MANCHESTER 1824
The University of Manchester

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

The IGR Care Call Project
Evaluation Report

December 2013

Linda Savas, Knowledge Transfer Associate, NIHR CLAHRC for Greater Manchester.
Linda.savas@srft.nhs.uk
Katherine Grady, Care Call Development Manager, Salford Royal NHS Foundation Trust.
Katherine.grady@srft.nhs.uk

Executive Summary

This report evaluates the IGR project and presents results available up to the date of data collection, 17th December 2013.

207 people with IGR were enrolled on the project and offered a choice of group education or total telephone pathway. The people who chose each pathway were similar in terms of age, weight, BMI and fasting blood glucose results. 20 (10%) patients did not attend their initial appointment and therefore received no intervention from the diabetes team following enrolment, 56 (27%) patients received some intervention but either withdrew or were discharged before completing the 12 month pathway. At data collection, 105 (51%) patients had completed the programme and a further 26 (12%) not yet completed but expected to.

Of the 207 enrolled, annual repeat results were available as follows; BMI and weight for 78 (38%) patients, fasting blood glucose for 102 (49%) patients and 2hr OGTT for 30 (10%) patients. Based on the blood results available at follow up, 47 (46%) had a normal fasting glucose, 40 (39%) remained IGR and 15 (15%) required a second blood test to confirm diagnosis of type 2 diabetes.

On completion of the 12 month programme, participants demonstrated statistically significant improvements in weight and BMI. There was no overall effect on the mean fasting blood glucose.

Quantitative outcomes

Based on the 78 patients with a recorded weight available at baseline and 12 months:

- The mean reduction in weight was 4.3kg (SD 5.74kg, 95% CI 3.0 to 5.6kg), a statistically significant weight loss ($p<0.05$)
- The mean weight loss was 5.8kg in those who chose group education and 3.0kg in those who chose total telephone support. This difference was statistically significant.

In percentages patients lost on average 4.7% of their body weight (SD 5.72, 95% CI 3.4 to 6.0). Further breakdown shows:

- The percentage weight loss in those who chose group education was on average 5.8% compared to 3.7% in those who chose the total telephone support. This difference in percentage weight loss was not statistically significant.

Based on the 78 patients with a recorded BMI available at baseline and 12 months:

- The mean reduction in BMI was 1.6kg/m^2 (SD 2.21, 95% CI 1.1 to 2.1), a statistically significant reduction in BMI ($p<0.05$)
- The mean reduction in the group education pathway was 2.1kg/m^2 and in the total telephone pathway the mean reduction was 1.1kg/m^2

Based on the 102 patients with fasting blood glucose results available at baseline and 12 months:

- The mean change was a reduction of 0.07mmol/l (SD 0.86 95% CI -0.10 to 0.24). These results are not statistically significant.

Qualitative outcomes

Comments from patient focus groups and questionnaires from participants who undertook the programme demonstrated that the service was very well received. Results demonstrated:

- 97% of patients always or sometimes discussed goals that would help reduce their risk of developing type 2 diabetes with their health advisor
- 96% of patients definitely or to some extent felt their health advisor gave them relevant advice about how to reduce their risk of developing type 2 diabetes
- 97% definitely or to some extent felt confident that they could manage their own risk of developing type 2 diabetes.

Due to the time constraints of the project, opinions from people who failed to attend any IGR intervention from the diabetes team or who withdrew prior to completion of the programme were not sought. Reasons for non-attendance or early withdrawal may offer additional insight in to any future service design.

Financial Implications

An initial cost benefit analysis was undertaken for the original project by Professor Ruth Boaden, Deputy Director NIHR CLAHRC for Greater Manchester and NHS Salford finance team. The project cost figures in this report are calculated using the original cost benefit analysis and have been broken down into stages: pre/enrolment, total telephone pathway, group education pathway and overall project cost.

Summary

Available results provide evidence to suggest that the IGR pathway delivered by Salford diabetes team provides an effective method of delivering a tailored intervention to patients with IGR, promoting positive lifestyle changes which could delay the onset of type 2 diabetes. However, results should be interpreted with caution due to the relatively small number of participants and it would be wrong to assume that the results obtained for those who received recall in general practice can be applied to all patients. Additionally, the research design required people to choose between the two pathways so it is not possible to distinguish between the effect of the treatment and the effect of other factors which might affect both the choice and the outcome.

Based on the results available, both choices of pathway appear to be successful in achieving a statistically significant reduction in weight and BMI which is known to prevent or delay the onset of type 2 diabetes in people with IGR.

Numbers of IGR referrals to Salford diabetes team have increased since the IGR project commenced in 2011. Whilst this suggests awareness of the IGR service has been raised, increasing numbers present challenges to diabetes team service delivery within existing resources.

IGR care call evaluation report

1.0 Background

The numbers of people diagnosed with type 2 diabetes are continually rising. Current prevalence of over 4% of the UK population is expected to increase to in excess of 8.5% by 2020.[1] Treating type 2 diabetes and its complications costs the NHS £8.8 billion each year.[2] Diabetes prevention studies and more recent translational research studies confirm the transition from being at risk to developing type 2 diabetes can be prevented or delayed by up to 58% in the short term and 38% after 10 years.[3-5] The Diabetes NSF, established to drive up service equality and tackle variations in care, set out 12 standards to be achieved by 2013 and Standards 1 and 2 support the NHS in their challenge to prevent type 2 diabetes.[6]

Risk factors associated with the development of type 2 diabetes include obesity and inactivity, particularly in those people who are diagnosed with impaired glucose regulation (IGR), a condition where blood glucose levels are raised above normal but not high enough to warrant a diagnosis of type 2 diabetes. The term IGR encompasses both impaired fasting glucose (IFG) and impaired glucose tolerance (IGT). They differ in that IFG is associated with a raised hepatic glucose output, is more common amongst males and tends to plateau in middle age. IGT is associated with peripheral insulin resistance, is more common amongst females and prevalence rises with advancing age. It is possible for people to be diagnosed with both IFG and IGT which additionally increases their CVD risk above that of a single diagnosis.[7]

There is strong evidence to suggest that without any lifestyle or medical intervention; in particular weight loss and activity, approximately 50% of people with IGR will develop type 2 diabetes accompanied by an increased risk of cardiovascular disease over a period of 10 years.[8] People who have a BMI >25kg/m^2 are more likely to develop type 2 diabetes. Risk rises as body weight increases ; evidence suggests that a 1kg/m^2 increase in BMI increases the risk of developing new-onset type 2 diabetes by 8.4%[9]. This is of particular relevance to Salford where over half of the 220,000 population have a recorded BMI >25kg/m^2. [10] Randomised controlled trials have shown that relatively modest lifestyle changes can delay or prevent the onset of type 2 diabetes in people with IGT and there is some evidence showing similar results in people with IFG.[11,12] The International Diabetes Federation and Diabetes UK both recommend lifestyle interventions as first line management in the prevention of type 2 diabetes.

Salford's Joint Health and Wellbeing Strategy (2012-2015)[13] emphasises their commitment to prevention of long term conditions. Their vision states:

> "***We believe that prevention is better than cure and that by empowering people we can improve quality of life, improve the long term health of communities in the city and promote individual responsibility and behaviour change."***

2.0 Project Rationale

The first project - IGT care-call - commenced in 2010 and was jointly undertaken by the Collaboration for Leadership in Applied Health Research and Care (CLAHRC) for Greater Manchester and NHS Salford Diabetes Team. Working together and utilising existing diabetes care call pathways and resources, the aim of the project was to design, deliver and evaluate a telephone based service that provided a six month lifestyle education programme for people diagnosed with impaired glucose tolerance (IGT) who were at risk of developing type 2 diabetes to prevent them developing the condition. Seven GP practices in Salford took part in the IGT care call project.

The evaluation report concluded that the project was a success in achieving its aims and results were presented to Salford Diabetes Care Strategy Group and Hundred's Health Clinical Commissioning Board. Some non-recurrent funding was made available to extend the initial project and make it available to all Salford GP practices; which aimed to build capacity and confirm that first project results could be reproduced.

The second project commenced in April 2012 and was renamed 'the IGR project'. Clinical consensus and opinion from the diabetes team (now under Salford Royal NHS Foundation Trust), key stakeholders and the Salford Diabetes Care Strategy Group was sought to develop and agree criteria for referral and design the pathway for the project (appendices 1 and 2). Diabetes specialist dieticians who produced the original service scripts reviewed and updated these to reflect recent evidence. The contents of the scripts included food, activity and lifestyle recommendations to prevent type 2 diabetes and were used by health advisors to deliver key educational messages.

Utilising patient feedback from the first project, changes to the pathway were incorporated in the IGR project pathway. A summary of the revised pathway was as follows:

- Patients with a diagnosis of IFG and/or IGT were accepted
- A choice of initial contact was offered; group education session or telephone. Both were delivered by a health care professional and included action planning
- Following initial contact all patients received eight follow up telephone calls from a diabetes health advisor. These were monthly for six months then at nine and 12 months
- The pathway was extended from six to 12 months to allow a step down approach to care
- The service was available for all Salford GPs to refer to.

The project aim was agreed with Salford Diabetes Care Strategy Group, Salford Diabetes Team and NIHR CLAHRC for Greater Manchester and was as follows:

GM CLAHRC and Salford diabetes team aimed to refine the impaired glucose pathway in 2013, expanding the service to target all patients with IGR in Salford to prevent or delay the onset of type 2 diabetes as measured through FBG, OGTT, weight and BMI results.

Specific project objectives included:

1. To expand the initial project IGT project pathway to offer an extended (12 month) and more flexible pathway (allowing a choice of group education pathway or total telephone pathway), in which 75% of service users will achieve one or more lifestyle goals by December 2013
2. To engage all GP practices in Salford so that all practices will be routinely referring patients for IGR education to Salford diabetes team by December 2013
3. To investigate whether the statistically significant reductions in weight loss, BMI, and blood glucose results achieved by participants in the initial IGT project could be maintained one year post discharge (by July 2013)
4. To assist identification of patients with IGR by understanding variations in approaches to coding and recalling patients with IFG and IGT in primary care and provide information to Salford Clinical Commissioning Group by June 2013.

2.1 Purpose of report

This report will summarise project progress and will include results to 17th December 2013 for specific project objectives one and two.
Separate reports have been produced and disseminated for objectives three and four and demonstrate these were achieved.

3.0 Referral Criteria for IGR pathway

The referral criteria was developed with clinical input from Salford Diabetes Care Strategy Group (appendix 2). It was distributed to all 54 GP practices' in Salford with the invitation of a practice visit to discuss the referral criteria and the IGR project with staff. Sixteen (30%) practices accepted this offer.

3.1 IGR referrals

A total of 322 referrals were received over 18 months by the diabetes team for IGR education. Of these, 115 (36%) were inappropriate for the project as they did not fit the project referral criteria (see table 1 below). Inappropriate referrals were referred back to the GP advising why the referral was inappropriate or requesting additional information or tests.

Table1: Inappropriate/non project referrals to the service (n=115)

Inappropriate/non project referrals	Total No
• No English • Learning Difficulties • Recent Bereavement • Cancer Diagnosis	10
Patient refused referral/refused any advice	3
*GDM (Gestational diabetes mellitus)	49
Incomplete or incorrect diagnosis results	51
Unable to contact:	2
Total	115

3.2 *GDM referrals

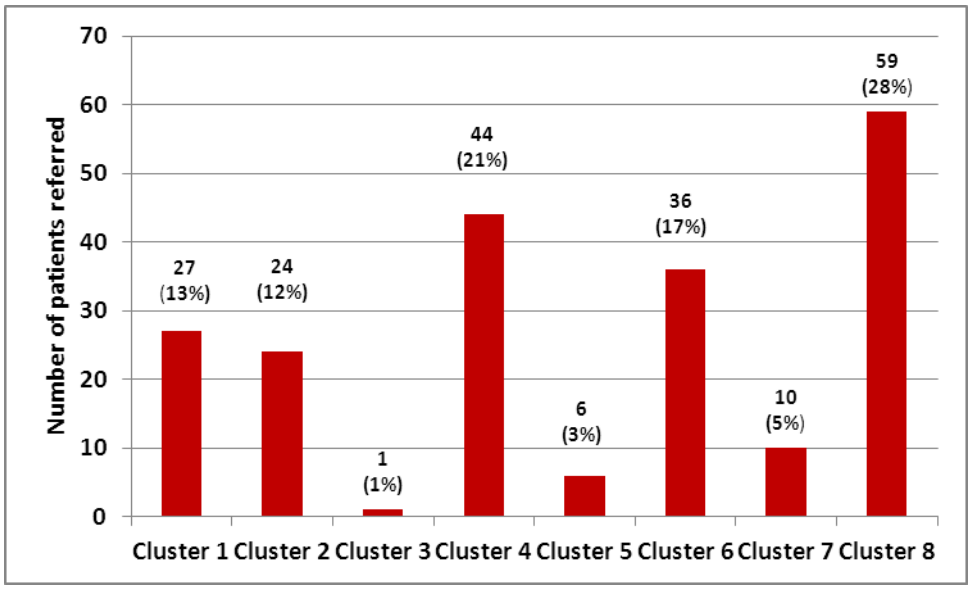
It was agreed with Salford Diabetes Care Strategy Group that patients referred with GDM would not be included in the project for various reasons. These included uncertainty of the duration of IGR due to patients being referred at varying stages post pregnancy, limited access to results as patients may attend other hospitals and a historically poor attendance at group education. Women who were referred with GDM were invited to the usual group education session but were not included in the project.

3.3 Appropriate referrals

As of 17th December 2013, 207 patients had been enrolled on the IGR care call project.
IGR care call was available to every GP practice in Salford. Each GP practice was advised about the service via several methods to encourage referrals. These included emails, postal 'flyers', practice visit invitation, appearing as agenda items on the Diabetes Care Strategy Group meetings and opportunistically when Salford diabetes team were visiting practices. Despite this, uptake of the service was slow to commence.

Figure 1 below demonstrates referral by GP cluster.

Figure 1: Appropriate referrals by cluster (n=207)



4.0 Baseline demographics

4.1 Age and gender of patients

Patient age on enrolment has been banded into four groups for evaluation purposes. Age distribution by gender is shown in table 2 below. As in the first project the biggest group (n= 82, 40%) of patients fall into the >64 years age band. This is not unexpected given that IGR risk increases with age.[7] There is increased frequency of patients in age band 45-54 years from 5.4% on the original IGT care call project to 19% on this project. This could be explained by accepting people with IFG on to this project as this condition tends to plateau in middle age.[7] Mean age was similar for both pathways, the group education pathway was 60.7 years and the telephone pathway 60.0 years.

Table 2: Age and gender of patients (n=207)

	Gender					
	Male		Female		Total No.	Total %
Age band/years	No.	%	No.	%		
< 45	11	5%	10	5%	21	10%
45-54	22	11%	17	8%	39	19%
55-64	37	18%	28	13%	65	31%
> 64	41	20%	41	20%	82	40%
Total	111	54%	96	46%	207	100.0%

4.2 Ethnicity

Salford's population is predominantly white[13] which is reflected in recorded ethnicity of patients enrolled with only 5 % from the non-white groups as shown in table 3 below.

Table 3: Ethnicity of patients (n=207)

Ethnicity	Total No	Total %
Asian	6	3%
Black	3	1%
White	197	95%
Mixed	1	1%
Total	207	100%

4.3 BMI Scores

Baseline BMI scores of the patients enrolled are shown in table 4 below. Of the 207 patients enrolled on the pathway 136 (66%) patients were classed as obese with BMI score >30 kg/m^2. There were slightly more male patients in this category (n=69, 34%). Fifty nine patients (28%) were classed as overweight with a BMI score of 25-30 kg/m^2. Only 12 (6%) patients had a healthy BMI score of 20-25 kg/m^2. Mean BMI across all 207 participants was 33.7kg/m^2

Table 4: Baseline BMI of patients enrolled on IGR care call pathway (n=207)

Baseline BMI (kg/m^2)	20-25 (Healthy)	25-30 (Overweight)	>30 (Obese)	Total
Female	7 (3%)	22 (10%)	67 (32%)	95 (46%)
Male	5 (3%)	37 (18%)	69 (34%)	112 (54%)
Total	12 (6%)	59 (28%)	136 (66%)	207 (100%)

4.4 Diagnosis by age and gender

All 207 patients referred had a diagnosis of either IFG or IGT made within the previous six months. Forty five (22%) patients had a diagnosis of both IFG and IGT and were therefore at highest risk of developing type 2 diabetes and cardiovascular disease (table 5 below).

Table 5: Diagnosis by gender and age band (n=207)

Age/years	IFG		IGT		IGT & IFG		Total	
	M	F	M	F	M	F		
<45	8	5	3	2	0	3	21	10%
45-54	7	13	5	2	10	2	39	19%
55-64	20	17	4	9	13	2	65	31%
>64	24	22	11	10	6	9	82	40%
	59 (29%)	57 (27%)	23 (11%)	23 (11%)	29 (14%)	16 (8%)		
Total	116 (56%)		46 (22%)		45 (22%)		207	(100%)

4.5 Choice of initial contact by age and gender

All 207 patients enrolled on the project were offered a choice of pathway until 100 patients had been enrolled on each. As some patients withdrew at the early stages of the project recruitment continued which resulted in 207 patients being enrolled. 112 (54%) chose the group education pathway and 95 (46%) the telephone pathway. Table 6 below demonstrates very similar distribution of pathway choice by gender and age band.

Table 6: Choice of pathway by age and gender (n=207)

Age/years	Group education pathway			Total Telephone Pathway		
	Male	Female	Total	Male	Female	Total
<45	6	5	11 (6%)	5	5	10 (5%)
45-54	11	9	20 (10%)	11	8	19 (10%)
55-64	24	14	38 (18%)	13	14	27 (12%)
>64	25	18	43 (20%)	16	23	39 (19%)
Total	66	46	112 (54%)	45	50	95 (46%)

4.6 Withdrawals

The cut-off date for data collection to enable this report was 17th December 2013. Seventy six patients (37%) who were enrolled on the project either withdrew or were discharged before completing the 12 month pathway. Of those, 46 (60.5%) chose the group education pathway and 30 (39.5%) chose the total telephone pathway. Table 7 demonstrates the reasons for withdrawals/discharges on each pathway.

Table 7: IGR care call withdrawals and discharges (n=76)

Reasons for Discharge/withdrawing.	Group education pathway	Total telephone pathway	Total
Diagnosed with type 2 diabetes	3	4	7 (9%)
Deceased	0	1	1 (1%)
Work commitments	4	3	7 (9%)
Other health problems	3	1	4 (5%)
Family member illness	1	0	1 (1%)
Unable to contact (after group education or action planning session)	12	11	23 (31%)
No longer wishes to receive the service	3	10	13 (17%)
*Did not attend group education session *Chose group education then cancelled prior to attending	*18 *2	0 0	20 (27%)
Total	46 (60%)	30 (40%)	76 (100%)

*At the enrolment call 18 patients chose the group education pathway, choosing a date and venue suitable for them. An appointment letter was sent to confirm the details; however they did not attend on the day. Two patients chose group education pathway but cancelled the appointment prior to the group, choosing not to continue with the service.

Table 8 below demonstrates progress of patients on the IGR pathway at the date of data collection.

Table 8: Progress of patients on IGR pathway (n=207)

Status	Group Education Pathway	Total Telephone Pathway	Total
Still on pathway	11	15	26 (12%)
Discharged (part of pathway completed)	26	30	56 (27%)
Discharged (none of pathway completed)	20	0	20 (10%)
Completed	55	50	105 (51%)
Total	112 (54%)	95 (46%)	207 (100%)

5.0 Quantitative Results

5.1 Method of analysis

The baseline age and clinical measures are reported for the 207 patients who were enrolled on the project. This includes the 20 patients who did not attend and therefore did not receive any input other than their enrolment call. Every patient was offered a choice of pathway either group education or total telephone. The baseline measures are reported for the whole population (n=207) and then for each pathway as means, standard deviations and minimum/maximums.

When the patient reached the nine month step down appointment their GP was contacted by letter to advise that annual recall was recommended. At data collection, 105 patients had completed the pathway and a further 26 not yet completed but expected to. Of the 207 enrolled, annual repeat results were available as follows; BMI and weight for 78 (38%) patients, fasting blood glucose for 102 (49%) patients and 2hr OGTT for 30 (10%) patients.

The change scores are reported for the whole population and then by each choice of pathway as means, standard deviations and minimum/maximums. We present confidence intervals and *p* values for the changes but these should be interpreted with caution as it would be wrong to assume that the results obtained for those who received recall in general practice can be applied to all patients.

Any difference in outcomes between those who attended the group education pathway and those who chose the total telephone pathway need to be interpreted cautiously. The research design required people to choose between the two pathways so it is not possible to distinguish between the effect of the treatment and the effect of other factors which might affect both the choice and the outcome, such as employment, physical mobility, sociability and determination.

Statistical analysis was advised on and performed by Dr. Sarah Cotterill, Research Fellow, Centre of Biostatistics, University of Manchester. Statistical analysis was undertaken using Stata11.

5.2 Summary of baseline

The 207 patients enrolled on the IGR project had a mean age of 60.4 years, a mean weight of 94.5kg, a mean BMI of 33.7kg/m^2, a mean fasting blood glucose of 6.3mmol/l and a mean 2 hr OGTT of 8.6mmol/l , as demonstrated below in table 9.

Table 9: Baseline characteristics by chosen pathway (n=207)

	Group Education pathway	Telephone pathway	*Total*
Age (years) mean (SD)	60.7 years (SD 12.1) Range 28-89 years (n=112)	60.0 years (SD 11.3) Range 33-61 years (n=95)	60.4 years (SD 11.7) Range 28-89 years (n=207)
Weight (kg) mean (SD)	96.8kg (SD 21.9) Range 42-163kg (n=109)	91.7kg (SD 21.9) Range 45.8-156.6kg (n=94)	94.5kg (SD 22.0) Range 42-163kg (n=203)
BMI (kg/m^2) mean (SD)	34.1kg/m^2 (SD 6.9) Range 21-62 kg/m^2 (n=112)	33.2kg/m^2 (SD 6.9) Range 20-62 kg/m^2 (n=95)	33.7kg/m^2 (SD 6.9) Range 20-62 kg/m^2 (n=207)
Fasting blood glucose (mmol/l) mean (SD)	6.3 mmol/l (SD 0.4) Range 4.6-6.9mmol/l (n=112)	6.3 mmol/l (SD 0.5) Range 4.8-6.9 mmol/l (n=95)	6.3 mmol/l (SD 0.4) Range 4.6-6.9 mmol/l (n=207)
2 hr OGTT (mmol/l) mean (SD)	8.6 mmol/l (SD 1.3) Range 5-11 mmol/l (n=62)	8.6 mmol/l (SD 1.3) Range 2.4-10.9 (n=50)	8.6 mmol/l (SD 1.3) Range 5-11 mmol/l (n=112)
Total patients	112	95	207

The baseline characteristics of the group education pathway and total telephone pathway are similar in age (mean age of 60.7 years in the group education pathway and 60.0 years in the total telephone pathway), BMI (mean BMI of 34.1kg/m^2 in the group education pathway, 33.2kg/m^2 in the total telephone pathway), fasting glucose (mean 6.3mmol/l in both groups) and 2 hr OGTT (mean 8.6mmol/l in both groups). There is a difference in mean weight of 5.1kg (95% CI -1.02 to 11.14) between those who chose the group education pathway (96.8kg), and those who chose the total telephone pathway (91.7kg) which is not statistically significant.

5.3 Changes in weight

78 (38%) of the 207 patients had a repeat weight measurement undertaken and recorded at their GP practice. Amongst these 78 patients the mean reduction in weight was 4.3kg (SD 5.74, 95% CI 3.0 to 5.6kg), a statistically significant weight loss ($p<0.05$). In percentages, patients lost on average 4.7% of their body weight (SD 5.72, CI 3.4 to 6.0). Table 10 below demonstrates the changes in weight.

Table 10: Changes in weight between baseline and 12 months (n=78)

Category	Baseline	12 months	*Difference*	*P*	*95% CI*
Weight (kg): mean (SD) (n=78)	95.5	91.2	4.3 (SD 5.74)	<0.05	3.0 to 5.6

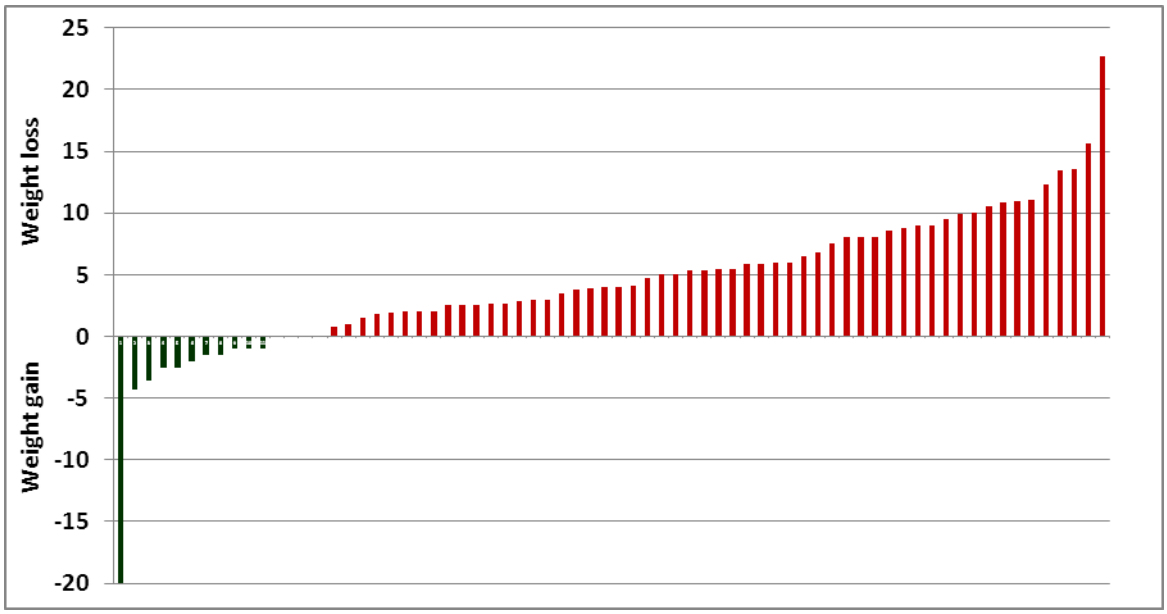
The mean weight loss was 5.8kg in those who chose the group education pathway and 3.0kg in those who chose the total telephone pathway and the difference is statistically significant (table 11 below). The percentage weight loss was on average 5.8% in the group education pathway and 3.7% on the total telephone pathway. This difference is not statistically significant.

Table 11: Mean change in weight at baseline and 12 months by choice of pathway (n=78)

Choice	Baseline	12 months	*Difference*	*P*	*95% CI*
Group Education pathway Weight (kg): mean (SD) (n=37)	98.9	93.1	5.8 (5.09)	<0.05	4.1 to 7.5
Total Telephone pathway Weight (kg): mean (SD) (n=41)	92.4	89.4	3.0 (6.0)	<0.05	1.1 to 4.9

Figure 2 below demonstrates individual weight changes displayed in ordered difference.

Figure 2: Ordered difference of weight change (n=78)



Ten patients who did not have repeat weight measured in general practice but self-reported their final weight were not included in the results as we could not confirm with certainty that the changes reported were accurate. Of this cohort, nine patients lost weight, a combined weight loss of 53.2kg equating to an average of 5.9kg per person. One patient reported a weight gain of 4.2kg. Self-reported weights have not been included in any calculations for this evaluation report.

5.4 Changes in BMI

Repeat BMI results were available for 78 (38%) patients. The mean reduction in BMI was 1.6 kg/m^2 (SD 2.21, 95% CI 1.1 to 2.1).

This was a statistically significant reduction in BMI ($p<0.05$), as shown in table 12 below.

Table12: Changes in BMI between baseline and 12 months (n=78)

Category	Baseline	12 months	*Difference*	*P*	*95% CI*
BMI (kg/m^2) mean (SD) (n=78)	34.4	32.8	1.6 (2.21)	<0.05	1.1 to 2.1

The mean reduction in BMI was 2.1kg/m^2 in those who chose the group education pathway and 1.1 kg/m^2 in those who chose telephone support as shown in table 13 below.

Table 13: Mean changes in BMI between baseline and 12 months by choice of pathway (n=78)

Choice	Baseline	12 months	*Difference*	*P*	*95% CI*
Group Education pathway BMI (kg/m^2) mean (SD) (n=37)	35.0	32.9	2.1	<0.05	1.5 to 2.8
Total Telephone pathway BMI (kg/m^2) mean (SD) (n=41)	33.8	32.7	1.1	<0.05	0.4 to 1.8

5.5 Changes in blood glucose results

Repeat fasting blood glucose results were available for 102 (49%) of the 207 patients. Among these 102 patients the mean change was a reduction of 0.07 mmol/l (SD 0.86, 95% CI -0.10 to 0.24), which is not statistically significant (table 14 below).

Table 14: Changes in fasting blood glucose between baseline and 12 months (n=102)

Category	Baseline	12 months	*Difference*	*P*	*95% CI*
Fasting blood glucose (mmol/l) mean (SD) (n=102)	6.23	6.16	0.07 (0.86)	0.39	-0.10 to 0.24

Table 15 below demonstrates the mean change in fasting blood glucose was an increase of 0.03 mmol/l in those who chose education and a reduction of 0.18 mmol/l in those who chose telephone support.

Table 15: Mean changes in fasting blood glucose by choice of pathway (n=102)

Choice	Baseline	12 months	*Difference*	*P*	*95% CI*
Group Education Pathway Fasting blood glucose (mmol/l) mean (SD) (n=52)	6.27	6.31	-0.03 (1.03)	0.81	-0.32 to 0.25
Total Telephone Pathway Fasting blood glucose (mmol/l) mean (SD) (n=50)	6.19	6.01	0.18 (0.63)	<0.05	0.00 to 0.36

We have based diagnoses at 12 months on results from the GP's choice of repeat blood test. This included fasting blood glucose, 2 hr OGTT and HbA1c. Table 16 below summarises diagnoses at baseline and 12 months. Of the 102 patients, 62 (61%) had a glucose tolerance test at referral and 33 (32%) at annual follow up.

Table 16: Diagnoses at baseline and 12 months (n=102)

Diagnosis	Baseline	12 months
Normal fasting glucose	0	47 (46%)
Impaired fasting glucose	51 (50%)	32 (31%)
Impaired glucose tolerance	27 (26%)	5 (5%)
Impaired fasting glucose and Impaired glucose tolerance	24 (24%)	3 (3%)
Require further investigations to confirm type 2 diabetes	0	15 (15%)
Total	102 (100%)	102 (100%)

Of the 47 people who had a normal fasting glucose at 12 months, 22 (47%) had chosen the group education pathway and 25 (53%) the total telephone pathway. Table 17 below shows initial diagnosis of those patients.

Table 17: Initial diagnosis of patients who had normal fasting glucose at 12 months (n=47)

Initial Diagnosis	Group Education Pathway	Total Telephone Pathway	Total
Impaired fasting glucose	14 (30%)	11 (23%)	25 (53%)
Impaired glucose tolerance	6 (13%)	12 (26%)	18 (39%)
IFG and IGT	2 (4%)	2 (4%)	4 (8%)
Total	22 (47%)	25 (53%)	47 (100%)

5.6 Overall goals achieved

Achievement of lifestyle goals was recorded by health advisors on an electronic database designed by a CLAHRC analyst. At the group education session or initial telephone action planning call the patient set a six month lifestyle goal to help prevent the onset of type 2 diabetes. Of the 105 patients who completed the pathway, three patients did not set a six month goal at initial contact as they were not ready to at this stage, preferring to digest more information before goal setting. Thirty one patients who chose either a specific weight loss or a reduction in blood sugar level as their six month goal either had incomplete or no repeat results available which meant we could not confirm if they achieved their goal . Table 18 below shows the achievement of six month lifestyle goal by choice of pathway.

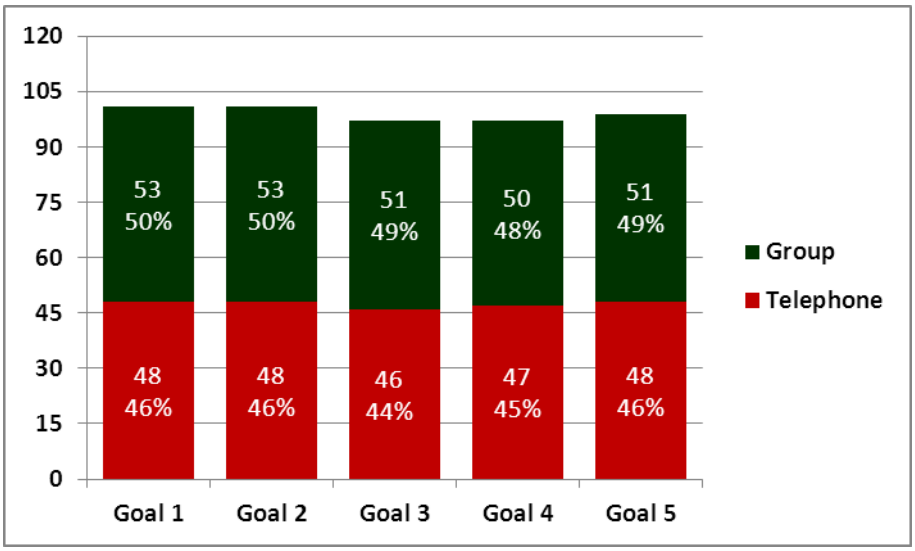
Table 18: Achievement of six month lifestyle goal by choice of pathway (n=105)

Six month goal	Group Education Pathway	Total Telephone Pathway	Total
Achieved/partially achieved	31	30	61 (58%)
Did not achieve	4	6	10 (10%)
Did not set	0	3	3 (3%)
Incomplete/no results	20	11	31 (29%)
Total	55	50	105 (100%)

5.7 Mini goals achieved

As part of the action planning process the patient identified and set a smaller 'mini' goal that would begin to lead to the achievement of the six month goal. This 'mini' goal was a small change that could be introduced into their lifestyle and potentially achieved by the next telephone appointment in one month. Each patient received five further telephone appointments with 'mini' goal setting at each one. In total, 575 mini goals were set for the 105 patients who completed the pathway and of these 495 (86%) were achieved or partially achieved. Figure 3 below demonstrates the number of patients on each pathway that achieved or partially achieved each goal.

Figure 3: Mini goals achieved



5.8 Summary of quantitative results

The people choosing the telephone or group education pathway were similar in terms of age, weight, BMI and fasting blood glucose level on diagnosis. For the patients for whom repeat clinical measurements were available, on average they lost 4.3kg during the 12 month IGR programme (4.7% body weight) and reduced their BMI by 1.6 kg/m^2 . On average, those who opted for the group education pathway experienced greater weight loss and BMI reduction than those who chose the telephone pathway. There was no overall effect on mean blood glucose levels. The majority of patients achieved the lifestyle goals they set at each call.

On commencing the programme, 50% patients had IFG, 26% IGT and 24% both IFG and IGT. Post intervention, 46% had normal fasting glucose levels, 31% IFG, 5% IGT, 3% both IFG and IGT. 15% required a further blood test to confirm or reject a diagnosis of type 2 diabetes.

6.0 Qualitative results

Two methods were used to gain feedback from patients, focus groups and patient questionnaires.

One focus group was held with all five diabetes health advisors who worked on the project. One health advisor had previously been involved in the initial IGT project.

6.1 Patient feedback focus groups

Two patient focus groups were held during the project. Patients were selected on the basis of number of IGR pathway appointments completed and availability to attend.

Focus group 1: April 4th 2013: Seven patients were invited, five attended. Three patients were female and two were male. All were white British.

Focus group 2: September 9th 2013: Nine patients were invited and all attended. Four patients were female and five patients were male. All were white British.

Both focus groups followed similar formats. The plan for focus group 2 is shown in appendix 3.

Whilst not formally recorded, discussions in both focus groups revealed a variety of employment status was represented from full and part time employment, to unemployed and retired.
Both focus groups were tape (audio) recorded once patient consent had been obtained.

6.2 Patient questionnaires

A questionnaire, cover letter and pre-paid reply envelope was posted to each patient immediately following their nine month 'step down' appointment (appendix 4). The questions were adapted from the previous IGT care call project and used both open and closed questions.
At the cut-off date of 17th December 2013, 74 questionnaires had been completed and returned.
A summary of results is shown in appendix 5.

6.3 Reaction to diagnosis in general practice

Following diagnosis with a chronic illness, a period of adjustment is often required, particularly when patients are asymptomatic and need to make short term changes to prevent long term complications[15.] Patients were referred to the diabetes team for impaired glucose education by their practice nurse or GP following diagnosis in general practice. Reactions to diagnosis were typically 'shocked' and 'frightened', either due to 'fear of the unknown' or having existing knowledge of diabetes related complications. The amount of information received at the time of diagnosis appeared to vary considerably between practices.

- *''They [GP] said,' well you need to start changing your lifestyle – eating more healthily and exercise- because if you don't, you're going to get full blown diabetes' ''*
- *''I didn't even hear about it [diagnosis]…. when the diabetes team phoned me up was the first time I heard…''*

- *''The doctor told me about it, she was explaining what it was, that your body doesn't process the sugar it takes in''*
- *"I would have liked to have known what it was, you know, this glucose intolerance thing. I wanted to know what it was. I got referred but I would have liked some information sooner''*
- *''One of my neighbours has diabetes and she has an awful time walking, pains in her legs and feet…and it was just the thought of ending up like that.''*

Patients frequently commented that the period between diagnosis and their first contact with the diabetes team resulted in them feeling quite isolated. This prompted many to search the internet for more information only to find this left them feeling overwhelmed at conflicting advice and worried about what the future might hold.

- *"Because of the internet you can go and look at anything and then your mind starts working overtime once you see something…. what about this, what about that, what's going to happen?"*
- *"I felt more nervous when I'd read what could happen on the internet."*

6.4 Choice of pathway

Patient feedback from the original IGT care call project highlighted that whilst a telephone delivered service was acceptable to the majority, some people would have preferred to have some face to face contact.

The group education pathway was chosen by people who described the need for peer support and who wanted to share experiences.

- *''I thought it would be better to meet somebody else and you could have a chat with people who had the same problem"*
- *"I prefer face to face because there's a few of you. I prefer it that way."*

Everyone was able to describe benefits of attending the group education session; however some people found there was a lot of information to take in.

- *''I definitely thought [the education group] was useful''*
- *''The education group was very helpful – simple teaching about foods and portions. They explained so you could understand and they answered my questions if I didn't understand it very well''*
- *"The main message I took from the group was that you had to do something to turn it round''*
- *"They showed us what a portion was, they had all these plastic foods but by the time they'd finished and gone through everything, I was a bit confused and forgotten what was what."*

The telephone pathway was primarily chosen by people because of its convenience to fit around work or social commitments; other reasons included lack of confidence to attend a group session and waiting time for initial contact.

- *"I was offered a choice of service ...there's a couple of things like parking… I couldn't afford to go down there and I'm not that mobile so I thought the phone call would be easier"*
- *"My doctor said ' I'm going to refer you to this group' but that was two months away so I said I would have the phone call as it meant I could start straight away"*
- *''I thought the first phone call was very good because it also included 'are you doing this are you doing that, how much are you eating?''*
- *"I was too nervous to attend a group with other people, so I chose the telephone."*

6.5 The role of information

If a patient is to 'self-manage' their condition they need both knowledge of their condition and the self-confidence in their own ability to manage their own health and wellbeing.[16]

Every patient received a 'starter pack' of information. Patients who chose group education session were sent an appointment letter which included their blood results and a diagnosis table (appendix 6 and 7). All other information was received and discussed when they attended the group. Patients who chose the telephone pathway were posted the starter information prior to their initial action planning call. This also included confirmation of their appointment and blood results. Every patient received an IGR patient information leaflet and leaflets on healthy eating and activity. Patients who chose the telephone pathway additionally received a DVD 'sensible portions for healthy eating'[17] as it was recognised that visual representation of food portion sizes was required when delivering this advice over the telephone. For the majority of patients, the information given by the diabetes team was the first they had received since diagnosis. The diagnosis table and explanation of blood test results appeared to aid understanding of IGR.

- *"I don't think at the doctors you get it just like that - they come out with it very quickly and you're not quite sure where you are or what it means, other than you're in that range"*
- *''I thought it was useful because it told you actually where you were [on the scale].''*

Patient questionnaire results at nine months suggested increased understanding of blood results; 93% of patients were able to identify the name of the blood test they had in the last 12 months with 66% saying they definitely understood what the results personally meant for them and a further 32% saying they understood to some extent.

Additional information was sent to patients throughout the programme as appropriate and was tailored to the individual's lifestyle goal. This supplementary information also evaluated positively with food related resources being particularly popular.

- *''It was personalised to my individual needs rather than a set universal strategy that would probably not have taken into account my particular circumstances"*
- *''I found the food booklet and DVD very helpful with portion control.''*

6.6 Acceptability of the IGR Service

The original IGT care call project concluded that a telephone delivered service was highly acceptable to patients. Focus group and patient questionnaires produced similar findings for this phase of the project, with particular aspects frequently commented on being flexibility, punctuality and professionalism.

- *"You made an appointment for a certain time and I wrote it down and I expected it and it came"*
- *''Very punctual, efficient and helpful. Gave good advice and cared''*
- *''My advisor was very professional, a good listener and very informative''*
- *'' [Health advisor] always called on time, gave me good advice with every call and was very professional''*
- *"Calls were made at a time most suitable to fit in with my job, discussions got straight to the point agreed for discussion at the previous call."*

Patients themselves were able to identify some of the potential strengths and weaknesses of opting for face to face contact or an entirely telephone based service.

- *''I think you're probably going to be put under a lot more pressure when you're sat with someone face to face, you can't lie because they can see your eyes''*
- *''I think [the telephone] is an easy way to skip something, I mean with everything that was going on with me, I didn't do everything that she said…I've stopped taking sugar in my food and eating more fruit and veg though…''*
- *''The phone is beneficial –but if it is the complete service people may not take it seriously. Some people may slip through the net.''*

These issues were explored at the focus groups where it became apparent that factors such as individual self-motivation and determination to succeed were the key to successful outcomes and important for an effective therapeutic relationship between patient and advisor.

- *''I don't see the point in lying. You want to achieve, and you want to get back to a reasonable blood glucose level. The person at the other end of the phone is trying to help you. Many times I've said 'I've done this or that' and she says 'never mind, don't worry, we'll look at that.''*

6.7 Goal setting

Focus group and questionnaire data suggested that goal setting was seen as an integral part of the pathway with 81% patients saying they always discussed their goals to reduce risk of developing type 2 diabetes at every call.

Patients commented that monthly calls worked well as this enabled sufficient time to get used to making one lifestyle change before attempting another. Duration of each call also evaluated positively.

- *''With a month in between each call there was time to achieve each planned goal''*
- *"I thought monthly was a perfect length of time because if I was slipping or not losing what I should, I'd look and think in 10 days' time she's going to be calling me, so I'm going to have to get myself back on track again"*
- *''Each call put the aim to the forefront of my mind and encouraged me to make more of an effort to achieve my goals.''*

A goal-setting approach to calls enabled both health advisors and patients to track progress towards the six month lifestyle goal. As people progressed through the programme, they showed increased knowledge, skills and confidence around how best to monitor their own progress.

- *''I monitor my own weight now… I try to take it at a constant time and compare it…''*
- *"Weight loss was my overall goal. I already recorded a graph of my blood pressure so I added my weight alongside it to keep track and it was quite good"*
- *''[Health advisor] always made sure I fully engaged in the discussion and that it was me who set any goals.''*

The extension of the original six month IGT pathway to the current twelve month IGR pathway was developed in response to patient feedback. People who took part in the original IGT project described feeling 'abandoned' when their monthly calls ceased and expressed the desire for some additional support, even if this was less frequent. The nine and 12 month 'step down' calls were developed to address this need, enabling people to have confidence in their own ability to self-manage over a longer period and create less dependence on the health advisor. Discussions at focus groups revealed that this appeared to have been successful.

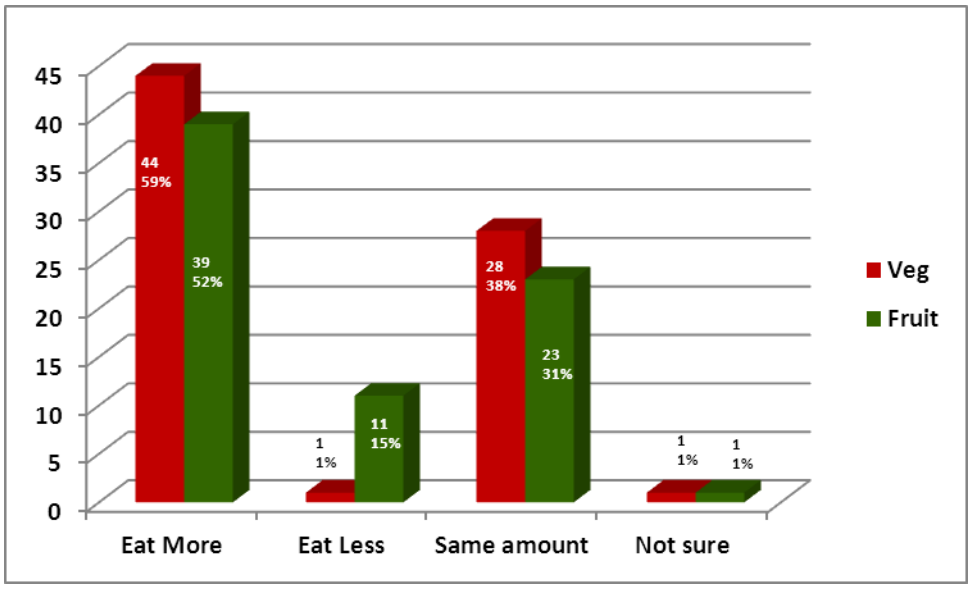
- *'' After the support finishes, keeping on track is my responsibility and the three month period between the final calls is a great help preparing for this…..''*
- *''I am very pleased with the support and advice I have been given. It enabled me to be determined to lose weight which I have done – I have gone from 15 stone 7 to 14 stone and I am determined to lose more''*
- *''Now I am back in control. [health advisor] has given me inspiration and the confidence to carry on.''*

6.8 Changes to diet

There are many diabetes prevention studies showing that moderate changes to diet and lifestyle in people with impaired glucose regulation can reduce the risk of developing type 2 diabetes.[8] The most common overall goal chosen on the IGR pathway was weight loss and a variety of methods identified to achieve this. These included eating 3 regular meals per day, reducing snacking, portion control, reducing fat intake, increasing vegetable intake and increasing activity levels.

Questionnaire data demonstrated that 97% of patients always discussed the food they were eating and potential changes to their diet at every call. These conversations aimed to increase knowledge around healthy eating and help the person identify areas where positive changes could be made. Figure 4 below shows how intake of fruit and vegetables changed following participation in the programme with 59% patients increasing vegetable consumption and 53% increasing fruit intake.

Figure 4: Changes to fruit and vegetable intake (n=74)



Focus group discussions and patient questionnaire feedback indicated that many patients had thought their diet was healthy on referral to the programme but, as their knowledge increased, were able to identify areas where this was not always the case. Once common example cited was the effect of fruit, fruit juices and carbohydrates on blood glucose levels.

- *''I thought I knew a lot about diabetes but now I understand a lot more, particularly about carbohydrate foods''*
- *''The calls made me more aware of what I was eating and how often. I try and eat more regularly now and have smaller portions''*
- *"They told me I should only really have three pieces [fruit] a day, because I was actually taking in too much sugar''*
- *"[Health advisor] helped me change my ways and eat more fruit and veg"*
- *''My wife bought smaller plates so it looks like I've got more. She doesn't think I've noticed, but I have, I've just not said anything. Like I say, I don't have any sugar now in my tea or on breakfast or anything.''*

If appropriate, health advisors were able to signpost patients to relevant local groups to increase skills to facilitate healthier eating.

- *''[Health advisor] told me about cooking lessons. I went to this class for four weeks and everything that you made was healthy….I grill now rather than fry in a pan.''*

6.9 Changes to activity levels

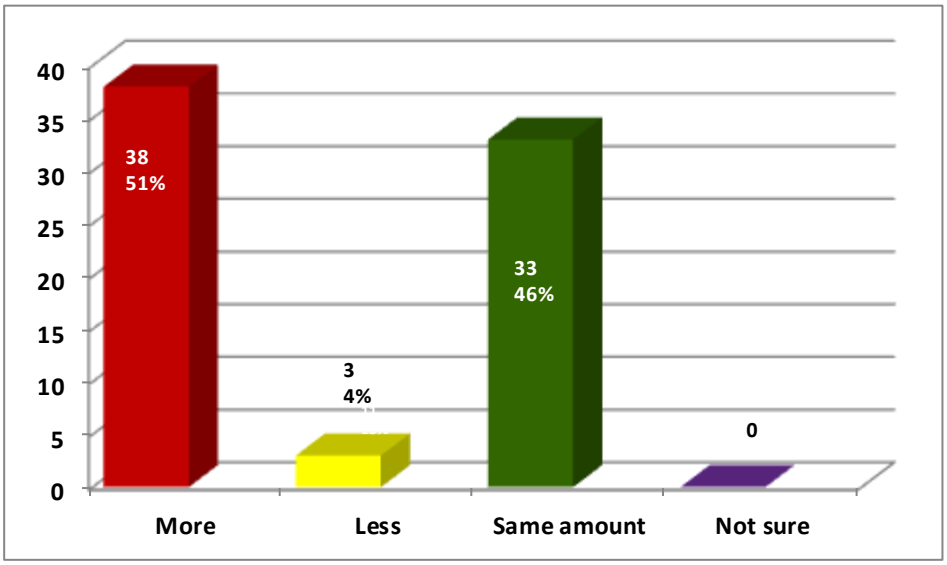
Evidence supports the view that any form of activity is more important than its intensity.[18] It is important that realistic goals are set that take into account the patients' current activity levels as

goals that are too ambitious can lead to demotivation. This is particularly relevant to people who may have other medical conditions, poor mobility or the elderly.

- *"Due to arthritis in my hips I am limited to the amount of physical activity I can do but I do try to exercise daily, and with encouragement from my health advisor I am going to try and increase it to twice a day."*

Questionnaire feedback demonstrated that 71% of patients always discussed their activity levels and identified any potential changes at every telephone appointment, with a further 27% discussing activity during some of the calls. These discussions resulted in half the patients reporting they were undertaking more activity by month nine (see figure 5 below).

Figure 5: Changes to activity levels (n=74)



- *"I walk my dog, play tennis, badminton and garden, no time to sit!'*
- *"I just borrow my son's bike and ride that, it really works!''*

Focus group discussions highlighted that health advisors signposted or directly referred patients to a variety of other services or courses which helped people increase their activity levels by slowly building self-confidence.

- *''I got a health trainer and went for a six weeks taster session. We did curling and tai chi, we went to the gym one week, different things like that. Then from there, I started going to the gym on a Monday morning, where my health trainer does a class for an hour, and I'm still doing that''*
- *"I've changed my way of life now with the healthy eating and exercise programme. I got an achievement award from my health trainer"*
- *''I go to the healthy heart club. They have exercise there and can also weigh me.''*

6.10 The role of the health advisor

Health advisors welcomed the opportunity to develop new skills by being involved in the IGR project.

- *"This is a unique role, I really enjoy that I can make a difference and help people"*
- *"You have to have knowledge of IGR and understand how the condition is treated – that comes with the training we receive from the diabetes team, all the resources and our development – you can't just give someone a manual and say ' there it is, read it and you're a health advisor now' "*
- *"Training is pretty intensive and you think you're not going to remember it all because there is a lot to take in, following the call plan, the patient record, the database... You worry you'll forget something but it just falls in to place once you get in to it.''*

All health advisors agreed the pathway was easy to follow from their perspective of making calls as it followed similar format to other aspects of their workload. Monthly calls were felt adequate as this seemed to allow sufficient time for the patient to begin to make each lifestyle change. The member of staff who worked on the previous IGT care call project where first follow up call post action planning was at two weeks rather than four as in this project, commented that she felt two weeks was more beneficial. Reasons for this were that a call at two weeks helped keep motivation levels high by providing encouragement for the first lifestyle change which many people often found unfamiliar and many people had more questions early on in the programme, particularly after receiving and reflecting on the information received at their initial contact and action planning.

Health advisors themselves did not work on the project in isolation, but received on-going support, education and updates about project progress from project leads and the diabetes team as required. This encouraged advisors to seek guidance when faced with difficult patients.

- *"Sometimes when you are short of ideas and you get to a point where you think 'what do I talk to this patient about?' I'll go and ask and she'll say 'well have you thought about this, what about that? Let's have a look'. You can bounce ideas.''*

Following the initial contact with a health care professional, each patient was allocated a health advisor who remained with them for the duration of the programme. This enabled a rapport to develop between health advisor and patient. The formation of a trusting relationship appeared to result in the patient being increasingly receptive to discussing their lifestyle over the duration of the programme.

- *"I felt I was speaking to a friend who was giving support in an empathic way"*
- *"I liked the consistency of talking to the same person all the time"*
- *"[Health advisor] was very supportive, she explained things in a way I could understand and she encouraged me. I hope I have not let her or myself down''*
- *"[Health advisor] never replied negatively on what I did, she always gave me an alternative solution"*
- *"I postponed my follow up call so I could achieve my goal. I didn't want to let her down."*

The formation of a bond was also felt by the health advisors.

- *"You want to treat them as an individual and make them feel like they are the most important thing"*
- *"It's about building that relationship up with them…"*
- *"You want to be really good and you want to deliver a great service and be confident on the phone."*

The health care professionals and health advisors who delivered the IGR service were perceived as being very knowledgeable about IGR. 96% of patients stated they definitely felt they had received relevant advice about how to reduce their risk of developing type 2 diabetes.

- *''A sense of being educated in a nice way to look after my health with diet and exercise and how diabetes affects the body. I found the service provided was excellent''*
- *''I liked the motivation and helpful advice from somebody who is qualified in this field.''*

Questionnaire data showed that 96% of patients said their health advisor always explained things in a way they could understand and 93% agreed their health advisor always listened carefully to what they had to say.

- *''I felt comfortable with [health advisor]. She was good at explaining things and she always listened to what I had to say''*
- *''My health advisor was brilliant explaining everything to me. She spent loads of time with me and didn't rush anything. She took time to explain things I didn't know or didn't understand.''*

Health advisors also recognised the value of good listening skills in their role.

- *"You have to listen closely….not say 'what was that, what did you say?'. You've got two ears and one mouth so listen twice as much as you speak!"*

In addition to a good telephone manner, other skills that health advisors identified as important to their role were knowledge of IGR and its management, understanding the blood tests that were undertaken and what results meant, and practical skills around motivational support, encouragement, and goal setting.

Questionnaire and focus group data was overwhelmingly positive about the IGR service with many patients expressing individual thanks to the diabetes team and acknowledging the importance of preventing type 2 diabetes. 70% of patients said they definitely felt more confident in being able to reduce their own risk of developing type 2 diabetes as a result of participating in the IGR programme, with a further 27% saying they felt confident to some extent.

- *''Since I joined this service, I have learnt a great deal and found it very helpful. Thank you''*
- *''I think this is a very important service that is provided free and it should continue at all costs to help people like me who have IGR''*
- *''If I hadn't joined the programme when I did I would probably have type 2 diabetes. I've changed my way of life now…''.*
- *''I have no suggestions for improvement. I count myself lucky to be included in this service''*

7.0 Project Costs

A cost benefit analysis was conducted as part of the original IGT care call project evaluation by Professor Ruth Boaden, Deputy Director, NIHR CLAHRC for Greater Manchester. This concluded that the total cost for 55 patients diagnosed with IGT on the six month care call pathway was £7,455 and the total cost per patient was £135.55. Based on available evidence, extending the service to the estimated Salford IGR population was predicted to show positive return on investment in year three, with further increasing savings beyond five years.[10]

For this evaluation report, project costs have been estimated by the authors for 100 patients enrolled on the total telephone pathway and 100 patients enrolled on the group education pathway. It also estimates costs associated with the 115 inappropriate referrals. Costs have been broken down into stages; pre pathway and enrolment, total telephone pathway, group education pathway and total overall project costs.

Table 19 below estimates the costs incurred following receipt of referral by the diabetes team up to and including patient choice of pathway (enrolment on project).

Table 19: Pre pathway and enrolment costs

Number of patients	Task	Time (minutes)	Total minutes	Band	Costs
200	Triage	10	2,000	7	
200	Introduction call/patient choice	15	3,000	7	
115	Triaged inappropriate referrals	10	1,150	7	Total Band 7 (6150 minutes)
315	Call costs (200 x 15) (115 x 10)		4,150	n/a	2075 @ 0.47 pence per minute landline rate = £9.75 2075 @ 2.5 pence per minute mobile rate = £51.87

Table 20 below estimates the costs for 100 patients who chose the total telephone pathway following enrolment.

Table 20: Total telephone pathway costs

Number of patients	Task	Time (minutes)	Total minutes	Band	Costs
100	Action Planning Call	60	6,000	7	Total Band 7 (6,000 mins) See overall project cost table
100	Introduction /recap call	20	2,000	4	
100	8 pathway calls (8x30=240)	240	24,000	4	Total Band 4 (26,000 mins) See overall project cost table
Call costs (no admin)	40 minutes action planning 100 Introduction calls 8 pathway calls (8x20=160)	40 20 160	4,000 2,000 16,000= 22,000	n/a	11,000 calls @ 0.47 ppm landline rate = £51.70 11,000 calls @ 2.5ppm mobile rate = £275

Table 21 below estimates the costs for 100 patients who chose the group education pathway following enrolment.

Table 21: Group education pathway costs

Number of patients	Task	Time (minutes)	Total minutes	Band	Costs
100	13 Education groups @ £3.75 hours per group (two band 7)	225 mins per group	5850	7	
100	Clinical admin	20	2,000	7	Total Band 7 (7850 mins) **See overall project cost table**
100	Introduction call	20	2,000	4	
100	8 pathway calls (8x30=240)	240	24,000	4	Total Band 4 (26,000 mins) **See overall project cost table**
Call costs (no admin)	100 Introduction calls 8 pathway calls (8x20=160)	20 20	2,000 16,000= 18,000	n/a	9,000 calls @ 0.47 ppm landline rate = £42.30 9,000 calls @ 2.5ppm mobile rate = £225

Table 22 below estimates the overall project costs for 200 patients. Band 7 and Band 4 salary costs were supplied by a SRFT accountant. These were calculated at mid-point and include on costs.

Table 22: Combined project costs

Stage	Band 7	Band 4
Combined costs	6,150	**Nil**
Telephone pathway costs	6,000 minutes	26,000 minutes
Group education pathway costs	7850 minutes	26,000 minutes
Total Time	20,000 minutes	52,000 minutes
WTE*	0.20 @ £43,363 = £8673	0.53 @ £24,830 = £13,160
Total staff costs	£21,833	
Cost of telephone calls	£655 + VAT@20% = £786	
Total cost per patient	£113.10	
Initial IGT project comparison	£135.55	

Estimated costs per patient on this project are similar to those calculated as part of the initial IGT care call project evaluation.

8.0 Discussion, conclusion and recommendations

The initial IGT care call project highlighted the need for a robust registration and recall system in general practice for this group of patients and undertaking this project highlighted the situation remains unchanged. Despite Salford's estimated IGR population of approximately 7000 [10] and the IGR service being available for all Salford GP practices to refer to, recruitment of 200 patients proved difficult. Practice visits revealed varying knowledge around IGR diagnosis, recommended management of this condition and a wide range of read codes used in general practice, all of which may have contributed to the high number of inappropriate referrals. This highlights the need for initial and on-going education of health care professionals who work with people at risk of developing type 2 diabetes. Should this project be used to inform potential future IGR service development, we recommend that offering proactive, facilitated support to general practices in identification and recall of people with IGR should form part of any implementation strategy to ensure successful uptake of the service.

Whilst working on the initial IGT project we identified that GPs and practice nurses have minimal consultation time allocated to deliver lifestyle advice, typically around 15 minutes per year. From the contact we have had with general practices over the course of this phase of the project, this appears to be unchanged. NICE evidence reviews suggest that the more sessions on diet, activity and counselling attended, the better the outcome for people at risk of developing type 2 diabetes[19]. Feedback from patient and health advisor focus groups supports this view, with both identifying repetition of key educational messages over the programme duration appeared to consolidate learning whilst 'mini' goal setting at each appointment encouraged and facilitated behaviour change. Whilst NICE do not outline the specific detailed content that any programme should include, they do recommend that features of any lifestyle intervention programme should include: design and delivery by specialists with relevant knowledge and skills who have undertaken externally accredited training; consist of 16 hours contact time with patients, either within a group, as a one to one or mixing both approaches; and that more intensive and frequent support be offered at the start, reducing frequency of contact over time to encourage more independent lifestyle management. Based on this, and the patient and health advisor feedback we have received in both projects, it would seem a sensible approach to consider these factors when designing any future IGR service. Due to the time constraints of the project, opinions from people who failed to attend any IGR intervention from the diabetes team or who withdrew prior to completion of the programme were not sought. Reasons for non-attendance or early withdrawal may offer additional insight in to any future service design.

The current twelve month IGR pathway was developed following feedback from patients who participated in the initial project and was delivered as 'The IGR project' by Salford diabetes team within their existing staffing levels and clinical commitments. The current pathway offers a practical and reproducible model that could be adapted and tailored to fit individual localities and target populations. It may be possible to re-structure this pathway to reduce costs and reflect the identified needs and staffing levels of any department delivering a similar service.

Large scale diabetes prevention programmes have consistently shown that type 2 diabetes can be prevented or delayed amongst people with impaired glucose regulation. Many of these trials set specific targets around weight loss, for example to reduce BMI to less than 24kg/m^2 or to achieve a reduction of 5-7% body weight[19] .The weight loss achieved in this project was 4.3kg or 4.7% body

weight in individuals with a mean start BMI of 33.7kg/m^2 . There is some evidence in the literature to suggest that as little as 4.2kg loss in body weight in at risk individuals where mean BMI was 31kg/m^2 can reduce the progression to type 2 diabetes by 50%, if sustained for around three years[5] .Whilst we present only 12 month data for this cohort of IGR patients, it worth noting that follow up of participants from the initial IGT project provided statistically significant evidence to suggest that the six month positive improvements they achieved in fasting blood glucose, weight and BMI were sustained one year post discharge.

Attendance and retention on the IGR project pathway has been varied. This could illustrate the subordinate place that education has amongst patients with IGR and may reflect a culture that perceives type 2 diabetes to be the 'mild' form of the disease despite its association with high morbidity and mortality. Patients may think they can manage IGR without referral for education and it is the role of the referring health care professional to emphasise the importance of making lifestyle changes to prevent type 2 diabetes and highlight the benefits on-going support can offer. Poor communication between the referring practitioner and the patient may increase non-attendance rates and/or early withdrawal from the programme.[20]

It is well known that one method of education does not work for all.[21] The idea to offer a choice of initial contact was developed in response to patient feedback during the initial project. This has the potential to increase patient engagement, motivation and satisfaction by providing the individual with the most convenient and accessible service for them. A totally telephone delivered pathway has the advantage of patients not having to worry about transport to group education session and consequently may be more suited to those with limited mobility or who are housebound; group education offers the opportunity for peer support and may be suited to those who prefer a more visual approach to learning.

This project aimed to build on knowledge gained from the previous IGT care call project and develop the IGR service rather than undertake new research. As such, local pathways, policies and procedures have been followed as opposed to a research protocol. One of the consequences of this is that patients may have received a different blood glucose test at diagnosis and annual recall, making interpretation of results difficult. In the initial IGT care call project, the participating practices agreed and were funded to undertake glucose tolerance tests to confirm diagnosis and at six months which provided a 'like for like' comparison. For this phase of the project, our diagnosis has been based on results of the GP choice of either fasting blood glucose or glucose tolerance test. Another limitation of both the IGT Care Call project and this IGR project was that both have lacked a control group who did not receive a lifestyle intervention; meaning it is not possible to demonstrate that the intervention alone was responsible for any improvements seen. As patients chose their own pathway rather than this being randomised, any differences in results between the telephone and group education pathways may be due to differences in the participants rather than differences in the intervention. However, taking the positive outcomes achieved from this project, IGT Care Call and 18 month follow up of the latter project participants, results suggest that Salford's diabetes team IGR programme may provide one method of lifestyle education to a varied inner city population and our findings are in keeping with other large cohort studies[3,12].

The 'cost per patient' on both the IGT pathway and IGR pathway has been calculated and these are very similar. Consequently no additional work has been undertaken on cost benefit analysis for

this evaluation as the initial projections remain relevant. NICE consider that their recommendations around any lifestyle intervention programme to prevent type 2 diabetes are cost effective'[19].

Since GM CLAHRC and Salford diabetes team began their collaboration working with people with IGR over four years ago, NICE have published two guidelines specifically around prevention of type 2 diabetes.[19,22] The first, PH35, centred around population and community level interventions, highlighting the risk factors of being overweight and inactive, particularly in high risk populations, and called for national and local action to promote healthy diet and activity. The more recently published PH38 outlined the importance not only of identifying those at risk of developing type 2 diabetes, but also recommended that once identified, individuals should be referred to intensive lifestyle change programmes to help prevent or delay the onset of type 2 diabetes, citing the IGT care call project as an example of 'see this guidance in practice'

Over the past four years, the number of referrals to Salford diabetes team for IGR education has significantly increased; suggesting awareness of the IGR service has been raised. Whilst this is positive in enabling greater numbers of people with IGR access to the specialist team, the increasing numbers present a challenge to service delivery within existing resources and any future development of an IGR service needs to be appropriately funded.

9.0 References

1. Yorkshire and Humber Public Health Observatory (2007) *Diabetes key Facts Supplement YHPO, York.*
2. Hex N, Bartlett C, Wright D et al (2012) Estimating the current and future costs of type 1 and type 2 diabetes in the UK, including direct health costs and indirect societal and productivity costs *Diabeteic Medicine* 29 (7) 855-862.
3. Eriksson KF and Lindgarde F (1991) Prevention of type 2 diabetes (non-insulin dependent) diabetes mellitus by diet and physical exercise. The 6 year Malmo feasibility study *Diabetologia* 34: 891-898.
4. Ramachandran A, Snehalatha C, Mary S et al (2006) The Indian Diabetes Prevention Programme shows that lifestyle modification and metformin prevent type 2 diabetes in Asian Indian subjects with impaired glucose tolerance (IDPP-1) *Diabetologia;* 29: 289-297.
5. Tuomilheto J, Lindstom J, Eriksson JG, et al (2001) Prevention of type 2 diabetes mellitus by changes in lifestyle among subjects with impaired glucose tolerance. *New England Journal of Medicine;* 344; 1343-1350.
6. Department of Health (2007) National Service Framework Diabetes. London.
7. Unwin N, Shaw J, Zimmet P et al (2002) Impaired glucose tolerance and impaired fasting glycaemia: the current status on definition and intervention. *Diabetic Medicine* 19: 708-723
8. Lindstroem J, et al (2008) Determinants for the effectiveness of lifestyle intervention in the Finnish Diabetes Prevention Study. *Diabetes Care* 31 (5): 857-862
9. The DECODE Study Group (2002) Age, BMI and glucose tolerance in 11 European population based surveys *Diabetic Medicine* 19: 558-565
10. NIHR Greater Manchester CLAHRC http://clahrc-gm.nihr.ac.uk/cms/wp-content/uploads/IGT-EVALUATION-FINAL-REPORT-June.pdf accessed 30.11.13
11. Pan X R et al (1997) Effects of diet and exercise in preventing NIDDM in people with impaired glucose tolerance. The D Qing IGT and Diabetes Study. *Diabetes Care* 20 (4): 537-544.
12. Li G et al (2008) The long term effect of lifestyle interventions to prevent diabetes in the China Da Qing Diabetes Prevention Study: a 20 year follow-up study. *The Lancet* 371: 1783-89.
13. Salford Joint Health and Wellbeing Strategy, 2012-2015 http://www.partnersinsalford.org/documents/JHWS_2_Salford_Joint_Health_and_Wellbeing_Strategy.pdf
14. Office for National Statistics (2001) Census Information.
15. Carver C S, Scheier M F (1998) The self regulation of behaviour. Cambridge University Press.
16. National Diabetes Support Team (2008) Partners in care: a guide to implementing a care-planning approach to diabetes care.
17. Sensible portions for healthy eating (2010). (DVD) NHS Salford and NIHR CLAHRC for Greater Manchester (scripted by Salford Diabetes Team)
18. Hansen D, Dendale P, Jonkers AL (2010) The impact of training modalities on the clinical benefits of exercise intervention in patients with cardiovascular disease risk or type 2 diabetes mellitus. *Sports Medicine* 40 (11): 921-40
19. NICE (2012) Public Health Guidance 38: Preventing type 2 diabetes: risk identification and interventions for individuals at high risk. NICE. London

20. Mitchel A J, Selmes T (2007) Why don't patients attend their appointments? Maintaining engagement with psychiatric services. *Advances in Psychiatric Treatment* vol 13, 423-434.
21. Diabetes self management education: Barrier Study (2006) Maine Centre for Disease control and prevention http://www.maine.gove/dhhs/mecdc/phdata/non-dhp-pdf-doc/diabetes-self-managment-education-barrier-study-september-.pdf accesssed 07/09/2013.
22. NICE (2011) Public Health Guidance 35: Population and community level interventions in high risk groups and the general population. NICE. London.

10.0 Appendices

10.1 Appendix 1: The IGR care call pathway.

Diagnosed with IGR in primary care
Referred to diabetes team

Triaged by diabetes specialist nurse.
Introduction call by health care professional:
Choice of service/ enroll participant
Telephone = patient information pack posted
Group education = appointment posted

First contact: Action planning (Health professional)
Discuss diagnosis and blood results
Discuss risk factors and diabetes prevention
Set six month lifestyle goal
Set 1st 'mini' goal (initial actions)
Make appointment for follow up telephone call

Six monthly Care call appointments (health advisor)
Motivational support techniques
Lifestyle education
Discuss and encourage progress with goals
Supporting resources, tailored to individual needs
Signpost/refer to relevant services

Nine month 'step down' appointment (health advisor)
Education and support
Discuss progress
Supporting resources, tailored to individual needs
Signpost/refer to relevant services
Questionnaire sent to patient
Reminder to patient and GP about repeat blood tests

12 month call
Discuss annual recall
Offer 'Keeping Well' course
Discharge to GP
Return to usual IGR practice protocol

10.2 Appendix 2: The IGR Project referral criteria

Making a referral for Impaired Glucose Regulation education

People with IFG

- EITHER **two** abnormal fasting glucose tests (at least one of which should be within the past six months)
- OR one abnormal fasting glucose test **and** HbA1c between 42-47 mmol/ml in past six months

People with IGT:

- Abnormal OGTT within the past six months

Making the referral:

- Please include current weight and BMI on the referral or ensure these are available to view on SIR
- Referrals should be made via 'Choose and Book' (Referral for diabetes education) or faxed to the diabetes team on 212- 2101
- Referral forms can be viewed on **www.salforddiabetescare.co.uk** (Guidelines & Referrals – referral forms- diabetes team referral form).

Making the Diagnosis (WHO) Venous Plasma Glucose (mmol/l):

Test result → / Type of test ↓	Normal	Impaired Fasting glycaemia (IFG)	Impaired Glucose Tolerance (IGT)	Diabetes
Fasting →	6.0 and below	6.1 – 6.9	Below 7.0	7.0 and above
	&	&	&	And / Or
2 hour GTT →	7.7 and below	7.7 and below	7.8 – 11.0	11.1 and above
				Note: If at least one other abnormal level on another occasion then diagnosis of DM can be made

10.3 Appendix 3: IGR patient focus group plan (Sept 2013)

Welcome, introductions, background :	**Time:** 'pre-group' 12.15-12.30pm
General Introduction to the focus group session: • Staff introductions and thank for coming. • Explain purpose of focus group: i.e. obtain feedback and opinions from people who have completed or nearing end of IGR programme and find out ways in which the service might be improved. Give brief overview of topics to be discussed; explain no right or wrong answers to questions. Be honest –we want to improve the service. Any views of individuals are made confidentially and reported anonymously etc. • Housekeeping (switch off mobile phones, fire safety, toilets, group ground rules; registration/consent form; confidential audio recording of the session) • Patient Group Introductions: name and when they joined IGR programme	<u>Resources:</u> Attendance sheet, pens, staff name badges, patient name cards with choice of first contact; tape recorder(s); consent forms
Diagnosis of Impaired Glucose Regulation, choice of initial contact and pathway structure (40 minutes)	**Approximate timings 12.30pm – 1.10pm**

Thinking back to what happened in the lead up to your diagnosis with IGR:
• Describe how you were diagnosed (e.g. did you perceive a problem and contact the GP yourself/ someone else advised you seek medical advice/ picked up on routine screening etc)
• Who told you your diagnosis?
• What information about IGR were you given by the person who told you your diagnosis? (e.g. general verbal advice, leaflets, signposting to websites etc.)
• Had you heard of IGR before diagnosis?
• At that time, did you know anyone else with IGR?
• How did you feel about your diagnosis?
• Were you offered any counselling/support following diagnosis?
• Who was the first person you told that you had IGR? (e.g. partner, friend)
 	
You were then referred to diabetes team for IGR education and told about the IGR programme, this consisted of a choice of initial contact, face to face group education or a longer telephone call before everyone receives the same telephone follow up for a year.
 	
• Were these two options for your first contact sufficient or could we have provided something else (e.g. web, workbooks etc) what technologies do you use? Could these have been used?
 	
Regardless of whether chose group education or telephone as first contact, everyone received their diagnosis results prior to that first appointment on the appointment letter.
 	
• Was it helpful to see diagnosis results before your first contact? Why?
 	
For those who chose group education as first contact:
• Why did you choose the Group education session as your first contact?
  ○ Overall impressions of the group? (inc. choice of venue & times; duration of session)
  ○ Did you try and find out anything about IGR before the group? (e.g. look web,	

books, talk to anyone etc) ○ Did the session provide enough information for your needs? ○ How did you feel about discussing your condition in front of other people? ○ How did you feel after the group? What was the main message you took away from the group? For those who chose telephone call as first contact: • Why did you choose telephone as your first contact? ○ Overall impressions of the first telephone call? (inc. choice of appointment times, duration) ○ Did you try and find out anything about IGR before the telephone call? (e.g. web, books, talk to anyone etc) ○ Where did you take the first call (at home, work, out etc)? Why this location? ○ Did the call provide enough information for your needs? ○ How did you feel after the first call? What was the main message you took away? After choice of first contact, everyone receives the same follow up telephone support which is monthly calls for 6 months, a call at 9 months and a final call at 12 months. ○ What are your views about frequency of calls? ○ What do you feel about duration of calls?	
Goal setting throughout the programme and plans after completion (40 minutes)	**1.10pm – 1.50pm**
At the end of the group education session or the initial phone call, we encourage people to think about an area of their lifestyle they would like to change over the coming six months, to help reduce their risk of developing type 2 diabetes. Who set a six month lifestyle goal? (work through participants individually and consider the following questions:) ○ What was your goal? ○ Why did you set this goal? ○ Had you ever tried to do anything like this in the past? If so, were you successful? ○ Did you tell anyone else you were trying to achieve this goal? (e.g. family, friends, other health care professionals). If so, how did you tell them and how did this person react? (encouraging, motivation etc) ○ How have you gone about trying to achieve X? (e.g. small goals each month) ○ Have you tracked/monitored your own progress? How? (e.g. use of fridge magnet, other charts or Apps). What other things could help you track your own progress? ○ Did you ever struggle to achieve your goal? (When/why struggle/what was most difficult?) ○ What/who motivated you when you were struggling or having difficult days? ○ What was the role of your care call health advisor in helping you achieve your goal? ○ Since being on the IGR programme, have you been put in touch with any other services? (Who? Have they helped? How?) ○ Have you achieved your goal? ○ (depending where on pathway) Do you have plans to continue/maintain your goal after discharge from the IGR programme? What would help you with this? (e.g. continue with this or other programme, additional support and/or resources that would help etc)	

Resources/Information used throughout the IGR programme: (15 mins)	**1.50pm 2.05pm**
Everyone will have received an education pack, either in advance of the first phone call or at group education session (show). Your diagnosis results formed part of the appointment letter. Group participants: • What do you think about the pack? • Did you use the pack during the education group? • Have you looked at the pack since the group? (e.g. after group, during calls) • Is there anything in the pack that has been particularly useful /not at all useful to you? Telephone participants: • What do you think about the pack? • Did you look at the pack/watch the DVD before the first phone call? • Did you use the pack at the first call? • Have you looked at the pack since the first call? • Is there anything in the pack that has been particularly useful /not at all useful to you? Some of you may have received other information leaflets in the post following the calls with your health advisor, • Have you received any other information following calls? What? Has it been useful? Why? • Will you use the information again after Care-Call has finished? • Could we provide anything else to help/other information you would have liked to receive?	Resources: Group and telephone education packs (inc. sample appointment/ diagnosis letter)
The role of the Health Advisor (15 mins)	**2.05pm -2.20pm**
• Was your health advisor knowledgeable about preventing diabetes? • How would you describe your health advisor? • How do you feel about your health advisor? (e.g. loyalty, friendship) • What do you like most about your health advisor? • What do you like least about your health advisor?	
General comments about the IGR programme (15 mins)	**2.20pm -2.35pm**
• Has the IGR programme helped you understand your risk of developing diabetes? How? • Has your knowledge of IGR changed since taking part in the programme? How? • How do you think we can improve other peoples' knowledge and awareness of IGR? • What do you like most about the IGR programme / Care-Call? • If you could change one thing about the IGR programme /Care Call what would it be? • Is there anything else you would like to tell us about your experience of the IGR programme?	
Summary, thank and issue vouchers. • Participants to vote for their most/least useful resources on the way out Close focus group	**2.35pm-2.45pm** All available care call resources

10.4: Appendix 4. The patient questionnaire

Q1. Did you discuss the food that you eat and any changes you could make to your diet?

- ☐ Yes, always
- ☐ Yes, sometimes
- ☐ No, but I would have liked to
- ☐ No, but I did not want to
- ☐ Don't know/not sure

Q2. Has the amount of vegetables you eat changed since using the care call service?

- ☐ I now eat **more** vegetables than I used to
- ☐ I now eat **less** vegetables than I used to
- ☐ It hasn't - I eat about the same amount vegetables as I always used to.
- ☐ Don't know/not sure

Q3. Has the amount of fruit you eat changed since using the care call service?

- ☐ I now eat **more** fruit than I used to
- ☐ I now eat **less** fruit than I used to
- ☐ It hasn't - I eat about the same amount fruit as I always used to
- ☐ Don't know/not sure

Q4. Did you discuss your levels of physical activity and any changes that you could make?

- ☐ Yes, always
- ☐ Yes, sometimes
- ☐ No, but I would have liked to
- ☐ No, but I did not want to
- ☐ Don't know/not sure

Q5. Has the amount of physical activity you do changed since using the care call service?

- ☐ I now do **more** activity than I used to
- ☐ I now do **less** activity than I used to
- ☐ It hasn't - I do about the same amount of activity as I always have
- ☐ Don't know/not sure

Q6. Which of these blood tests have you had in the past 12 months (please tick all that apply).

- ☐ Fasting blood glucose
- ☐ Oral glucose tolerance test (this is sometimes called an OGTT or a 2-hour glucose test).
- ☐ HbA1c
- ☐ Don't know/not sure

Q7. Thinking about your blood tests, do you think you understand what the results mean to you?

- ☐ Yes, definitely
- ☐ Yes, to some extent
- ☐ No
- ☐ Don't know/not sure

Q8. Do you feel your health advisor always listened carefully to what you had to say?

☐ Yes, always
☐ Yes, sometimes
☐ No, but I would have liked them to
☐ No, but I did not want them to
☐ Don't know/not sure

Q9. Did your health advisor explain things in a way you could understand?

☐ Yes, always
☐ Yes, sometimes
☐ No
☐ Don't know/not sure

Q10. Did you discuss YOUR ideas about the best way to manage your IGR with your health advisor?

☐ Yes, always
☐ Yes, sometimes
☐ No, but I would have liked to
☐ No, but I did not want to
☐ Don't know/not sure

Q11. Did you discuss YOUR goals to help reduce your risk of developing type 2 diabetes with your health advisor?

☐ Yes, always
☐ Yes, sometimes
☐ No, but I would have liked to
☐ No, but I did not want to
☐ Don't know/not sure

Q12. Do you think your health advisor gave you relevant advice about how to reduce your risk of developing type 2 diabetes?

☐ Yes, definitely
☐ Yes, to some extent
☐ No
☐ Don't know/not sure

Q13. As a result of the calls you have received over the past 9 months, do you feel more confident in being able to reduce your risk of developing type 2 diabetes?

☐ Yes, definitely
☐ Yes, to some extent
☐ No
☐ 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?

Is there anything else you would like to tell us about the care-call service?

10.5: Appendix 5: Patient questionnaire results

No	Question	Results		
1	**Did you discuss the food that you eat and any changes you could make to your diet?**	Yes, always Yes, sometimes No, but I would have liked to No, but I did not want to Don't know/not sure	**72** **2** **0** **0** **0**	**97.3%** **2.7%** **0** **0** **0**
2	**Has the amount of vegetables you eat changed since using the Care call service?**	I now eat **more** vegetables than I used to I now eat **less** vegetables than I used to It hasn't - I eat about the same amount of vegetables as I always used to. Don't know/not sure	**44** **1** **28** **1**	**59.4%** **1.3%** **37.8%** **1.3%**
3	**Has the amount of fruit you eat changed since using the Care call service?**	I now eat **more** fruit than I used to I now eat **less** fruit than I used to It hasn't - I eat about the same amount of vegetables as I always used to. Don't know/not sure	**39** **11** **23** **1**	**52.7%** **14.9%** **31.1%** **1.3%**
4	**Did you discuss your levels of physical activity and any changes that you could make?**	Yes, always Yes, sometimes No, but I would have liked to No, but I did not want to Don't know/not sure	**53** **20** **1**	**71.6%** **27%** **1.3%**
5.	**Has the amount of physical activity you do changed since using the Care call service?**	I now do **more** activity than I used to I now do **less** activity than I used to It hasn't - I do about the same amount of activity as I always have Don't know/not sure	**38** **3** **33** **0**	**51.4%** **4.1%** **44.6%** **0**
6	**Which of these blood tests have you had in the past 12 months (please tick all that apply).**	Fasting blood glucose Oral glucose tolerance test (this is sometimes called an OGTT or a 2-hour glucose test). HbA1c Don't know/not sure	**59** **35** **9** **5**	**79.7%** **47.3%** **12.2%** **6.8%**
7	**Thinking about your blood tests, do you think you understand what the results mean to you?**	Yes, definitely Yes, to some extent No Don't know/not sure	**49** **24** **0** **1**	**66.2%** **32.4%** **0** **1.3%**
8	**Do you feel your health advisor always listened carefully to what you had to say?**	Yes, always Yes, sometimes No, but I would have liked to No, but I did not want to No answer	**69** **4** **0** **0** **1**	**93.2%** **5.4%** **0** **0** **1.3%**
9	**Did your health advisor explain things in a way you could understand?**	Yes, definitely Yes, to some extent No Don't know/not sure	**71** **2** **0** **1**	**95.9%** **2.7%** **0** **1.3%**

10	**Q10. Did you discuss YOUR ideas about the best way to manage your IGR with your health advisor?**	Yes, always Yes, sometimes No, but I would have liked to No, but I did not want to Don't know/not sure Blank	**50** **22** **0** **0** **1** **1**	**67.6%** **29.7%** **0** **0** **1.3%** **1.3%**
11	**Did you discuss YOUR goals to help reduce your risk of developing type 2 diabetes with your health advisor?**	Yes, always Yes, sometimes No, but I would have liked to No, but I did not want to Don't know/not sure Blank	**60** **12** **0** **0** **0** **2**	**81.1%** **16.2%** **0** **0** **0** **2.6%**
12	**Do you think your health advisor gave you relevant advice about how to reduce your risk of developing type 2 diabetes?**	Yes, definitely Yes, to some extent No Don't know/not sure Blank	**71** **2** **0** **0** **1**	**96%** **2.6%** **0** **0** **1.3%**
13	**As a result of the calls you have received over the past 9 months, do you feel more confident in being able to reduce your risk of developing type 2 diabetes?**	Yes, definitely Yes, to some extent No Don't know/not sure Blank	**52** **20** **0** **0** **2**	**70.3%** **27%** **0** **0** **2.6%**

10.6: Appendix 6: IFG Diagnosis letter

Dear MsXXXX

You recently had a blood test that diagnosed impaired glucose regulation (IGR).

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

Your fasting blood test was 6.6 mmol/l

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

	Normal	**Impaired fasting glucose (IFG)**	**Type 2 diabetes**
Fasting Blood Test (mmol/l)	Below 6.0	6.1 – 6.9	7.0 and above

I have enclosed a leaflet with some information on impaired glucose regulation. This will be discussed at your first **telephone appointment on:**

Friday 26th July at **2.00pm**

Please have this letter and pack available to discuss at the telephone call.

If this appointment is inconvenient, please contact me on the telephone number above to rearrange a more suitable time.

Yours sincerely,

XXXXX
SRFT Diabetes Team

10.7: Appendix 7 IGT diagnosis letter

Dear XXXX

You recently had a blood test that diagnosed impaired glucose tolerance.

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

Your fasting blood test was 6.9 mmol/l

Your 2 hour test was 8.4 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 some information which you may find beneficial. This will be discussed at your first **telephone appointment on:**

TUESDAY 25TH JUNE at 10.00AM

Please have this letter and pack available to discuss at the telephone call.

If this appointment is inconvenient please contact me on the telephone number above to rearrange a more suitable time.

Yours sincerely

Diabetes Team