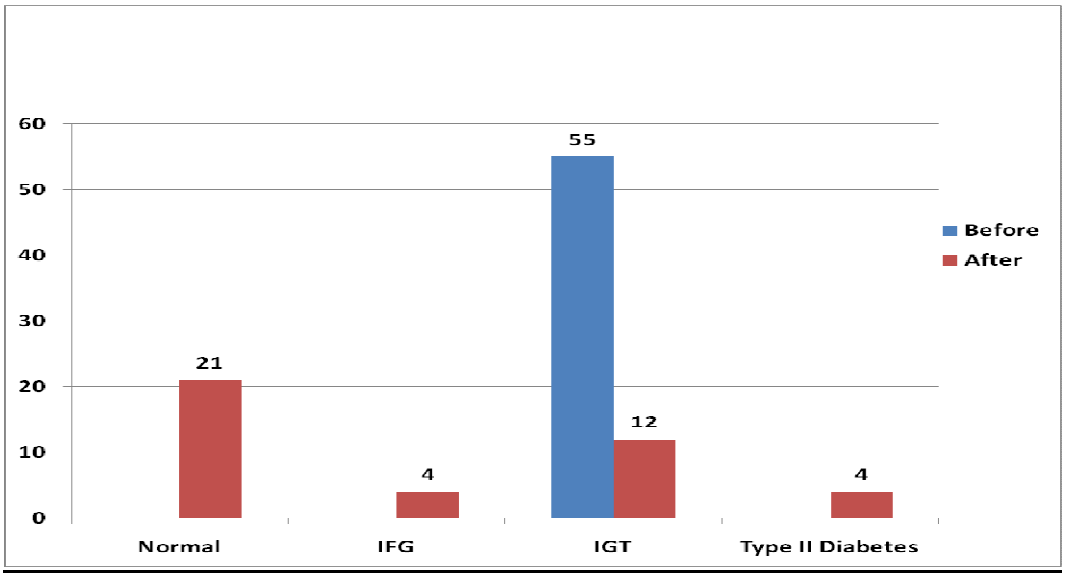
On completion of the programme, 21 participants (51%) had a final FBG and OGTT result within the normal range and were no longer classed as having IGT (see figure 6 below).

Four patients (9.8 %) had a normal 2 hour OGTT result but still had a raised FBG result, this meant that although they no longer had IGT they had reduced their risk of developing type 2 diabetes by 'moving down' to Impaired Fasting Glucose (IFG) category.

Six (14%) patients did reduce their OGTT result but still remained in the IGT classification.

Ten patients (24%) increased their OGTT result and of these four patients were now classed as having type 2 diabetes. This information is summarised in figure 6 below.

Figure 6: Classification of repeat blood results



5.9 Goals not achieved

There can be many barriers for people not changing their behaviour to achieve their goal and several models, theories and methods of behaviour change that enforce these [35,36]. However, it should never be under estimated how much determination it can take to change even the simplest behaviours where long standing habits are involved. Making short term changes is easier than long term sustained change. Of the results collated, 11 patients (20%) did not achieve their overall goal which in all cases was weight loss. However, of this group of patients, 9 (81%) made other positive lifestyle and behaviour changes which resulted in five patients reverting to normal blood glucose results. Only two of this group of patients did not change any part of their lifestyle. Barriers to change in both cases included denial of condition, work commitments and family circumstances.

6.0: Qualitative data

6.1 Project aim No.2

Project aim No.2
'To deliver a telephone-based support service for people with IGT that 75% of users rate as assisting them in one or more lifestyle goals by March 2011'

In order to confirm the second project aim was achieved, a questionnaire with 15 questions (Appendix 4) was sent to all 55 patients who had completed the IGT Care-Call project. Forty one questionnaires were returned representing a 74.5% response rate. It was clear from the results that the project aim was achieved. Specifically questions 2, 5 and 13 relate to lifestyle goals.

Results from question 2 showed that 38 people (92.7%) discussed their goals regularly with their health advisor helping them achieve their overall six month goal. Question 5 identified that 39 people (95.1%)

agreed a plan to achieve their goal prior to the next telephone appointment. Question 13 shows 37 patients (90.2%) felt their health advisor gave relevant up to date advice on how to reduce their risk of developing type 2 diabetes. A summary of results is in Appendix 5.

Further information obtained from written comments on the questionnaire is included in feedback below.

7.0: Acceptability of the service: patient feedback

Patient acceptability of the service was obtained from 2 focus groups and a patient questionnaire.

Focus group 1: 17th August 2010. Sixteen patients were invited to the focus group one, of which five attended. Two patients were accompanied by carers. Three patients were female, two were male. All patients were at different stages of the IGT Care-Call pathway, but none had gone past their third goal setting appointment. Patient details were anonymous, however through discussion it was found that four patients had retired and one male patient was in full time employment.
Focus group 2: 14th March 2011. Twelve patients were invited to the second focus group. Five attended, of which two were accompanied by carers. Three patients were male and two were female. Two males and one female were in full time employment, one male and one female had retired. Both focus groups were tape recorded once patient consent was obtained.

7.1 Reaction to diagnosis and the role of Care-Call

Being diagnosed with chronic illness can have a profound impact on one's life. A period of adjustment is often needed to cope with the diagnosis, especially when patients are asymptomatic and have been placed in a position where they are required to make considerable short term changes to avoid long term complications [37]. All participants were informed of their IGT diagnosis at their GP surgery. Practice nurses gave basic initial advice before referring to Care-Call. Many people commented on the difficulties of absorbing their diagnosis and the need to digest this information. First reactions ranged from shocked to part comprehension to acceptance and enquiry.

- *'I felt a little bit gob smacked to be totally honest. Once a year I get a full MOT….then out of the blue I get a call from the nurse…..and I thought crikey, how do I go on from here..?'* (Participant, focus group 1).
- *'I didn't really know that much about it, I don't know many people with diabetes so it wasn't something I was aware of'* (Participant, focus group 1).

Individual reactions depended on the exact nature of the diagnosis and whether the individual understood the implications for them.

- *'It didn't worry me but there is a strong family history of diabetes in my family….. Although the initial diagnosis of IGT didn't worry or scare me, I thought I don't want to let it get to full blown diabetes because I know what the end results are'* (Participant, focus group 2).

Interestingly, when participants were asked if they had known of their increased risk of developing type 2 diabetes, it still appeared that they would have been reluctant to seek advice or request testing from their GP.

- *'The doctor would think what do you want that for, they would think you sit at home with a medical book'* (Participant, focus group1)
- *' I'm only 38...they look at me and think I'm a long way off for that'.*

7.2 The role of information

To enable an individual to effectively self-manage their condition and include them in any decision making processes, they need a good understanding of their condition and how they can access any additional information they need[38].
All participants received a 'starter pack' of information following their initial introductory call. This included their fasting and OGTT results and a diagnosis table. These were discussed at the action planning call. Having their own results and being given opportunity to discuss these and compare them to target levels appeared to aid understanding of IGT.

- *'It focuses your mind…until I got the letter I was totally ignorant to what I had got'* (Participant, focus group 2)
- *'It was helpful because it showed you the window where my blood results should be…'* (Participant, focus group 2)
- *'I wasn't that worried as my blood result was at the bottom of the scale. I would have been more worried if it was at the top'* (Participant, focus group 2)
- *'I had absolutely no idea about IGT until I got these results so I did find the IGT leaflet very useful'* (Participant, focus group 2).

The patient questionnaire re-enforced these findings. 76% of people were able to identify they had a fasting glucose test in the past year of which 96% completely or partially understood what this result meant for them. 89% of participants were able to identify they had an oral glucose tolerance test with 97% completely or partially understanding what the results meant to them.
Very positive responses were received about the information and supplementary resources that Care-Call provided over the six month programme. 60% of the information voted as being 'most useful' was found in the initial starter pack, with half of this being specifically related to IGT and personal results. This suggests that people are interested in finding out more about their condition and that relevant resources should be available to supplement verbal advice from health care professionals.

- *'The information I first received from Care-Call, I did find it very useful'* (Participant, focus group 2)

Some participants had searched the internet to find out more about IGT but the general agreement at the focus groups was that this was not found to be particularly helpful.

- *'That's the trouble with the internet, it can give you too much information but no clear easy explanation'* (Participant, focus group 2).

The tailored resources that followed over the duration of the programme evaluated well and were seen to re-enforce key educational messages from calls and help the individual achieve their own personal goals. Information was viewed as customised and relevant for the individual (e.g. detailed understanding of one's own food habits and unhealthy food choices). 40% of people asked to vote on which items were 'least useful' requested to abstain as they felt that everything they received was

relevant and provided some benefit. It was suggested by some participants that more information on calorie content of different foods and meals would be beneficial.
Participants appreciated the fact that literature was sent out over a period of time and crucially this 'drip feeding' of information appeared to enhance understanding.

- *'It was sent out in the right amounts and at the right times so there was just enough information for your brain to take in'* (Participant, focus group 2).

The DVD 'Sensible portions for healthy eating' that was developed specifically for this project was particularly valued for its ability to provide a visual representation of appropriate sized food portions and its simplistic and practical approach.

- *'Before the DVD I never knew what a food portion was…now I realise a portion is the same as my palm'* (Participant, focus group 2)
- *'It told you how to bulk up your food to make your plate look full'*(Participant, focus group 2)
- *' I like the simpleness of the DVD'* (Participant, focus group 2)

The resources were also identified as a useful resource to refer to in the future.

- *'I do look at it now, not every week, but I do refer to it'* (Participant, focus group 2)
- *Since [health advisor name] started sending me information I have developed a file. I refer to it every now and again'* (Participant, focus group 2)

One participant in each of the focus groups had additional medical problems other than IGT. Both felt that their health advisors were not able to answer specific medical questions regarding their health and had been asked to return to their GP/practice nurse to discuss these issues further.

7.3 Patient acceptability of a telephone based service

The original PACCTS research concluded that its call-centre intervention was highly acceptable to patients with type 2 diabetes and well received by local medical practices[32].
Both focus groups and patient questionnaires produced similar findings:
Overall, participants were generally positive about receiving a telephone based service. Particular aspects that were frequently commented on were the punctuality of calls received, flexibility in the frequency of calls and professional service received.

- *'Any time they promise to call, they do'* (B003)
- *'A very helpful and flexible service'* (B004)
- *'All phone sessions were conducted in a friendly, professional and very satisfactory manner'* (D017)
- *''My health advisor dealt with me with dignity and aplomb'* (A003)

Many participants highlighted the convenience of using a telephone service which fitted around their individual lifestyle and saved valuable time.

- *'[Health advisor name] worked around my hours of work'* (B004)
- *' I work and it fits in great with my lifestyle'* (Participant, focus group 2)

- *'[Health advisor name] is excellent and understands that my job changes day by day'* (Participant, focus group 1)
- *'If I was to go somewhere I would have to get ready, go there and park up and probably end up being out a couple of hours, especially with the traffic'* (Participant, focus group 1)

One participant at the first focus group felt strongly that she preferred face to face contact and did not feel a telephone service suited her needs. However, she went on to explain that Care-Call had 'caught her at a bad time' as she was recovering from serious health problems and suffering depression.

Whilst the feedback for the telephone service itself was positive, some participants expressed a desire to see their health advisor to enable them to 'put a face to the name'. Suggestions of how best to do this included an initial meeting prior to the six month programme, a mixture of face to face and telephone appointments or a simple photograph of the health advisor.

- *'Perhaps the initial visit could be face to face….then when you speak to the health advisor on the phone you have already met them before'* (D011)
- *'I think some sort of a reference point to know who you are talking to…even if it's only a little photo.'* (Participant, focus group 1)

This theme was explored at both focus groups. Interestingly, although participants were curious as to the appearance of their health advisor, the lack of this visual image did not make them view the service any less personal to them.
Although the benefits of receiving a tailored service from a named health advisor were frequently commented on, one participant highlighted one of the drawbacks is the lack of peer support.

- *'I would like to talk with a group of people who have the same thing so we could help each other'* (B008)

7.4 The role of the health advisor

Research suggests that if people are satisfied with the care they receive their clinical outcomes are more likely to improve[39].
Building rapport resulted in the formation of a relationship or bond developing between health advisor and patient. Both focus group and questionnaire data highlighted the depth of this bond.

- *'..The patience they have, the support they give, I just think they are wonderful and I think of [health advisor name] as a friend'* (Participant focus group 2)
- *'I liked the nice friendly way my health advisor gave me helpful information about what was required with diet, exercise etc. It was a pleasure talking to [health advisor name]'* (F011)

It was apparent from focus group data that health advisors were also seen as non-judgemental and approachable.

- *'[Health advisor name] is not as judgemental as experiences I have had at Weightwatchers, it's more encouragement than judgemental'* (Participant, focus group 2)
- *'[Health advisor name] is first class, he does help me. It's inspiration isn't it, you know somebody is there if you have a problem* (Participant, focus group 2)

- *'[Health advisor name] is very approachable and listens well, pointing you in the right direction'* (A006)

Health advisors were perceived as being very knowledgeable about IGT. 87% of participants said they definitely felt their health advisor gave them relevant and up to date advice about how to reduce the risk of developing type 2 diabetes and 100% said their health advisor always explained things in a way they could understand.

- '*[Health advisor names] sound like specialists in their field, they really are absolutely amazing'* (Participant, focus group 2)
- *'I found my health advisor very friendly and helpful explaining what IGT meant'* (M007)

Participants appreciated that health advisors saw them as equal partners in the appointments and felt comfortable sharing their views. 87% of participants said they always discussed their own ideas about the best way to manage their IGT with their health advisor and 100% said their health advisor always listened carefully to what they had to say.

- *'I was treated like a thinking adult!'* (E004)
- *'[Health advisor name] spoke to me as an equal and made me feel comfortable about myself'* (D015)
- *'[Health advisor name] was really friendly and understood what I was talking about'* (M006)

The trust that developed between health advisor and participant resulted in honest discussions taking place.

- *'It's only cheating yourself if you don't tell them something or you tell lies'* (Participant, focus group 1)

General themes that emerged throughout the focus groups and the patient questionnaires was the high level of interest and support that was shown to individual participants by the health advisors. This created an environment where the person felt able to ask questions and was receptive to exploring issues around changes to lifestyle behaviour.

- *'I particularly valued the interest that was shown in me as a person'* (E004)
- *'If you know that someone is looking after your health, the least you can do is look after your own'* (Participant, focus group1)
- *'What I like about Care-Call is the time my health advisor has for me and how they take time in explaining things to me'* (B003)
- *'[Health advisor name] keeps asking is there anything else you would like to ask me…he is very, very good'* (Participant, focus group1)

Receiving ongoing education and support over a period of time was recognised as being a key component of giving people the increasing confidence to change their own lifestyle behaviours.

- *'..It's no good doing it on your own. You need [health advisor name] and everybody else behind the scenes just to help you along'* (Participant, focus group 2)
- *'I felt someone was really helping me and giving me more confidence'* (J001)

- *'I need someone to gee me along… to keep asking me how are you doing, what is your weight…that sort of support is invaluable to me'*(Participant, focus group 2)

The main strategies employed by the health advisors were motivational interviewing and behaviour change techniques. This approach clearly contrasted with more directive styles that participants had previously experienced and lead to more positive outcomes. Behaviour change is most successful when the patient decides if and what they want to change[40].

- *'My health advisor was understanding and motivating without being overpowering or pushy'* (B004)
- *'I think one of the ways they give you motivation is they are so laid back….in some places they hammer you and hammer you'*(Participant, focus group 2)
- *'You realise they are phoning to help me, they are doing this for me. I don't have to do this but they are trying to help me, support me and motivate me…it gives you the motivation to then help yourself'* (Participant, focus group2)

People who are persuaded verbally that they possess the capabilities to master given activities are likely to mobilize greater effort and sustain it than if they harbour self doubts and dwell on personal deficiencies when problems arise[41].
Participants highlighted the role of the health advisor in re-motivating them when things had not always gone to plan.

- *'[Health advisor name] makes you feel good even if you have a little blip'* (C002)

7.5 Goal setting

General goals help establish the areas of a patient's life that need improvement, specific goals itemise observable changes so both the health advisor and the patient can monitor whether progress is being made[42].
Focus group and questionnaire data showed that all participants remembered the goal they had set. Data also illustrated a high level of knowledge regarding appropriate lifestyle education such as walking 10,000 steps per day or eating '5 a day'. The predominant goal set was weight loss, followed by or in association with activity. Targeted weight loss on average was between 1 and 3 lbs per week.
Personalised goal setting was seen as an integral part of the six month programme with 89% of participants saying their health advisor always discussed their own personal goals during the six month programme of calls and 92% stating they always agreed a plan about what they would achieve before the next call. Key to achieving success was the understanding that small steps make a big difference.

- *'In the time I have been doing this with Care-Call I have lost about 1 stone 6 lbs. and this is gradually, just losing one or two pounds a week. In contrast, when I went to Weightwatchers I was really upset if I hadn't lost four pounds and often thought I had starved myself and not got any benefit'* (Participant, focus group 2)
- *'It was very well structured, it was small steps, try this or try that.... '* (Participant, focus group 2)
- *'[Health advisor] guided me in to taking small steps…his communication skills and guidance were superb'* (Participant, focus group 2)

One issue highlighted in the focus groups was that people recognised the variety of ways in which similar goals could be achieved. For many, weight loss involved changes in eating habits, smaller meal portions and eating 'junk' food less often. Others achieved their weight loss goal through increased

activity or in combination with dietary changes. As participants progressed through the programme, they showed increased knowledge, confidence and skills around their own goal setting. People with a high level of confidence in their ability to change are more likely to achieve their goals and are more likely to solve any problems that get in their way[43].

- *'I made myself a chart and set myself a target of 1kg weight loss a week which I thought was achievable, my weight has come down gradually. Some weeks I may not have made it, but that just made me try harder the next week'* (Participant, focus group 2)

7.6 Diet and IGT

There are several studies of diabetes prevention showing that moderate changes to diet and lifestyle in people with IGT reduces the risk of developing type 2 diabetes [13,14].
92% of participants stated that diet and dietary changes were always discussed during calls.
Focus group discussions revealed that purchasing food can be a source of difficulty, in particular using food labelling to identify the more healthy food choices. Older people often struggled to understand sugar and fat content of food and metric weights. Knowledge and skills around reading food labelling appeared to have improved during the Care-Call programme.

- *'I got the food booklet…we tend to look at the packets now and read the labels....you can see there is lots of fat in corned beef... '* (Participant, focus group 2)

Some participants, many of whom had been to commercial weight loss programmes previously, expressed interest in having a calorie counter, but also acknowledged the difficulty understanding these.

- *'The trouble with calorie counting is that they put so many calories per 100g and then you have to start working it out'* (Participant, focus group 1)

Importantly, focus group discussions indicated that participating in the Care-Call programme increased understanding of portion sizes and the amount and type of food eaten in relation to body weight. 20% of information identified as being 'most useful' was related to identifying correct portion sizes.

- *'I didn't realise I was eating all the wrong foods…or that being a little overweight could cause such big problems'* (Participant, focus group2)
- *'Care-Call kept me on my toes to change how much I was eating, to cut down my portion sizes and eat fruit after my meals'* (B008)
- *'I put my portions on the plate and if it is too much I wrap it in cling film or freeze it. Before I would have eaten it'* (Participant, focus group 1)

Evidence shows that patients with IGT can reduce their blood glucose by 15% after a 12 month programme to encourage walking using a pedometer[43].
The focus groups provided evidence that people had taken up a variety of courses through their GP, explored local council 'Fit City' services or incorporated more activity in to their daily routine. Some people highlighted the role of the health advisor in facilitating this.

- *'Since joining Care-Call we [wife and daughter] walk around the park every night and sometimes in the day too…'* (Participant, focus group1)
- *'When I first started if I did 10 [lengths] I was tired, but I'm up to 40 now'* (Participant, focus group1)

- *' I mentioned [activities] to my health advisor and 2 days later I got a full list of different places I could attend for different things where I would meet people of my own age* (Participant, focus group1)
- *'I always meant to exercise, wanted to exercise, but the health advisor spurred me on. She put me in touch with a 12 week course that really helped'* (Participant, focus group 1)

The questionnaire and focus group data was overwhelmingly positive about the Care-Call service, with many participants expressing their individual thanks and acknowledging the importance of preventing type 2 diabetes.

- *'All I have to say is thank you for your time and patience, your advice and help'* (D014)
- *'It is an excellent scheme and if it helps reduce the chances of getting diabetes for anyone it is worth doing'* (B002)

8.0: Acceptability of the service: Practice feedback

Seven Salford GP practices participated in the IGT Care-Call project, comprising 13 health professionals. The majority of staff involved were practice nurses. A small number of GPs were also involved. All 13 staff (100%) were asked to complete a questionnaire (Appendix 6) regarding the project and the service. Questions were predominantly qualitative. Twelve replies were received, equating to a 92% response rate.

The service provided to GP practices for this project was described succinctly by one member of staff, indicating a high level of understanding regarding the project aims.

- *'Patients are encouraged to modify lifestyle and behaviours that could lead to diabetes, supported throughout and given the tools to maintain lifestyle change'* (Practice Q)

All staff described a high level of support from CLAHRC and the Care-Call team throughout the project. Two practices noted that any queries had been swiftly dealt with and passed to the appropriate person quickly. The IGT Care-Call service was described as,

- '*Organised, accessible and very helpful'* (Practice R)
- '*Very good, easy to contact, good availability'* (Practice U)

Many staff felt that their practice was already pro-active in identifying the IGT population and that they had robust registers and recall systems in place. Several commented that participating in the project had further increased their knowledge and understanding regarding the benefits of early lifestyle intervention for people with IGT. In some cases this had resulted in a positive change in practice regarding management of their IGT population.

- *' We now do annual glucose tolerance tests rather than annual fasting glucose'* (Practice S)
- *'We are now more proactive and try to ensure that [patients] are reviewed at least annually'* (Practice Q)
- *'[the project] encouraged more active searching'* (Practice T)
- *'I now use the IGT leaflet to give to my patients'* (Practice X)

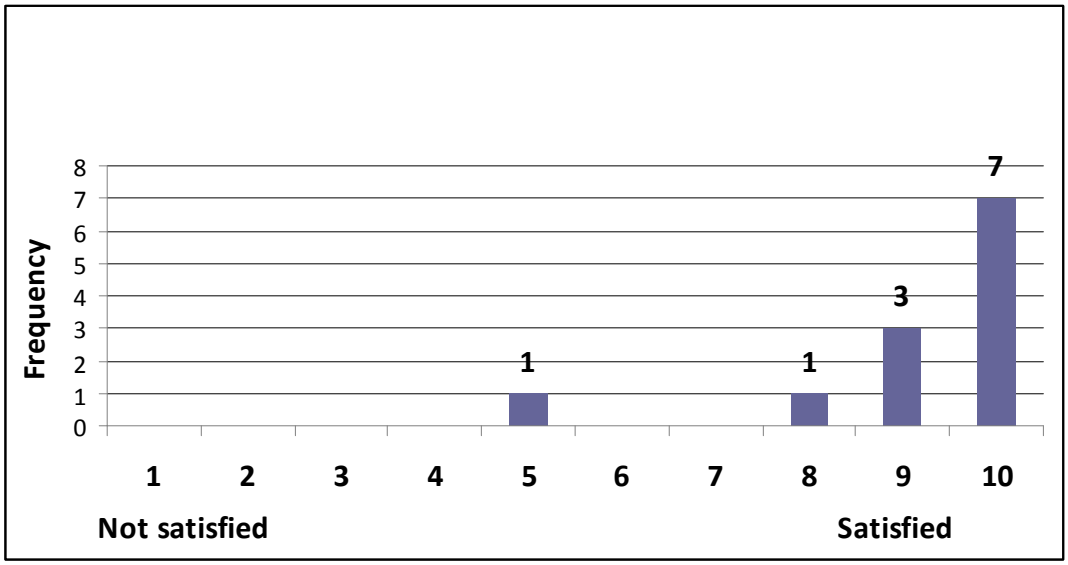
Whilst it was acknowledged that a telephone approach may not be suitable for everyone, practice staff advised that the majority of patients were happy being referred to Care-Call, seeing it as a positive step to prevent or delay diabetes. It was noted that that this method of care delivery resulted in a very accessible service for patients and it was also viewed as an appropriate environment for learning to occur.
Participating in the project resulted in additional benefits for some practices. Not having to worry about the management of these patients was described by one participant:

- *' I feel [the patients] are being managed by another service which allows us to take a back seat for 6 months'* (Practice X)

8.1 Confidence in Care-Call providing lifestyle advice

The structured six month Care-Call programme was rated favourably, with staff reporting a high level of confidence that Care-Call provided their patients with up to date, evidence based dietary and lifestyle advice (average rating = 9.2 out of 10). Results are summarised in Figure 7 below:

Figure 7: Confidence of practice staff in the ability of Care-Call to provide up to date dietary and lifestyle advice given to patients

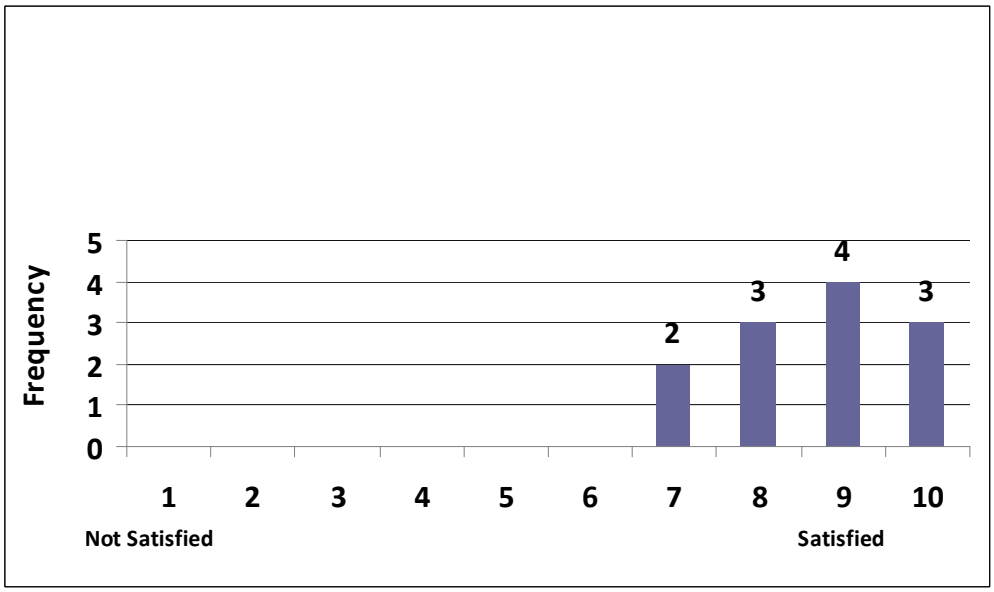


- *'It helps the practice and the nurses to know that patients are getting the right information and are supported to make lifestyle changes…'* (Practice X)

8.2 Confidence in Care-Call assisting motivation

High levels of confidence in the motivational ability of Care-Call in assisting people to make positive behaviour changes were noted (average score 8.6 out of 10) and shown in Figure 8 below.

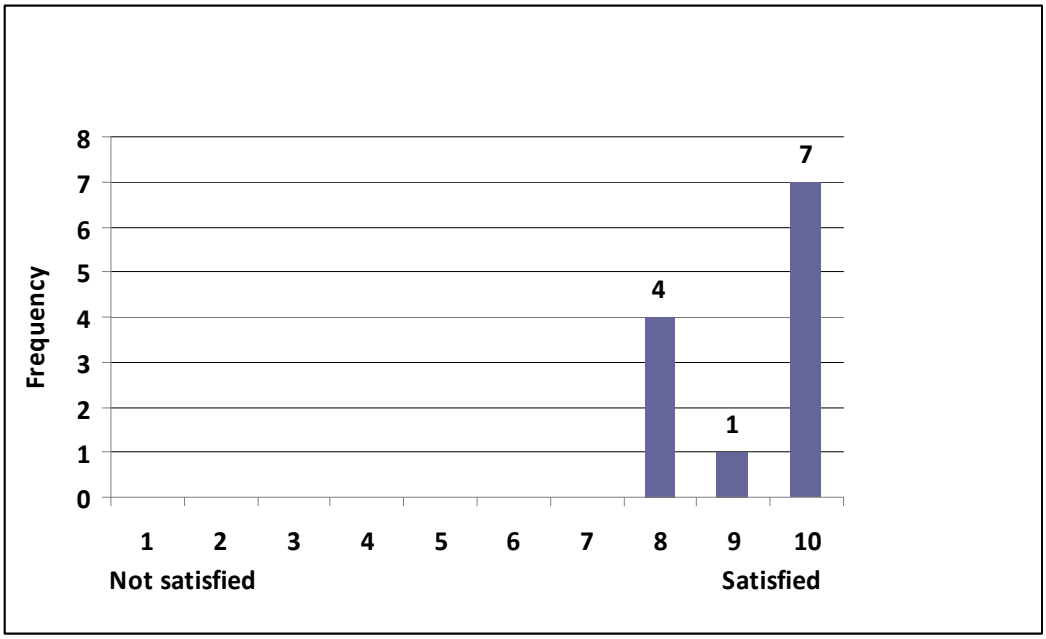
Figure 8: Confidence of practice staff in the ability of Care-Call to motivate patients



8.3 Satisfaction in Care-Call information and resources

Practice staff were very satisfied with the supporting patient information leaflets and resources used during the project (average rating 9.2 out of 10). Results are shown in Figure 9.

Figure 9: Satisfaction of practice staff regarding patient information and resources used in the project



Practice nurses in particular highlighted that health advisors were able to spend significantly more time with people over the six month period than could ever be achieved with them in general practice.

- *'A very useful service to have available to us. It offers a far greater level of advice and support than we are able to offer due to time constraints'* (Practice S)
- *'[Patients] have received more education and input than they would have had from us alone'* (Practice R).

Delivering the programme over six months was felt to benefit patients as it allowed sufficient time to ensure understanding of the educational messages as well as provide support with implementing lifestyle behaviour changes.

- *'Care-Call offers more long term support which is better for us and the patient as sometimes messages need reinforcing to be effective'* (Practice P)
- *'The ongoing nature of the service encourages patients to continue with changes longer term'* (Practice R)

Staff were asked for their views on how they felt the IGT Care-Call service compared to the education session previously provided. Whilst the benefits of specialist nurse input and group education were highly valued, the continued 'drip feeding' of information and ongoing encouragement and support delivered over the six month project were also noted to have their own advantages.

- *'Patients who participated in [the project] seem to have achieved more, e.g. weight loss, understanding of their diet, portion sizes'* (Practice V)
- *'Feedback has been good from patients and enables me to discuss their care management with them on a much higher level of understanding'* (Practice U)
- *'It improves compliance with healthy lifestyle and positive reinforcement'* (Practice T)

Interestingly, the IGT Care-Call service was often referred to as a lifestyle service rather than a diabetes prevention service.

- *'An excellent resource for helping people with lifestyle changes'* (Practice R)

The only disadvantage to participating in the project was that the documentation required to allow evaluation of project was time consuming to complete. This was further complicated by needing to collect assessment data on the electronic database installed at the practice. It is worth noting that should the project be rolled out, referral information from the practices to Care-Call would not need to include any of the project paperwork. Instead, practices could refer patients using the standard diabetes team referral form already in use, and include blood test results. There would also be no requirement to recall patients after six months as in this project, as current guidance recommends annual recall.

- *'The paperwork and 6 month follow up tests were time consuming as we are short staffed'* (Practice P)

Overall, the IGT Care-Call service provided was viewed very favourably and its successes noted.

- *'Very worthwhile project with good success'* (Practice R)
- *'…Some results have been impressive* (Practice P)

Staff were positive towards the idea of the IGT Care-Call service continuing and being rolled out across the district.

- *'I am looking forward to the project moving forward so all patients in the target group can be supported by a dedicated team'* (Practice V)
- *' I hope it will continue long term!'* (Practice P)

9.0: Acceptability of service: health advisor feedback

Two health advisors took part in the IGT Care-Call project. Although having some reservations about working with this new group of people, they welcomed the opportunity to develop new skills and be involved in the project from the start.

- *'I felt proud to be asked, it meant they thought I was capable, and also that I am responsive to change'*
- *'Initially I thought this group of patients would not be motivated as they didn't have diabetes, in fact they are more motivated and positive because they know they can do something to prevent themselves from getting type 2 diabetes.'*

9.1 The service

Health advisors particularly liked the referral method into Care-Call as well as the structured IGT Care-Call pathway itself. It was noted this provided an equitable service to each patient, providing a framework on which to build the programme of calls.

- *'The patient had been informed about IGT Care-Call by the practice nurse and they were referred straight away so they were expecting our call, there was no cold calling'*
- *'Having the introduction call from us, being able to tell patients what to expect at the action planning session and telling them you will send them their blood results with a small amount of information helps them prepare questions.'*

9.2 Goal setting

The health advisors felt the goal setting process helped keep the motivation levels high, particularly if a goal had not been achieved that month. Comments obtained from the health advisors regarding the process of goal setting highlight their skills in providing appropriate educational messages and techniques used when exploring barriers preventing behaviour change.

- *'If a patient has not achieved their goal, I tell them not to dwell on it, let's start again with something new, or let's re-visit the old goal and see how we can make it work.'*
- *'It also allows me to regularly reinforce the complications that come with type 2 diabetes and link it back to prevention'*

9.3 Job Satisfaction

The health advisors are passionate about their role and describe a high level of job satisfaction. This appears to be due to their enjoyment of working with people and helping to prevent illness.

- *'You get to know these patients, they almost become a friend'*
- *'I like the fact I have got the opportunity to help prevent someone getting type 2 diabetes'*
- *'I feel like the action planning call is the destination and it is my job to be the map that gets them there over the five goals'*
- *'If they don't achieve their goal, I can take it personally, I think I have let them down'*

9.4 Health advisor skills

When asked what skills are required for the role of health advisor, both staff were in agreement that as Care-Call is a telephone service, excellent telephone communication skills and a pleasant manner are essential. Being a good listener was identified as a key attribute, as was the ability to accurately judge the other persons reactions.

- *'You have to listen intently but let them know you are listening, you never want to hear the words "Are you still there"' You know you are not doing your job properly if they have to ask that'*

9.5 Suggestions for development of the service

Whilst patients were very happy to receive a telephone service, they often expressed a desire to know what their health advisor looked like. The health advisors themselves suggested one solution to this issue,

- *'If we could be trained to do the action planning,, we could offer this appointment as a face to face if they preferred, that way they could get to see what their health advisor looked like'*

Both health advisors could easily see the potential for using this service for other groups of patients and would welcome the opportunity to be involved in any further service developments. Suggestions were made on possible ways of achieving this.

- *We could use this service for patients who have been discharged from hospital after… say TIA…, just telephoning them a week after discharge would provide a source of support. Then we can begin to get them motivated to change their lifestyle while it is still fresh on their mind'*

Both health advisors felt the IGT Care-Call service should be extended beyond six months and could identify benefits in doing this. This theme was strongly supported by patients who attended the second focus group.

- *'With some patients it takes you two or three phone calls before they begin to trust you and begin to want to change. You don't really get to see a change if you then only have another two calls'*

10.0: Cost benefit analysis

A cost benefit analysis showed that providing the service for the 55 patients in this project incurred a staff and overhead cost of £7,455 i.e. approximately £135 per patient (for six months in the service). It is estimated from previous large scale research studies that preventing the development of type 2 diabetes in patients with IGT will save a considerable amount in primary care and medication costs in future. On this basis the programme will pay for itself by year three.
If the service were extended to all IGT patients in NHS Salford, with 20% of them entering the service each year, each for a period of six months, payback would also be during Year 3. A more detailed report can be found in Appendix 7.

11.0: Conclusions

This project was a success in terms of:

- Achievement of project aims
- Very good acceptability to service users, practice staff and health advisors delivering the service
- Achievement of outcomes regarding weight loss, blood glucose results, lifestyle and behaviour changes. All these factors are known to reduce the risk of developing type 2 diabetes in patients with IGT
- Non clinical staff can have a substantial impact on clinical outcomes in people with IGT.

12.0: Lessons Learnt

Although this project was conducted on a small scale, it was found that there was uncertainty in some GP practices regarding recommendations for the management of IGT patients in Salford. Some practices were identified as having no recall system or IGT register. GP practices need to be supported to develop these registers which would allow them to recall the patients annually as per the NHS Salford guidelines.

Feedback from the GPs and practice nurses highlighted that using the FINDRISC risk assessment tool was time consuming. Initial and final FBG and OGTT, weight and BMI were more valued clinical measures than the FINDRISC score.

Although practice staff were aware of local services there was lack of up to date awareness and their referral routes in GP practices.

Both GP practice staff and health advisors were able to see the benefits of extending the Care-Call service to people with any impairment of glucose regulation and not just those with IGT.

The focus groups identified that people felt they would benefit from additional support after the six month programme. A twelve month programme was perceived as being most beneficial although there is no current evidence to support this view.

The Care-Call concept could be transferrable and easily adapted to provide education and lifestyle advice to a wide variety of people and medical conditions. A small project conducted by NHS Salford and

Care-Call with CVD patients has indicated this by achieving similar findings in terms of weight loss and patient acceptability of the service.

13.0: Recommendations

People with IGT felt very strongly that there is a need for increased public awareness campaigns to assist understanding of IGT and the dangers of diabetes. It was suggested this should be similar to the national stroke campaign, 'Act Fast'.

It was suggested that a reputable IGT website where reliable and accurate advice could be obtained would be beneficial.

One suggestion was to follow the existing six month IGT Care-Call programme with reduced support in months 6-12 with the option of additional support only if required.

As the FINDRISC score was used specifically for evaluation of this project it could be excluded if the service is rolled out.

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15: Appendices

Appendix 1: FINDRISC Risk assessment tool

Choose the right alternative and add up the points to calculate the total risk score. This questionnaire can be found at: www.diabetes.fi/english/risktest/

1. **Age**
- Under 45 years (0 points)
- 45-54 years (2 points)
- 55-64 years (3 points)
- Over 64 years (4 points)

2. **Body-Mass-Index**
- Lower than 25 kg/m² (0 points)
- 25 - 30 kg/m² (1 point)
- Higher than 30kg/m² (3 points)

3. **Waist circumference measured below the ribs (usually at the level of the navel)**

WOMEN
- Less than 80 cm (0 point)
- 80 – 88 cm (3 points)
- More than 88 cm (4 points)

Men
- Less than 94 cm (0 point)
- 94 – 102 cm (3 points)
- More than 102 cm (4 points)

4. **Do you usually have at least 30 minutes of physical activity at work and/or during leisure time (including normal daily activity)?**
- Yes (0 point)
- No (2 points)

5. **How often do you eat vegetables, fruit or berries?**
- Every day (0 points)
- Not every day (1 point)

6. **Have you ever taken antihypertensive medication regularly?**
- No (0 points)
- Yes (2 points)

7. **Have you ever been found to have high blood glucose (e.g. in a health examination, during an illness, during pregnancy)?**
- No (0 points)
- Yes (5 points)

8. **Have any of the members of your immediate family or other relatives been diagnosed with diabetes (type 1 or 2)?**

- o No (0 points)
- o Yes: grandparent, aunt, uncle or first cousin (but no own parent, brother, sister or child) (3 points)
- o Yes: parent, brother, sister or own child (5 points)

Risk Score	Risk of developing type 2 diabetes within 10 years is:
0 - 6 points	Low: estimated 1 in 100 will develop disease
7 - 11 points	Slightly elevated: estimated 1 in 25 will develop disease
12 – 14 points	Moderate: estimated 1 in 6 will develop disease
15 – 20 points	High: estimated 1 in 3 will develop disease
Higher than 20 points	Very high: estimated 1 in 2 will develop disease

Appendix 2: Copy of blood results letter sent to patients

NHS Salford

Salford Community Health

Care-Call
3rd floor, Sentinel House
Albert Street
Eccles
M30 0NJ
Tel: 0161 212 2110

Dear

You recently had a blood test that diagnosed you as having impaired glucose tolerance (IGT).

IGT means that you do not have type 2 diabetes, but you are at increased risk of developing it.

Your fasting blood test was .....mmol/l

Your 2 hour test was .....mmol/l

The table below may help you understand how the diagnosis was made.

Blood test	**Normal**	**Impaired glucose tolerance (IGT)**	**Type 2 diabetes**
Fasting (mmol/l)	6.0 and below	Below 7.0	7.0 and above
	and	and	and
2 hour oral glucose tolerance test (OGTT) (mmol/l)	7.7 and below	7.8 – 11.0	11.1 and above

I have enclosed a leaflet with some information on impaired glucose tolerance. This will be discussed at your next Care-Call appointment.

If you have any questions or concerns please contact either myself or your health advisor .....on the telephone number above.

Yours sincerely

Katherine Grady
Care-Call Development Manager

Appendix 3: Signposting and referral information

Service	Number signposted or directly referred
Health Walks	16
Active Lifestyle Team	14
Salford Fit City	8
Recommended an approved website	4
Smoking cessation team	3
Local community class	2
Health Trainers	1
Mental health team	1
TOTAL	**49**

Appendix 4: Patient Questionnaire

PLANNING YOUR CARE

THINKING ABOUT THE CALLS YOU HAVE RECEIVED OVER THE PAST 6 MONTHS…

1. Did you discuss **your** ideas about the best way to manage your impaired glucose tolerance (IGT) with your health advisor?

1 ☐ Yes, always
2 ☐ Yes, sometimes
3 ☐ No, but I **would have liked to**
4 ☐ No, but I **did not want to**
5 ☐ Don't know / can't remember

2. Did you discuss **your** goals to help reduce your risk of developing type 2 diabetes with your health advisor?

1 ☐ Yes, always
2 ☐ Yes, sometimes
3 ☐ No, but I **would have liked to**
4 ☐ No, but I **did not want to**
5 ☐ Don't know / can't remember

3. Did you discuss the food that you eat and any changes you could make to your diet?

1 ☐ Yes, always
2 ☐ Yes, sometimes
3 ☐ No, but I **would have liked to**
4 ☐ No, but I **did not want to**
5 ☐ Don't know / can't remember

4. Did you discuss your levels of physical activity and any changes that you could make?

1 ☐ Yes, always
2 ☐ Yes, sometimes
3 ☐ No, but I **would have liked to**
4 ☐ No, but I **did not want to**
5 ☐ Don't know / can't remember

5. At each call, did you **agree** a plan about which goals you would try and achieve before your next call?

1 ☐ Yes
2 ☐ No
3 ☐ Don't know / can't remember

6. Do you feel your health advisor always listened carefully to what you had to say?

1 ☐ Yes, always
2 ☐ Yes, sometimes
3 ☐ No
4 ☐ Don't know /can't remember

7. Did your health advisor explain things in a way you could understand?

1 ☐ Yes, always
2 ☐ Yes, sometimes
3 ☐ No
4 ☐ Don't know / can't remember

8. As a result of the calls you have received over the past 6 months, do you feel more confident in being able to reduce your risk of developing type 2 diabetes?

1 ☐ Yes, definitely
2 ☐ Yes, to some extent
3 ☐ No

9. Were you given a contact number to call if you needed to contact your health advisor?

(e.g. to change an appointment)

1 ☐ Yes
2 ☐ No

10. In the last 12 months, have you had any of the following tests

1 ☐ fasting blood glucose➔ **Go to Q.11**

2 ☐ oral glucose tolerance test (this is sometimes called an OGTT or a 2-hour glucose test)
➔**Go to Q.12**

3 ☐ Don't know / Can't remember
➔ **Go to Q.13**

11. Thinking about your **fasting glucose** test, do you think you understand what the results mean for you?

1 ☐ Yes, completely
2 ☐ Yes, to some extent
3 ☐ No
4 ☐ Don't know / Not sure

12. Thinking about your **oral glucose tolerance test (OGTT),** do you think you understand what the results mean for you?

1 ☐ Yes, completely
2 ☐ Yes, to some extent
3 ☐ No
4 ☐ Don't know / Not sure

13. Do you think your health advisor gave you relevant and up-to date advice about how to reduce your risk of developing type 2 diabetes?

1 ☐ Yes, definitely
2 ☐ Yes, to some extent
3 ☐ No
4 ☐ Don't know / Not sure

OTHER COMMENTS

What did you particularly like about the Care-Call Service?
Do you have any suggestions about how we could improve the Care-Call service for people with IGT?
Is there anything else you would like to tell us about the Care-Call service?

Thank you very much for your help
Please return the questionnaire in the stamped addressed envelope provided

Appendix 3: Summary of results from patient questionnaire

No	Question	Results		
1	Did you discuss your ideas about the best way to manage IGT with your health advisor	Yes, always Yes, sometimes No	37 4 0	(90.2%) (9.8%)
2	Did you discuss your goals to help reduce your risk of developing type 2 diabetes with your health advisor?	Yes, always Yes, sometimes No	38 3 0	(92.7%) (7.3%)
3	Did you discuss the food that you eat and any changes you could make to your diet?	Yes, always Yes, sometimes No, but would have liked to	38 2 1	(92.7%) (4.9%) (2.4%)
4	Did you discuss levels of physical activity and changes you could make?	Yes, always Yes, sometimes No, but I did not want to	32 7 2	(78.0%) (17.1%) (4.9%)
5	At each call, did you agree a plan about which goals you would try and achieve before your next call?	Yes No	39 2	(95.1%) (4.9%)
6	Do you feel your health advisor always listened carefully to what you had to say?	Yes, always Yes, sometimes No	41 0 0	(100%)
7	Did your health advisor explain things in a way you could understand?	Yes, always Yes, sometimes No	41 0 0	(100%)
8	As a result of the calls do you feel more confident in being able to reduce your risk of developing type 2 diabetes?	Yes, definitely Yes, to some extent No	32 9 0	(78%) (22%)
9	Were you given a contact number for the service?	Yes No	40 1	(97.5%) (2.5%)
10	In the last 12 months have you had a FBG or OGTT test?	FBG identified OGTT identified Could not remember	32 37 1	(78%) (90.2%) (2.4%)
11	Do you understand what the fasting blood test results mean for you?	Yes, completely Yes, to some extent Not answered	16 15 10	(39%) (36.6%) (24%)
12	Do you understand what the oral glucose tolerance test results mean for you?	Yes, completely Yes, to some extent Not answered	20 16 3	(48%) (39%) (7.3%)
13	Do you think your health advisor gave you relevant and up to date advice about how to reduce your risk of developing type 2 diabetes?	Yes, always Yes, sometimes No Not answered	37 3 0 1	(90.2%) (7.3%) (2.4%)

Appendix 5: Practice staff questionnaire.

CLAHRC/ Care-Call IGT project: Preventing type 2 diabetes

Questionnaire for participating practices

Thank you for your continued participation in this project. We would value your thoughts and opinions about the service to contribute to the overall evaluation and would be grateful if you could complete this questionnaire.

1. **How would you describe the level of support you received from Care-Call / CLAHRC to participate in this project?**
   ……
   ……
   ……

2. **How did patients react when you advised them you would be referring them to the Care-Call /IGT service?**
   ……
   ……
   ……

3. **What are your views on using this 6 month Care-Call programme to manage people with IGT?**
   ……
   ……
   ……

4. **Has your participation in this project had any impact on the way you / your practice manage this group of people?**
   ……
   ……
   ……

5. **Prior to this project, people with IGT were invited to attend a one off education session. How do you feel the -IGT service compares with the education group?**
   ……
   ……
   ……

6. **Every patient on the Care-Call IGT programme received an information pack containing 'starter' information which was then added to during the programme. Every practice received a sample pack at the start of the project and these were also on display at staff workshops.**

   How satisfied were you with the level of written information that your patients received?

   Not satisfied Very satisfied

   1 2 3 4 5 6 7 8 9 10

7. How confident are you that Care-Call can provide your patients with up to date, evidence based dietary and lifestyle advice?

Not confident Very confident

1 2 3 4 5 6 7 8 9 10

8. How confident are you that Care-Call can motivate your patients to make positive behaviour changes?

Not confident Very confident

1 2 3 4 5 6 7 8 9 10

9. Is there anything else you would like tell us about the Care-Call service?

……
……
……
……
……
……..

Thank you for your help.

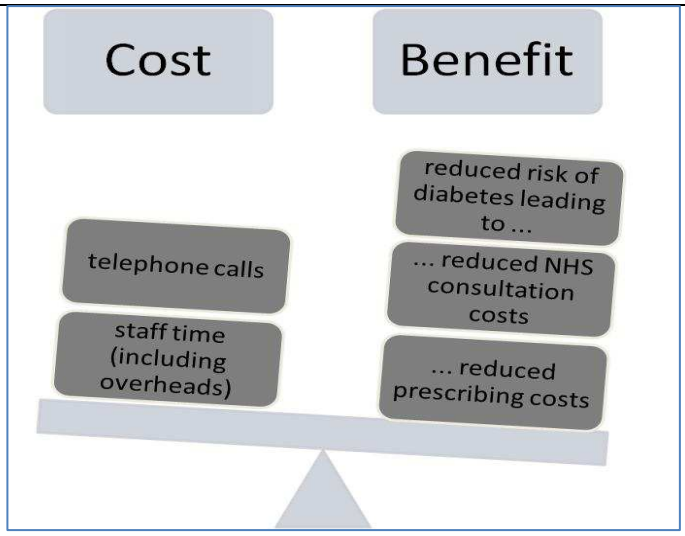
Please return the questionnaire in the envelope provided.

Appendix 6: Cost benefit analysis.

Care-Call Service to promote lifestyle changes for people with Impaired Glucose Tolerance (IGT) in NHS Salford

This document summarises the costs and benefits of the Care-Call Service for IGT patients, as shown by the programme supported by CLAHRC in 2010/11.

The benefits are also extrapolated to the whole of the NHS Salford population to give an indication of the potential impact if the service were extended in this way.



HEADLINES

- The risk of developing type 2 diabetes has been shown to be reduced by supporting patients identified with Impaired Glucose Tolerance (IGT) in lifestyle interventions to reduce weight through influencing diet and activity.
- Using the existing Care-Call telephone-based support system in NHS Salford, IGT patients have been supported in these activities.
- The service is delivered by non-clinical staff, trained to provide a structured education programme and motivational support. Patients receive regular telephone calls from their dedicated health advisor to support them in achieving their goals set at the start of the programme.
- Evaluation shows very positive results in terms of patients achieving goals and acceptance of the service.
- The service has been costed to include staff time and telephone calls, with associated administration, and is directly proportional to the number of patients using the service.
- The benefits are a reduced risk of developing type 2 diabetes and the associated CVD risks, which could potentially reduce primary care consultation and prescribing costs.
- This programme will pay for itself in less than three years using this crude cost analysis, without costing any patient benefits or staff training costs.

Participants

55 patients diagnosed with IGT were recruited from 7 practices, and enrolled on the programme for six months from Autumn 2010.

Objectives To reduce the incidence of type 2 diabetes in patients with IGT by providing support for patients to modify risk factors.

Implications of IGT

- IGT is itself a risk factor for developing diabetes. Modifiable risk factors include being overweight/obesity, a sedentary lifestyle and dietary factors.[1]
- 60% of people who develop type 2 diabetes have either IGT or Impaired Fasting Glycaemia (IFG) 5 years or so before diabetes develops[2]
- In the absence of any intervention, 50% of IGT patients will develop type 2 diabetes within 10 years[3]
- Lifestyle interventions have been shown to achieve sustained weight loss, delayed onset of type 2 diabetes by 4 years and reduced diabetes incidence rate by 34%[4]

Specific objectives of this service:

- To deliver a telephone-based support service for people with IGT in which 75% of service users achieve and sustain one or more lifestyle goals by March 2011
- To deliver a telephone-based support service for people with IGT that 75% of service users rate as assisting them in achieving one or more lifestyle goals by March 2011

Achievements of this service

- 'Mini goals' have been set that lead to achievement of the overall goal, of which 88% have been achieved or partially achieved (243 'mini goals' out of 275).
- Many patients have achieved encouraging rates of weight loss (on average 5.4% per patient in six months), which is now generating interest from other obesity management services in the area.
- Patient questionnaires and focus group findings indicates high patient satisfaction to date.
- Formal quantitative and qualitative evaluation now being completed (May 2011).

Costs

NHS Salford costs to provide service for 55 patients:

- Staff[5] (Band 4) providing the lifestyle support: £82.45 per patient
- Staff (Band 7 health professional) providing initial goal setting support and patient assessment: £41.58 per patient
- Costs of telephone calls to patients[6] : £11.52 per patient
- Total cost per patient: £135.55 (for 6 months in the programme)
- Total cost for all 55 patients: £7,455

NOTE: as the service was already established and staff trained in the relevant motivational interviewing approaches, cost of training has not been included here. It would however be relevant if the service were rolled out further and has been included in later sections of this analysis

1 Based on Paulweber et al (2010) A European evidence-based guideline for the prevention of type 2 diabetes, *Horm Met Res*, 42 (Suppl.1): S3-S36

2 Unwin et al (2002) Impaired glucose tolerance and impaired fasting glycaemia: the current status on definition and intervention, *Diabetic Medicine*, 19: 708-723

3 Lindstroem et al (2008). Determinants for the effectiveness of lifestyle intervention in the Finnish Diabetes Prevention Study, *Diabetes Care* 31(5): 857-862; Ratner (2006). An update on the Diabetes Prevention Program, *Endocrine Practice* 12(Suppl1): 20-24

4 Diabetes Prevention Program Research Group (2009) 10-year follow-up of diabetes incidence and weight loss in the Diabetes Prevention Program Outcomes Study, *The Lancet*, published online 29th October 2009

5 All staff costs assume overhead rate of 50%

6 Local calls at 6.4p/minute (BT tariff for domestic services)

NHS Salford costs of diabetes for whole population:

Research into the cost of diabetes[7] indicates that:

- cost of primary care consultations for diabetes: £340 per patient/year
- cost of prescribing for diabetes: £740 per patient/year
- primary care and prescribing costs: £1,080 per patient/year

NOTE: in this analysis we have not taken into account secondary care costs, which are estimated from the same research data to be ~ £1,380 per patient/year (excluding prescribing)

CLAHRC resources:

- 0.5 Knowledge Transfer Associate (Band 6) for one year allocated to this project, plus clinical, academic, programme management and administrative support.
- 0.4 FTE NHS Salford staff member (Band 7) seconded to CLAHRC team for one year to set up and evaluate the programme and conduct action planning with patients following a detailed lifestyle assessment

NOTE: these are not included in the cost/benefit analysis but are provided to indicate scale of central support provided to establish and evaluate this pilot programme

Benefits

Short term cost savings

- There might be some savings from reduced requirements for other services to support e.g. obesity as BMI reduces, but there are assumed to be negligible and are not included in this analysis.

Long term savings:

- In the absence of any intervention, over a period of 10 years 50% of IGT patients will develop type 2 diabetes i.e. ~27 patients from those in this programme over 10 years.
- A lifestyle intervention can reduce the incidence risk of diabetes by 34% i.e. ~9 patients will not develop diabetes who would otherwise have done so, over 10 years.
- We assume that development of diabetes is linear over the 10 years i.e. a rate of 0.9 patients/year.
- Costs of primary care consultation and prescribing for type 2 diabetes: £1080 per patient/per year (not including treatment costs for complications, e.g. related CVD events or secondary care costs).

This gives the following cost profile for this programme:

	Y1	Y2	Y3	Y4
Cost	£7,455	0	0	0
Savings	£1,010	£2,020	£3,029	£4,039
Cumulative saving		£3,029	£6,059	£10,098

This shows payback on investment in 3 years and 5 months in terms of reduction in what would have been spent to support patients who develop diabetes

[7] Currie et al (2010) Estimation of primary care treatment costs and treatment efficacy for people with type 1 and type 2 diabetes in the United Kingdom from 1997 to 2007, *Diabetic Medicine* 27(8): 938-948

Extension of provision to whole of NHS Salford population

Assumptions

- Population of NHS Salford (45-74 years old): 69,937[8]
- 10% of the population of this age group[9] will have IGT i.e. ~7,000 people
- 50% of these will develop type 2 diabetes within 10 years.
- We assume that the rate of developing diabetes, over 10 years, is linear i.e. a rate of ~350 per year.

We assume that we would enrol 20% of those with IGT in the service each year (each for a period of 6 months).

Costs

- 3.7 Band 4 and 1.1 band 7 FTE staff will be needed to provide the service at this level
- Band 4 staff require 3 months training
- Band 7 staff provide a day a month to update/maintain scripts used by advisors
- Set up cost for new service (assuming all staff trained again): ~ £18,000
- Annual cost to provide service for 20% of IGT patients: ~ £213,000

This gives the following cost profile for the whole population, showing positive return on investment during year 3, with further (increasing) savings beyond five years (not shown here):

	Y1	Y2	Y3	Y4	Y5
Cost	£249,197	£213,158	£213,158	£213,158	£213,158
Primary care/prescribing cost saving	£128,404	£256,809	£385,213	£513,617	£642,022
Cumulative savings	-£120,793	£77,142	£94,913	£395,372	£824,235

Limitations of analysis

- As with all analyses of this type, not all actual reductions will be achieved, but these predictions are conservative
- The research evidence showing that lifestyle interventions can also *delay the development* of diabetes in patients with IGT[10] has not been taken into account in this basic analysis.
- There will be NHS infrastructure and management costs in providing any service and these have been taken into account by adding a 50% overhead to staff costs. These will include provision of appropriate premises, phone systems and databases to record information about patients and may be underestimated here
- Many costs are crude estimates
- No patient quality of life issues/benefits have been costed in this analysis

8 NHS Information Centre, 2010 population data from registered GP patients

9 Data provided by Prof Kamlesh Khunti, University of Leicester, to Martin Gibson, August 2009

10 Diabetes Prevention Program Research Group (2009) 10-year follow-up of diabetes incidence and weight loss in the Diabetes Prevention Program Outcomes Study, *The Lancet*, published online 29th October 2009