

**Final Report of the Early Detection  
and  
Risk Reduction Program for  
Women with a History of  
Gestational Diabetes Mellitus**

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## 1.0 EXECUTIVE SUMMARY

This report describes the Early Detection and Risk Reduction Program for Women with a History of Gestational Diabetes Mellitus (GDM). This pilot program was a component of a Department of Health (WA) diabetes strategy to integrate diabetes service delivery and diabetes prevention in Perth, Western Australia. It was re-emphasised that women with a history of GDM are at high risk of the later development of Type 2 diabetes. There is also a growing body of evidence that with lifestyle modification, Type 2 diabetes may be prevented or the onset delayed (Pan, X. *et al.*, 1997). However, there were no known programs in Western Australia to follow up women with a history of GDM systematically.

In 2000 a program was developed to address this issue. Methodology included the development of partnerships with health professionals who provide health services to women during and after pregnancy. A systems approach was used to increase the capacity of existing health care providers to identify women who have been diagnosed with GDM and refer for regular follow-up. General practitioners (GPs) were identified as the key health care providers to follow up women in the community. Strategies included:

- Developing a comprehensive discharge process in maternity hospitals to facilitate referral to GPs in the post- partum period.
- Increasing the capacity of midwives, diabetes teams and child health nurses (CHN) to provide information to women regarding their risk of Type 2 diabetes.
- Increasing the capacity of GPs to screen women and register them on a database that supports the regular recall and screening of women at risk of developing Type 2 diabetes.
- Building partnerships with key stakeholders, obtaining support from health service managers, developing resources and work force development supported the strategies.

Key outcomes from the pilot program highlight that mechanisms and structures can be put in place to integrate the systematic follow-up of women with a history of GDM

into routine work practice. The health service providers in this pilot program have demonstrated a strong commitment to the process, and the organisations involved value the program as a best practice model. Despite the fact that the numbers of women registered on the program were low, the women who were consulted expressed interest in being followed up and in reducing their risk for Type 2 diabetes. It is evident that if GPs are to be the health care providers who follow up women for regular screening, they will require more support to adopt this program into normal work practice.

Based on the results of the pilot a number of recommendations were developed to improve follow up of women at risk.

## **2.0 RECOMMENDATIONS**

### ***2.1 Program sustainability***

#### **Implement strategies to ensure the sustainability of the program:**

**Option 1:** The program is coordinated at a Federal level and is expanded to have a national brief. This involves:

- Program funding provided by Commonwealth Department of Health and Aged Care.
- Development of a national recall system or utilisation of an existing database that can provide for the needs of the program.
- Central resource distribution.
- Standardisation of program resources for distribution to stakeholders to all states and territories within Australia.
- Central program co-ordination facilitated by a national program coordinator, supported by a national advisory committee to guide program expansion.
- Formation of a national advisory committee to guide the program development and implementation.
- An invitation to the Royal Australian College of General Practitioners (RACGP) and the National Diabetes in Pregnancy Advisory Committee (NDiPAC) to

provide representatives onto the national advisory committee to guide strategies to recruit stakeholders onto the program.

**Option 2:** The program remains within the State and is implemented statewide and coordinated by Department of Health (DoH) of Western Australia (WA).

This involves:

- Program funding provided by Department of Health (DoH), Western Australia (WA).
- Utilisations of existing recall system.
- DoH WA to be responsible for central resource distribution, central storage and brokerage.
- Central coordination facilitated by a project officer supported by a State advisory committee to guide program expansion.
- A State advisory committee be formed to guide the program development, implementation and evaluation.

**Option 3:** The DoH contracts East Metropolitan Population Health Unit (EMPHU) to implement the program statewide.

This involves:

- DoH WA to fund EMPHU to coordinate program.
- DoH WA to house and disseminate resources to regional areas within the State.
- DoH WA to adapt resources to suit regional needs of indigenous, culturally and linguistically diverse (CALD) people and other specific groups.
- EMPHU to employ a program coordinator.
- Program coordinator support regional diabetes coordinators within the health regions within the State to implement the program. This may involve the formation of a State advisory committee, coordinated by the project officer, therefore supporting the Healthy Lifestyle Strategic Plan for Prevention of Diabetes and Cardiovascular Disease (Department of Health, 2002).

**Option 4:** The program remains in East Metropolitan Health Service (EMHS) area and administered by EMPHU.

This involves:

- EMPHU supporting existing program in EMHS.
- EMPHU expanding the program to encompass additional hospital sites divisions of general practice within the EMHS catchment area, within the EMHS Diabetes Program Plan 2002-2005.

**For all options listed above, it is suggested that:**

- An advisory committee with representation from all key stakeholders be formed, to guide program implementation and monitor of program needs.

## **2.2 Infrastructure**

**Provide a sound and supportive infrastructure to maintain and support the program.**

- The people used in the pilot program eg CHNs, GPs, divisions of general practice and maternity hospitals be used to facilitate the integration of the program into routine work practices.
- Commitment from management for program implementation is demonstrated from each service organisation prior to program implementation.

### *Database Utilisation*

- Identify ways to increase registration of eligible women on a database. For example, send GP packages to the GPs of women who expressed in the client phone survey that they would like to be registered on a database.
- Discuss with the appropriate division of general practice, options for the Cardiab database or other appropriate databases to be utilised as a statewide recall system for the program in the future.
- Explore options for utilising other preferred databases for general practice settings.

### *Discharge strategies*

- Within each hospital develop a strategy that empowers women to ask their GP to be screened for Type 2 diabetes and be registered on a recall system, eg provide a consent form for mothers to give to GPs at their six week check up.

- Review discharge checklists in each hospital to ensure that a health professional suggests a “*follow up six-week check*” when the mother is discharged.
- Each hospital modifies and monitors discharge-planning processes as part of their organisation’s quality improvement cycle.
- Each hospital develops a system to monitor program throughput and report centrally on a regular basis.
- Each hospital explores ways to integrate the discharge process into induction process for new staff members.
- For continuity of the service and sustainability of the discharge process, ensure the discharge planning documentation is officially processed through a medical record committee to ensure it meets medical record standards and local workplace practices.
- Each hospital support the collaboration of staff members involved in the delivery of followup information to clients in both antenatal and postnatal phases of obstetric care.

### **2.3 Partnerships**

#### **Address barriers for GPs to participate in the program:**

- Expand existing collaboration with GPs to engage more GPs in the program. For example, work closely with GP liaison officers within hospital sites, and divisions of general practice to promote the program to GPs.
- Further promote the program to GPs through GP journals and newsletters.
- Conduct an evaluation to determine utilisation of the GP pack amongst GPs and the effectiveness of the referral pathway.
- Consult with GPs who have registered clients to determine better ways to promote the program to colleagues.
- Invite the RACGP onto the program advisory committee to guide program strategies.
- Explore options to develop networks and foster support for the program amongst the obstetricians.

## ***2.4 Strategies for Prevention***

**Address the primary target group's (women at risk) barriers to being physically active and eating a healthy diet:**

- Develop and link with existing newsletters, brochures and other initiatives that promote the benefits of a healthy diet and physical activity that includes local contacts for community based physical activity programs, for dissemination through CHNs, GPs and to registered clients via the Cardiab database and other databases.
- Conduct an audit of community based physical activity programs and opportunities for women in the EMHS in order to increase options available for women to access physical activity.

## ***2.5 Impact Evaluation***

**Conduct further research.**

- Conduct a comprehensive study to evaluate the impact of physical activity and nutrition interventions in delaying the progression from GDM to Type 2 diabetes.
- Explore the psychosocial influences that impact on women's perception of barriers to physical activity and accessing recommended nutrition.
- Conduct further research or refer to existing evidence to determine why the women surveyed in this program were more receptive to nutrition related messages than physical activity related messages.

### **3.0 INTRODUCTION**

In 2000, the East Metropolitan Population Health Unit (EMPHU) developed the Early Detection and Risk Reduction Program for Women with a History of Gestational Diabetes Mellitus (GDM). It was developed as part of an integrated service delivery model that contributes to appropriate diabetes service delivery and diabetes prevention in the inner city area.

The program encouraged intersectoral collaboration through the development of partnerships across the public and private health sectors. It included the development of a comprehensive hospital discharge planning system and data storage facility that support the recall and annual screening of women at risk of developing Type 2 diabetes.

The divisions of general practice assisted by associated women's health service providers, were prime facilitators in the projects recruitment, brief intervention and implementation phases.

EMPHU supported the health services and service providers in the formative phase, with administration, resource development, recruitment, training and support.

### **4.0 BACKGROUND AND RATIONALE**

#### ***4.1 Prevalence of Diabetes in Australia***

In the national health priorities, Type 2 diabetes is listed as the fifth major priority. The Australian Diabetes and Lifestyle Study (Dunstan, D. *et al.*, 2001) reports that 7.5% of the Australian population over the age of 25 years have undiagnosed or diagnosed diabetes and a further 16.3% have impaired glucose metabolism. The report states that the prevalence increases with age. The prevalence of diabetes in people over the age of 35 years is 9% and rises to 23.6 % in people over the age of 75 years. In some populations the prevalence is much higher. In Aboriginal communities it is reported to be in the order of 20% (Colagiuri, S. *et al.*, 1998).

Diabetes is a major cause of ischaemic heart disease, stroke and impotence. Research indicates that 50% of all deaths in people with diabetes is due to coronary heart disease (CHD), and a further 15% is due to cerebrovascular disease (The Inner City Local Advisory Committee for Diabetes, 1998). These complications reflect the annual costs of diabetes in Australia, estimated at a massive \$1.85 billion. The true burden of diabetes in terms of health resources, personal suffering and detriment to quality of life is immeasurable (Colagiuri, S. *et al.*, 1998).

#### **4.2 Prevalence of GDM in Australia**

GDM is one of the most common medical complications of pregnancy. It is defined as 'carbohydrate intolerance of variable severity with onset or first recognition during pregnancy' (Hoffman, L. *et al.*, 1998). Women with GDM are at elevated risk of numerous maternal health complications, and their infants are at elevated risk of death and morbidity (Dye, T. *et al.*, 1997).

The incidence of GDM is reported to be 6.3% in Anglo Celtic populations and up to 15% in higher risk populations. Populations at higher risk of developing GDM are also at higher risk of developing Type 2 diabetes, with more than 50% of Latino women in California developing diabetes within 5 years of GDM (Kjos, S. *et al.*, 1995). Thus the high risk of developing Type 2 diabetes in women with a history of GDM warrants the development of appropriate intervention strategies.

#### **4.3 Prevalence of GDM in Western Australia**

The Western Australian Diabetes Strategy (Health Department of Western Australia, 1999) reports that the prevalence of GDM in Western Australia is 3.5%. This is lower than the reported national prevalence, which is suggested to be between 5.5-8.8% in Anglo-Celtic women (Oats, J. & Beischer, N., 1986).

#### **4.4 Prevalence of GDM in Culturally and Linguistically Diverse (CALD) communities.**

GDM is prevalent among CALD populations, particularly those from India, Asia and the Pacific Islands, being up to 20% higher than in Caucasian women (Commonwealth Department of Health and Aged Care, 1999). Oats and Beischer

(1986) reported the prevalence of GDM ranging between 9-18% in Southern European, Asian, Arabian and Indian women. Data obtained from the Western Australian Health Department, (WA Midwives Notification System, 2000) suggest that GDM is present in up to 49% of Aboriginal pregnancies.

The resulting mortality due to diabetes is substantially higher in Aboriginal than in non-Aboriginal populations. The age standardised rates for deaths due to diabetes in Western Australia, reveal that Aboriginal women die from Type 2 diabetes at a rate of 198 per 100,000 per year, compared with 11.3 per 100,000 per year in non Aboriginal women in Western Australia (Health Department of Western Australia, 1999).

#### **4.5 Rationale for case finding and diagnosis**

There are a number of guidelines or recommendation for screening. The Australian Centre for Diabetes Strategies, (2001) supports the process and timing of Type 2 diabetes case detection and diagnosis in women with a history of GDM as being the same as for the rest of the population (ie screening annually if showing IGT or IFG or three yearly if normal result). The National Health and Medical Research Council (NHMRC) supports the use of Randomised Plasma Glucose (RPG) or Fasting Plasma Glucose (FPG) screen with follow up Oral Glucose Tolerance Test (OGTT). Aside from other populations at risk, the NHMRC suggest that women with previous GDM should be regularly tested for undiagnosed Type 2 diabetes every three years, by measuring FPG. (See Appendix 1). These guidelines were reviewed by the Australian Diabetes in Pregnancy Society (ADIPS) in April 2002. Amendments have been recommended for women who have the potential for further pregnancies. This is based on the rationale that undiagnosed Type 2 diabetes would have adverse affect on foetal development. Therefore, all fertile women with a history of GDM should be tested for undiagnosed diabetes every one to two years, depending on risk for undiagnosed Type 2 diabetes (Simmons, D. *et al.*, 2002).

#### **4.6 Prevention of Type 2 diabetes development in women with a history of GDM**

The rate of progression to Type 2 diabetes onset after a GDM pregnancy depends on the population. It is estimated that 50% of Hispanic women develop diabetes within

five years of GDM whilst 30% of women of white ancestry develop diabetes within 20 years (Hitchman, R. *et al.*, 1998).

An analysis of data collected at the Mercy Women's Hospital in Melbourne on pregnant women with GDM show that 50% went onto develop Type 2 diabetes (Segal, L. *et al.*, 1996). Peters et al cited in Segal, L. *et al.*, 1996 found 22% of their sample of women who had GDM were diagnosed with diabetes after an average of 21 months follow up. The Western Australian Diabetes Strategy (1999) suggests that 5-9% per annum of women with GDM develop Type 1 or Type 2 diabetes.

Although there is a genetic contribution to the aetiology of Type 2 diabetes, it is now recognised as being a potentially preventable condition. Segal, *et al.*, (1996) completed a research project with the central focus being to determine the risk of the development of Type 2 diabetes in women with a history of GDM. The results suggested that a woman who has had GDM and loses weight, is at far less risk of developing Type 2 diabetes than a woman whose weight remained unchanged or increased. This is supported by O'Sullivan cited in Segal, L. *et al.*, 1996 who found that 26.8% of women who developed Type 2 diabetes later in life were of average weight, whilst the remaining 75% were overweight or obese. This reinforces the importance of weight loss post-partum as a preventive strategy in the reducing the risk of developing Type 2 diabetes.

#### **4.7 Strategies for prevention**

Prevention and early diagnosis are the most effective and appropriate means of reducing the burden of diabetes on the individual, the health care system and the community. Lifestyle factors that are known to delay or prevent the further development of Type 2 diabetes include eating a healthy diet, performing regular physical exercise and achieving a healthy weight (Colagiuri, S. *et al.*, 1998).

The Western Australian Diabetes Strategy (1999) states that systematic efforts to increase GDM case finding and long term post-partum monitoring would improve perinatal outcomes and assist in delaying or possibly preventing the development of Type 2 diabetes in the mother.

The Commonwealth Department of Health and Aged Care and the Australian Institute of Health and Welfare, (1999) suggest that preventative strategies in diabetes require the coordination of primary prevention across national health priority areas. A discussion paper produced by EMPHU and the Western Australian Diabetes Taskforce (1998) suggests that GPs have an important role to play in the identification and intervention of people at risk. If GPs assist in recommending positive health behaviour change the potential impact is high. The Commonwealth Department of Health and Aged Care and the Australian Institute of Health and Welfare (1999) document state that there is no existing systematic collaboration with GPs to follow up women who have had GDM. Therefore, encouraging the involvement of GPs in the prevention of Type 2 diabetes in women with a history of GDM is a favourable preventive option.

#### **4.8 Physical activity interventions**

Diabetes risk reduction programs based upon lifestyle change, diabetes awareness and empowerment of high-risk individuals have been shown to significantly reduce risk factors for the future development of Type 2 diabetes. A recent randomised trial of impaired glucose tolerance in China showed that the progression to diabetes over six years was reduced by 46% through exercise (Pan, X. *et al.*, 1997). This six-year delay in the onset of Type 2 diabetes is a substantial health gain.

The Third International Workshop Conference on GDM (1998) has recommended exercise as a treatment modality for GDM women who do not have a medical or obstetric contraindication for an exercise or physical activity program (The Federal University of Rio de Janeiro, 1999). This indicates global support for the use of exercise as a prevention strategy.

Research indicates that increased physical activity can delay or prevent the onset of Type 2 diabetes in about 50% of susceptible individuals. Apart from decreasing the risk of developing Type 2 diabetes, it has beneficial effects on hypertension, body composition and fat distribution (Lehmann, R. & Spinus, G., 1996). Physical activity is essential for the prevention of the development of Type 2 diabetes. Furthermore, it prevents their health problems associated with physical inactivity.

## **4.9 Dietary Interventions**

Poor nutrition is an important risk factor in the development of Type 2 diabetes. Multiple dietary factors that contribute to diabetes, predominantly the amount of dietary fat, fibre and glycaemia index carbohydrates consumed (Colagiuri, S. *et al.*, 1998).

Dietary interventions alone reduced progression from to diabetes by 31% over a six years period (Pan, X. *et al.*, 1997). The Da Qing Study (Pan, X. *et al.*, 1997) reported a six year reduction in progression from impaired glucose tolerance (IGT) to Type 2 diabetes in Chinese men and women. Further research has shown that women who modified their dietary fat intake between pregnancies lessened their risk of subsequent GDM (Pan, X. *et al.*, 1997). A 16 year follow up study of women who had GDM in Boston, USA, revealed that Type 2 diabetes developed in 48% of obese women and 28% of non obese women (Pan, X. *et al.*, 1997).

## **5.0 PROGRAM AIMS**

The principal aims of the program were to:

- Reduce the risks of the development, and promote the early diagnosis, of Type 2 diabetes in women with a history of GDM.
- Promote awareness among women with a history of GDM of her risk of developing Type 2 diabetes.
- Decrease the incidence of Type 2 diabetes in women with a history of GDM.

### **5.1 Program Objectives**

1. To determine the level of GP support for early diagnosis, regular screening and provision of risk reduction information to women with a history of GDM.
2. To determine the level of support needed by women with a history of GDM to pursue a healthy lifestyle in order to delay or prevent progression to Type 2 diabetes.

3. To consolidate and expand partnerships between health service providers involved in the detection of Type 2 diabetes in women with a history GDM.
4. To develop a client referral system and information storage mechanism.
5. To reorientate health services to support and promote early detection of and screening for Type 2 diabetes in the target group.
6. To develop resources to support health care professionals to disseminate risk reduction and screening information to the primary target group.
7. To create supportive environments for the implementation of physical activity and exercise interventions for mothers.

## **6.0 TARGET GROUPS**

### ***6.1 Primary Target Group***

Women with a history of GDM who reside within the northern and eastern precincts of the Perth metropolitan area.

### ***6.2 Secondary Target Group***

Health professionals that provide health care to the primary target group ie, GPs, midwives and community nurses.

## **7.0 PROGRAM DESCRIPTION AND METHODOLOGY**

The program was structured within a capacity building framework, employing the principles of building partnerships, resource allocation, organisational development, workforce development and providing leadership. Capacity building centres upon helping people to improve their lifestyle (Hawe, P. *et al.*, 1997). The capacity building framework encourages sustainability by promoting strategies that build knowledge and skills of the target groups to ensure they can maintain a better quality of life after the program. The five elements of the capacity building model were incorporated into the program to ensure that there was an infrastructure to support key health care

professionals to deliver screening and risk reduction information to clients. The program centred on the modification of diabetes service delivery, resource maximisation and diabetes program and policy development at an organisational level.

## **7.1 Partnerships**

Partnerships capitalise on the unique strengths of organisations and achieve what individual organisations cannot do alone.

### *Relationships and shared goals*

A steering committee was established to guide the development, monitoring, evaluation and expansion of the program and service to other health services and Divisions of General Practice. Committee members consisted of representatives from a tertiary referral hospital, a private and a public hospital, a consumer organisation, obstetricians, Divisions of General Practice and community nursing. The management of the organisation nominated representatives.

Terms of reference and memoranda of understanding were developed to secure commitment from committee members and outline the roles and responsibilities of committee members to share in the planning and implementation of the program. (See Appendix 2 and 3).

Steering committee meetings were conducted every six weeks. This provided a co-operative environment for members to plan program initiatives, review program progress and problem solve challenges/barriers to program implementation as required. Agenda and minutes were distributed to the committee prior to each meeting.

### **7.1.1 General Practitioners**

GP support was initially sought through liaison with managers from four divisions of general practice within the catchment area of the program. Managers were consulted to gain commitment and support for the program and a means to promote it to GPs registered within their Division.

### **7.1.2 Hospitals**

Hospitals with birthing facilities and/ or provided antenatal care were considered recruitment sites of women with a history of GDM. Maternity hospitals were utilised to disseminate risk reduction information to clients.

The staff of three maternity hospitals were involved at a number of levels. Co-operative relationships with hospital management, midwifery and diabetes team staff were developed. The process involved identifying shared goals and aims and common interest within departments within each hospital.

#### *Tertiary Referral Hospital*

A tertiary maternity hospital, a leader in women's health care, was approached because it has a Statewide brief, which allowed access to a large number of women in Western Australia. The hospital has a comprehensive antenatal diabetes clinic and midwife shared care program, dealing with more than 350 women with GDM per year.

Three individuals on the steering committee represented the hospital. Their role was to: assist the promotion of the program to staff at a number of levels; guide the development of program resources; assist in the coordination of training of discharge planning staff; and, provide consultancy to the project officer in planning and implementation of program strategies.

#### *Private Maternity Hospital*

A partnership was forged with a private hospital located in the central Perth precinct, as means of allowing for a comparative pilot site. The hospital had a Statewide brief but was smaller, and a discharge process different from that of the tertiary hospital. This provided an opportunity to compare the processes employed at each hospital.

Support for the program was secured from the hospital's medical advisory committee, hospital management and private obstetricians working within the hospital. Their commitment to follow up the women was confirmed through representation on the program steering committee.

### *District Hospital*

Staff from a local district hospital were involved in the pilot, as service providers and clients were from the local catchment area. Furthermore it had already implemented structures and policies to follow up women with a history of GDM through the diabetes team and midwives. The program added value to the existing service.

#### **7.1.3 Child Health Nurses**

Child health nurses (CHNs) were considered to be valuable health professionals who could assist in following up women with a history of GDM. CHNs within two health services were consulted to determine their support and level of interest in the program. All CHNs volunteered their support to provide risk reduction and follow up resources and information to women in the post partum period.

### **7.2 Resource Development and Allocation**

Resource allocation goes beyond securing finances, and encompasses access to information and specialist advice. The most important resource for the program already existed, as structures were in place to integrate the program into routine work practice. Some resources were required to guide the reorientation of health services to address the issue of follow-up in women at risk of developing Type 2 diabetes in future.

#### **7.2.1 Human Resources**

A project officer position was established, contracted through a regional population health unit, to develop and implement the pilot program, under the direction of a steering committee. Steering committee members contributed specialist advice and in-kind support for the program by providing consultancy and guidance to implement program strategies.

#### **7.2.2 Information**

Resources were developed to assist health care professionals within their existing roles to implement the program strategies as required.

### *General Practitioners*

Resources were developed to support and assist GPs to screen for and diagnose Type 2 diabetes, and to provide risk reduction information to the target group. Resources were developed through liaison and focus testing with steering committee members and representatives from the divisions of general practice. (Cross-Reference 7.3 Organisational Development).

### *Hospitals*

The three pilot hospitals had the role of providing risk reduction information to clients centred upon physical activity prescription through promotion of the 1999 Physical Activity Guidelines for Australians (Active Australia & Commonwealth Department of Health and Aged Care, 1999) and the Dietary Guidelines for Australians (National Health and Medical Research Council, 1991). Information was disseminated to clients and existing discharge processes were modified within each hospital. Discharge information packs were developed, containing pamphlets for planning a future pregnancy, understanding GDM, and cards containing diabetes risk reduction information, screening reminders and registration forms for GPs. One hospital, on their own initiative, distributed consent forms to be screened and registered on a database by their GP. Other hospitals relied on the GP to provide the consent form.

The routine discharge process at the tertiary hospital was for a computer generated Obstetric Discharge Summary to be sent to the GPs. This summary was modified to contain additional fields to include the maternal medical history and requirement for followup screening for Type 2 diabetes. A letter from the diabetes physician to the GPs was included with the discharge summary.

### *Child Health Nurses*

Through consultation and discussion with CHNs, supportive resources including a screening reminder card, information pamphlets and display posters were developed and disseminated to CHNs.

A copy of the discharge summary is sent to CHNs post delivery. The Postnatal Episode section states 'Annual GP Assessment for diabetes suggested', this ensured that the CHNs were aware of the client's prior history and need for regular for Type 2 diabetes screening with her GPs.

### **7.3 Organisational development**

Organisational development strategies ensure that structure, systems and policies are in place to support programs goals and objectives. Organisational structures and processes were essential for the development of the program's collaborative activities. The skills of the staff within the organisations involved in the program and their management supported and guided the development of appropriate checklists, procedures and systems for the organisation.

#### **7.3.1 Quality improvement systems**

##### *Tertiary referral hospital*

The tertiary referral hospital modified its existing discharge process as part of a quality improvement system to guide program planning and evaluation. A discharge file was developed to include a checklist, risk reduction resources and instructions for staff involved in the process to monitor the type of information given out to clients with a history of GDM. A medical record number was applied to the checklist, to ensure the information was both recorded and collected for future evaluation. Furthermore, the tertiary referral hospital evaluated the discharge process via a client phone survey and conducted a survey with midwives trained in the discharge process. This was supported by strategic plans and management support and commitment to the to program, by numerous hospital departments. This reflected the hospital's commitment to reorientate the operation of its information systems to utilise best practice tools, to both monitor and evaluate work practices.

##### *Aboriginal Controlled Community Health Organisation (ACCHO)*

Meetings were held with the diabetes team at the ACCHO to develop a system of opportunistic follow up of Aboriginal women. The diabetes team at the ACCHO developed an in-house referral form for GPs to refer clients to the diabetes team during their initial visit and as required.

##### *General Practitioners*

Program manuals and process guides were developed for GPs. The manuals were based on NHMRC best practice guidelines for diagnosis and screening for the diagnosis of Type 2 diabetes. Resources to promote the system for registration and

recall for regular screening were developed to facilitate this process. All resources including consent forms and order forms for access to sustainable resources were included in the GP packages. The resources and programs were promoted to GPs, with briefing sessions in order to orientate GPs to the program.

#### *Health Information Centre*

In February 2000, contact was made with health system performance staff in the Health Information Centre at the DoH, WA, in an effort to consider options for a statewide system of discharge. An existing, paper based discharge form, the Notification of Case attended (MR 15) is used in hospitals around the State. An option to include a field within the form to accommodate a section to include the message, 'suggested screening for women with prior GDM' was tabled with the DoH. Whilst there were plans within the DoH to alter the paper form to an electronic format, alterations to the fields on the form were not implement.

#### *Other Health Services*

Throughout the pilot phase an interest to be involved in the program was expressed by other hospitals within the catchment area. A meeting was held with the diabetes and management teams within these health services and it was decided that they be included in the program following the pilot phase. This was to ensure a best practice model for follow up was developed before generalising the program beyond the catchment area boundaries.

Health care professionals working in the area of diabetes within other health services beyond the program catchment area were sent informative letters about the program, to raise their awareness and as a professional courtesy.

### **7.3.2 Organisational management structures**

Management support and commitment to the program was ensured through the representation of senior managers from the pilot sites on the steering committee.

### **7.3.3 Informal organisational culture**

#### *Tertiary and local hospital sites*

Efforts were made to ensure that the diabetes and midwifery teams collaborated to develop strategies to provide comprehensive delivery of follow up information to clients in both the antenatal (when attending for diabetes education) and postnatal phases (when discharged from hospital). Midwives and the diabetes team attended meetings together to share ideas and problem solve strategies to develop the discharge file and checklist.

### **7.3.4 Information systems – monitoring and evaluation**

#### *Cardiab Database*

An agreement was made between the program steering committee and the division of general practice, that the database be made available for the registration and recall of women who have had GDM. To facilitate this, the division of general practice added fields to its existing Cardiab database to allow women with a history of GDM to be entered onto the system and receive regular screening reminders and to allow risk reduction information and resources to be sent to their client's home address.

The purpose of the database is to assist GPs in record keeping, monitoring and regular recall of post GDM patients. Use of the database is made available as a free service to GPs within the Division of General Practice.

## **7.4 Workforce development**

Workforce development includes on the job learning by providing a range of opportunities for people across health systems to learn about health promotion, for example health promotion committees, scholarships, mentoring and information sharing initiatives.

### **7.4.1 Professional Support**

#### *Formal training*

The program plan was presented at the tertiary referral hospital as part of the postgraduate lecture series forum for consultants, registrars and senior staff.

Additional training was offered within the GPs' manual for individuals or groups of GPs within the same practice.

Inservice training was offered to midwives in each of the hospitals over a three month period from May 2001 to July 2001, in order to orientate the staff to the program and to the resources and protocols. Procedures were developed and adapted collaboratively for each hospital with the staff involved in the discharge planning process to ensure they would be appropriate and add value to existing systems. Feedback from the midwives and staff involved in discharge planning has facilitated incidental learning.

#### *Informal learning*

The CHNs in the two health services were provided with a briefing on the pilot program and invited to be stakeholders in the program. The CHNs were directly involved in the development of suitable resources for their services. This has facilitated a proactive and reflective learning process for the CHNs and has had a significant impact on their practice.

The program was launched to GPs and health professionals from the catchment area of the program in July 2000. In excess of sixty GPs and key stakeholders attended the launch where the keynote speaker presented the program and GP package and a paper on new treatment modalities for Type 2 diabetes. GPs attending were those who completed the GP faxstream survey and were predominantly from three divisions of general practice. Attendees were provided with a GP information package with the option of additional training from the project officer, if required. Attending GPs received continued medical education (CME) points, contributing to their professional development, enhancing their skills in diabetes screening and followup.

The program was promoted through a number of professional newsletters including the Antenatal and Child Health Nutrition Bulletin and various GP newsletters in order to increase awareness of the program and recruit service providers onto the program.

## **7.5 Leadership**

Leadership is evident at all levels of program delivery in sustained and successful programs. The program was developed in a comprehensive fashion to respond to the needs of consumers and health professionals. The program supported stakeholders to challenge operational systems and adjust work practice to improve health outcomes for high risk groups. Leadership qualities were strengthened through consultation and collaboration with stakeholders to foster and build on a shared vision.

### **7.5.1 Formative research**

#### *GP Survey*

A survey was developed to assess GP current screening rates for Type 2 diabetes in the target group and to determine what support they needed to screen and register clients for regular follow up. (See Appendix 4). The survey was administered to GPs from divisions of general practice within the catchment area of the program. GPs were identified as being the most appropriate health care providers to follow up women with a history of GDM in order to provide risk reduction information, screen them for Type 2 diabetes and register them on a database to receive screening reminders and further risk reduction information.

The majority of mothers visit their GPs for postnatal care six weeks post-partum. This was considered an opportune time for GPs to discuss screening for Type 2 diabetes, registration on the database and risk reduction strategies.

#### *Physical activity and eating habit survey*

A survey was developed for the target group, to determine readiness and barriers to being physically active and pursuing a nutritious diet. Furthermore the survey collected information regarding the types of activity the women would like to be involved in and their needs in relation to receiving information about physical activity and nutrition. The survey utilised the Stages of Change Model (Prochaska, J. & al, e., 1994) to identify the respondents' readiness for healthy lifestyle change so that appropriate interventions can be implemented.

The Stages of Change Model (Prochaska, J. & al, e., 1994) includes precontemplation, contemplation, preparatory, action and maintenance stages. The stages are sequenced along a continuum reflecting readiness to start a type of behaviour change. For example if a woman is in the precontemplation stage for physical activity, she is not currently thinking about being physically active. If a woman is in the contemplation phase for physical activity, she is not currently active but is considering it. The preparatory stage reflects that a woman is making changes in her life to be more physically active but is yet to start. If in the action stage, the woman is currently physically active and if a woman is in the maintenance stage for physical activity, she has been physically active for more than 12 months. The amount of time it takes to move from one stage to another is variable, depending on the individual.

The survey instrument was sent to 247 women who were discharged from the tertiary referral hospital over a 12-month period. (See Appendix 5).

### **7.5.2 Visioning the future and creative collaboration**

Dynamic growth of the program guided by strategic thinking successfully incorporated program ideas into existing systems of practice for CHNs. In initial consultations, CHNs assisted the project officer to develop resources for their clients.

Midwives in each pilot hospital were consulted to adapt discharge packs to meet the current hospital discharge planning process.

#### *Promotion*

The program framework was presented at a number state and national conferences as the only program of its type that utilised a model of best practice, involving systematic collaboration with a wide range of health professional within a discrete catchment area. This model is congruent with the recommended follow up outlined by NHMRC guidelines for detection of Type 2 diabetes and Australian Diabetes in Pregnancy Society guidelines for management of GDM (Simmons, D. *et al.*, 2002), (Australian Centre for Diabetes Strategies, 2001). The program was presented as part of a postgraduate lecture series at the tertiary referral hospital, as an example of creative collaboration through partnerships in education.

In order to assess the impact of these collaborative processes a number of surveys were undertaken.

#### *Midwife's discharge survey*

A survey to evaluate the discharge process was hand delivered to all midwives working within the hospitals. The purpose of the survey was to assess the ease of use, compliance in use and possible improvements to the post GDM pack from a midwife's view. The diabetes educator midwife and project officer designed the questionnaire, drawing from each hospital's administrative support staff, to produce copies. Diabetes educator midwives were responsible for the dissemination of the questionnaire to midwives at their shift hand-over. Midwives were given a two week period to complete the questionnaire and place it in a file on the ward for collection.

#### *Client phone survey*

To evaluate the effectiveness of the discharge processes within the hospitals, a phone survey was conducted with a sample of women with a history of GDM who had delivered at the pilot sites.

The survey aimed to evaluate whether women who were given the GDM Take Home Pack when discharged from all hospital sites were provided with adequate information, whether they had taken steps to follow up GDM and if they had been registered on Cardiab database.

The sample selection included all women who were discharged at the tertiary referral hospital (n=102), all the women discharged from the private hospital (n=15) and all women discharged from the local hospital (n=60) over the ten month period after the discharge process commenced.

A telephone survey and a data collection spreadsheet were developed. Diabetes team members and midwives within the pilot sites conducted the interviews.

## 8.0 RESULTS

### 8.1 Objective 1

**To determine the level of GPs support for early diagnosis, regular screening and provision of risk reduction information to women with a history of GDM.**

The key findings of the survey to GPs are stated below.

#### *Response rate*

The response rates for the survey are outlined in Table 1.

**Table 1: Response rates from general practice**

<b>DIVISION</b>	<b>Responses</b>	<b>Total Sent</b>	<b>Response Rate</b>
<b>1</b>	<b>22</b>	<b>133</b>	<b>17%</b>
<b>2</b>	<b>56</b>	<b>178</b>	<b>32%</b>
<b>3</b>	<b>35</b>	<b>65*</b>	<b>54%</b>
<b>TOTAL</b>	<b>113</b>	<b>376</b>	<b>30%</b>

\* surveys were distributed to practices not individual GPs.

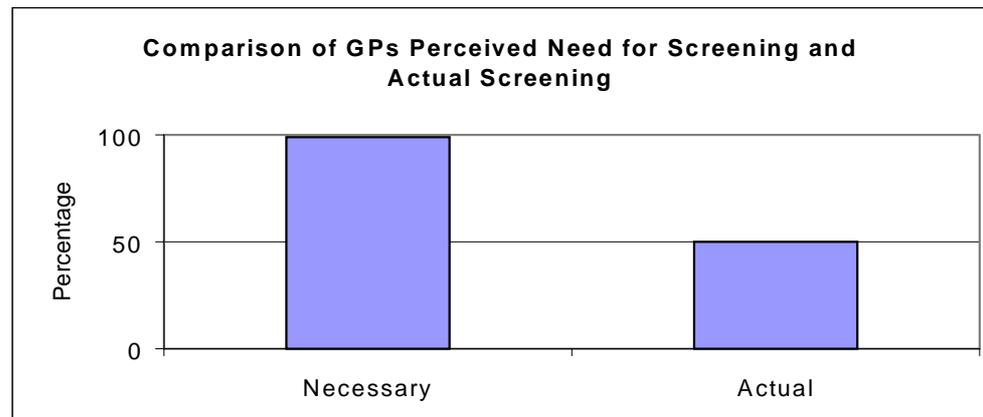
#### *Type 2 screening*

Most of the respondents (9% 112/113) stated that screening for Type 2 diabetes in women with a history of GDM was necessary. Whilst 99% of respondents stated that it was necessary to screen for Type 2 diabetes, only 50% actually provided screening. Refer to Figure 1.

#### *Register patients*

A total of 90% (101/112) of respondents over the three divisions of general practice indicated their willingness to register patients for annual screening. The majority (95% 106/112) was prepared to disseminate a form asking patients for their consent to be sent information regarding risk reduction programs.

**Figure 1: Comparison of GP's perceived and actual screening for Type 2 diabetes.**



### *Information needs*

Of the total number of respondents, 76% (86/113) requested more information about the Early Detection and Risk Reduction Program for Women with a History of GDM.

The survey established the need to formalise a screening system which included a patient database and training and education in the screening process for GPs.

## **8.2 Objective 2**

**To determine the support needs of women with a history of GDM to pursue a healthy lifestyle to delay or prevent progression to Type 2 diabetes.**

### **8.2.1 Physical activity and eating habit survey**

#### *Response rate*

A total of 247 new mothers were sent a survey questionnaire. 100 mothers returned the survey whilst 13 were returned unopened and/or with a note indicating the person was no longer at that place of residence. This represented a response rate of 40% (100/247). The respondents' ages ranged from 18 – 45 years (average age 33.3; sd = 5.3).

#### *Survey Section 1: Physical activity*

#### *Stages of change*

A total of 61% (61/100) of the respondents reported that they were not yet physically active. That is, they indicated that they were yet to start physical activity. Of these respondents, two (3.3%) were at the pre-contemplative stage, 25 (41%) were at the contemplative stage and 34 (56%) were at the preparatory stage.

Respondents (38%) reported that they ‘were usually quite active’. Of these respondents, 50% (19/38) indicated that they had been active for up to twelve months, and a further 50% (19/38) reported that they had been active for over twelve months. Thus, half of the respondents who reported that they were ‘usually quite active’ could be classified as being at the action stage, and the other half as belonging in the maintenance stage.

There was one (1%) non respondent to this question.

**Table 2: Stages of change**

<i>Stage</i>	<i>Percentage*</i>	<i>n</i>
Precontemplative	2%	2
Contemplative	25%	25
Preparatory	34%	34
Action**	19%	19
Maintenance***	19%	19
Non Respondent	1%	1

\* Percentages have been rounded to the nearest whole number.

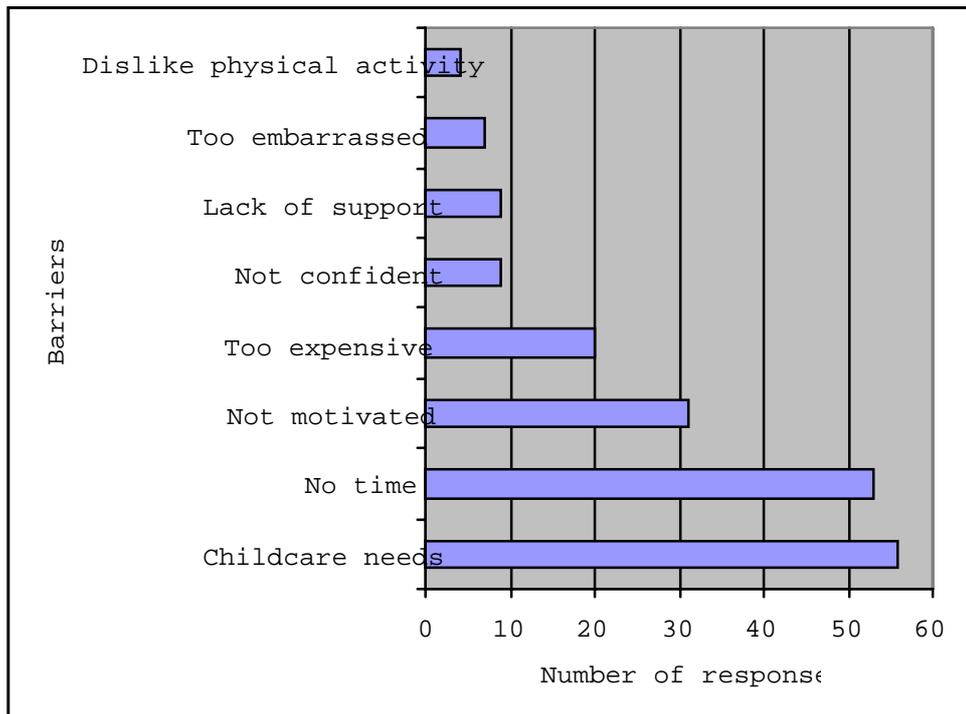
\*\* Action is defined here as being physically active for between one and twelve months.

\*\* Maintenance is defined here as being physically active for over twelve months.

### *Barriers to being Physically Active*

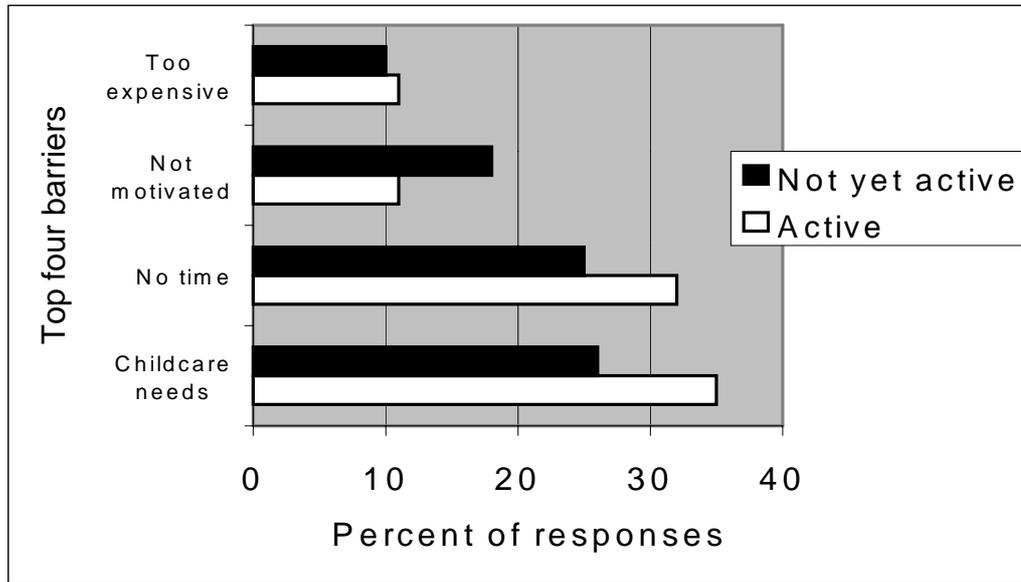
The barriers to being physically active respondents most commonly reported were ‘having no time’ and ‘child care needs’. The next most common responses were ‘not motivated’ and ‘too expensive’. A lack of support from an important person and the lack of suitable facilities were also given as factors that prevented the respondents from becoming more physically active.

**Figure 2: Reported barriers to becoming physically active by respondents**



In order to compare whether there was a difference in perception to barriers between the active and the not yet active respondents, the data was analysed according to percentage of responses, as there was a higher proportion of not yet active respondents (61%) to active respondents (38%). There was no difference in perception of barriers. See figure 3.

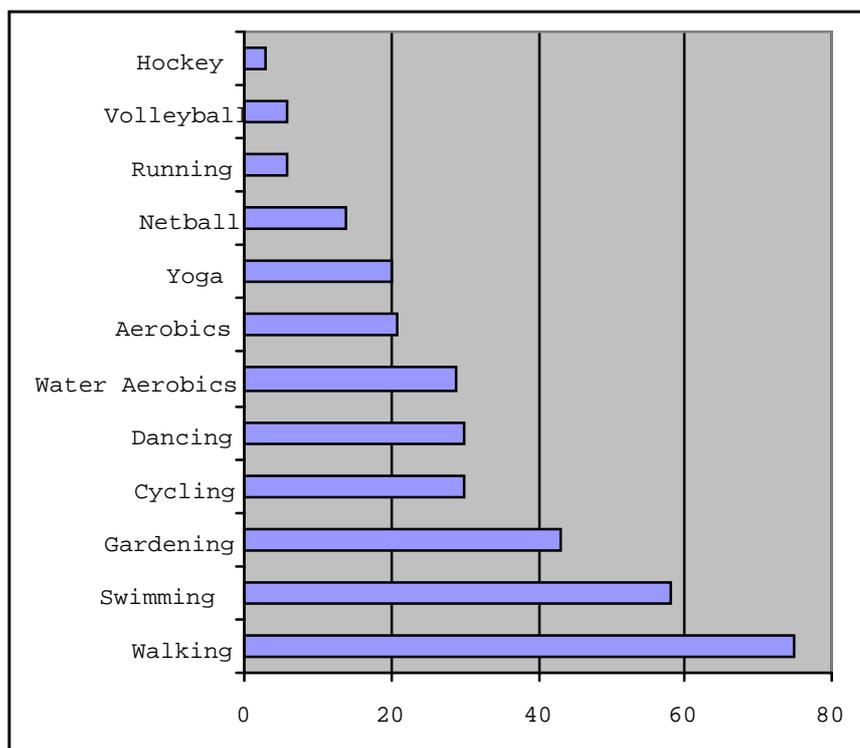
**Figure 3: Reported barriers to becoming physically active, for not yet active and active respondents**



*Preferred Physical Activity*

The most preferred types of physical activity the respondents selected included ‘walking’ ‘swimming’ and ‘gardening’. The ranges of activities mentioned are shown in figure 4.

**Figure 4: Preferred physical activities**



### *Medical complaints that may prevent physical activity*

Medical conditions were recognised as a barrier to physical activity. However, it was asked as separate question because it was considered a real barrier as apposed to a perceived barrier to physical activity. A total of 27 respondents reported that they had medical conditions that prevented them from exercising or being physically active. The most commonly reported medical condition was knee or joint pain (37%, 10/27). The next most common condition was back pain (22%, 6/27).

### *Survey Section Two: Eating Habits*

#### ***Stages of Change***

32% (32/100) of the respondents indicated that they were not yet following a low fat diet. That is, they reported that they were yet to start eating low fat foods. Of these respondents, nine percent (3/32) were at the pre-contemplative stage, 38% (12/32) were at the contemplative stage and 53% (17/32) were at the preparatory stage.

68% (68/100) of the respondents reported that they ‘usually followed a low fat diet’. Of these respondents, 54% (37/68) indicated that they had been following a low fat diet for up to twelve months, and a further 46% (31/68) reported that they had been eating low fat foods for over twelve months. According to the Stages of Change model (Prochaska, J. & al, e., 1994) approximately half of the respondents who reported that they ‘usually ate low fat foods’ can be classified as being at the action stage, and half as belonging in the maintenance stage.

**Table 3: Stages of change - Healthy eating**

<b><i>Stage</i></b>	<b><i>Percentage*</i></b>	<b><i>n</i></b>
Precontemplative	3%	3
Contemplative	12%	12
Preparatory	17%	17
Action**	37%	37
Maintenance***	31%	31

N=100

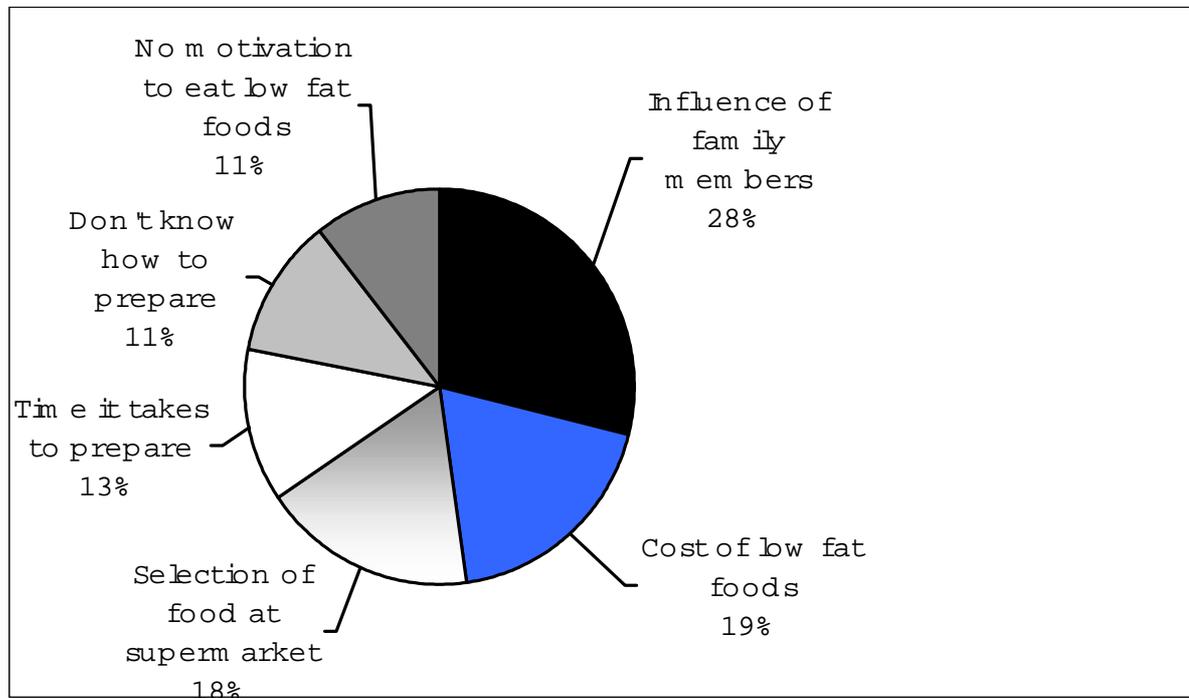
\*\* Action is defined here as having followed a low fat diet for between one and twelve months.

\*\* Maintenance is defined here as having followed a low fat diet for over twelve months.

### *Barriers to eating low fat foods*

Figure 5 shows the barriers to eating low fat foods reported by the respondents. The most common barrier was the influence of family members, followed by the cost of low-fat foods, and the selection of low fat foods at the supermarket.

**Figure 5: Barriers to eating low fat foods**



There were few differences in the barriers reported by respondents already eating low fat foods and respondents not yet eating low fat foods. The influence of family members, the cost of low fat foods and the selection of food at the supermarket were the three most commonly cited barriers for respondents from both of these groups.

### ***Further information about low fat foods***

83% (83/100) of respondents who completed the survey reported that they would like to receive further information on low fat foods. The multiple response question asked how respondents would like to receive this information. The respondents could choose more than one response to the question. The most commonly selected response included newsletter (52%; 65/124) and the next most popular method of receiving information was via a pamphlet (29%; 36/124). Seminars (4%; 5/124),

education sessions (9%; 9/124) and discussion groups with other mums (7%; 9/124) were far less commonly endorsed.

When asked in a multiple response question, which topics pertaining to low fat foods they would be most interested in, the respondents indicated that they would be most interested in low fat cooking tips (41%; 71/175) followed by low fat cooking for mum and baby (31%; 55/175) and selecting low fat foods from the supermarket (28%; 49/175).

Newsletters and pamphlets were the most popular means by which these women would prefer to receive further information, both in relation to information about physical activity and information on low fat foods.

### **8.3 Objective 3**

**To develop a client referral system and information storage mechanism.**

#### **8.3.1 Client Phone Survey**

##### *Response rate*

A total of 60 (60/177) clients from the three pilot sites completed the phone survey, this reflects a response rate of 34%. Of these, 15 were from the private hospital (15/15), 30 from the district hospital (30/60) and 17 from the tertiary hospital (17/102). The main reasons for non responding include, clients didn't answer phone, answering machine, wrong number and some of the clients did not have a phone number listing.

##### *Women who received a discharge pack*

Most respondents (82% 49/60) of answered 'yes' to the question 'Did you receive a discharge pack when you were discharged?'

##### *Women who received and opened the discharge pack*

Of the respondents who answered yes to "receiving the pack", 98% (48/49) opened it and read its contents.

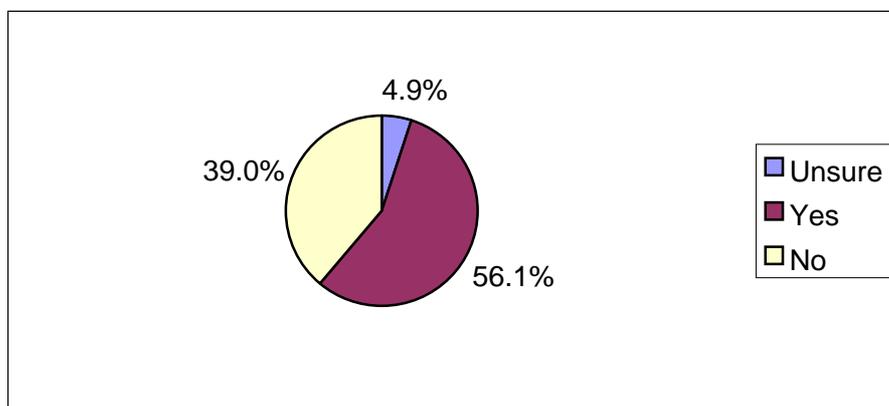
### *Visit to GPs*

Of the respondents who received the pack and opened its contents, 85% (41/48) had visited their GP following their pregnancy, whilst 15% did not (7/48).

### *GPs suggested follow up*

Of the respondents who received the pack and visited their GP, 56% (23/41) of them indicated that ‘their GP suggested they have a followup screen for Type 2 diabetes, 39% (16/41) indicated their GP did not suggest they have a ‘followup screen Type 2 diabetes’ whilst five per cent (2/41) were unsure. See figure 6.

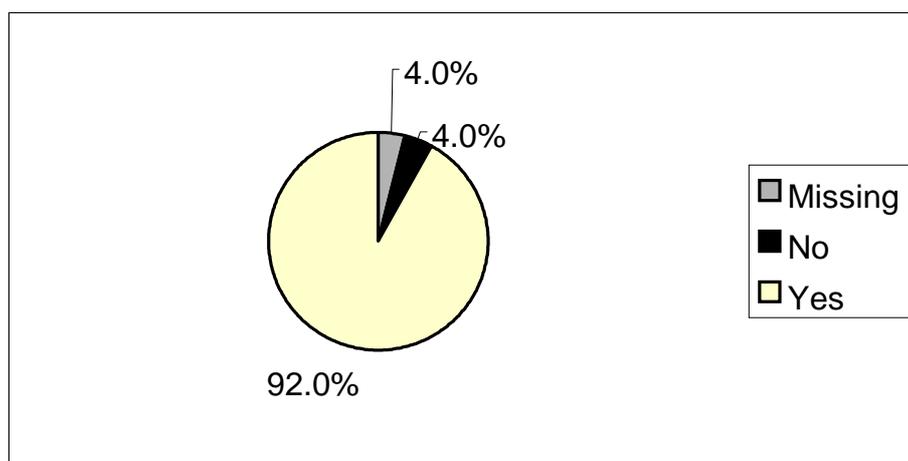
**Figure 6: Women whose GP suggested follow up**



### *Women interested in registering*

Figure 7 shows that of the respondents that opened the discharge pack (48), 92% (44/48) indicated they would like to be registered on the database, 4% indicated they would not like to be registered and 4 % reflects missing data.

**Figure 7: Women who opened pack & would like to be registered**



*Women registered on database*

A total of 18% (11/60) who completed the survey indicated they had completed a consent form to be registered in the database.

**8.3.2 Discharge packs distributed**

Discharge packs were placed on the wards in May 2001 within the three hospitals.

**Table 4: Discharge packs**

Hospital	Discharge packs given out
Private Maternity	15
District	60
Tertiary maternity	102
<b>TOTAL</b> packs given out since discharge started in May 2001 to March 2002	<b>177</b>

**8.3.3 Midwives discharge survey**

*Response rate*

A total of 46 midwives from the three hospitals completed the survey. In the tertiary hospital the surveys were distributed to one ward (n=30) in the district hospital to the maternity ward midwives (n=15), the project midwife in the private hospital completed the survey. This reflects a response rate of 100% of the selected sample of midwives (46/46).

### *Awareness of GDM packs*

93% (43/46) of midwives surveyed were aware of where the post GDM packs were stored within their hospital. The remaining 7% (7/46) did not respond to the question.

### *Does every woman receive a pack?*

A majority of respondents (72% 33/46) of stated they 'always' gave the GDM packs to appropriate women discharged, 15% (7/46) said 'sometimes' and 13% (6/46) said 'never'.

### *How did midwives find out about the GDM Packs?*

Table 5 shows how midwives were made aware of the GDM packs on their ward. The most common awareness raising tool was through a 'colleague- midwife'(29/52) 'attended an inservice'(14/52), 'found the file on the ward'(7/52) or other (2/52).

**Table 5: How midwives found out about the GDM packs**

	<i>Percentage</i>	<i>n</i>
Attended Inservice	27%	14
Colleague - Midwife	56%	29
Ward Clerk	0%	0
I found the file on the wards and used it	13%	7
Other	4%	2
<b>Total</b>	<b>100%</b>	<b>52</b>

### *Requests for more information*

The majority (83% 38/46) of midwives reported that they would like additional information included in the post GDM packs. From the topics provided, 38% (20/52) of respondents requested additional nutrition information, 35% (18/53) physical activity information, 21% (11/52) stress reduction information and 6% (3/52) other.

### 8.3.4 Number of clients registered on Cardiab database from July 2000 to December 2002.

The database identified for the storage information facility for the program was the Cardiab database located at a division of general practice. Only 13% (23/177) of the clients given a discharge pack from the pilot hospitals had been registered onto the database.

**Table 6: Number of clients registered on database.**

<i>Year</i>	<i>Period</i>	<i>Registrations</i>
2000	July –Dec	3
2001	Jan – June	9
	July- Dec	3
2002	Jan – Dec	8
TOTAL		23

## 8.4 Objective 5

**To reorientate health services to support and promote early detection and screening of Type 2 diabetes in the target group.**

### 8.4.1 Midwife training

The following table documents the number of training sessions that were conducted by the project officer to upskill midwives within the three hospitals.

**Table 7: Training sessions for midwives in the hospitals**

<b>Hospital</b>	<b>Training session</b>
Private Maternity	2
District	1
Tertiary Maternity	3

### 8.4.2 Promotional tools employed throughout the program

A number of promotional activities and initiatives were undertaken to promote the program. The program was launched to 60 health professionals and stakeholders. In addition, 200 community members attended a further program launch. The program was presented at three State and National conferences to a total of 370 delegates. A number of keynote presentations were made at Statewide forums and pilot hospital

sites to over 125 delegates. A number of articles were published in peer review journals, newsletters and local community newspapers. (See appendix 6).

Program summaries and resources have been requested and supplied to a number of interstate (n=7) and Western Australian (n=10) organisations, health services, individuals and hospitals who were not included in the pilot program. A total of 9 these health services intend to implement the program in their own area. Only 2 divisions of general practice from Western Australia who were not included in the pilot program have requested and was sent information and resources for the program.

### **8.5 Objective 6**

**Develop resources to support health professionals to disseminate risk reduction and screening information to the primary target group.**

The following Table (8) documents the number and type of resources that were distributed between May 2000 and March 2001.

**Table 8: Resources disseminated**

<i>Resource Title</i>	<i>No. Printed</i>	<i>No. given out</i>	<i>Production Costs (including GST)</i>
<b>GP purple manual</b>	Manuals 500	153	\$795
<b>Manual Stickers (front cover and spine)</b>	500	153	\$135.
<b>GP Client case notes stickers</b>	2400	918	\$186
<b>Pamphlet 'Have you had GDM. Planning Another baby?'</b>	3000	990	\$800
<b>Pamphlet 'So you've had GDM what now?'</b>	8000	2300	\$1146
<b>Pamphlet 'Maintain a Balance', Diabetes Australia (WA). (purchased for discharge packs)</b>	Purchased 500	300	\$50
<b>Pamphlet : Health professional</b>	3000	1385	\$812
<b>Sticker: GDM screen for (CHN)</b>	1000	870	\$905
<b>Poster: Planning future Pregnancy</b>	500	70	\$528
<b>Card: Laminated Screening Guidelines</b>	2000	160	\$1538
<b>Card: Stay Diabetes Free (little)</b>	10,000	4140	\$658
<b>Balloons containing program logo</b>	500	500	\$305
			\$7858.

### **8.5.1 Estimated cost of information packages**

#### **Client discharge pack**

The client discharge packs were estimated to cost \$1.50 per item. The content of the packs included two client pamphlets, a client risk card and a coloured cover sheet.

#### **General practitioner's package**

The GP packs were estimated to cost \$9.56 per item. The packs included 10x2 client pamphlets, client risk cards, five health professionals pamphlets, six stickers for client notes, GP program manual, poster and a purple file.

### **8.5.2 Project coordination and staffing**

The project was coordinated by a project officer employed full time for two years. The project officer's role was to develop, implement and evaluate the program plan. This involved conducting formative research, building partnerships, consulting with stakeholders, developing resources and systems for communication referral, providing briefing and training of health professionals, implementing a multi-strategic program promotion plan, disseminating preliminary evaluation findings and compiling the final report.

## **9.0 DISCUSSION**

### **9.1 Partnerships**

The program is centred heavily upon the development of partnerships and increasing the capacity of existing health care providers to maintain the program post pilot phase. Whilst the organisations involved in the program had varied goals and objectives, structures and individuals, partnerships appeared to work effectively based on the consultation phase employed and intense processes of negotiation and problem solving.

Involving all health services within the catchment area of the program was beyond the capacity of the resources in the pilot. Informative letters were sent to other hospitals and facilities in the catchment area, however, there was the potential for the services

not involved in the pilot to feel disadvantaged. This is an indicator of the willingness for existing health services to participate in a program that has the potential to add value to their services.

## **9.2 General Practitioner Support**

Examination of figure one (p33), reveals that 99% (112/113) of GPs who responded to the survey considered it necessary to screen for Type 2 diabetes in women with a history of GDM. However, only half of the respondents (50%, 56/113) actually screened for Type 2 diabetes in women with a history of GDM. This demonstrates that GPs may require information and support to conduct screenings.

The survey findings also show there is strong GP willingness to register patients on a database so that they can send regular screening reminders (90%, 101/112). Despite the results Table 6 (p43) shows that only 23 patients have been registered on the database from July 2000 to December 2002. There is anecdotal evidence that GPs are reluctant to be involved in pilot programs of this nature due to the threat of non-recurrent funding and resources, short timeframes and limited evaluation of program outcomes. GPs seem more likely to support and be committed to programs which were sustainable and integrated into existing health service delivery systems. GP representatives on the steering committee commented that GPs need at least three years to be familiarised and committed to a program This is further supported by Sheddac-Rizkallah, M. C. & Bone, L. R., 1998 who state that a program should be supported for five years to enhance institutionalisation prospects.

The findings of the client survey show that 92% of the women who opened the discharge pack (44/48) indicated they would like to be registered on the database. However, they are yet to be screened and registered on the database. It is unknown whether the women's GPs were informed about the program, or whether they were unwilling to register the women for regular recall and monitoring. Both the GPs survey and the client survey indicated a high willingness of both parties to screen and register women. It is suggested that further investigation be undertaken to identify the reason(s) for low registration rates of women onto the Cardiab database.

### **9.3 Support needs of women at risk**

Examination of the physical activity and eating habit survey revealed a response rate of 40% (100/247). Because of the length and comprehensive nature of the questions within the survey, this is considered to be a satisfactory response rate. The methodology included a follow up letter and a prize incentive to enhance the response rate. The adequate response rate may also reflect client interest in the subject matter and its personal relevance to respondents.

#### *Stages of change*

The results of the survey show that over half of the women surveyed (61/100) were not yet physically active. Therefore, viable options to create opportunities for them to increase their levels of physical activity need to be explored. For women in the pre-contemplation stage, options may include creative and personalised strategies to inform them of the importance of physical activity for their individual situations. For women in the contemplation stage, there is a need to identify champions and role models within existing health services and community (CHN, other active mothers) where the mother resides to engage her interest in physical activity. Allowing an opportunity to be active may impact on social support, provide opportunities to develop friendships with other mothers and gain support from a homogenous group. For women in the preparatory to maintenance stage for physical activity, opportunities to link into existing community based physical activity opportunities in their local areas should be explored. This allows mothers registered on the database to receive information about programs in their local area. An audit of facilities may be required to identify requirements for increased intensity of exercise as per the physical activity guidelines. This may include audit of recreation centres that provide crèche facilities, or options to form a babysitters club for mothers who wish to meet and be active together.

Respondents indicated that they were more likely to modify their eating habits and less likely to consider modifying their activity levels for better health. More than half of the respondents (61% 61/100) were not yet physically active, whilst 32% (32/100) indicated that they were not yet following a low fat diet. Therefore, a greater number of respondents were making changes to their diet whilst fewer were making changes

to the amount of physical activity they were doing. This indicates that the women appeared to be more amenable to changing their nutrition behaviour than changing their physical activity behaviour. Mitchell, H. *et al.*, (1999), reported that females are usually sensitive about nutrition and dieting, so this could be a response that they thought they “should” provide. Further research is required to determine the causal factors that affect the adoption of physical activity and nutrition related behaviours. It appears these women were more receptive to nutrition messages, which may require less energy, effort or motivation to make changes as opposed to physical activity.

The results indicated that both active and inactive women selected ‘no time’ and ‘child care needs’ as main barriers to being physically active. As there was no difference between the barriers for physical activity for active and inactive women, it may be that respondents reflected their perceived rather than actual barriers. Further research may assist to explore the psychosocial influences that impact on this issue.

#### *Information needs*

The women indicated that they preferred to receive information about physical activity and low fat foods in a written format such as newsletters and pamphlets.

Women indicated that they would like information on the topics of low fat cooking tips, low fat cooking for mother and baby and guidance to select low fat foods in the supermarket. This raises the question of whether respondents misunderstood the question. There is concern that mothers may have perceived that it was important to provide their infants with a diet low in fat, which is contrary to recommended nutritional needs of babies. The questions within the survey had a particular focus on eating ‘low fat foods’ as opposed to recommended nutritional guidelines in general.

### **9.4 Referral and information storage mechanisms**

#### *Client support and referral*

A majority of respondents (82%) received a pack when discharged from the pilot hospitals. A large number (92%) of these opened and read its contents, indicating they would like to be registered on the database. Whilst the initial consultation process involved health professionals providing service to the women, the women surveyed embraced the process with enthusiasm and expressed a high demand to be registered

on the database. It is suggested that if the program is adopted in other regions, a more direct approach be implemented to empower them to ask their GPs for screening and registration.

#### *Midwives survey*

The discharge processes employed in the three hospital sites, utilising the discharge packs and follow up process is, in part, an effective client referral strategy.

A limitation of the midwives survey was that it was not possible to identify the total population of midwives involved in the discharge process in the hospitals. This was due to the transient nature of the staff roster system within acute care settings and shift work. Hence it is difficult to determine what proportion the 46 responses represented out of the total population of midwives.

It is encouraging that 72% (33/46) of respondents stated they 'always give out the packs'. This reflects that the discharge process has been soundly implemented and adopted within the three health services. It is important to note that midwives in the three pilot sites were trained in the discharge process between May and July of 2001 and were surveyed about the discharge process eight months later in February 2002. Options need to be explored to integrate the process into current induction processes for new staff members within the three hospitals.

There was excellent recognition of the packs and where they were located within the hospitals. This result may reflect the extensive consultation process undertaken in each pilot site with midwives and medical records staff to determine the style and content of packs and where they could be accessed on the wards. Furthermore, respondents requested that additional information in relation to physical activity, nutrition and stress reduction be placed within the packs. As generic information pertaining to nutrition and physical activity are already included, information in relation to stress and other health topics were considered too specific to be included with the pack.

### *Registrations on database*

Table 6 (p43) shows that only 23 clients were registered on the database from July 2000 to December 2002. This low response may be due to a number of factors. A total of 153 GP packs were disseminated from July 2000 to March 2002, of which 110 were sent to GPs and/or practices within the catchment area of the program. It is estimated that approximately 11% (12/110) of the GPs who received packs registered clients. It is evident that further collaboration with GPs is required to engage more in the program. A resource that has not been investigated to date could be to utilise GP liaison officers who communicate with GPs regularly through newsletters and site visits.

As previously mentioned, the short timeframe of the pilot program was too short to allow for GPs and primary health care providers to accept into their current work practice (Sheddiac-Rizkallah, M. C. & Bone, L. R., 1998). This is probably the critical limiting factor in the low registration of women. There are a number of other factors that may have had some impact.

Personal communication with steering committee members highlighted that the perception that all women attended their GPs for a six-week check post-partum was questionable. Through personal experience, they found that their clients were not attending for this service. It is suggested that the discharge checklists in all three hospital sites be reviewed to ensure that a *'followup six-week check'* be suggested by a health professional when the mother is discharged. This may involve further consultation with obstetricians and GPs who assist in shared care and pregnancy management, to ensure they undertake the initial Type 2 diabetes screen at the six week health check and communicate the results to the client's GP, who can then provide ongoing care.

An alternative scenario could be that mothers receiving the *'follow-up six week health check'* message at discharge are not seeing a GP who is informed about the program. Results of the client survey indicate that 92% of respondents who received and opened the discharge packs would like to be registered. Therefore strategies to empower the women to approach their GPs about the program need to be explored. A strategy of this nature was implemented at one of the three hospitals. This involved

providing the woman with a consent form for the database. Therefore a strategy that involves information being delivered to the GPs by the woman attending for visit may be explored at the other hospitals implementing the program.

There is a possibility that GPs informed about the program choose to utilise alternative databases to register clients eg Medical Director. This is difficult to confirm. Furthermore, GPs who are informed and have the program resources, may not be the service provider for women at risk. It is suggested that an evaluation on the utilisation of the GP pack be conducted to investigate the perceived quality of pack resources and evaluate the effectiveness of the referral pathway.

### **9.5 Consultation with stakeholders**

The consultation process as described in section 7.1, was imperative for the program's success. The project officer conducted consultations with support from a well-known and networked health professional with extensive experience in diabetes. This may have enhanced key stakeholder acceptability of the program and its value to their health service. The project officer endeavoured to maintain open communication with all stakeholders throughout the program and offered continued support to each level of service delivery on an ongoing basis. Formal communication with stakeholders was maintained through follow up letters, steering committee meeting minutes and e-mails. The consultations which occurred with GPs, CHNs and hospital staff guided the development of the locally required resources. Staff suggestions were actioned and feedback was provided at all levels. This ensured that health care professionals involved, maintained their locus of control and local ownership of the program. These elements were essential for sustainability.

It was important to identify stakeholders whose core business involved existing service to the primary target group. This provided the necessary infrastructure from which the program could be placed within the health service.

In future, the program could be more readily assimilated into the public sector, as services may not involve a fee for service. However a major and vital stakeholder in the delivery of care to the primary target group include obstetricians working in the

private sector. Options to develop networks and foster support for the program within obstetrician networks need to be explored.

### **9.6 Reorientation of Health Services**

The program resources and strategies were highly visible within the health services. This was made possible through staff training and information lectures. Appendix 6 outlines the promotional strategies employed throughout the program. Promotional tools enhanced the visibility of the program. Program launches facilitated support from stakeholders and community members. Postgraduate lectures, symposia and conferences provided a vehicle for the dissemination of program resources and preliminary evaluations of program strategies. Articles in peer review journals provided a wider promotion of the program beyond key stakeholders. Tailor made briefing interventions and staff training enabled staff to remain informed about discharge processes, follow-up procedures and familiarise themselves with the application of program resources.

Aside from the steering committee members, champions emerged throughout the program to support its cause. These included key obstetricians, GPs, diabetes educators, midwives and CHNs. The value of program champions is often a hidden component of the program success. This success lends to the creativity and flexibility of the health professionals who work within a dynamic social and political environment.

A major success of the program has been the recognition by the health services that the program could be promoted as a quality improvement initiative. The ideal situation chosen by the organisational partners recognised that by adopting the program, best practice was achieved and the organisation was recognised for leadership in the field.

### **9.7 Resources**

Client and health professional resources that were developed ranged from generic client information, identifying health professional screening guidelines, identifying

existing databases and developing processes for discharge planning and information storage.

The Type 2 diabetes-screening guidelines recently developed and ratified by the NHMRC were chosen as the most appropriate, evidence based screening tool for the health professionals to use. The guidelines were modified in layout and style in consultation with GPs, to cater to their current work practice and working environment.

The GPs package was developed using an existing database and modelled on the resources of an existing diabetes program titled 'Diabetes Management in General Practice'.

A client information sticker and poster were developed specifically at the request of CHNs who identified a need for these resources. The format required, eg sticker and poster, was noted as the most suitable resource for their current working practice and working environment.

In the ward setting within the hospitals, a number of procedural manuals were currently in use. The midwives requested that the same format be utilised to house the discharge packs in each hospital. To facilitate this, files containing all discharge material were labelled on the spine and front cover.

The program has been developed to support program sustainability. The pilot project coordination and funding was provided for a period of three years until 2002, by EMPHU. The maintenance phase of the program will require less resources, however some resources will be required to maintain health professional training, update materials and central brokerage of resources. To maintain the service in the EMHS and to generalise the program to other areas in the State, it is suggested that options be explored to identify the required program coordinators to sustain and fund the program either at a regional, State or National level.

## 10.0 CONCLUSION

The formative research, implementation and evaluation of this pilot program were conducted over a very short time frame. The need for the program was identified by all key organisations involved in the pilot program who remain committed to sustaining their role in the Early Detection and Risk Reduction Program for Women with a History of GDM program.

It is imperative that lessons learnt from this program are addressed and that this program be transferred to all health organisations involved in the care of this target group at high risk of developing Type 2 diabetes. Especially in the light of the recent research identifying that close to 25% of Australians are already affected by Type 2 diabetes (Dunstan, D. *et al.*, 2001). There is an increasing body of knowledge indicating that Type 2 diabetes is preventable and that early diagnosis is likely to reduce risk of complications associated with Type 2 diabetes.

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## 12.0 APPENDICES

### Appendix 1: NHMRC Guideline for Case Detection and Diagnosis of Type 2 diabetes,

#### Cases Detection and Diagnosis

(*Consultation draft, 2000, Part 4, pg 210-212*).

#### How should case detection and diagnostic testing for Type 2 diabetes be performed?

- Fasting plasma glucose should be measured as the initial screening test in people with risk factors for undiagnosed Type 2 diabetes.
- A random plasma glucose may be used if collection of a fasting sample is considered impractical.
- Laboratory testing (rather than blood glucose meter testing) should be used to measure blood glucose for the screening test.
- Laboratory testing is mandatory for the diagnostic test.
- The 1999 WHO criteria should be used to diagnose Type 2 diabetes.
- An oral Glucose Tolerance Test should be performed in all people with an equivocal result – fasting plasma glucose of 5.5-6.9 mmol/l, or random plasma glucose of 5.5-11.0 mmol/l.
- The diagnosis of diabetes requires two positive laboratory blood tests on separate days unless the plasma glucose is unequivocally elevated in the presence of acute metabolic decompensation or obvious symptoms.

#### Testing tools

##### Fasting Plasma Glucose

- using a fasting plasma glucose cut off value of 5.5 mmol/l and above for further testing for diabetes and IGT has acceptable sensitivity and specificity.

##### Random Blood Glucose

- random blood glucose measurement is not as discriminatory as fasting plasma glucose in detecting undiagnosed Type 2 diabetes
- blood glucose meters are not sufficiently accurate for screening an individual for possible undiagnosed Type 2 diabetes
- if random blood glucose is used for screening, the measurement should be performed in a laboratory (not using a blood glucose meter) and follow up testing is required for a result between 5.5 and 11.0 mmol/l.

#### How to Detect Type 2 diabetes

These guidelines make no distinction between screening people in the different high risk groups for undiagnosed Type 2 diabetes, including women with previous gestational diabetes (GDM). These recommendations differ from the consensus statement of the Australasian Diabetes in Pregnancy Society which recommends

periodic post partum testing with an OGTT. Kousta et al (1999) noted a discordance between the 1997 ADA criteria and the 1985 WHO criteria in women with previous GDM similar to that observed in other populations (Table 15). However there is no data to suggest that previous GDM requires surveillance procedures different to the rest of the high risk community.

#### *Frequency of Testing*

- Periodic testing for undiagnosed Type 2 diabetes is recommended by measuring fasting plasma glucose according to the following schedule:

- ◆ each year for people with impaired glucose tolerance (IGT) or impaired fasting glucose (IFG)
- ◆ every 3 years for at risk people with a negative screening blood test
- ◆ people with an initial plasma glucose consistent with a diagnosis of diabetes or IGT/IFG which is not confirmed on subsequent testing should be retested after 1 year

## **Appendix 2: Steering Committee Terms of Reference**

### **Structure**

1. The steering committee consists of representation from key organisations required to carry out specific roles as outlined in the implementation plan.
2. Meetings will be convened every 3 months.
3. The Project Officer will chair the meetings.
4. Meeting minutes will be distributed via e mail to all members.
5. Funding for the program is scheduled until June 2002. A review phase is therefore scheduled for late 2001.

### **Function**

The tasks of the Steering Committee are to:

1. Plan and implement the strategies contained within the plan.
2. Contribute expertise required to implement and guide the program strategies and resources in conjunction with project coordinator and project officer.
3. Provide input into the development of intervention evaluations and interim papers.
4. Developing and piloting resources and referral pathways.
5. Regular dissemination of progress reports back to representative organisation.
6. Marketing and promotion the program.
7. Assist in formalising publications resulting from program interventions.

### **Organisation**

1. The coordination of the Steering Committee is the responsibility of the Project Officer.
2. The steering committee will be required to gain consensus on tasks achieved.
3. The project officer shall report the program progress to the steering committee via e mail and minutes every three months.

## **MEMBER ROLES**

- **Medical Director of Obstetrics, KEMH**
  - Assist program promotion at all levels. To obstetricians, discharge staff at KEMH, arrange promotion at lunchtime staff meeting.
  - Play a guiding role in the development of program resources, namely the discharge planning protocols form KEMH.
  - Assist in the coordination of training of KEMH discharge planning staff.
  - Provide a consultancy role for project officer and coordinator in program development and implementation.
- **Clinical Midwife Consultant- Diabetes, KEMH**
  - Assist in the promotion of program to KEMH discharge staff.
  - To develop discharge planning resources and training materials for KEMH discharge staff, in partnership with project officer.

- To assist in the conduction of discharge staff training and dissemination of educational resources to discharge staff. IE Conduct training sessions to staff with reference to the utilisation of modified discharge forms.
  - Supervise the appropriate format changes required for discharge planning forms utilised at the KEMH. i.e. Trial birth notification form to CHN'S, review and modify the discharge form sent via KEMH to GPs.
  - Assist in the dissemination of mothers Physical Activity and Eating Habit Survey from the diabetes clinic at KEMH.
- **Diabetes Care General Practitioner and Women's Health Officer, Derbarl Yerrigan Health Service**
    - Provide a point of contact at Derbarl Yerrigan for the promotion of program to aboriginal women.
    - To provide guidance to project officer and assist in the development of resources and educational materials for aboriginal women.
    - Assist in assimilation of program into existing diabetes services at Derbarl Yerrigan.
- **Child and Community Health Nurse Representative, Swan Health Service**
    - Promote and market the program to Clinical Managers and community nurses.
    - Report back program developments to Child and Community Health Nurses and Clinical Managers
    - Guide the development and piloting of Community and Child Health Nurse resources and induction sessions.
- **General Practitioner, Perth Division of General Practice**
    - Promotion of program and its developments to GPS's within the Divisions, via divisions newsletter, written reports and promotional events.
    - Provide guidance to Project officer in the development of GPS resources and promotional tools.
- **Diabetes Programs Coordinator: Perth Division of General Practice**
    - Provide assistance to program officer in the development of GPS training resources and induction materials for GPS's within the divisions of general practice.
    - Provide training and induction to GPS's who register an interest in the program.
    - Promotion of program to GPS's
    - To marry the program to existing diabetes services within the Divisions of General Practice.
- **Midwife, Mercy Hospital**
    - The coordination of induction sessions to discharge planning staff at Mercy hospital. To provide guidance to the Project Officer in promotion of program to Mercy staff.

- Guide the process of discharge planning modification at Mercy hospital.
  - **Health Service Manager, Diabetes Australia**
  - Provide guidance to the project officer in the development of promotional items and resources such as pamphlets, newsletters, articles etc for dissemination to the target group and health professionals.
  - Provide assistance in the promotion of the program, with particular reference to the wider community.
  - Providing information about existing resources and services that may assist or impact upon the program.
- To provide guidance on consumer related issues.

### **Appendix 3. Steering Committee Members**

Dr Brian Roberman	Director of Obstetrics, KEMH
Dr Ian Churchward	Perth Division of General Practice
Ms Mary Hervey	Perth Division of General Practice
Dr Dianne Faulkner Hill	Derbarl Yerrigan Health Service
Ms Janet Lagstrom	King Edward Memorial Hospital
Ms Maureen Unsworth	Diabetes Program Coordinator
Ms Anne Polley	Diabetes Project Officer (Chair)
Ms Kerry Greene	Midwife, Mercy Hospital Mt Lawley
Ms Patsy Wyndham	Diabetes Educator, Swan Health Service
Ms Jo Hart	Diabetes Australia (WA)
Dr Barry Walters	Obstetric Physician, Royal Perth Hospital and King Edward Memorial Hospital

## Appendix 4. GP Survey

### **CONFIDENTIAL QUESTIONNAIRE**

#### **The Early Detection and Risk Reduction Program for women who have had Gestational Diabetes.**

Dear Colleague

**Re: Diabetes Management in General Practice.**

As you would be aware, a priority program for many Divisions of General Practice is diabetes management.

In addition to targeting people with diagnosed diabetes, general practitioners have a major role in ensuring early diagnosis and supporting risk reduction programs aimed at preventing or delaying the onset of diabetes.

The Perth and Osborne Divisions of General Practice are working in partnership with The Inner City Diabetes Service and King Edward Memorial Hospital to develop a program. The program targets women who have had GDM that are at risk for developing type 2 diabetes in later life.

The following survey will assist in the planning of a Type 2 Diabetes Prevention Program entitled **The Early Detection and Risk reduction program for women who have had Gestational Diabetes.**

Please complete this survey and return by fax to:

**Mary Hervey**, Perth Division of General Practice Fax: 9 473 1754.

Thank you for taking the time to complete this questionnaire.

Yours sincerely

Dr Ian Churchward  
Perth Division of General Practice

### **DIRECTIONS**

Please answer by ticking the appropriate box  or by writing in the space provided.

All responses will be treated as **STRICTLY CONFIDENTIAL**

**TO THE FOLLOWING QUESTIONS PLEASE TICK  THE MOST APPROPRIATE ANSWER IN THE BOX PROVIDED.**

**1. Within your role as a General Practitioner, do you:** (please tick  )

- Deliver Babies Yes No
- Assist in shared care and pregnancy management Yes No
- Provide follow up to women post delivery Yes No

**2. Do you consider it necessary to screen for Type 2 Diabetes in women with a history of Gestational Diabetes Mellitus(GDM)?** (please tick )

Yes No

If No, please explain below:

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**3. Do you annually screen for Type 2 Diabetes in clients with a history of GDM?** (Please tick ).

Yes No

**4. Would you be prepared to disseminate a consent form to women with a history of GDM, asking permission:**

- To register her name and contact details on a register for annual screening.
- To have sent to her information regarding risk reduction programs for the development of Type 2 Diabetes.

Yes No

Yes No

**5. Would you like to be provided with more information on the Early Detection and Risk Reduction Program for Women with a history of GDM?**

Yes No

If yes, please provide your details below:

**THANKYOU FOR TAKING THE TIME TO COMPLETE THIS QUESTIONNAIRE**

**PLEASE RETURN THIS SURVEY TO THE PERTH DIVISION OF GENERAL PRACTICE BY FAX TO :**

**Mary Hervey on Fax No : 9 473 1754**

## Appendix 5: Physical activity and eating habit survey



### **THE EARLY DETECTION AND RISK REDUCTION PROGRAM FOR WOMEN WITH A HISTORY OF GESTATIONAL DIABETES.**

The Inner City Diabetes Service along with King Edward Memorial Hospital are conducting a survey of the needs of women who have had Diabetes in Pregnancy (Gestational Diabetes).

We would like to know what your thoughts are about Physical Activity and Eating Habits. The outcome of the survey will be used to provide women with a history of Diabetes in Pregnancy (Gestational Diabetes) access to physical activity and nutritional programs that they want and enjoy!



**If you have any questions with regard to the survey, please call:  
Anne Polley (Diabetes Project Officer) on 9 224 2869**

## Physical Activity and Eating Habit Survey

**You DO NOT need to put your name on this survey.**

1. How old are you? \_\_\_\_\_ Years
3. How old is your youngest child? \_\_\_\_\_ Months
4. What is your postcode?

### **SECTION 1. The following questions relate to Physical Activity.**

**1. Which of the following statements best describes you:** (Please tick  one of the following options)

a. I'm not physically active and I don't plan on doing any physical activity in the future.

*If you ticked option (a) go to question 6.*

b. I'm not active at the moment but am thinking about it.

c. I am preparing to do more physical activity but am yet to start

d. I am usually quite active. I either walk, dance, swim, play sport or some other physical activity 3 to 5 times a week.

*If you ticked option (d) please answer the following;*

I have been quite active for: (please tick  the most appropriate option)

Up to a month

1-6 months

6-12 months

Over 1 year

**2. If you would like to be more active what stops you from doing more?** (Please tick )

- |   |                          |                  |                          |
|---|--------------------------|------------------|--------------------------|
| Dislike physical activity                           | <input type="checkbox"/> | Not Confident    | <input type="checkbox"/> |
| No Suitable facilities                              | <input type="checkbox"/> | Too Expensive    | <input type="checkbox"/> |
| No Time   | <input type="checkbox"/> | Child care needs | <input type="checkbox"/> |
| Not Motivated                                       | <input type="checkbox"/> | Too embarrassed  | <input type="checkbox"/> |
| Lack of support from important persons in your life |                          |                  | <input type="checkbox"/> |

Other:(Please give details)

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**3. If you had no limitations, what types of physical activity would you like to be involved in?** (Please tick  as many of the answers as you like)

- |                |                          |                          |                          |
|----------------|--------------------------|--------------------------|--------------------------|
| Walking        | <input type="checkbox"/> | Netball                  | <input type="checkbox"/> |
| Gardening      | <input type="checkbox"/> | Volleyball               | <input type="checkbox"/> |
| Swimming       | <input type="checkbox"/> | Hockey                   | <input type="checkbox"/> |
| Aerobics       | <input type="checkbox"/> |                          |                          |
| Water Aerobics | <input type="checkbox"/> | Others (Please specify): |                          |
| Running        | <input type="checkbox"/> | _____                    |                          |
| Cycling        | <input type="checkbox"/> | _____                    |                          |
| Yoga           | <input type="checkbox"/> |                          |                          |
| Dancing        | <input type="checkbox"/> |                          |                          |

**4. If you ticked (  ) more than 1 of the above options, which would you be **MOST INTERESTED** in doing?** (please answer below)

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**5. Do you have any muscle or joint problems, or a medical condition which prevents you from exercising or which makes exercising difficult for you?**

Yes

No

If Yes please specify:

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**6. Are you aware that regular exercise can help to control diabetes during pregnancy and may prevent the onset of diabetes after Gestational Diabetes?**

Yes

No

**7. If information that assists you to become more physically active was available, how would you like to receive the information?** (Please Tick )

A newsletter

Education session

Pamphlet

Discussion group with other mothers

Seminar

Other (please specify) \_\_\_\_\_

## **SECTION 2.**

**The following questions relate to your eating habits.**

**8. Which of the following statements best describes you:** (Please tick  one of the following options).

a. I have never thought about changing my eating habits to decrease the amount of high fat foods that I eat and I'm not really planning on doing it in the future.

b. In the past month, I have thought about changing my eating habits to decrease the amount of high fat foods I eat.

c. I am currently preparing to decrease the amount high fat foods I eat.   
(eg. Seeking out low fat recipes to prepare for my family)

d. I am decreasing the amount of high fat foods I eat.   
(eg. Reducing the amount of margarine I use on bread, or purchasing foods which have low fat on their label)

*If you selected option d, please answer the following question;*

I have been decreasing the amount of high fat foods I eat for: (please tick  the most appropriate option)

- Up to a month
- 1-6 months
- 6-12 months
- Over 1 year

**9. Following are a list of possible barriers to eating low fat foods. Please indicate (by tick ) those that have stopped you from eating low fat foods in the past:**

- Selection of food at supermarket
- No Motivation to eat low fat foods
- Cost of low fat foods
- The time it takes to prepare low fat meals
- Don't know how to prepare low fat meals
- Influence of family members (eg. partner)

Other (please specify):

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**10. In future, would you like to receive information that assists you to eat low fat foods?**

Yes

No

If Yes;

**a. How would you like to receive the information?**

(Please Tick )

A newsletter  Education session

Pamphlet  Discussion group with other mothers

Seminar

Other (please specify) \_\_\_\_\_

**b. What topics would you like the information to cover:**

Low fat cooking tips

Selecting low fat foods in a supermarket

Low fat cooking for mother and baby

Other (please specify) \_\_\_\_\_

Thank you for taking the time to complete this form.

Your feedback is appreciated.

PLEASE RETURN THE SURVEY IN THE YELLOW  
ENVELOPE PROVIDED BY FRIDAY 11<sup>TH</sup> AUGUST.

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## Appendix 6: Promotional tools employed throughout the program

<i>Promotional Item</i>	<i>Date</i>	<i>Target Audience</i>	<i>Expected Reach</i>
<b><u>Conferences</u></b>			
•ADEA*state conference, WA	2000	Diabetes Educators, General practitioners, health promotion officers, obstetricians, endocrinologists, nurses.	120
•ADEA National Conference 2001	Sept 2001		150
•ADIPS* National Meeting 2001	Sept 2001		100
<b><u>Launches</u></b>			
Program Launch to health Professionals	July 2000	General practitioners and health professionals from the catchment area.	60 GPs and key stakeholders
Community Launch	Oct 2000	Community members: families within the Bayswater area of Perth.	200
<b><u>Presentations</u></b>			
King Edward Memorial Hospital Post graduate lecture Series	July 2000	GPS interns, registrars, hospital staff, nurses, diabetes educators.	65
Diabetes Symposium, Perth WA.	May 2002	Divisions of General practice representatives, general practitioners, public health practitioners,	60
<b><u>Articles</u></b>			
Healthview Spring 2000, 'Mothers urged to watch for diabetes'.	Sept 2000	Health professionals	2000
Child Health and	April 2001	Child and community health nurses, dieticians, allied health	1300

Antenatal Nutrition Bulletin, edition 42. <i>'Effects of pregnancy complications on the future health of women: diabetes diagnosed in pregnancy and future risk of diabetes.'</i>		practitioners.	
Subiaco Post, <i>KEMH paves new path in diabetes prevention.</i>	Oct 2001		4000
Articles in Division Newsletters	August 2000 Nov 2000	Community members living within the Subiaco precinct	500
		General practitioners	

\*ADEA: Australian Diabetes Education Association

\*ADIPS: Australian Diabetes in Pregnancy Society.