Municipal (Curitiba) and State (Paraná) Health Protocols for the Population with Diabetes Mellitus

Protocolos Municipais (Curitiba) e Estaduais (Paraná) de Saúde Direcionados a População com Diabetes Mellitus
Protocolos Municipales (Curitiba) y Estatales (Paraná) de Salud Dirigidos a la Población con Diabetes Mellitus

RESUMO
Objetivo: identificar os protocolos municipais (Curitiba) e estaduais (Paraná) de saúde direcionados a população com diabetes mellitus tipo 2. **Método:** pesquisa documental, retrospectiva e descritiva, que seguiu as etapas de levantamento, organização e análise de protocolos relacionados a atenção da população com diabetes mellitus tipo 2. As buscas foram realizadas entre outubro e novembro de 2024 nos meios digitais da Secretaria Municipal de Saúde e Secretaria de Saúde do Estado. Os dados foram analisados segundo Bardin. **Resultados:** identificou-se 13 documentos, 11 de âmbito municipal e dois de âmbito estadual, relacionados diretamente ao diagnóstico, tratamento, cuidados ou fluxos de atendimento. Emergiram duas categorias: tratamento e recomendações medicamentosas; cuidados e fluxos de atenção. Na primeira categoria destaca-se recomendações de tratamento com hipoglicemiantes. Na segunda categoria destaca-se fluxos de atendimento que auxiliam os profissionais. **Conclusão:** os protocolos auxiliam os profissionais nas condutas adotadas, padronizando o cuidado e garantindo orientações clínicas uniformes e a integralidade do cuidado.
DESCRITORES: Diabetes Mellitus; Atenção primária à saúde; Enfermagem. Protocolos Clínicos; Análise Documental.

ABSTRACT:
Objective: to identify municipal (Curitiba) and state (Paraná) health protocols aimed at the population with type 2 diabetes mellitus. **Method:** a retrospective and descriptive documentary study, which followed the steps of surveying, organizing, and analyzing protocols related to the care of the population with type 2 diabetes mellitus. The searches were conducted between October and November 2024 in the digital media of the Municipal Health Department and State Health Department. The data were analyzed according to Bardin. **Results:** 13 documents were identified, 11 at the municipal level and two at the state level, directly related to diagnosis, treatment, care, or care flows. Two categories emerged: treatment and medication recommendations; care and care flows. In the first category, recommendations for treatment with hypoglycemic agents stand out. In the second category, care flows that assist professionals stand out. **Conclusion:** the protocols assist professionals in the procedures adopted, standardizing care and ensuring uniform clinical guidelines and comprehensive care.
DESCRIPTORS: Diabetes Mellitus; Primary health care; Nursing. Clinical Protocols; Document Analysis.

RESUMEN:
Objetivo: identificar los protocolos municipales (Curitiba) y estatales (Paraná) de salud dirigidos a la población con diabetes mellitus tipo 2. **Método:** investigación documental, retrospectiva y descriptiva, que siguió las etapas de recopilación, organización y análisis de protocolos relacionados con la atención a la población con diabetes mellitus tipo 2. Las búsquedas se realizaron entre octubre y noviembre de 2024 en los medios digitales de la Secretaría Municipal de Salud y la Secretaría de Salud del Estado. Los datos se analizaron según Bardin. **Resultados:** se identificaron 13 documentos, 11 de ámbito municipal y dos de ámbito estatal, relacionados directamente con el diagnóstico, el tratamiento, los cuidados o los flujos de atención. Surgieron dos categorías: tratamiento y recomendaciones farmacológicas; cuidados y flujos de atención. En la primera categoría destacan las recomendaciones de tratamiento con hipoglucemiantes. En la segunda categoría destacan los flujos de atención que ayudan a los profesionales. **Conclusión:** los protocolos ayudan a los profesionales en las conductas adoptadas, estandarizando la atención y garantizando orientaciones clínicas uniformes y la integralidad de la atención.
DESCRIPTORES: Diabetes mellitus; Atención primaria de salud; Enfermería. Protocolos clínicos; Análisis documental.

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INTRODUCTION

In the Unified Health System (SUS), especially in Primary Health Care (PHC), many protocols and guidelines are used to guide conduct in the care of diseases and conditions, in addition to assisting professionals, health establishments, and users [1].

By definition, protocols are standardized records of procedures based on the best scientific evidence and serve as a basis for decision-making by professionals working at various levels of care [2]. They must be clear in operational terms and contain specifications on what to do, how to do it, and who should perform certain actions, guiding professionals in defining the best course of action, reducing variability in actions, facilitating the incorporation of new technologies, enabling the monitoring of indicators and processes, and promoting the quality and safety of care [3].

For each level of health care, a set of protocols is needed that are aligned with the user's needs at that moment. Primary Health Care (PHC) is the gateway to the health system and plays a central role in longitudinal care, especially for people with chronic conditions such as type 2 diabetes mellitus (DM2). In this context, the use of clinical protocols is an indispensable tool for organizing the work process of the healthcare team, standardizing procedures, and ensuring safety and quality of care [1].

DM2 is among the chronic diseases with a high potential for complications, which evolves with high morbidity and mortality, greatly impacting the healthcare system and society. According to data from the Ministry of Health's Mortality Monitoring Panel, in 2024 in Curitiba, there were 18 deaths from type 2 diabetes mellitus in the 60-69 age group, 27 in the 70-79 age group, and 36 among people aged 80 and over. In the entire state of Paraná, there were 212 deaths in the 60-69 age group, 303 in the 70-79 age group, and 370 among people aged 80 or older, totaling 885 deaths in one year from this disease [4].

Considering these data, the importance of early diagnosis is understood, and protocols can assist professionals in defining treatment and therapeutic goals, systematic follow-up with consultations, exams, and guidance, and referrals when necessary.

Given the importance of protocols for guiding and ensuring comprehensive, safe, and evidence-based care in primary health care for the population with type 2 DM, this article aimed to identify municipal (Curitiba) and state (Paraná) health protocols directed at the population with type 2 diabetes mellitus.

METHODOLOGY

This is a retrospective, descriptive documentary study, following the steps of surveying, organizing, and analyzing the available protocols directly related to the population with type 2 DM.

Documentary research is defined as research that uses documents from primary sources as its data collection source, i.e., documents that have not undergone analytical treatment and are publicly available [5]. A document is understood to be any material that can be used as a means of information, such as laws, regulations, standards, opinions, letters, memoranda, personal diaries, autobiographies, newspapers, magazines, speeches, statistics, and archives. It should be noted that in documentary research, it is important to understand the chosen means of communication, its context and purpose, for whom it was created, and the intent of the material analyzed [6].

In this article, documents are considered to be textual and infographic elements that aim to inform, guide, and clarify a specific subject or theme for a specific audience—in this research, primary care health professionals who serve the population with type 2 DM. The documents sought are available online on the official communication channels at the municipal (Curitiba) and state (Paraná) levels. The digital search was conducted between October and November 2024, followed by the organization of data using spreadsheets, analysis, and interpretation of the results.

At the municipal level, the search was conducted on the website of the Municipal Health Secretariat (Secretaria Municipal da Saúde de Curitiba), under the "Primary Care" menu, searching the following tabs: Pharmaceutical Assistance, Children, Acute Demands, Communicable Diseases, Nursing, Curitiba Mother Worth Living, Nutrition, Guidance for Professionals, Listen to Your Heart Program, Oral Health, and People with Disabilities. At the state level, the search was conducted on the website of the Paraná State Health Secretariat (Secretaria da Saúde) in the "Clique Saúde" menu, where the "Diabetes" tab is located, and in the "Institucional" menu in the "SUS Management Tools>State Health Plan" tab.

The following criteria were applied to filter the documents: reading the document title, selecting those that directly mentioned the words "diabetes mellitus" or words related

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to diagnosis, care, treatment, or DM care flow. All documents that met the above criteria were included for analysis, with no limit on the date of publication. Documents related to the dispensing and storage of supplies were excluded.

The analysis of the selected documents was performed using Bardin's Content Analysis (2010), following these phases: 1) organization of the analysis – organization and exploration of the material, selection of material after skimming; 2) coding – classification of the constituent elements of a set; 3) categorization – identification of context units in the documents; 4) treatment of results, inference, and interpretation – treatment of raw results in order to make them meaningful and valid [7].

The documents were identified with the initials DE (written document) followed by the alphanumeric number from 1 to 13 sequentially.

RESULTS

Thirteen documents related to diagnosis, treatment, care, or care flows for people with DM were identified. It should be noted that in the municipal survey, no documents directly related to DM were found in the "Primary Care" menu under the following tabs: Children, Communicable Diseases, Curitiba Mothers' Health Program, Nutrition, Oral Health, Guidance for Professionals, and People with Disabilities.

At the state level, in the menu called "Clique Saúde" (Click Health), the "Diabetes" tab was identified, which contains information such as definition, symptoms, prevention, and treatment, in addition to the support material "Diabetes Mellitus Guidelines." In the "Institutional" menu, under the tab "SUS Management Tools>State Health Plan," you can find the 2024-2027 State Health Plan.

After reading and analyzing the documents, two categories emerged, according to the format and purpose of the documents. Those with informative content focused on treatment were categorized as "Treatment and Medication Recommendations" (TABLE 1), while those with guidance content, in flowchart format focused on care and treatment, were categorized as "Care and Treatment Flows" (TABLE 2).

Treatment and medication recommendations

Documents related to drug treatment were included, presenting recommendations on the use of oral hypoglycemic agents and insulin, as well as recommendations on monitoring glycemic profile, glycated hemoglobin, and self-monitoring of capillary blood glucose, necessary for adjustments in drug treatment.

A summary of the documents included in this category is described in Table 1.

TABLE 1: Summary of documents related to the category Drug Treatment and Recommendations.

Code	Location tab	Year	Title	Type of Doc
DE1	Pharmaceutical Assistance	n/a	Diabetes: importance of using the glycemic profile and monitoring glycated hemoglobin	Article
DE2	Pharmaceutical Care	n/a	Rational use of glibenclamide in DM2 – glibenclamide vs. glibenclamide	Article
DE3	Listen to Your Heart Program: Care flows	2024	Technical Note – Dapagliflozin in the treatment of type 2 diabetes mellitus	Technical Standard
DE4	Listen to Your Heart Program: Care Flows	2023	Recommendations for Self-Monitoring of Capillary Blood Glucose (SMBG)	Technical Standard
DE5	Listen to Your Heart Program: Care Flows	2023	Recommendations for Insulin Therapy in DM2 – 07/2023	Technical Standard
DE6	Listen to Your Heart Program: Care Flows	2023	Recommendations for Insulin Therapy – User	Guidance for users with DM
DE13	Institucional>Instrumentos de Gestão do SUS > Plano Estadual de Saúde	2024-2027	Plano Estadual de Saúde	

SOURCE: The authors (2025)

The documents entitled Diabetes: importance of using the glycemic profile and monitoring glycated hemoglobin [8] and Rational use of glipizide in DM2 – glipizide vs. glibenclamide [9] are articles developed by the Committee for the Rational Use of Medicines (CURAME) and present important recommendations for the treatment of DM2. The first [8] highlights the importance of monitoring the glycemic profile through glucose meter reports, used by users for self-monitoring of capillary blood glucose (SMBG), and also through glycated hemoglobin test reports provided by the Municipal Laboratory. The second [8] warns about the recommendation for the use of the hypoglycemic agents glibenclamide and glicazide, the former being the most tested and least expensive med-

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ication, and therefore more suitable for patients with DM2 who are under 65 years of age and not overweight. In line with these is the Technical Note – Dapagliflozin in the treatment of type 2 diabetes mellitus [10], which recommends indications for the use of dapagliflozin in the Unified Health System (SUS).

Three documents with recommendations related to treatment were identified, two aimed at professionals and one aimed at users. The first, Recommendations for Self-Monitoring of Capillary Blood Glucose (AMGC) [11], deals with the recommendations that professionals should provide to users who perform AMGG, with a description of the goals to be achieved in terms of blood glucose levels and the correct way to adjust insulin according to the results. The second, Recommendations for Insulin Therapy in DM2 – 07/2023 [12], presents a complete guide to the main insulin therapy regimens, as well as guidelines for the care in the application and storage of insulin. The third, Recommendations for Insulin Therapy – User [13], presents recommendations for insulin administration, with tables for schedule control, drawings for identifying application sites, guidelines for self-adjusting doses according to AMGC results, and guidelines for cases of hypoglycemia and hyperglycemia.

Care and care flows

The second category presents documents related to care provided by the multidisciplinary team, including acute and chronic demands. This category also includes two state-level documents, which are more comprehensive and present both informative content and guidelines for professionals on treatment and care procedures. The description of the documents included in this category is presented in Table 2.

TABLE 2: Summary of documents related to the Care and Care Flows category

Code	Location tab	Year	Title	Type of Doc
DE7	Acute Demands	2023	Hyperglycemia – v.3	Flowchart
DE8	Nursing	2023	Assessment and management of feet in people with diabetes	Technical Standard
DE9	Listen to Your Heart Program: Care flows	2023	Care Flow for People with Diabetes Mellitus	Line of Care/Care Flow
DE10	Listen to Your Heart Program: Care Flows	2023	Care Flow for People with High-Risk Diabetes – 60 years of age or younger	Care Flow
DE11	Listen to Your Heart Program: Care flows	2023	Organization of Care for DM2	Technical Standard
DE12	Diabetes	2018	Diabetes Mellitus Guidelines	Guidelines
DE13	Institutional>SUS Management Tools > State Health Plan	2024-2027	State Health Plan	

SOURCE: The authors (2025)

The document Hyperglycemia [14] located in the "acute demands" tab provides guidelines for treating hyperglycemia, considering capillary blood glucose > 250 mg/dl associated with warning signs such as nausea and vomiting, tachycardia, abdominal pain, among others. The flowchart is short and objective and can be used both by healthcare professionals and by users who need guidance in emergency cases.

The document Assessment and management of the feet of people with diabetes [15] is a Technical Standard that highlights the importance of screening for the risk of foot ulceration and reinforces that the assessment should be performed at the time of diagnosis in all people with DM. This document presents a detailed physical examination protocol, including protective sensitivity assessment performed through vibratory sensitivity and protective sensitivity threshold (LSP) tests, ulceration risk classification, guidelines according to findings, and foot assessment frequency.

Two care flows were found. The first, called Care Flow for People with Diabetes Mellitus [16], presents clinical criteria for DM screening, risk stratification according to glycated hemoglobin values, directing to three axes: care plan, pharmacological treatment, and follow-up. The second, called Care Flow for People with High-Risk Diabetes [17] – 60 years of age or younger – provides general care to users with DM2 stratified as high risk, considering the care flow with each health team professional.

The Technical Note Organization of Care for DM2 [18] organizes the care flow for users with DM2 in terms of risk stratification, minimum expected frequency of consultations with each health professional (physician, nurse, pharmacist), risk of ulceration, care plan with indicators to be evaluated, concept of therapeutic inertia, and the conduct to be adopted in this situation.

The state-level documents identified were the Diabetes Mellitus Guideline [19] and the State Health Plan [20].

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The first is a guidance document that presents aspects related to DM, from diagnosis, care plan, pharmacological treatment, complications, and aspects related to the life cycle. The second is a SUS planning instrument related to the implementation and maintenance of state government health programs, projects, and actions. Among the action strategies is the Diabetes Mellitus and Systemic Arterial Hypertension (SAH) Guideline (page 47), which presents the Chronic Conditions Care Model (MACC) with the aim of improving the resolution of care for users with DM and SAH.

DISCUSSION

Care for people with type 2 DM is complex and requires clear and well-defined guidelines for all health professionals involved in the care process. In this sense, it is clear that guidelines related to pharmaceutical care are important and stand out among the guidance documents identified in this study.

Three guidance documents for pharmacy professionals [8-10] were identified, reinforcing the importance of this professional in the care of people with type 2 DM, due to the characteristics of the treatment, which involves the use of medications with different mechanisms of action and modes of administration. The study highlights the importance of pharmacists in the care of patients with DM, emphasizing their role in adjusting medication doses and choosing drugs, considering aspects such as individual needs, safety, cost, and efficacy [21].

The presence of the pharmacist in multidisciplinary care contributes to the reduction of glycated hemoglobin (HbA1c) levels, the improvement of other health conditions, such as reduction of blood pressure, reduction of triglyceride levels, and greater compliance with drug treatment [21]. This statement reinforces the importance of monitoring glycated hemoglobin and glycemic profile, as highlighted in one of the documents identified in this research [8]. The document states that the results recorded by the glucometer software provide important information that should be considered for adjustments in therapeutic approaches. In this sense, glycated hemoglobin monitoring is also necessary, especially for patients with results above 9% who are not yet using insulin, as it may indicate a delayed introduction of this therapy.

Another key factor for the treatment and care of users with type 2 DM is self-monitoring of capillary blood glucose (SMBG) and the use of insulin. The technical standard Recommendations for Self-Monitoring of Capillary Blood Glucose [11] provides guidance on adjusting insulin doses according to test values and capillary blood glucose targets to be achieved. The Technical Standard Recommendations for Insulin Therapy in DM2 [12] is intended for healthcare professionals and provides guidance on insulin regimens, application, and storage.

According to the Brazilian Diabetes Society, insulin therapy should be initiated for patients who have not achieved the therapeutic HbA1c target with optimization of available oral treatment, for individuals with hyperglycemia (HbA1c > 9% or fasting blood glucose > 300 mg/dl), symptoms of acute hyperglycemia, or complications or hospitalizations related to DM [22]. Therefore, recommendations regarding the initiation and follow-up of insulin treatment should receive special attention from professionals so that users correctly understand what to do and how to do it. In this sense, primary care nurses have the advantage of established relationships and knowledge of protocols to provide health education that promotes appropriate treatment [23].

The Technical Standard Recommendations for Insulin Treatment in DM2 – User [13] is intended for users and presents, in a more didactic way, guidelines on the adequacy of insulin treatment, according to capillary blood glucose results. The document provides an option for recording blood glucose check times and insulin doses administered at each time, making it easier for users to control the information. It also provides information on application sites, storage, signs of hypoglycemia and hyperglycemia, as well as the procedures to be adopted at each moment.

Protocols such as this promote health education for users as they provide visual, explanatory, and easy-to-understand content, increasing the self-care skills of people with DM and significantly improving adherence to healthy eating [23]. The same study shows low adherence by users to capillary blood glucose testing (only 38.9% of respondents) due to the unavailability of glucometers. The importance of monitoring capillary blood glucose for better treatment adjustment is emphasized, and the protocols included in this study [11, 13] reinforce this guidance.

Among the health demands of the population with type 2 DM is hyperglycemia, an acute condition characterized by high capillary blood glucose levels that requires immediate care [24]. As this is a condition that can lead to death, protocols must be very well defined, and all professionals involved in user care must be aware of the care flows. They must also be aligned with guidelines for monitoring capillary blood glucose and the correct use of medication, whether oral or insulin.

In addition to the need for blood glucose control through drug treatment, other care is necessary for users with DM2. Among these, foot care stands out, considering that diabetic

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foot is the most frequent complication in this population, which can lead to consequences such as hospitalization and amputation [25]. In this sense, nurses are the professionals who have mastery and responsibility. The technical standard for "Assessment and management of the feet of people with diabetes" [15] describes a protocol for examining diabetic feet, intended for all users diagnosed with the disease. The manual also provides guidance on assessing sensitivity to screen for chronic sensory-motor neuropathy, combining the vibratory sensitivity test with the use of a tuning fork and the protective sensitivity threshold (PST) with the use of an esthesiometer (10-gram monofilament).

The technical standard is in line with the guidelines of the Brazilian Diabetes Society regarding foot assessment and care, guidelines, and frequency of assessment according to the risk of developing lesions [26]. Periodic foot examinations allow for early identification of changes and appropriate treatment, preventing a significant number of complications related to lesions, and nurses in primary care should be responsible for this follow-up [27].

To assist in the process of monitoring users, professionals rely on well-structured flows that determine the path to be followed by the user for comprehensive health care and the procedures adopted. Three documents with these characteristics were identified in the present study [16-18], the first of which is called "Flow of care for people with DM" [16], which describes the care flow, risk stratification, and care plan, including glycemic and blood pressure control, foot assessment, routine exams, mental, reproductive, and oral health care, vaccination plan, and, finally, pharmacological treatment for patients within the glycemic target and self-adjustment of the insulin dose for patients who did not reach the glycemic target.

The second flowchart for professionals is the "Care Flowchart for People with High-Risk DM – 60 years of age or younger" [17], which describes the general care flowchart for defining a care plan, according to the care flowchart of each professional in the multidisciplinary team, including physicians, pharmacists, nurses, dentists, and nutritionists.

The third document that guides healthcare for the diabetic population is the technical standard "Organization of Care for Type 2 DM" [18], which describes risk stratification and concentration of care, determining the frequency of consultations to be carried out depending on risk stratification, routine tests, the need or not for self-monitoring of capillary blood glucose, and objectives and goals to be achieved according to each indicator, namely: lifestyle, nutrition, glycemic control, blood pressure, LDL cholesterol, renal function, retina, feet, mental health, oral health, reproductive health, and vaccination. This document presents the definition of therapeutic inertia, which is characterized by the persistence of HbA1c outside the target range, and recommends a "proactive approach" by the healthcare team, with changes in pharmacological approaches and referrals.

The three organizational flow documents [12-13, 15] reinforce the organization of primary health care in the monitoring of people with type 2 DM, as they guide professionals in meeting health demands quickly and uniformly, ensuring that users receive all necessary assistance. These tools are in line with the Ministry of Health's Care Guidelines, which aim to guide health services and demonstrate care flows by establishing the ideal care pathway for users [28].

The latest documents are at the state level, and both address the topic of DM more broadly. The first is the Diabetes Mellitus Guideline [19], a detailed document that presents physiological aspects, care and treatment plans, and even possible complications involved. The second is the State Health Plan 2024-2027 [20], which presents the Chronic Conditions Care Model (MACC), highlighting the concept of the Risk Pyramid, in which the population is stratified into different levels, with a health intervention recommended at each level of care. In this model, there are five levels of stratification, and interventions range from health promotion to the management of very complex chronic conditions. The main concept of this model is the close relationship between primary care and Specialized Primary and Outpatient Care (AAE), these levels of care being interdependent, with patients moving between them during the monitoring of their chronic health condition.

An evaluative study found that the implementation of the MACC qualifies multiprofessional care actions and includes technical and pedagogical support for PHC professionals, allowing for closer relationships between these professionals and SACA professionals. According to the authors, these movements have a positive impact on the stabilization of the chronic conditions of people treated in the AAE [29].

Thus, it is possible to understand the importance of protocols in PHC, which assist professionals, based on scientific evidence, ensuring safe, standardized, quality, and efficient care.

The limitations of the study lie in the territoriality of care flows, which may be designed to serve the population of the municipality in question but may not fully apply to other realities.

The contributions to the health field lie in promoting a comprehensive approach to the care of people

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living with diabetes. The study offers PHC professionals a clinical management tool, facilitating knowledge and immediate access to all available protocols and therapeutic guidelines. The results have the potential to assist in the development of health promotion actions, contributing directly to the organization of services, the development of new care flows, the optimization of existing protocols, and serving as a basis for the creation of educational materials, assisting users in self-care and contributing to treatment adherence.

FINAL CONSIDERATIONS

Protocols are fundamental tools for the organization of health care, as they guide professionals in clinical decision-making and ensure that users' demands are adequately met. In Primary Health Care, which often treats people with type 2 diabetes mellitus, protocols are essential in defining treatment, planning care, and guiding the work of the multidisciplinary team, encouraging comprehensive, safe, and evidence-based care.

The use of clinical protocols in PHC is an essential strategy for improving the quality of care for people with DM2, promoting equity, safety, and effectiveness in the healthcare system. When properly implemented, these instruments strengthen the work of the team, support care management, and contribute to better health outcomes.

This research reinforces that protocols assist professionals in decision-making, standardizing care and ensuring that uniform clinical guidelines are followed. In addition, they strengthen the comprehensiveness of care by guiding appropriate referrals, promoting early diagnosis, and enabling continuous monitoring of chronic health conditions.

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