CONSEJERÍA DE SALUD

Andalusian Public Health System

COMPREHENSIVE DIABETES PLAN FOR ANDALUSIA 2003-2007

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Comprehensive Diabetes Plan for Andalusia

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I. INTRODUCTION

Diabetes Mellitus (DM) is a chronic illness with a tremendous social and healthcare impact. It affects large numbers of people and can be expected to increase significantly over coming years as a result of increased life expectancy, unhealthy lifestyles and rising rates of obesity. It is a significant problem at a personal level and for public health, not only because of its high prevalence and incidence but also because of its chronicity, which may entail complications. These include cardiovascular disease, ictus, blindness, renal problems and amputations of the foot or leg, and are the cause of a high rate of premature death and significant effects on quality of life. Diabetes mellitus may also result in complications during pregnancy for both the mother and the foetus or newborn child.

While great progress has been made in the treatment and control of diabetes in recent years, similar progress has not been achieved regarding health outcomes. Improvements are still needed. This situation has led the Ministry of Health for the Andalusian Regional Government to consider diabetes as a top-priority health problem and to create a specific tool for comprehensive care for diabetes patients as a starting point for drawing up measures and solutions.

The need to define the most appropriate intervention strategies for dealing with the main problems, together with the increasing need in the health system and in society in general to know the results of investments in improving health makes it necessary to carry out periodic and on-going assessment of any actions taken.

The Comprehensive Diabetes Plan has been drawn up to provide a tool for dealing with the different stages of the natural history of diabetes (primary prevention, early detection, monitoring and treatment to limit complications, etc.) by means of a global strategy including preventive, curative or care actions as well as training and research into the causes and solutions for the disease. The Plan is based on a series of principles:

- **Person-centred**: Information shall be provided as well as the necessary tools to empower individuals so that they can adopt healthy lifestyles and lead the control of their disease.

- **Based on cooperation**: Agreements should be reached between the individual and the healthcare team in an atmosphere of shared decisions on objectives and the monitoring plan.

- **Equity:** Services should be planned to meet the needs of the whole population and individuals, including specific groups.

- **Integrated:** The know-how and skills of all the professionals involved should be integrated to form a multi-disciplinary team including Primary Care, Specialist Services and various public sectors, in order to guarantee continuity of care and a support system that will ensure maximum autonomy.

- **Results-oriented:** Efforts should aim to reduce the incidence and impact of diabetes.

When drawing up comprehensive plans, it is especially important to define the criteria for selecting the members of the working group, its composition, the person to whom suggestions should be addressed and the procedure for enhancing the document. Basically, selection must be carried out with care and the most appropriate working methods established.

The following elements were used in drawing up the Plan:

1. Analysis of the current situation from the points of view of epidemiology, healthcare organisation and available resources.

2. Expectations of diabetes patients and their families.

II. ANALYSIS OF THE CURRENT SITUATION

II.1. Epidemiological analysis. Most relevant data

Prevalence: It is estimated that 6% of the population has diabetes (known and unknown)

Incidence:

DM1® 16 cases per 100,000 people per year, and rising
DM2 ® 60-150 cases per 100,000 people per year

Mortality:

In 6th position amongst causes of death (3rd amongst women and 8th amongst men). Total deaths with diabetes in Andalusia in 2000: 1745 (3% of total deaths).

Years of Potential Life Lost (YPLL) in Andalusia amount to 47 for men (per 100,000 inhabitants) and 31 in women (per 100,000 inhabitants).

Trend (1975-2000): Increase in absolute numbers (from population ageing and increased prevalence of diabetes) with a reduction in standardised rates (adjusted for age) and in YPLL.

Morbidity:

Acute complications:

- Diabetic ketoacidosis in 11.7 cases/100,000 inhabitants / year in 2000 (from Minimum Basic Data Set, stabilised figures for 1998-2000).

- Hyperosmolar hyperglycaemic decompensation in 4.6 cases / 100,000 inhabitants / year (from Minimum Basic Data Set, showing a slight increase since 1998, perhaps related to ageing of the population and greater prevalence of diabetes)

Chronic complications:

- Diabetic retinopathy: according to studies carried out in some areas of the Andalusian community, the prevalence of retinopathy is 51.4 – 73.3% in people suffering from diabetes for more than 10 years.

- Chronic renal insufficiency in substitution treatment: the percentage of patients with chronic renal insufficiency in substitution treatment, whose primary renal disease is diabetes, in Andalusia is approximately 10% (prevalent cases). In incident cases, in Spain in 2000, 23% of people beginning substitution renal treatment had diabetes, and in Andalusia 21%.

- Cardiovascular disease: the rates of admission of patients with diabetes with myocardial infarction or ictus were stable from 1998 to 2000.

- Amputations: the rate of amputations increased from 16 to 18 per 1,000 inhabitants per year. However, the rate of amputated patients decreased so it can be deduced that the increase is in the number of reamputations.

Hospital discharges: In 1999, a total of 52,454 people were admitted to hospital with diabetes, representing 10% of total discharges and 14% of total stays. Average stay was 4 days longer for people with diabetes than for those without diabetes. Of total admissions, 5% were for severe complications, 40% for chronic complications (33% with cardiovascular disease) and 55% for non-diabetes related pathologies.

II.2. Evaluation of users' needs and expectations

This was a key aspect when drawing up the Comprehensive Diabetes Plan as it provided useful information for establishing the main Actions aiming to meet users' demands through an on-going strategy for improving quality. The analysis of *«Patients' and family members' expectations in the healthcare process for diabetes»*) followed a qualitative methodology based on 4 focus groups - 2 with people having diabetes type 1 and their family members, and the other 2 with patients having diabetes type 2 and their family members. The information was analysed using qualitative analysis (content analysis) procedures and organised according to the SERVQUALE1 variables for perceived quality:

Tangibility: perception of resources available, whether they are adequate and sufficient.

Accessibility: Facility for contacting professionals by telephone or physically, with reference to waiting times, working hours, etc.

Response: capacity for responding in time and diligently. Flexible adaptation to requirements.

Courtesy: friendliness, consideration for users and carers.

Understanding: degree of empathy and understanding amongst professionals of personal circumstances

Communication: understanding of language. Listening. Asking opinions of users and carers. Encouraging participation in care.

Competence: preparation, experience and scientific/technical, relational knowledge of professionals. Internal coordination within the organisation.

Security: patient's or main carer's perception as to whether contact with professionals increases or decreases their physical and/or emotional security.

The key elements involved in the analysis of expectations of diabetes patients and their families regarding healthcare services requiring greater attention were as follows:

[1] This includes health centres, local and ancillary outpatient clinics

- Increased accessibility to information and materials needed for treatment.
- Single, coordinated appointment to cover different needs.
- Accessibility to professionals having appropriate skills.
- Coordination amongst all care providers.

II.3. Improvement opportunities

Considering the diagnosis of the current situation of diabetes in Andalusia and of the expectations of patients and their main carers and available resources, the main areas for action and objectives of the Plan have been established as follows:

1. To improve access to information on diabetes and prevention for the general public and for diabetes patients, as well as access to therapeutic education so that patients can learn to participate in the control of their diabetes.

2. To define and establish preventive activities to promote healthy lifestyles.

3. To facilitate early detection of diabetes, before the presentation of severe and/or chronic complications.

4. To re-design episode-based healthcare, moving towards care for chronic processes based on seamless healthcare management of diabetes, and guaranteeing continuity of care. To standardise laboratory and quality control techniques used to monitor metabolic control. To facilitate access to the latest-generation control materials, adapted to the characteristics of each patient.

5. To provide diabetology education and emotional and psychological support as required.

6. To improve information systems.

7. To define and promote methods for collaboration and actions with groups and associations of patients.

8. To implement on-going training programmes for professionals in the Andalusian Public Health System involved in the care of diabetes patients.

9. To promote research in the fields of the prevention and cure of diabetes and of improved care.

10. To improve resources and renovate technology in health centres for both diagnosis (retinographs, equipment for functional haemodynamic studies, etc.) and treatment (digital unit for diabetic foot salvage surgery, laser therapy, etc.), with special emphasis on the role of telemedicine.

III. OBJECTIVES

The Comprehensive Diabetes Plan for Andalusia covers a number of actions with a view to achieving the following objectives:

1. To reduce the incidence of diabetes in Andalusia.

2. To reduce the impact of diabetes (complications and mortality).

3. To improve quality of life for people with diabetes.

4. To guarantee that diabetes patients receive healthcare based on structuring of the Diabetes Process from the point of view of continuity of care as an element of overall quality.

5. To adapt service provision to people's needs effectively and efficiently.

6. To increase knowledge and information on diabetes amongst the general public.

7. To build the future by investing in training for professionals and in research into the disease and its effects.

IV. ACTIONS

The Comprehensive Diabetes Plan for Andalusia covers the period from 2003 to 2007. In order to achieve its objectives, the following Actions have been established:

1) Communication and information
2) Primary prevention
3) Healthcare for diabetes patients: management of the healthcare process
4) Special actions
5) Information systems
6) Volunteer services and aid groups: associations
7) Training and professional development
8) Research and innovation
9) Promotion of the Andalusian network for diabetes care
10) Regulations: Advisory Council on Diabetes in Andalusia

IV.1. Public communication and information:

Strategies are to be drawn up to improve access to information for the general public and for diabetes patients. In addition to information campaigns, a permanent telephone line will be set up. There will also be a specific section on the web site, with discussion and consultancy forums for both professionals and the general public. A training plan on communication skills for healthcare professionals will be adopted.

IV.2. Prevention of diabetes

Diabetes mellitus is one of the fastest-developing chronic diseases in the world today. The control of a number of known risk factors, such as obesity and unhealthy lifestyles, can help reduce incidence. This plan therefore establishes strategies for the detection and control of such risk factors, as well as training plans for healthcare professionals, information and awareness campaigns, inter-sector actions across different organisations and strategies for early detection of diabetes in order to alter its course and prevent the development of complications.

Prevention of diabetes type 1 (DM1)

There is now sufficient evidence to assert that, in the destruction of pancreatic beta cells that takes place in Diabetes Mellitus type 1, the leading role is played by various mediators of the autoimmune response, at least in a large proportion of cases.

Genetic factors have been included. The fairly high incidence of DM1 in first-degree relatives (up to 10 times more frequent than in the general population) reflects the influence of the genetic component in development of the disease. Depending on the degree of the family relationship, the risk of contracting the disease at some stage of life varies.

Table 20. Family risk of contracting DM1 depending on the degree of relationship.

GROUP	RISK (%)
Non-related	<1
Related	
Parent	3
Child	6
Of affected father	8
Of affected mother	3
Sibling	5
Identical twin	33
HLA identical	15
HLA haploidentical	5
HLA non-identical	1

This susceptibility is located in several genes, especially the one which controls the immune response called the Major Histocompatibility Complex (MHC), known in man as Human Leucocyte Antigens (HLA) and located in chromosome 6. In DM1 it is accepted that the genetic component represents 50% of the risk, the other 50% being environmental factors.

Environmental factors also play an important role in development of DM1. It has been shown that the geographical factor influences incidence of the disease. The environmental factors that are most closely related to the aetiology of DM1 are infections (viruses) and toxic and dietary factors.

To date, there have been many studies on pharmacological intervention (immunosuppressors, immunoglobulins, etc.) in patients with the clinical symptoms of DM1 but the results are not yet clear. Important studies are now under way on susceptibility in first-degree relatives of patients with DM1, such as the TRIGR study on newborns which is planned to have a minimum duration of 5 years, and in first-degree relatives who are also bearers of antibodies. The latter involves two important clinical trials using different pharmacological interventions, but results are not yet available. One of these is the multi-national European ENDIT (European Nicotinamide Diabetes Intervention Trial) using nicotinamide in high doses. The other is the DPT-1 (Diabetes Prevention Trial) in North America, using insulin treatment. Results so far indicate that intervention with injected insulin does not delay or prevent DM1, although the study is continuing with a sub-group with moderate risk using oral insulin.

At present and in line with recommendations from the Spanish and American Diabetes Associations, intervention to prevent DM1 should only be attempted in the context of research and only in this context should the immunological and/or genetic markers be determined for the detection of high-risk individuals, since as yet no studies on intervention have achieved favourable results. Moreover, there are no useful methods for prenatal diagnosis or established indications.

Actions

During the period 2003-2006, the healthcare institutions should:

1. Promote initiatives in the field of research for the prevention of DM1 with the aim, also, of providing guidance on the advisability of taking such action amongst the general public or in individuals with risk factors (such as first-degree relatives).

2. Contribute to the better recording and monitoring of clinical trials within the Andalusian Autonomous Community regarding the prevention of DM1.

3. Regarding genetic counselling, information should be given on the risk of DM1 in descendants according to the degree of family relationship.

Prevention of DM2

DM2 is one of the fastest developing chronic diseases in the world. This is partly related to the growth and ageing of the population, but it is also appearing at increasingly early ages and this fact seems to be related to other factors – genetic, certain ethnic traits, obesity, fat distribution, physical inactivity, smoking, a background of gestational diabetes or impaired glucose tolerance.

Genetic factors: There is a known genetic component in DM2. The risk of suffering DM2 for a first-degree relative is 5-10 times greater. The genetic basis of the most common form is still unknown. Inheritance in DM2 is polygenic and seems to be unrelated to genes linked to the HLA system. In some forms of adult diabetes that appear in young people (MODY-type diabetes), the mechanism for transmission is dominant autosomic so it affects 50% of descendants. To date, there are no useful methods for prenatal diagnosis or any set indications.

Table 2 shows estimates of the risk of developing DM2 in first-degree relatives (parents, siblings, and children) of trial subjects (with DM2).

Table 2. Approximate risk of developing DM2 in first-degree relatives

GROUP	RISK (%)
Non-related	2.5-5%
Relatived	
Child	10-30
MODY-type DM1	50
Sibling	10-26
Identical twin	90-100
MODY–type DM	50

Modifiable risk factors: Primary prevention in diabetes should address DM2. The following are the modifiable risk factors:

- *Obesity:* The risk of developing diabetes increases constantly with obesity and is approximately 5-10 times greater in obese individuals than in the non-obese. According to the Andalusian Nutritional Survey, 21.6% of the population aged between 25 and 60 is obese (BWI $\geq$ 30 kg/m^2) and 39% is

overweight (BWI = 25-29.9 kg/m^2). It is noted that the prevalence of obesity in Andalusia presents higher values than those estimated for the Spanish population, both the general average (21.6 vs. 13.4%), and in the group of men (19.9 vs. 11.5%) and women (23.3 vs. 15.3%). In a study carried out in four Spanish cities (Cadiz, Murcia, Orense and Madrid), there is a high prevalence of overweight and obesity. This is related to the consumption of a hypercaloric diet, with a large intake of saturated fats, proteins and sugar, and a low intake of complex carbohydrates and fibre. In the 2 cities with high rates of mortality from ischaemic cardiopathy (Cadiz and Murcia), BWI is greater in children, with a larger intake of calories, lipids and sodium in comparison with the 2 cities with low mortality rates from ischaemic cardiopathy (Madrid, Orense).

- *Fat distribution:* In addition to total obesity, the distribution of body fat also seems to play an important role in the development of diabetes. Abdominal obesity is an important indicator of risk for DM2 and should be focused on in weight reduction programmes.

- *Dietary factors*: People with a high intake of total fats and saturated fats have a greater risk of diabetes. Reduction in the intake of total fats to <30% and of saturated fats to <10% reduces the risk of diabetes. In the Andalusian Nutrition Survey, the following data were gathered regarding diet:
    - Average fibre intake (17.5 g) below the nutritional goals proposed for the Spanish population (25 g).
    - Predominance of animal origin foodstuffs, especially meat and dairy products.
    - Reduction in consumption of vegetable origin foodstuffs, especially bread, cereals, potatoes and pulses.
    - High total fat consumption. Monounsaturated fatty acids fall within the recommended levels due to the intake of olive oil, saturated fatty acids are above recommended levels for the Spanish population and polyunsaturated fatty acids are within recommended levels.

- *Physical activity:* Several studies have shown that physical activity affords protection against diabetes in both adults and the elderly, more in the obese than in the non-obese. It has been estimated that people who exercise have 30-60% less risk of developing diabetes than those who do not. Risk decreases with increased frequency and intensity of physical activity. The percentage of people with sedentary habits in Andalusia is estimated to be very high.

- *Gestational diabetes (GD)* increases the risk for women of developing diabetes in the short, medium and long term. It has recently been suggested that intra-uterine development of the foetus in an anomalous metabolic medium may determine the development of diabetes, hypertension, dyslipaemia and obesity in adulthood.

- *Impaired glucose tolerance (IGT).* This is an area of interest because it not only represents the preliminary step prior to onset of diabetes and therefore indicates an opportunity for preventive action but also, a relationship has been observed with macrovascular disease, which we know to be the main cause of death in such patients.

- *Smoking:* Some epidemiological studies associate smoking with the development of diabetes. Smoking is one of the factors which may increase insulin resistance and interfere with its action. Smokers who have maintained the habit for more than 25 years have a greater risk of DM2

Actions

In prevention, the intervention strategies for the general public are similar to those described for reducing cardiovascular disease and cancer. Cooperation is required amongst various sectors so that, through legislative, educational and financial measures, healthy lifestyles can be promoted, with increased physical activity, balanced diet, reduction in overweight and cessation of smoking. Together, such measures should help reduce the incidence of diabetes, cardiovascular disease and cancer.

During the period 2003-2007

1. With regard to the general public, the healthcare institutions shall:

a. Design, implement and evaluate strategies for reducing the risk of diabetes type 2 amongst the general public. This will involve acting together with other bodies:

- *Public Administration and institutions*:

- *Regional Ministry of Education*: Actions in schools.
  - Strategies to promote the consumption of healthy diets and resources to improve or create sports facilities.
  - Introduction in the syllabus of the positive effects of the Mediterranean diet and the promotion of healthy eating habits and physical activity.
  - Information materials to promote the Mediterranean diet.
  - Establishment of the schools community as a target group (teachers and parents).

- *Regional Ministry of Governance* (Directorate General for Consumer Affairs): Measures to improve food labelling (at present in small print, occupying less than 10% of total label space).

- *Regional Ministry of Social Affairs, Department for Sports and Tourism, Directorate General for Young People, Trade Union and business organisations, scientific associations, professional associations, Andalusian Federation of Municipalities and Provinces*: Recommendations and support for initiatives to create attractive, safe places to carry out physical activity, promotion of public transport.

- *Food sector*: Recommendations and advice on the production of attractive healthy foods.

- *Agreements with the catering sector* to promote the Mediterranean diet and healthy menus.

- Introduction of health promotion and prevention goals in the *Andalusian Plan for Healthy Companies.*

- *Mass media*: recommendations and support for healthy actions through news items, advertisements, programmes and competitions.

b. Promote **institutional information and awareness campaigns on diabetes and healthy habits** (messages in public places, mass media): promotion of the Mediterranean diet (fruit, vegetables, fish, pulses, olive oil).

Such actions should be coordinated with those for the prevention of cardiovascular disease and some types of cancer.

2. With regard to people with risk factors, the health institutions shall :

a. Guarantee ***Continuous Training for professionals*** on:
- Risk factors for diabetes and possibilities for prevention
- Effective actions to promote healthy lifestyles (balanced diet, increased physical activity, cessation of smoking)
- Communication techniques (motivational interviews, group sessions, etc.)

b. Draw up materials *to support actions*

3. Health centres and healthcare professionals shall set up methods for the following:

a. Appropriate and timely screening for risk factors to complement screening for cardiovascular risk factors, to establish strategies for action on lifestyles
- Establish programmes for monitoring people with Impaired Glucose Tolerance and women with Gestational Diabetes for the early detection of diabetes and actions to try to prevent diabetes type 2.
- Develop techniques for motivational interviews and education sessions for groups of people presenting risk factors.
- Promote participation with the community in health education programmes and as part of healthcare, dietary advice and physical activity.

b. Regarding genetic counselling, provide information on the risk of DM2 in descendants in the case of MODY-type diabetes. There are no consistent arguments for doing so for other forms of DM2.

IV.3. Healthcare: Management of the Comprehensive Healthcare Process

A central section of the Plan is the **redesign of the healthcare model through Management of the Healthcare Process**. Diabetes is included as one of the top priorities in the Regional Ministry of Health's Quality Plan, which structures care delivery on the basis of a model for shared care, establishing a recording system that is suitable for a chronic process, with planning of visits and methods for recapturing patients. The Single Health Record and the Diabetes Card will be useful in this model of shared care. Key elements in the Process are: early detection of diabetes, planning and monitoring of treatment and therapeutic education.

Systematic actions are considered to improve control, early detection and treatment of the complications of diabetes. Technology is to be provided and renovated in health centres for the early detection and treatment of diabetic retinopathy (digital retinographs, laser therapy units for retina photocoagulation) to guarantee access for patients and proper treatment. Also a digital radiology

unit for surgical revascularisation of small vessels in a reference centre in Western Andalusia to complement the unit that already exists in a centre in Eastern Andalusia.

Consideration will also be given to the development of specific programmes based on telemedicine and the inclusion of subcutaneous insulin infusion pumps for salvage treatment for patients meeting the requirements laid down in the Plan (patients who show insufficient response to intensive insulin treatment, fertile women in pregnancy programmes or pregnant women).

An important element is organisation of Day Hospital care in health centres for appropriate patients, with the aim of improving their quality of life because to date they have had to be admitted to hospital although this is not strictly necessary. Human resources will be adapted to achieve territorial balance throughout the Andalusian community. It is recommended that a professional should be appointed to be in charge of the Diabetes Process in every healthcare centre (hospitals and health centres). The diabetes reference group shall be set up in the Andalusian Community, comprising representatives from all the professional bodies involved, for the monitoring and updating of the healthcare process. Factors for cardiovascular risk and psychological problems are other aspects covered in the improvement of care for people with diabetes. Essentially, the aim is to achieve horizontal organisation, with cooperation from Primary Care and Specialist Care, defining quality standards for each step in care, establishing recommendations on the basis of scientific evidence and determining the precise needs and skills of each professional involved in the process.

In view of the relevance of laboratory testing in the care of diabetes, methods shall be adopted for the standardisation and quality control of laboratory techniques (glycaemia, glycosilate haemoglobin, microalbuminuria, etc.).

The key elements in developing the diabetes healthcare process are:

- Early detection
- Treatment and monitoring
- Therapeutic education

Early detection

It is estimated that for every person with diabetes there is one as yet undiagnosed. Diabetes type 2 is said to be diagnosed with a delay of 5-10 years, by which time chronic complications are present in 30% of patients.

Populational and selective screening in the Andalusian community require large levels of resources and are not known to achieve a positive impact on health in the long term. They are therefore not considered cost-effective and are no longer recommended. Since early detection is considered important for altering the course of diabetes and avoiding complications whenever possible and since by nature it is asymptomatic in most cases, a consensus has been reached to carry out timely screening in the risk population for early detection of DM2 whenever there is contact with the health system for whatever reason.

In the case of DM1, which usually has a sudden onset, patients have often consulted their doctors in the previous few weeks or days for symptoms which, had they led to intervention to confirm or rule out diabetes, would often have prevented the development of ketoacidosis and coma.

Actions

During the period from 2003 to 2007 health centres shall:

1. Guarantee a diagnosis in the early stages of DM1 and DM2, preventing the appearance of severe complications and the development of chronic complications, by means of:
   - *Creating awareness and providing training for professionals for the detection of symptoms and signs for the early detection of DM1*.
   - *Setting up programmes for timely screening in people presenting DM2 risk factors.*
   - *Development of screening for gestational diabetes in women with moderate or high risk during pregnancy, with post-natal evaluation in cases of diagnosis of gestational diabetes.*
   - *Identification of areas of probable infradiagnosis to detect related factors and establish corrective measures where appropriate.*

Treatment and monitoring

In the monitoring of patients with diabetes, activities focus on optimising metabolic control and the detection and early treatment of chronic complications.

For intervention in chronic problems to be effective, the participation of multi-disciplinary teams is necessary. People with diabetes come into contact with many health-related professionals during the course of their lives. A lack of proper communication and coordination may have unfortunate consequences for patients and their families and for professionals. If criteria are established for inter-consulting and cooperation, then high quality care can be delivered to diabetics, integrating different services and creating what is known as the Shared Care model.

There is no doubt that Primary Care plays a strategic role as it allows a comprehensive, longitudinal and on-going approach throughout the patient's life.

There has been much discussion about the good and bad results obtained when diabetic patients are treated in Primary Care. Unstructured care at Primary Care level is associated with poor monitoring, bad control and high mortality, as when care is provided in an unstructured way in other areas. It has been shown that an organised, structured system with computerised records, regular check-ups and recapture systems for patients and their doctors can lead to results that are as good as or better than those achieved in hospital care.

Diabetes is a chronic process, one that requires changes in the care given through the health system. Actions of many types must be taken with professionals and in the organisation of health services to improve the care received by diabetics. Actions with professionals that have proved to be useful include continuing training, audits, local consensus and reminders. At service organisation level, changes in recording systems are needed, as well as the review of professional roles and regular, programmed visits with recapture systems.

Care for the population with diabetes should be delivered in each area of healthcare, evaluating needs and resources – both human and instrumental, and involving the management structures at

[2] Translator's note: In Spain, this stage of schooling is for entry to higher education.

primary and specialist care so that they can develop the Diabetes Healthcare Process. Coordination must be achieved amongst the different healthcare levels to ensure on-going care based on the same working methodology throughout, and amongst all those involved in the care of patients with diabetes in the Andalusian community.

General Actions

During the period 2003-2004

1. During initial evaluation and treatment all health centres shall:

a. Promote care for patients with initial DM1 in a Day Hospital organisation, in the absence of severe complications, for initial evaluation, the start of insulin treatment and an intensive, initial diabetology education plan.

b. Provide care for patients with initial DM2 in Primary Care, in the absence of severe complications, for correct initial evaluation, the start of treatment and a basic diabetology education plan adapted to the characteristics of each patient.

2. During monitoring, all health centres shall:

a. Implement and develop healthcare for patients with diabetes through the comprehensive healthcare process by means of the following:

- Promotion of multidisciplinary coordination and cooperation amongst all the professionals and services involved to guarantee continuity of care, facilitating participation by all the different professionals, irrespective of their area of action, in order to create a line of work based on shared goals, and systematised activities.

- Guarantee the creation and use of the Shared Single Case History.

- Local development and implementation of the Diabetes Healthcare Process, by consensus amongst all those involved.

- A system for the recording and control of patient monitoring activities (metabolic control, screening for complications), to be included in the digital case history, to allow the patient's situation to be monitored and any non-compliance with quality standards detected, at any time.

- Regular check-ups will be organised, planned and systematised to evaluate control, adjustments to treatment, early detection and treatment of complications.

- Mechanisms for recapture shall be established to prevent any interruptions to monitoring because of patient absence.

- Programmes for quality control and on-going improvement.

- The diabetes reference group shall be established in the Andalusian Autonomous

Community, comprising representatives from all the professional groups involved for the monitoring and updating of the care process.

Specific Actions

When monitoring diabetes patients, there are two specific aspects that must be evaluated – metabolic control, and screening for chronic complications to facilitate early detection and treatment.

Evaluation of metabolic control

There are three critical points for evaluating metabolic control:

- Determination of HbA1c is the gold standard for evaluating glycaemic control in the medium and long term in diabetes patients. However, the methods and reference materials used vary greatly so it is very important to achieve standardisation of techniques and materials. Although there is no international agreement on a reference method, in 2002 the International Federation of Clinical Chemistry (IFCC) published the results drawn up by a working group on a reference method for determining HbA1c in human blood based on the use of HPLC and mass spectrometry or HPLC and capillary electrophoresis. The two methods give identical results. In the US, the National Glycohaemoglobin Standardization Program (NGSP) allows just two types of accredited laboratory – Level I with a coefficient of variation below 3% and Level II with a coefficient of variation below 5%.

- Test strips are very useful for facilitating glycaemic control - for the prevention and detection of hypoglycaemia and the detection of hyperglycaemia. However, determination is very imprecise and there are differences between the strips from different commercial firms. It is recommended that determinations with glucose meters show maximum deviation of 5%.

- Determination of glycaemia in venous plasma. The diagnosis of diabetes mellitus is based on the determination of basal glycaemia, at random or 2 hours after oral intake of glucose. Determinations of glycaemia also serve as a complementary method to glucosilate haemoglobin in the evaluation of glycaemic control. This is perfectly simple, but when samples are taken in outlying centres, the blood samples often have to be transported to the reference laboratory so that several hours may pass between extraction and analysis. This is very important because glycaemic levels may drop by about 7% per hour unless the sample is centrifuged.

Actions

In order to guarantee quality and standardise the laboratory techniques and procedures in the evaluation of metabolic control, the following Actions are laid down for 2003-2004:

1. ***Establish a quality plan for glycaemia testing, covering the following:***

    - ***Testing for glycaemia in venous plasma, in health centres*** (including outlying extraction centres): centrifugation of the sample for 30 – 60 minutes after extraction (or conservation in tubes with glycolisis inhibitors) and refrigeration at 4-6ºC until testing. Testing by enzyme techniques in venous plasma.

    - ***Testing for glycaemia using a glucose meter in health centres:*** Quality control for apparatus

in regular use in health centres that use the reference laboratories.

- ***Self-testing by patients for glycaemia using glucose meters***. Glucose solutions are used that simulate the viscosity of total blood, with three different glucose concentrations to check at least once a year the reliability of the meters used by patients.

2. ***Promote standardisation of the test for HbA1c*** in all laboratories in Andalusia. At least one laboratory should be accredited in the Autonomous Community by the NGSP which shall be the point of reference for accreditation of other laboratories. It should be stipulated in tenders that equipment used for testing HbA1c is accredited.

Early detection and treatment of chronic complications

Early detection and treatment of diabetic retinopathy

Comprehensive action for the prevention and treatment of eye complications in diabetes should be based on:

-Prevention (control of risk factors: glycaemia, hypertension).
-Early detection (screening and diagnosis of diabetic retinopathy).
-Proper treatment of diabetic retinopathy.

Study of the fundus of the eye is necessary to detect diabetic retinopathy and is usually carried out by means of direct ophthalmoscopy. This method has been described as presenting very low sensitivity, even in expert hands. Sensitivity may even fall below acceptable levels if exploration is carried out by inexpert doctors. Direct ophthalmoscopy is not therefore the preferred method for screening diabetic patients.

The preferred type of examination of the fundus for the detection of diabetic retinopathy today is 7-field, 30º stereoscopic retinography (14 photographs), as well as slit-lamp ophthalmoscopy with contact or non-contact lens. The problems that arise for screening stem from the time needed for examination – approximately 30-45 minutes – and the need for it to be carried out by experienced ophthalmologists.

Although many methods have been studied for systematic screening of the diabetic population, there is no consensus as to which is the best. It has been stated that digital retinography is an ideal method, reaching figures that meet the St Vincent criteria (80% sensitivity and 95% specificity), even with non-midriatic retinographs. Screening based on retinography can be carried out irrespective of the values and has the added advantage of providing lasting records.

An analysis carried out by the technology evaluation agency of the Basque Country into the cost-effectiveness of non-midriatic fundus cameras in the diagnosis of diabetic retinopathy resulted in a cost per real positive case detected of 18,883 Ptas. using the traditional method (biomicroscopy with a non-contact lens), whereas with the non-midriatic fundus camera the cost is 12,642 Ptas. The latter method gives sensitivity of 91.9% and specificity of 89.7%.

Current possibilities for computerised connections amongst different points of the health system in Andalusia make digital retinography a suitable method for screening for diabetic retinopathy,

complementing the activity of the Ophthalmological Services of the Andalusian Health Network. It offers the following advantages:

- Screening of patients for the detection of diabetic retinopathy which may endanger vision is feasible within recommended times, allowing early treatment when needed and reducing the number of cases of blindness caused by diabetes.
- Provision of ophthalmological care for patients located far from hospitals, avoiding the need for travel.
- Reduction of waiting lists for ophthalmological consultations.
- Easier connections and coordination amongst health centres and specialist care providers.

The main problem involved in the use of retinographs in diabetes is that they do not detect clinically significant macular oedema. However, most patients with macular oedema also present a reduction in visual acuity and/or diabetic retinopathy lesions that are detectable with retinography. For this reason, in screening for diabetic retinopathy by means of retinography, before the photograph is taken, corrected or stenopeic visual acuity should first be measured.

Recommendations for the healthcare process vary for DM1 or DM2:

- In patients with DM1, as of 5 years after diagnosis or from puberty visual acuity should be measured and the fundus examined with the pupillary dilation with biomicropscopy or digital retinography in hospital centres or outlying specialist centres.
- In patients with DM2, once diagnosed, visual acuity should be measured and the fundus examined with pupillary dilation every 2 years in low-risk patients and every year in other cases, combining different methods depending on the availability of human resources and equipment in the area (biomicroscopy with contact or non-contact lens, or digital retinography in hospital centres or outlying specialist centres, digital retinography in health centres using mobile or fixed retinography units).

Actions

During 2003, digital retinography will be assessed as a systematic method of detection by means of a study into the cost-effectiveness of implementing it in our health system.

As of 2004, the best (most cost-effective) clinical methods will gradually be introduced to ensure that all the population with diabetes receives the necessary fundus examinations.

As of 2003, the following Actions are established with the aim of preventing the appearance of chronic eye complications and if present, detecting them and treating them early in order to reduce the number of cases of blindness caused by diabetes**.**

1. Guarantee proper treatment of diabetes-related eye complications:

    - By facilitating access for patients with diabetes to ophthalmological clinics in health centres within the public network.

    - By providing ophthalmological services with the necessary equipment (digital angiography, laser therapy, vitrectomy) as required in each centre.

2. Guarantee retinopathy screening in people with diabetes in order to carry out early diagnosis of treatable diabetic retinopathy, through:

   - The use of all the health resources available today. Combination of existing resources will increase the percentage of the population than can be screened:

     - Use of retinographs in specialist centres and hospitals together with fundoscopy by ophthalmologists in hospitals and specialist centres and by doctors treating patients with diabetes (general practitioners, endocrinologists, internists)

     - Training of professionals.

     - Creation of awareness amongst professionals that they must follow the quality standards laid down in the Diabetes Process (pupillary dilation and periodic examinations).

3. Creation of a method for recording eye problems in diabetes patients, to be included in the digital case history, for the purpose of checking examinations, interventions and indicators.

Early detection and treatment of diabetic foot

The prevalence of diabetic foot is estimated at 8-13%. Diabetic foot lesions are responsible for 20-50% of hospital admissions of patients with diabetes. Patients with diabetic foot generate 3 times more emergency and accident visits and 22 more doctor's visits, with hospital stays ranging between 30 and 40 days. Average expenditure on care for diabetic foot is estimated at about 27,000€.

Approximately 40-60% of non-traumatic lower limb amputations are carried out on patients with diabetes. 30-50% of cases of minor or conservative amputation require re-amputation within a period of 1-3 years, 50% of patients with one amputated limb show complications on the other foot after 2 years, and there is a 50% possibility of a further amputation during the next 3-5 years. Peripheral vascular disease is associated with 62% of unhealed ulcers and is the cause of 46% of amputations.

Diabetic foot is a serious, complex pathology with a very high economic and human cost, requiring a multidisciplinary approach. The professionals involved must adopt practices to achieve the goals established. The main responsibility for those providing foot care is to recognise risk and note early lesions. It is also essential that patients carry out observations to note the appearance of lesions. Education must be provided to all patients with diabetes, especially those in risk categories.

Efficient organisation requires establishing protocols for education, screening, risk reduction, treatment and supervision. There is strong evidence that the creation of a multidisciplinary team for overall foot care reduces the need for amputation. It is essential that patients should feel that they too belong to the team.

Actions

As of 2003, the following Actions are established for detecting and correcting feet at risk, reducing the rate of diabetic foot, reducing the number of amputations and increasing the number of rehabilitated patients.

1. Annual screening strategies for diabetic foot will be adopted in all health centres and education will be provided to encourage low-risk patients to carry out self-care, stepping up surveillance once a foot at risk is detected. Professionals will receive training and will be provided with the necessary tools for detection.

2. Promotion of functional organisation for overall care of diabetic foot, based on:
    - Formation of a multi-disciplinary team with coordination of all the parties involved
    - Appropriate sizing of teams
    - Necessary technology and instrumentation
    - Awareness and training for the professionals involved
    - Establishment of channels for communication and methods of coordination
    - Solution of diabetic foot problems by professionals with the necessary skills for nail care, callus treatment, orthoses for lifting pressure from ulcers

3. Production of a guide to clinical practice, establishing protocols for primary care and hospital ward care, avoiding the need for internal formalities which slow down the process and defining the actions to be taken by each party in accordance with patient type.

4. Monitoring compliance with the quality standards of the Diabetes Care Process and of the results obtained.

Screening and treatment for cardiovascular risk factors

Cardiovascular disease (CVD) is the main cause of mortality and morbidity in the population with diabetes for whom the risk is 2-3 times greater in men and 4-5 times greater in women. Myocardial infarction is 2-3 times more frequent in the population with diabetes and the prognosis is worse.

Diabetes is generally associated with hypertension and dyslipaemia which, together with obesity and insulin resistance, constitute the metabolic syndrome. Each on its own is a risk factor but when present together the risk of cardiovascular disease and death multiplies. Smoking also increases risk.

In studies on intervention in secondary prevention, intensive glycaemic control, lipid control and the use of aspirin have been seen to be beneficial. In primary prevention, control of hypertension has reduced cardiovascular events and possibly, when there is a high risk, glycaemic and lipid control and the use of aspirin may also be beneficial. The main challenge today is how to deal with all the risk factors together in such patients and how to advise them to mitigate their risk.

Actions

As of 2003, the following Actions are established:

1. At institutional level, comprehensive instruments for estimating cardiovascular risk will be included in the case history.

2. All health centres will carry out assessment of cardiovascular risk in all people with diabetes and

will perform any necessary interventions to optimise control in risk groups.

3. Hospitals shall adopt systems to guarantee that people with diabetes who are admitted for whatever reason and in whom a high cardiovascular risk is detected receive advice on methods for reducing risk. This will be noted in the discharge report to facilitate follow-up at primary care level.

Early detection and treatment of diabetic nephropathy

Approximately 20-30% of patients with diabetes develop nephropathy. Progressive renal damage, leading to deterioration of the renal function and possible terminal kidney failure is a serious complication of diabetes mellitus type 1 (DM1) and type 2 (DM2). Diabetic nephropathy is the most frequent cause of terminal kidney failure in westernised countries, accounting for almost 30% of all cases. Although progression to terminal kidney failure is lower in DM2, because of the greater prevalence of patients with DM2, the total number of patients with diabetes who present advanced renal insufficiency is the same for diabetes mellitus type 1 and type 2.

People with diabetic nephropathy also have a high risk of cardiovascular disease and death. Mortality in patients with diabetes and nephropathy is 8 times greater than for patients with diabetes without nephropathy.

The earliest marker of kidney disease is microalbuminuria. Its prevalence in people with diabetes is 20-30%. If there is no intervention, over 80% of patients with DM1 and 20-40% of patients with DM2 will progress towards nephropathy.

The risk of developing nephropathy increases with age, the duration of diabetes and poor glycaemic control. Other risk factors are hypertension, smoking and dyslipaemia.

Intensive glycaemic control and blood pressure control can delay the onset and progression of diabetic nephropathy.

In spite of efforts to prevent and delay the progression of nephropathy, there is a constant, increasing need for substitution treatment amongst people with diabetes.

Many people with diabetes and advanced renal insufficiency are referred to specialist units when it is too late to plan substitution treatment so the risk of mortality in such people is greater.

Once they are undergoing substitution treatment, people with diabetes find it difficult to gain access to routine healthcare for their diabetes so that they are often lost to follow-up.

Actions

As of 2003, the following Actions are adopted:

- Establish strategies for early detection of diabetic nephropathy.

- Implement and adapt to the local situation the recommendations of the Diabetes Healthcare Process with regard to screening, diagnosis and treatment of diabetic nephropathy.

- Promote functional integration of all those involved in the overall care of diabetic nephropathy in order to guarantee continued care of diabetes, optimising control and screening for and treating other complications of diabetes.

Psychological and mental health screening and treatment

It has been stated that behaviour disorders are more frequent in children and adolescents and depressive disorders amongst people with diabetes, especially those who present co-morbidity. This is an important aspect because it significantly affects their capacity for self-care.

Actions

As of 2003, the following actions are established:

1. Development of specific skills for professionals who belong to Mental Health teams, through specific training programmes.

2. Alignment of psychological support with actual demand.

Therapeutic education

Diabetes is the prototype of high-prevalence chronic disease which sometimes can be prevented but, once present, requires constant, lifelong healthcare. A key aspect of effective control is diabetological education.

There is some confusion about the effectiveness of diabetological education, especially because of the heterogeneity of studies carried out and the different outcomes considered. However, it is now widely accepted that education is required to change habits and acquire the capacity for self-care, these being key elements in diabetes, so that metabolic control can be improved and complications prevented.

It is necessary for all children, young people and adults with diabetes and their family members to receive care that will help them to take shared decisions, providing the necessary resources for them to be able to control their diabetes on a day-to-day basis and allowing them to adopt and maintain healthy lifestyles, sharing responsibility with the healthcare team. This can be achieved through information and education, whatever the method adopted.

Actions:

As of 2003, in order to improve the results of healthcare by encouraging informed and shared decision-making, and promoting self-care in people with diabetes, the following Actions are established for health centres and institutions.

Health centres:

1. Promote the inclusion of education in diabetological healthcare.

2. Guarantee that healthcare professionals caring for people with diabetes have the necessary attitudes, communication skills and knowledge for carrying out diabetological education. Promotion of the necessary training in communication skills and education.

3. Promote the design, implementation and inspection of educational programmes for training people with diabetes[1].

   - Primary care and hospital services should offer all people presenting initial DM1 or DM2 an individual educational programme allowing them to gradually obtain the necessary knowledge and skills for dealing with the disease. On completion of the initial education programme (onset stage), the people should be called in periodically for the purpose of reinforcement, evaluation of knowledge and determination of any problems for carrying out proper control of the disease.

   - Health centres should draw up an annual programme for diabetological education for groups, designed for associations of diabetics, family members and carers of diabetics, etc.

4. Information and the necessary educational programmes must be available for all people with diabetes and their family members, irrespective of age, gender or disability, so that they can understand and accept the disease from the very beginning after diagnosis.

5. People presenting diabetes should receive the necessary emotional and psychological support from healthcare personnel:

   - Evaluation of the impact of diagnosis on the person with diabetes and on the family members or carers, and follow-up and handling of the process of acceptance of the disease. Any needs for specialist psychological support must be detected and met.

   - Information and advice on social resources and benefits available (associations of diabetics,

1 Any educational intervention with people with diabetes shall cover the following :

a. Inform the patient of the diagnosis.
b. Diagnose the educational needs of the person with diabetes, determining attitudes towards and knowledge of the health problem and above all, defining health behaviour (to reinforce it) and unhealthy behaviour (in order to work towards change).
c. Establish the educational programme: goals, content, methodology, activities, evaluation (in relation to attitudes, knowledge and behaviour).
d. Follow-up, essentially to reinforce healthy behaviour and prevent relapses.
e. Evaluation of attitudes, knowledge, skills and acquired behaviour.

This plan of work shall be used for both the individual and group working methodologies.

The following areas must be covered in DM1, in the stage that immediately follows diagnosis. Psycho-social adaptation. Nature of diabetes. Injection and self-testing techniques. Diet. Prevention and treatment of hypoglucaemia. During the next 12 months: additional dietary information, Handling of insulin treatment. Physical activity. What to do when ill and when acetone occurs. Control objectives. Prevention of diabetic foot. Special situations (travel, eating out, parties, contraception, pregnancy planning in women. Chronic complications

In DM2, in the initial phase, the basic areas to be covered are: Psycho-social adaptation. Nature of diabetes. Diet. Pharmacological treatment if appropriate. During the 12 months after diagnosis, additional dietary information and pharmacological treatment, as well as the other areas specified for DM1.

Subsequently, after covering this programme, identification of individual education needs and adaptation.

patient groups, etc.).

- Strategies to improve compliance: a framework for communication shall be established to assist patients in keeping to their treatment and achieving the therapeutic objectives that are established by consensus. Action can be offered either individually or to groups to provide information and skills for dealing with the most common causes of non-compliance with treatment.

- **As of 2003**, the health institutions shall promote research into diabetological education in order to increase knowledge on the best strategies for intervention.

IV.4. Special Actions

A number of ***special programmes are available for providing care to specific target groups***, such as diabetic children, pregnant women or women in fertile age, hospitalised patients, the disabled...

Children with diabetes

Existing data point to an increase in the prevalence of diabetes, suggesting the need to conduct research on the possible causal factors that have led to this rise. The data are also a sign of the foreseeable increase in the demand for healthcare to treat Type 1 Diabetes in the years to come. Likewise, Type 2 Diabetes in expected to escalate in children and adolescents, as a result of heightened obesity rates and the lack of physical exercise in these age groups.

There are four key areas for intervention to be taken into consideration when planning healthcare for children with diabetes:

3. Early diagnosis and treatment.

4. Continuous care for diabetic children, provided by an expert multi-disciplinary team specialising in child diabetes, in close collaboration with Primary Care.

5. Healthcare for diabetic children out-of-hospital or in care centres.

6. Smooth transition (*organised, planned and agreed*) between teams of healthcare professionals delivering paediatric and adult care to diabetes patients.

Actions:

The following actions were established as of 2003:

1. *Guaranteeing early diagnosis and care for children with diabetes.* The aim is to deliver diagnosis as soon as clinical suspicion arises and to start the insulin regimen within 24 hours, under the supervision of a specialist team, in order to curb the incidence of ketoacidosis as the clinical manifestation of the disease.

Patients are detected on the basis of symptoms presented at the healthcare centre or hospital emergency admissions departments. When faced with clinical suspicion of the disease, in no case should diagnosis be delayed, and complete blood tests should be conducted. The condition must be diagnosed immediately and the child should be admitted into hospital to initiate insulin therapy and ensure access to the healthcare team specialising in child diabetes.

Schools, nurseries, child day-care centres, and other establishments caring for children, should be briefed on the symptoms and signs of Type 1 child Diabetes.

To accomplish this aim, the following actions are established:

- Actions to be implemented at primary care centres and hospital emergency admissions departments. They should be equipped with devices for measuring glycaemia (glucometers) and ketonemia. The patient will be referred to a specialist child diabetes team after a phone briefing (using telephone contact numbers), with a medical report (on paper or via e-mail). Depending on the time or day of the week, the child could also be treated by hospital emergency admissions departments which should have the necessary means at their disposal (knowledge, skills, and attitudes, resources) to deliver emergency treatment to diabetic patients.

- An outreach plan on the signs and symptoms of child diabetes targeting families. Information is to be provided in writing – diptychs, posters, letters… - and sent by post to homes, child day-care centres, or health centres.

2. *To promote the delivery of continued care to diabetic children by a multi-disciplinary expert team specialising in child diabetes.*

   Patients and their relatives should be provided with adequate treatment as soon as the disease is diagnosed by a multi-disciplinary expert team specialising in child diabetes. If no severe complications are present, efforts will be made to deliver care at a healthcare centre. Patient follow-up should be carried out by the same team, endeavouring to achieve optimal metabolic control, in close collaboration with Primary Care.

   It would be desirable to find solutions to help parents reconcile work with essential education/ training in diabetology, avoiding any possible hindrances, as soon as the disease has been diagnosed (training should include both parents).

   When patients are admitted into hospital to treat severe complications (severe hypoglycaemia, ketoacidosis), efforts will be made to avoid prolonging hospital stays for more than three days. Out-of-hospital monitoring should be carried out by a team specialising in care for stable diabetic children. The team should be formed by an expert paediatric physician, a nurse specialising in child diabetes education, and patients/relatives shall be provided with access to a child psychologist, social worker and expert in child nutrition, if necessary.

3. *Optimising healthcare delivery to diabetic children beyond the healthcare setting (schools, holiday camps….).*

   With the aim of providing healthcare to diabetic children outside hospital/healthcare facilities, the

following intersectoral targets are established:

- Collaboration in organising seminars and workshops on child diabetes, targeting teachers, tutors, coaches, facilitating their attendance.

- Producing a healthcare protocol for diabetic children to be displayed in nursing facilities. Include glucagon in first-aid kits at schools.

- Producing educational/outreach material.

4. *To promote a smooth transition between paediatric physicians and specialists for adults.*

   The developmental transition between childhood and adulthood includes puberty-related biological changes that raise further complications for diabetic patients and healthcare professionals alike. Teenagers are at higher risk of recurrent ketoacidosis, poor metabolic control, risk-taking behaviour, the escalation of microvascular complications, lack of treatment compliance and follow-up.

   With the aim of delivering satisfactory age-related follow-up and to ensure a smooth transition between follow-up teams from child to adult diabetics, the healthcare system will design, implement and audit a transfer process between paediatric specialists and physicians for adults, identifying and re-recruiting non-compliant patients. The following specific actions are required:

   - Flexible and customised care. Efforts will be made to treat patients individually, ensuring privacy while creating an atmosphere of trust with the team of healthcare professionals. Information on sexual health, pregnancy, contraception, avoiding toxic substances (tobacco alcohol and drugs). Promote leisure activities and exercise.

   - Preparing for discharge in advance, with shared decision-making with patient. Efforts will be made to avoid discharging patients at times of emotional instability and poor metabolic control with the aim of avoiding possible compromise of patient follow-up.

Women of fertile age or pregnant women with diabetes

Diabetes is a disease that increasingly presents complications during pregnancy, compromising the future of mother and child. 0.3% of women of fertile age suffer from diabetes. By providing appropriate healthcare, most complications can be reduced to levels of prevalence in the general population.

Two, very different situations may arise

- **Pre-gestational Diabetes** is diagnosed before current pregnancy, in the form of DM 1 or 2, or hydrocarbonated intolerance.

- **Gestational Diabetes** is diagnosed for the first time during current pregnancy.

Three circumstances can be present in **Pregestational Diabetes**:

1. Diabetic women of fertile age who

- ***Do not wish to conceive:*** the urgent priority is to establish an efficient contraceptive method.

- ***Do wish to conceive:*** Women require intensive control to achieve optimal metabolic control. Strict pre-gestational control should be conducted at least 6 months prior to conception. Also recommended is the use of a method of contraception for at least 3-6 months until optimal metabolic control is achieved. Any circumstances that may render pregnancy ill-advised should be discussed with the patient – poor metabolic control, proliferative retinopathy, ischemic heart disease, nephropathy with renal function decline.

2. Pregnant women with diabetes

- These patients must undergo intensive assessment and control from the early stages of pregnancy by a multi-disciplinary emergency team with specific skills in providing care for diabetes and pregnancy.

3. Postpartum

- An **effective method of contraception** should be established as early as possible, **informing** patients of the need to follow strict pre-gestational control if they wish to conceive again.

- It is also important to convey the importance of continuing with proper metabolic control and to review the insulin regimen as, in most cases, insulin requirements tend to diminish at this stage.

- Breast feeding is advisable.

Gestational diabetes is one of the most frequent problems arising during pregnancy. It is currently defined as "varying degrees of hydrocarbonated intolerance, recognised for the first time during pregnancy". It is diagnosed in 3-6% of all pregnancies. Empirical studies have associated it with foetal complications – increased perinatal morbidity and mortality rates, malformations and macrosomia – and maternal complications – gestation problems, increased caesareans, and heightened risk of short, medium and long-term Diabetes.

Women at high risk of suffering gestational diabetes are recommended to undergo screening as early as possible, during the first consultation, to rule out previously unknown pre-gestational diabetes.

Women diagnosed with GD are at high risk of presenting glucose tolerance alterations, and other cardiovascular risk factors at postpartum, in the short, medium and long-term. Early intervention might be invaluable to prevent type 2 diabetes and cardiovascular disease.

Actions

The following lines of action were established as of 2003:

1. **At health centres/hospitals**

- Resources will be provided to set up multi-disciplinary teams (endocrinologist, internist, GP, obstetrician, nurse, paediatric specialist, midwife) to ensure comprehensive follow-up of women with pre-gestational or gestational diabetes. .

- Effective family planning should be guaranteed, by actively recruiting diabetic women in fertile age, to provide them with information and appropriate contraception. In addition they will be briefed on the importance of planning pregnancy in close collaboration with their doctors to establish pre-gestational control.

- Postpartum assessment for women with gestational diabetes will be promoted, offering screening and preventive programmes focusing on healthy lifestyles. For women with pre-gestational diabetes, endeavours will be made to establish methods of contraception that will allow planning future pregnancies.

2. **Healthcare institutions** will conduct outreach campaigns conveying the need for diabetic women to adopt an effective family planning strategy.

Hospitalised patients

Patients with diabetes are invariably admitted into hospital for reasons that are not related to their disease. Not paying enough attention to diabetes care during hospital admission or following discharge may lead to metabolic decompensation.

Actions

With the purpose of improving diabetic patient care during hospital admission and following discharge, the following actions were established as of 2003.

1. **Hospitals** guarantee comprehensive and coordinated care for patients with diabetes during hospital admittance. Healthcare will be delivered in the framework of the responsibilities established for management of diabetic patients. In addition, continuity of care must be guaranteed as a part of overall quality.

Institutionalised patients

In some cases, diabetic patients that were being cared for by the Andalusian Public Health System are put into institutions (old people's homes, drug addiction treatment centres, orphanages, prisons...), so diabetes control is assumed by these institutions.

Actions

To avoid poor control and ensure institutional follow-up of diabetic patients, the following action plan was established for the period 2003-2006:

1. Intersectoral agreements to be established in a framework of collaboration and cooperation with the Regional Ministries for Justice & Public Administration and Social Affairs in Andalusia, to guarantee a well-coordinated approach and to ensure continuity of care while patients remain

under the care of institutions, in accordance with the quality standards established in the Comprehensive Healthcare Process for Diabetes.

Patients with disabilities

The chronic complications that arise in the course of diabetes may lead to disabilities that sometimes restrict patient autonomy, forcing them to abandon self-care. Likewise, patients who previously suffered some form of disability may also develop the disease with foreseeable limitations to self-care.

The provision of healthcare to these individuals should focus both on patients and care-givers, as well as on the setting where patients lead their daily lives. It is therefore essential - more so in such cases - that a multi-disciplinary team of healthcare professionals provide assistance to the patient to identify and respond to any care requirements that may arise.

Hence, these patients require tailored care applying the healthcare approaches applicable both to diabetic and disabled patients, or those undergoing disabling diseases. As to targets, activities, types of healthcare professionals and times devoted to each patient at health centres, the same applies here as for any patient without a disability.

Healthcare will only vary in terms of adapting the disability that poses restrictions. Among the most frequent in diabetic patients are:

- Amputation of lower limbs.
- Visual impairment or total loss of vision.
- Dialysis.

Actions

The following actions were established for the period 2003-2006 to ensure adequate provision of healthcare for diabetic patients with some form of disability:

1. To assess the patient's self-care skills, strengthening and promoting them.

2. To assess care-givers' skills, strengthening and promoting them.

3. To understand which patients' needs are not being met in his/her environment.

4. To offer and make available the necessary resources – both material and human – to cover those needs...

IV.5. Associations of Diabetes Patients

Associations of Diabetic Patients play a highly significant role in modern societies. They understand the day to day reality of patients with diabetes and hence are able to act as a channel for conveying their problems to healthcare organisations, while helping to raise public awareness about the disease. In addition, they feed their own experience into the process thereby contributing to improving diabetic patients' quality of life and particularly during the initial stages of the disease, they help patients and their relatives accept and cope with the disease. For these reasons, this Plan contains a special

programme aimed at promoting and fostering joint activities with these Associations.

Actions

The following actions were established for the period 2003-2006:

1. Collaboration agreements to be set up with Associations of Diabetic Patients.

2. Together with these Associations, a joint outreach action plan will be promoted to raise the awareness of the public and healthcare professionals alike.

3. Focal groups will be established in an active endeavour to identify the expectations held by patients and their relatives.

4. Associations will be encouraged to take part in groups set up to improve the healthcare process for these patients.

5. Mutual support groups at local level will be encouraged, and will be provided with educational material and training/outreach programmes, in response to requests for joint collaboration in this area.

6. Collaboration agreements will be signed with these Associations, to foster activities that will enable full integration of diabetic children and adolescents, through meetings, workshops, camps etc.

IV.6. Information systems

Information systems are the basic pillar for implementation of the Comprehensive Diabetes Plan, since they furnish data that allow conducting the planning, management and assessment stages of the Plan. They also provide support for healthcare, training and research activities. One of the actions addresses the incorporation of mechanisms to improve information systems:

The data sources available to date are as follows:

a) Mortality registers

b) Minimum Basic Set of Data (MBSD) at hospital discharge

c) Questionnaire on nutrition
d) SIFAR: the prevalence of diabetes treated with anti-diabetic agents, as indicators of quality in prescriptions for diabetes.

e) Registry of Patients with End-Stage Chronic Renal Failure undergoing Replacement Therapy in Andalusia

f) Population census and forecasts

g) Health Survey

Implementation of the *TASS Clinical Record* in all primary care centres, including a *section on follow-up of healthcare processes*, that brings in three priority indicators for registering and monitoring the Diabetes Healthcare Process in TASS (prior to implementation of the new Diraya Health Record): Findings regarding HBA1c, screening of eye grounds and inspection of feet.

IV.7. Research line

The ***Research Plan*** is given added thrust particularly by promoting basic and epidemiological research, research for primary care prevention and clinical research. Diabetes is now a priority in the call for Research Projects published by the Andalusian Regional Ministry of Health. It is important to highlight that a legal framework has been established in Andalusia to support stem cell research for obtaining insulin-producing cells and islet transplantation, as therapeutic alternatives to diabetes.

Actions

The following actions were established as of 2003:

- More investment for diabetology research.
- Promoting diabetes-related research in line with the Health Research Framework Programme in Andalusia.
- Promoting training of researchers in the field of diabetes, while creating and developing infrastructures and settings for diabetology research. Also, coordination of research on diabetes in Andalusia, fostering the creation of regional, national and international research networks focusing on diabetes-related research.
- Strategies to be established to promote transfer of research results to clinical practice.
  - Promote basic, clinical and epidemiological research and also research into health services.

IV.8. Training Line

The Plan proposes implementation of a ***Specific Training Plan*** which adapts professional skills to those defined in the skills map contained in the Diabetes Healthcare Process.

UNDERGRADUATE TRAINING

Actions:

The following actions were established for the period 2003-2007 with the purpose of ensuring that graduate medical and nursing students leave college capable of identifying and managing diabetic patients, according to best in class knowledge and efficient criteria:

1. **Enhance relations and coordination between Regional Departments** for Education & Science, and Health in terms of:

   - Academic cooperation between Medical Faculties and Schools and the Andalusian Public Health System's healthcare network.

   - Adapting syllabuses at Medical Faculties and Nursing Schools to promote enhanced education on diabetes and care of diabetic patients.

   - Providing adequate resources (space, staff, and time) at Departments or Units that deliver practical training in order to achieve the above goals.

2. **Promote and enhance training in the field of diabetes at Andalusia's Universities.**

   - *Training at Medical Schools:*

   • Theoretical training: It appears to be well-balanced in terms of time devoted (between 0.5 and 1 credit points). It should more holistic (unified and non-repetitive) with coordinated participation of the specialists involved in treating diabetes: Endocrinologists, internists, GPs, obstetricians, ophthalmologists, cardiologists, nephrologists... Theoretical training should have clear aims, focusing on what students need to know about diabetes. It should entail acquiring basic knowledge, and subsequently the skills and attitudes required for identifying/detecting complications, and for correct treatment of diabetic patients.

   • *Practical training*: It should be designed with clear targets, and foster active participation of students. Assessment is also required.

   - *Training at Nursing Schools:* The same applies here as indicated above for training at Medical Schools. However, the ratio between practical/theoretical credit points should be enhanced, placing more emphasis on dealing with education or nursing care.

POSTGRADUATE TRAINING

Specialist training bears a direct relationship with the follow-up of diabetic patients. Frequently, resident physicians are keen and motivated to tackle severe diabetes-related events arising at emergency admissions or to treat diabetic patients admitted to hospital – generally symptomatic and with complications. Training to deal with follow-up of asymptomatic diabetics is rare; these patients only visit health centres to obtain prescriptions or for consultation on issues unrelated to diabetes and at most only require follow-up during metabolic decompensation episodes.

Training of specialists involved in identifying and treating complications (ophthalmologists, surgeons, nephrologists..) will hinge on the motivation and work plan of the teams with which they train. Specialists will be better trained – acquiring leading-edge knowledge, skills and attitudes for detecting and treating diabetes – if they come into contact with an ophthalmologist whose major concern is diabetic retinopathy, a surgeon keen to treat lower limb lesions, or a nephrologist committed to diabetic nephropathy.

Training programmes for specialist physicians who come into play in the Diabetes Healthcare

Process should be aimed at fostering the acquisition of knowledge, skills and attitudes, during the resident training stage to allow future doctors to deliver effective assistance to diabetic patients in their area of expertise, to engage in prevention and health promotion, along with health education, so that they may later on take responsibility for continuing self-training.

Actions

The following actions are established for the period 2003-2007:

1. Training Committees will be reinforced at health centres in the Region of Andalusia, with the aim of producing a single training programme for Andalusia's training colleges and schools, thereby contributing to enhancing the programme in terms of its approach to diabetes.

2. In the framework that establishes comprehensive and continuous care for diabetic patients, it is necessary to implement a training and rotation programme for the healthcare professionals involved in caring for diabetic patients, in the different areas of intervention. This will enhance coordination and cooperation.

3. Ad hoc working groups will submit to the National Specialist Committee any amendments to training programmes so that they can be adapted to the management requirements of the Diabetes Healthcare Process.

The Diabetes Healthcare Process proposes that Specialist Care (SC) treat patients in coordination with Primary Care (PC) in the following cases: patients with DM1, DM caused by specific conditions, pre-gestational DM or gestational DM with insulin regimen, DM2 patients presenting advanced-stage complications, or when targets have not been met in PC. Healthcare for patients with DM2 and gestational diabetes under diet treatment should be delivered by PC; patients with DM1 should be treated by both PC and SC. GPs should acquire further training, with mandatory rotation in endocrinology and internist medicine departments; they should also plan training on diabetes while on duty at health centres. Training for Specialists in Endocrinology and Nutrition, Internal Medicine, Paediatrics and Family Medicine should also be broadened to cover the MIR (resident physician) specialist training programme and to adapt to the provisions included in the Healthcare process.

CONTINUING EDUCATION

When addressing the hurdles perceived by healthcare professionals in treating diabetic patients, it is imperative to tackle poor patient compliance with treatment regimens and follow-up programmes. Assessments frequently point to poor compliance on the part of healthcare professionals with the recommendations contained in clinical practice guidelines, or quality standards. Perhaps neither physicians nor patients are sufficiently motivated.

Over the last few years more and more training options are becoming available – conferences, courses, seminars, congresses, symposia – and are providing a plethora of information. The traditional Continuing Education (CE) plan, focussing on the transfer of theoretical knowledge, is proving ineffective in triggering changes to clinical practice and in improving the quality of healthcare. It has been suggested that healthcare professionals' beliefs and attitudes – and not knowledge deficits – are the main hurdles that hinder compliance with recommendations. So CE should be steered appropriately to ensure that it is effective.

CE plays a vital role in promoting positive attitudes, encouraging levels of excellence in healthcare for diabetic patients, and the implementation of prevention strategies, while helping healthcare professionals take the necessary steps to move away from a healthcare model focusing on care by episodes, towards a healthcare model for chronic processes.

Actions

In 2003 healthcare institutions:

1. Will complete the skills map outlining the knowledge, skills and attitudes to be fostered among healthcare professionals treating diabetic patients.

2. Will facilitate access to new communication technologies, and will provide more information at health centres.

In the period 2003-2004 health centres:

1. Will design and implement a training programme that adapts current healthcare professionals' skills to those contained in the Diabetes Healthcare Process skills map.

   Training programmes should focus on the challenges posed by clinical practice, fostering education based on personal discovery and own experience. It is vital to establish objectives on the basis of perceived training needs and the gaps or deficits identified. More specifically, programmes should enhance knowledge on screening and early detection strategies, therapy options and metabolic control management, screening for complications and treatment, and diabetes-related education.

IV.9. Promotion of the Andalusian Healthcare Network:

In ***promoting the Andalusian Healthcare Network*** to improve healthcare for diabetes in Andalusia, the Plan for Diabetes foresees augmenting human and technological resources, implementing the Single Medical record, the diabetes card, day-time hospitals, and broadening the portfolio of services to include education in diabetes and surgical vessel revascularisation.

Increasing human resources is aimed at addressing territorial rebalance in the Region. All healthcare institutions (hospitals and care centres) will have a healthcare professional with responsibility for the Diabetes Process. A Reference Group for Diabetes will be established in Andalusia, formed by representatives of the professional groups involved in the process, with the aim of monitoring and up-dating the healthcare process.

Enhancing and up-dating technological resources is aimed at early detection and treatment of diabetic retinopathy at health centres (digital retinography, retinal laser photocoagulation devices), guaranteeing access for patients and the delivery of appropriate treatment. In addition, a digital radiology unit for small vessel surgical revascularisation will also be made available at the reference centre in east Andalusia, complementing existing technology there. Specific programmes supported by telemedicine will also be promoted, including subcutaneous insulin infusion pumps as rescue treatment for patients who meet the requirements outlined in the Plan (patients who do not respond to intensive insulin regimens, women in fertile age who are pregnant or wish to conceive). Also to be

implemented are the Single Medical record, the diabetes card, day-time hospitals and broadening the portfolio of services to include education in diabetes and small vessel surgical revascularisation.

Actions:

As of 2003

1. **A Citizen's Single Digital Health Record** will be implemented in Andalusia.

2. Multi-disciplinary teams at each healthcare centre will implement the **Diabetes Healthcare Process,** and will share responsibility for providing healthcare to diabetic patients on the basis of the provisions and functions laid down in said Process. To this purpose, a professional will be appointed as responsible for the Diabetes Process in care centres, county and regional hospitals. These institutions will work jointly on a model of shared care, with joint objectives, which will become a point of reference for the public.

3. **Communication channels** between the various parties involved in providing healthcare to diabetic patients will be established and promoted. Coordination plans will be implemented internally – at each healthcare centre – and externally - for contacts with professionals at other, related centres.

4. A **Diabetes Card** will be designed and implemented as an instrument to foster shared care, complementing the Single Medical Record.

5. In the hospital setting, diabetic patients will be offered assistance at day-hospitals provided they fulfil the following criteria:
    - DM1 debut without severe metabolic decompensation
    - Pregnant women starting treatment
    - Metabolic DM decompensation not requiring hospital admission
    - Start of intensive regimen using insulin infusion pumps
    - Treating diabetic foot with torpid evolution

6. Health centres will broaden their Portfolio of Services
    - **Education in Diabetes:** offered on an individual basis and in groups at all health centres by healthcare professionals with the necessary skills.
    - **Surgical vessel revascularisation** (rescue surgery for diabetic foot).
    - **Problems associated with diabetic foot** will be treated by professionals with the necessary know-how to care for nails, callous formations and orthosis for unloading pressure areas in ulcers.
    - **Influenza vaccines:** guaranteed for all diabetic patients.
7. **Plan for technological up-dating**
    - Replacement of obsolete equipment and introduction of diabetic retinopathy diagnostic and treatment techniques (digital retinography equipment, retinal laser photocoagulation devices) at all health centres in the Andalusian Public Health System, extending fluorescein angiography to all specialised hospitals.
    - Mobile digital retinography devices will be purchased for implementation of the diabetic retinopathy screening programme, prioritising areas where access to technology is hindered due to geographical distance, excessive delays in ophthalmology consultations etc.

- Purchase of a radiology digital unit for vessel surgical revascularisation at the reference centre in east Andalusia.
- Subcutaneous insulin infusion pumps will be included in the healthcare catalogue of services, for the following patient groups:
  - Patients who have the necessary skills, are compliant and psychologically stable, do not achieve optimal control with multi-dose insulin regimens, are keen to use insulin pumps and use is recommended by their doctor.
  - Patients who fulfil the criteria noted above, and in addition present irregular glycemic profiles, with unpredicted glycemic excursions during a prolonged period of time.
  - Diabetic women in fertile age, who wish to enter a pregnancy programme, have great difficulties in achieving optimal metabolic control or wish to use this device to achieve more precise and flexible metabolic control. In these cases, use of the pump will be limited to the pregnancy plan period (optimal duration is 6 months prior to conception) and during gestation.

  This option should be seen as a "rescue" treatment for patients who fulfil the requirements noted above, and fail to achieve good metabolic control with intensive treatment based on a multiple injection regimen.

7. Other material resources

- Health centres will ensure that their professionals have basic equipment at their disposal and will guarantee access to techniques for metabolic control and early detection of the chronic complications associated with diabetes (glycosylated haemoglobin, lipidogram, microalbuminuria, optotypes, Semmens-Wenstein monofilament or diapason…).
- Material will be produced and delivered with the aim of promoting health and education in diabetes. Material will support outreach campaigns and will also be given to patients.

8. Human Resources

- Staff will be increased progressively to respond to healthcare requirements, avoiding territorial imbalance, both in primary and specialised care. Specialist physicians will be recruited to address current imbalances in terms of number of physicians/100,000 inhabitants in each province against the average number in Andalusia. So, specialists in endocrinology will be recruited for Almeria (3), Cadiz (1), Cordoba (1), Huelva (2), Jaen (3), Malaga (4), as well as other specialists for areas where territorial imbalance is detected. To ensure full cover for education in diabetes, health centres will have a part or full-time nurse – depending on needs - with specific training.
- All health centres will recruit and provide access to a healthcare professional with specialised training in the treatment of diabetes. He/she will be responsible for implementing the Diabetes Healthcare Process and will be the contact person for coordination with other levels of healthcare and with the community.

IV.10. Regulations: Diabetes Advisory Committee.

The *Diabetes Advisory Committee* was established in Andalusia as an advisory body to the Regional Ministry for Health. It was established as a result of legislation that came into force on 17th March 1995, which formally promulgated the creation of a Diabetes Advisory Committee (Published in the Official Gazette of Andalusia No. 52, 31 March 1995) as a *body that would give recommendations to the Regional Ministry of Health on the mechanisms and activities to be implemented for diabetes prevention and healthcare*. It encompasses representatives of various related Scientific Societies,

Associations of Diabetic Patients, Regional Ministry for Health, and the Andalusian Public Health Service. The said legislation establishes the Committee's functions and proposes the following actions with regard to the Plan for Diabetes:

- Report on the degree of implementation of the Plan.
- Identify obstacles that hinder implementation and report on the necessary resources and requirements to be put in place to overcome those hurdles.
- To report and give recommendations on research and other surveys required for adequate performance of the Plan.
- Coordinate activities, educational material and disease prevention policy, as well as any other initiatives that may lead to improved quality of life for diabetic patients.
- Supervise any initiatives that may arise for training healthcare professionals.
- Plan and coordinate any events that may be staged in collaboration with Associations of Diabetic Patients and other institutions.
- Provide information on initiatives that are being carried out for prevention of diabetes via the internet.

V. ASSESSMENT

Three types of assessment studies will be conducted:

1.- Assessing objectives and actions: analysing the degree of compliance with the Plan, i.e. if proposed actions have been implemented or not.

2.- Assessing participation: to understand the degree of involvement of those taking part in implementation of the actions contained in the Plan.

3.- Assessing Users' views: target population views will be compiled in order to infer the impact of the actions established in the Plan. This will be done through debate groups and interviews with patients and the parties (agents) involved.

Each type of assessment study will

1. Establish assessment indicators
2. Design supporting documents and data sources
3. Compile data systematically.

The Plan is structured around flexible methodologies that allow ongoing evaluation and regular review of the measures contained in the Plan. Hence, the Plan comprises specific measures, ready for implementation, and others to be developed throughout its two-year duration. So, the Plan is not a static, air-tight document; it is a flexible working document open to any proposals that are deemed to be useful.

By way of **conclusion**, the Plan contributes with

1. Improved access to data/information (WEB, 24-hour medical hot-line, publications).

2. Redesign of the healthcare model: Management of the Healthcare Process, where healthcare is based on a shared-care model, and the implementation of a register system tailor-made to cater for chronic diseases; planning of visits and implementation of systems to recapture patients.

3. Healthcare provided in Day-time Hospitals at care centres, following the recommendations contained in the Plan.

4. Implementation of a specific Education Plan to adapt healthcare professionals' skills to those contained in the Diabetes Healthcare Process skills map.

5. Boosting the Research Plan, with particular emphasis on fostering basic and epidemiological research, primary care and clinical research.

6. Further technology to upgrade diabetic retinopathy diagnostic and treatment techniques at health centres (digital retinography and retinal laser photocoagulation devices), digital radiology arch for vessel surgical revascularisation at reference centre in east Andalusia. Subcutaneous insulin infusion pumps for rescue treatment of patients that fulfil the requirements established in the Plan.

7. Enhancing human resources by recruiting: specialist endocrinologists in Almeria (3), Cadiz (1), Cordoba (1), Huelva (2), Jaen (3), Malaga (4), as well as paediatric specialists with specific diabetology training for Almeria, thereby increasing staff by one extra physician.

8. Introducing a new healthcare professional at each care centre who will be responsible for the Diabetes Healthcare Process.

9. Implementation of standardisation and quality control methods for laboratory techniques.

10. Enhancing and fostering joint initiatives with Associations of Diabetic Patients.

11. Extending the portfolio of services to include education in diabetes, vessel surgical revascularisation, influenza vaccines and diabetic foot care.

12. New instruments to improve information systems.

VI. SUMMARY

Diabetes Mellitus (DM) is a chronic process affecting large number of people and constituting a personal and public health problem of enormous proportions.

The Comprehensive Diabetes Plan for Andalusia has been devised as a tool for dealing with the various stages in the natural history of diabetes (primary prevention, early detection, follow-up and treatment to reduce complications, etc.) by means of a global strategy covering the most appropriate intervention for prevention, curing or care and for training and carrying out research into the causes of the disease and solutions for it.

The Comprehensive Diabetes Plan is based on the following principles:

- **Person-centred**: Information shall be provided as well as the necessary tools to empower individuals so that they can adopt healthy lifestyles and lead the control of their disease.

- **Based on cooperation**: Agreements should be reached between the individual and the healthcare team in an atmosphere of shared decisions on objectives and the monitoring plan.

- **Equity:** Services should be planned to meet the needs of the whole population and individuals, including specific groups.

- **Integrated:** The know-how and skills of all the professionals involved should be integrated to form a multi-disciplinary team including Primary Care, Specialist Services and various public sectors, in order to guarantee continuity of care and a support system that will ensure maximum autonomy.

- **Results-oriented:** Efforts should aim to reduce the incidence and impact of diabetes.

The elements used when drawing up the Plan were:
- Analysis of the current situation, from the points of view of epidemiology, healthcare organisation and available resources.
- Expectations of diabetes patients and their families.
- Contributions from the working group on the Comprehensive Healthcare Process for Diabetes

Analysis of the current situation. Most relevant data

Prevalence: It is estimated that 6% of the population has diabetes (known and unknown)

Incidence:
DM1 16 cases per 100,000 people per year, and rising
DM2 60-150 cases per 100,000 people per year

Mortality:
In 6th position amongst causes of death (3rd amongst women and 8th amongst men). Total deaths with diabetes in Andalusia in 2000: 1745 (3% of total deaths).

Years of Potential Life Lost (YPLL) in Andalusia amount to 47 for men (per 100,000 inhabitants) and 31 in women (per 100,000 inhabitants).

Trend (1975-2000): Increase in absolute numbers (from population ageing and increased prevalence of diabetes) with a reduction in standardised rates (adjusted for age) and in YPLL.

Morbidity:

Acute complications:

- Diabetic ketoacidosis in 11.7 cases/100,000 inhabitants / year in 2000 (from Minimum Basic Data Set, stabilised figures for 1998-2000).

- Hyperosmolar hyperglycaemic decompensation in 4.6 cases / 100,000 inhabitants / year (from Minimum Basic Data Set, showing a slight increase since 1998, perhaps related to ageing of the population and greater prevalence of diabetes)

Chronic complications:

- Diabetic retinopathy: according to studies carried out in some areas of the Andalusian community, the prevalence of retinopathy is 51.4 – 73.3% in people suffering from diabetes for more than 10 years.

- Chronic renal insufficiency in substitution treatment: the percentage of patients with chronic renal insufficiency in substitution treatment, whose primary renal disease is diabetes, in Andalusia is approximately 10% (prevalent cases). In incident cases, in Spain in 2000, 23% of people beginning substitution renal treatment had diabetes, and in Andalusia 21%.

- Cardiovascular disease: the rates of admission of patients with diabetes with myocardial infarction or ictus were stable from 1998 to 2000.

- Amputations: the rate of amputations increased from 16 to 18 per 1,000 inhabitants per year. However, the rate of amputated patients decreased so it can be deduced that the increase is in the number of reamputations.

Hospital discharges: In 1999, a total of 52,424 people were admitted to hospital with diabetes, representing 10% of total discharges and 14% of total stays. Average stay was 4 days longer for people with diabetes than for those without diabetes. Of total admissions, 5% were for severe complications, 40% for chronic complications (33% with cardiovascular disease) and 55% for non-diabetes related pathologies.

Key elements of the analysis of expectations of diabetes patients and their family members regarding healthcare services

- Increased accessibility to information and materials needed for treatment.
- Single, coordinated appointment to cover different needs.
- Accessibility to professionals having appropriate skills.
- Coordination amongst all care providers.

Opportunities for improvement

Considering the diagnosis of the current situation of diabetes in Andalusia and of the expectations of patients and their main carers and available resources, the main areas for action have been established as follows:

1. To improve access to information on diabetes and prevention for the general public and for diabetes patients, as well as access to therapeutic education so that patients can learn to participate in the control of their diabetes.
2. To define and establish preventive activities to promote healthy lifestyles.
3. To facilitate early detection of diabetes, before the presentation of severe and/or chronic complications.
4. To re-design episode-based healthcare, moving towards care for chronic processes based on seamless healthcare management of diabetes, and guaranteeing continuity of care.
5. To standardise laboratory and quality control techniques used to monitor metabolic control.
6. To facilitate access to the latest-generation control materials, adapted to the characteristics of each patient.
7. To provide emotional and psychological support as required.
8. To improve information systems.
9. To define and promote methods for collaboration and actions with groups and associations of patients.
10. To implement on-going training programmes for professionals in the Andalusian Public Health System involved in the care of diabetes patients.
11. To promote research in the fields of the prevention and cure of diabetes and of improved care.
12. To improve resources and renovate technology in health centres for both diagnosis (retinographs, equipment for functional haemodynamic studies, etc.) and treatment (digital unit for diabetic foot salvage surgery, laser therapy, etc.), with special emphasis on the role of telemedicine.

The Comprehensive Diabetes Plan for Andalusia covers a set of actions involving organisation and functional changes as well as training for professionals, and specific funding to meet the following **objectives:**

1. To reduce the incidence of diabetes in Andalusia.
2. To reduce the impact of diabetes (complications and mortality).
3. To improve quality of life for people with diabetes.
4. To guarantee that diabetes patients receive healthcare on the basis of continuity as an element for overall quality.
5. To adapt the service portfolio to people's needs in an effective, efficient way.
6. To increase the degree of knowledge and information on diabetes amongst the general public.
7. To build a future by investing in training for professionals and in research to fight the disease and its effects.

In order to achieve these objectives, lines of action have been established in the following areas:

1. Communication and information
2. Primary prevention
3. Healthcare for Diabetes Patients: Management of the Healthcare Process
4. Special situations

5. Information systems
6. Volunteer services and aid groups: associations
7. Training and professional development
8. Research and innovation
9. Promotion of the Andalusian network for diabetes care
10. Regulation: Advisory Council on Diabetes in Andalusia

In conclusion, the new features introduced by the plan are:

1. Improved access to information (24-hour hotline, website)
2. Care in Day Hospitals in health centres, in line with provisions laid down in the Plan.
3. Re-design of the healthcare model: Management of the healthcare Process, structuring care delivery on the basis of a model for shared care and establishing a recording system that is suitable for a chronic process, with planning of visits and methods for recapturing patients.
4. Development of a specific Training Plan to align professionals' skills with those laid down in the Diabetes Process skills map.
5. Promotion of the Research Plan, especially in the fields of basic research, epidemiological research, primary prevention and clinical research.
6. Provision and renovation of technology for diagnostic techniques and treatment of diabetic retinopathy in health centres (digital retinographs, laser therapy units for retina photocoagulation), provision of a digital radiology unit for small vessel revascularisation surgery in the reference centre in Western Andalusia. Inclusion of subcutaneous insulin infusion pumps as a salvage therapy for patients meeting requirements laid down in the Plan.
7. Increase in human resources (specialist endocrinologists – 3 in Almeria, 1 in Cadiz, 1 in Cordoba, 2 in Huelva, 3 in Jaen, 4 in Malaga, and 1 additional paediatrician with skills in diabetes in Almeria)
8. Recognition of the figure of a professional responsible for the Diabetes Process in all health centres
9. Adoption of methods for laboratory technique standardisation and quality control
10. Promotion of actions in conjunction with associations of diabetics.
11. Expansion of service portfolio, including diabetological education, small vessel revascularisation surgery, anti-influenza vaccination and foot care.
12. Incorporation of tools to improve information systems.

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