

STRATEGIC MANAGEMENT IN PRIMARY HEALTH CARE: KNOWLEDGE AND BONDING TO CLINICAL PRACTICE GUIDELINES IN LOW BACK PAIN MANAGEMENT AND HEALTH RESOURCES

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ABSTRACT: This article analyzes strategic management in Primary Health Care, focusing on physicians' knowledge of and adherence to Clinical Practice Guidelines for the diagnosis and request of imaging examinations in the management of low back pain. The study also examines the prevalence of low back pain and public expenditure on lumbar spine imaging examinations in the municipalities belonging to the Association of Municipalities of Entre Rios, Santa Catarina, between 2019 and 2023. An exploratory, descriptive, cross-sectional, multimethod field study was conducted, using a case study design. Data was collected through structured interviews with 47 physicians working in Primary Health Care and through information obtained from the e-SUS Primary Health Care System, the National Regulation System, and the systems used by the Intermunicipal Health Consortium. The results showed that 70.21% of the physicians were unaware of the recommendations contained in the Clinical Practice Guidelines, while 93.62% reported that they did not follow these recommendations in their clinical practice. The findings also revealed an 18.01% increase in the prevalence of lumbar conditions between 2019 and 2023, accompanied by substantial growth in expenditure on imaging examinations, reaching increases of 147.62% and 163.80% in the systems analyzed. It is concluded that the limited knowledge of and adherence to evidence-based guidelines may contribute to unnecessary imaging requests and increased public health expenditure. Therefore, strategic management actions involving professional training, dissemination of clinical guidelines, monitoring of epidemiological indicators, and integration of health information systems are essential to improve the quality, effectiveness, and financial sustainability of Primary Health Care.

KEYWORDS: Primary Health Care. Strategic management. Low back pain. Clinical Practice Guidelines. Diagnostic imaging.

GESTÃO ESTRATÉGICA NA ATENÇÃO PRIMÁRIA À SAÚDE: CONHECIMENTO E ADEÇÃO ÀS DIRETRIZES DE PRÁTICA CLÍNICA PARA O MANEJO DA LOMBALGIA E RECURSOS DE SAÚDE

RESUMO: Este artigo analisa a gestão estratégica na Atenção Primária à Saúde, com foco no conhecimento e na adesão dos médicos às Diretrizes de Prática Clínica para o diagnóstico e a solicitação de exames de imagem no manejo da lombalgia. O estudo também examina a prevalência de lombalgia e os gastos públicos com exames de imagem da coluna lombar nos municípios integrantes da Associação de Municípios de Entre Rios, Santa Catarina, entre 2019 e 2023. Realizou-se um estudo de campo exploratório, descritivo, transversal e de métodos mistos, utilizando o delineamento de estudo de caso. Os dados foram coletados por meio de entrevistas estruturadas com 47 médicos atuantes na Atenção Primária à Saúde e de informações obtidas do sistema e-SUS Atenção Primária, do Sistema Nacional de Regulação e dos sistemas utilizados pelo Consórcio Intermunicipal de Saúde. Os resultados mostraram que 70,21% dos médicos desconheciam as recomendações contidas nas Diretrizes de Prática Clínica, enquanto 93,62% relataram não seguir tais recomendações em sua prática clínica. Os achados também revelaram um aumento de 18,01% na prevalência de condições lombares entre 2019 e 2023, acompanhado por um crescimento substancial nos gastos com exames de imagem, atingindo aumentos de 147,62% e 163,80% nos sistemas analisados. Conclui-se que o conhecimento e a adesão limitados a diretrizes baseadas em evidências podem contribuir para solicitações desnecessárias de exames de imagem e para o aumento dos gastos públicos em saúde. Portanto, ações de gestão estratégica que envolvam capacitação profissional, disseminação de diretrizes clínicas, monitoramento de indicadores epidemiológicos e integração de sistemas de informação em saúde são essenciais para melhorar a qualidade, a efetividade e a sustentabilidade financeira da Atenção Primária à Saúde.

PALAVRAS-CHAVE: Atenção Primária à Saúde. Gestão estratégica. Lombalgia. Diretrizes de Prática Clínica. Diagnóstico por imagem.

INTRODUCTION

Lower back pain (LBP) constitutes a major public health problem, with a global lifetime prevalence estimated at 70-85%¹. It is considered the leading cause of global disability and work absenteeism and leads to loss of productivity, high socioeconomic costs, and premature retirements^{2; 3; 4}.

The second most prevalent reason for consultations with a family doctor is LBP⁵. According to a survey by the Ministry of Labor and Social Security that analyzed the ranking of the five most prevalent sickness benefit claims, issues related to the lumbar spine were present in three out of five conditions⁶.

In recent years, several Clinical Practice Guidelines (CPGs) have emerged to

improve the effectiveness and efficiency of health care^{7; 8}, standardized procedures that aid reasoning and clinical decision-making in the management of LBP⁹.

National^{10; 11} and international guidelines^{12; 13; 14; 15} recommend that imaging exams should be avoided in patients with low back pain (LBP), unless there is a clinical suspicion of red flag pathology, such as fracture, infection, malignancy, or if imaging is necessary for further management, for example, surgery¹², with these causes being rare, comprising approximately 5% of cases of patients with low back pain¹⁶.

Despite the recommendations of the clinical practice guidelines regarding the management of low back pain, a large proportion of physicians request imaging exams outside these recommendations^{17; 18}, leading to an increase in socioeconomic burden, as patients may need to undergo multiple tests, referrals, and additional surgeries with questionable efficacy^{17; 19}. The Ministry of Health in Brazil has supported the use of clinical guidelines based scientific evidence for various health conditions. However, on the website of the Health Department of the government of Santa Catarina in Protocols and Therapeutic Guidelines, there is no reference document to guide Primary Health Care (PHC) professionals on the request for imaging exams, such as magnetic resonance imaging, in the management of low back pain (LBP).

Because evidence-based practice is essential and health decision-making should integrate scientific evidence, knowledge and bonding to the Clinical Practice Guidelines (CPGs) for LBP can provide appropriate diagnoses, reduce ineffective treatments, lead to better resolution, and decrease costs²⁰.

Thus, analyzing the knowledge and bonding to DPC (diagnosis and imaging exams) of LD by APS doctors from the Association of Municipalities of Entre Rios of Santa Catarina (AMERIOS/SC) is of great importance. Likewise, determining the prevalence of LD through the electronic system e-SUS APS (e-SUS APS), as well as the amount spent on imaging exams (X-ray, magnetic resonance, and computed tomography) of the lumbar spine, through the National Regulation System (SISREG) and the systems used by the Intermunicipal Health Consortium of AMERIOS/SC (CIS/AMERIOS/SC), in the health units of the municipalities that make up AMERIOS/SC, from 2019 to 2023.

METHODOLOGY

TYPE OF RESEARCH

Exploratory, cross-sectional, descriptive field research, multimethod, and case study method.

RESEARCH LOCATION

It included all the Basic Health Units (UBS) of the 17 municipalities that make up AMERIOS/SC: Bom Jesus do Oeste, Caibi, Campo Erê, Cunha Porã, Cunhataí, Flor do Sertão, Iraceminha, Maravilha, Modelo, Palmitos, Riqueza, Romelândia, Saltinho, Santa Terezinha do Progresso, São Miguel da Boa Vista, Saudades, and Tigrinhos. These municipalities cover 26 UBS and 46 Family Health Strategies (ESF).

SAMPLE

INCLUSION CRITERIA

General practitioners and general clinicians, physicians specialized in Family and/or Community Medicine, as well as those specialized in traumatology and orthopedics, who attend patients with low back pain (LBP) in the health units of AMERIOS/SC. These professionals should attend at least one patient with LBP per week and have been working in primary health care (PHC) for at least six months.

EXCLUSION CRITERIA

Doctors from other specialties (pediatricians, gynecologists, neurologists, among others) who work in health units in the municipalities that make up AMERIOS/SC.

INSTRUMENTS

A structured interview was used to assess the knowledge and adherence to DPC (diagnosis and imaging exams) for low back pain (LBP) by primary care physicians in

the municipalities that make up AMERIOS/SC. This interview was developed and conducted by the author of this study and contained both open and closed questions, related to the recommendations given by AMB/CFM Guideline II: Clinical Diagnosis of Low Back Pain and Sciatica (2008) and VA/DoD Clinical Practice Guideline: Diagnosis and Treatment of Low Back Pain (2022). For obtaining the health system data, data collection spreadsheets developed by the authors were used, involving e-SUS APS (quantitative data on appointments according to the codes of the International Classification of Primary Care (ICPC) and International Statistical Classification of Diseases), and Health-Related Problems (ICD) related to DL), SISREG and CIS/AMERIOS/SC systems (GEMUS, Rang, and IDS Saúde) (amount spent on lumbar spine imaging exams), between 2019 and 2023.

DATA COLLECTION

Initially, authorization was obtained from the Technical-Administrative Coordinator of AMERIOS/SC and the health secretaries of the municipalities that make up this association.

After full approval by the Research Ethics Committee with opinion nº. 6.006.190, visits to the UBS were scheduled. The professionals who agreed to participate in this research signed the Free and Informed Consent Form and completed the research instruments.

In all collections, the author of this study was present and available to answer any questions. The data collection took an average of 20 minutes with each professional.

DATA COLLECTION ANALYSIS

The quantitative data were analyzed using descriptive statistics (mean, standard deviation of the mean, minimum and maximum values, frequencies, and proportions expressed as percentages). For the qualitative data obtained from the structured interview, the responses were evaluated through content analysis based on Grounded Theory with a summative approach, and subsequently through descriptive statistics.

RESULTS

This research involved 17 municipalities that make up AMERIOS/SC. It totaled 26 UBS, which included 46 ESF and 48 physicians.

DEMOGRAPHIC AND PROFESSIONAL DATA OF THE PARTICIPANTS

A total of 47 doctors agreed to participate in this study. The age of the participants ranged from 24 to 72 years, with a mean of 37.89 (± 11.37) years; 33 (70.21%) doctors were male and 14 (29.78%) were female. Most of the doctors had completed their medical education at a private university ($n=28$; 59.57%) and did not have a specialization ($n=29$; 61.70%). The majority were general practitioners ($n=37$; 78.72%). Among the doctors who had a specialization, most were specialized in Family/Community/Public Health Medicine ($n=9$; 19.15%).

Regarding the length of time since graduation, 25 (53.19%) doctors had graduated 6 months to 5 years ago, 7 (14.89%) had graduated between 6 and 10 years ago, 10 (21.28%) between 11 and 20 years ago, 1 (2.12%) between 21 and 30 years ago, and 4 (8.51%) more than 31 years ago.

Of the total interviewed, 28 (59.57%) doctors had been working in Primary Health Care (PHC) for six months to 5 years, 7 (14.89%) had been working for 6 to 10 years, 8 (17.02%) for 11 to 20 years, 2 (4.25%) for 21 to 30 years, and 2 (4.25%) for more than 31 years. The number of patient consultations per week for doctors treating patients with low back pain (LBP) was reported to range from 5 to 115 patients, with an average of 29.53 (± 20.74).

Of the total doctors interviewed, 33 (70.21%) reported being unaware of the LBP Clinical Practice Guidelines (diagnosis and imaging tests) recommendations. Of the 14 (29.79%) doctors who reported knowing the LBP CPG recommendations, 13 (27.66%) reported being familiar with the AMB/CFM guideline recommendations related to LBP. Forty-four (93.62%) doctors reported that they do not follow the recommendations of any CPG (diagnosis and imaging tests) as a reference for managing LBP.

Thirty-three (70.21%) doctors reported that they do not use the Access and Risk

Classification Protocols – Adult Exams, under the Regulation item, available on the official website of the Government of the State of Santa Catarina. Furthermore, 41 (87.23%) doctors have not received any training (continuing and/or permanent education) in the past 5 years on the management of patients with LBP.

KNOWLEDGE AND ADHERENCE TO CLINICAL PRACTICE GUIDELINES (DIAGNOSIS AND IMAGING EXAMS) FOR LOW BACK PAIN GUIDELINE II OF THE BRAZILIAN MEDICAL ASSOCIATION/FEDERAL COUNCIL OF MEDICINE (AMB/CFM): CLINICAL DIAGNOSIS OF LOW BACK PAIN (2008)

Table 1 illustrates the information regarding the knowledge of and adherence to the recommendations/guidelines of the AMB/CFM Guideline: Guideline II - Clinical Diagnosis of Low Back Pain (2008), analyzed through 9 health questions related to the physical examination.

It was found that 67.74% of the physicians interviewed reported that they were aware of these recommendations; however, 67.37% reported that they do not adhere to these recommendations in their clinical practice in the management of low back pain (LBP).

GUIDELINE VETERANS AFFAIRS/ DEPARTMENT OF DEFENSE (VA/DOD): DIAGNOSIS AND TREATMENT OF LOW BACK PAIN (2022)

Graph 1 illustrates the imaging exams that would be requested by doctors working in primary health care (APS) at the Basic Health Units (UBS) in the municipalities that make up AMERIOS/SC, according to the signs, symptoms, and history of the patient with low back pain (LBP). It was found that if a patient with LBP presents symptoms of urinary retention or urinary and/or fecal incontinence, saddle anesthesia, changes in rectal tone, severe/progressive neurological deficits of the lower limbs, whose possible cause could be cauda equina syndrome, 41 (87.23%) doctors reported that they would request an MRI.

In conditions of LBP accompanied by fever, immunosuppression, intravenous drug use, and recent history of infection, where the possible cause or condition would be

an infection, 19 (40.42%) reported that they would not request any imaging exam, and 11 (23.40%) doctors would request another type of imaging exam (some reported that they would refer the patient to the hospital emergency/urgent care for lumbar puncture evaluation, pyelonephritis, ultrasound of the kidneys and abdomen, lumbar CT scan).

Patients with a history of cancer with new-onset low back pain and/or unexplained weight loss, failure of low back pain improvement after 1 month, age over 50 years, and with several risk factors present, 22 (46.81%) doctors reported that they would request magnetic resonance imaging and 16 (34.04%) would request other exams such as computed tomography, PET scan, or scintigraphy. The remaining requests are shown in the chart for analysis.

OPEN AND CLOSED QUESTIONS REGARDING GUIDELINE II OF THE BRAZILIAN MEDICAL ASSOCIATION/FEDERAL COUNCIL OF MEDICINE (AMB/CFM): CLINICAL DIAGNOSIS OF LOW BACK PAIN (2008) AND THE VETERANS AFFAIRS/DEPARTMENT OF DEFENSE (VA/DOD) GUIDELINE: DIAGNOSIS AND TREATMENT OF LOW BACK PAIN (2022)

Table 2 provides information regarding the variables assessed in the open and closed questions during the interviews with the physicians in this study. Among the respondents, 46 (97.87%) physicians reported performing anamnesis and physical examination in the assessment of their patients with LBP. The identification and evaluation of possible neurological deficits in patients with LBP were reported to be carried out by 40 (85.10%) physicians. Among the tests used to assess these neurological deficits, 34 (72.34%) physicians reported using the Lasègue maneuver, and 18 (38.30%) reported using the evaluation of sensitivity and muscle strength.

In the clinical evaluation of red flags (warning signs) in patients with low back pain, 43 (91.49%) doctors reported that they perform such an evaluation. When asked to list what these warning signs would be, cauda equina syndrome and related alterations were reported by 12 (25.53%) doctors. Ten (21.28%) doctors mentioned cancer and/or a history of malignancy and/or weight loss, seven (14.89%) mentioned fracture and trauma, six (12.76%) mentioned infection, and 18 (38.30%) doctors mentioned signs and

symptoms not consistent with the red flags addressed in low back pain clinical practice guidelines.

When asked about physical examination findings consistent with cauda equina syndrome, most doctors (n=20; 42.55%) reported that they do not remember and/or are unaware of such findings; severe/progressive neurological deficits of the lower limbs were reported by 14 (29.79%) doctors; urinary and/or fecal incontinence, and changes in anal tone were reported by 11 (23.40%) doctors.

Regarding the request for routine imaging exams for patients with nonspecific low back pain, 33 (70.21%) doctors reported that they do not routinely request them. Additionally, 21 (44.68%) stated that they request imaging exams to reassure the patient or at the patient's request, 20 (42.55%) do not request them, and six (12.76%) request them occasionally.

E-SUS PRIMARY HEALTH CARE SYSTEM (E-SUS PHC): PREVALENCE OF LOW BACK PAIN

We can observe in the sum of the municipalities that make up AMERIOS/SC, the prevalence of 10,493 lumbar conditions related to low back pain was recorded in 2019, 12,404 in 2020, 15,083 in 2021, 14,539 in 2022, and 11,894 in 2023. There was an increase in the prevalence of lumbar conditions of 1,911 cases (18.21%) from 2019 to 2020, and of 2,679 cases (21.60%) from 2020 to 2021. There was a decrease of 544 cases (3.61%) from 2021 to 2022, and of 2,645 cases (18.19%) from 2022 to 2023.

NATIONAL REGULATION SYSTEM (SISREG) AND SYSTEMS USED BY THE INTERMUNICIPAL HEALTH CONSORTIUM OF THE ASSOCIATION OF MUNICIPALITIES OF ENTRE RIOS (CIS/AMERIOS): AMOUNT SPENT ON IMAGING EXAMS RELATED TO LUMBAR CONDITIONS

Graphs 2 and 3 present the data collected from the electronic health information system SISREG and the systems used by CIS/AMERIOS/SC (GEMUS, Rang, and IDS Saúde), related to spending on lumbar spine imaging exams from 2019 to 2023.

Through the analysis of SISREG data, there was a gradual increase in spending on imaging exams (X-ray, computed tomography, and magnetic resonance imaging) for lumbar conditions, from 2019 to 2020, rising by 130.08%, from R\$ 80,470.52 to R\$ 185,145.92; from 2020 to 2021, there was a decrease of 3.59%, from R\$ 185,145.92 to R\$ 178,505.75; again, there was an increase in spending from 2021 to 2022, reaching 46.07%, from R\$ 178,505.75 to R\$260,752.45; finally, there was a reduction in spending of 24.95% from 2022 to 2023, from R\$ 260,752.45 to R\$ 195,706.24. Thus, there was an overall increase in spending on lumbar spine imaging exams of 147.62% from 2019 to 2023 (Graph 2).

Through the analysis of data from the systems used by CIS/AMERIOS/SC (GEMUS, Rang, and IDS Saúde), there was a gradual increase in spending on imaging exams (X-ray, computed tomography, and magnetic resonance) related to lumbar conditions from 2019 to 2022. From 2019 to 2020, there was an increase of 106.70%, rising from R\$64,019.31 to R\$132,326.84. From 2020 to 2021, there was an increase of 5.87%, going from R\$132,326.84 to R\$140,094.33; from 2021 to 2022, there was an increase of 56.63%, rising from R\$140,094.33 to R\$219,427.10; finally, there was a reduction in spending of 5.4% from 2022 to 2023, decreasing from R\$219,427.10 to R\$207,572.85. Thus, there was an increase in spending on lumbar spine imaging exams from 2019 to 2023 of 163.80% (Graph 3).

DISCUSSION

KNOWLEDGE AND ADHERENCE TO CLINICAL PRACTICE GUIDELINES (DIAGNOSIS AND IMAGING EXAMS) FOR LOW BACK PAIN

The management of LBP should be outlined by the healthcare professional and be based on information supported by scientific evidence regarding diagnosis, management, and prognosis, information that is contained in the LBP CPGs^{9; 13; 14; 21; 22}.

The majority of physicians interviewed (70.21%) reported being unaware of the CPG recommendations concerning diagnosis and imaging exams intended for the management of patients with LBP, and 93.62% reported not adhering to such recommendations in their clinical practice. Few studies have evaluated healthcare

professionals' knowledge of and adherence to LBP CPGs.

The study that presented results consistent with the one currently developed involved 56 physicians in Tijuana, Mexico, where 51% of the physicians reported being unaware of the LBP CPGs. That study concluded that although some physicians (49%) reported knowing the LBP CPGs, they lack greater mastery of and bonding to such guidelines ²³.

Divergent results were reported in a study involving Canadian chiropractors, where 50% of participants stated they were aware of the current radiographic guideline recommendations for low back pain (LBP) to support their clinical decisions, and the bonding rate to these guidelines was 75% ²⁴.

For the diagnosis of LBP, various guidelines recommend that the starting point for managing this health condition is taking a medical history and performing a physical examination ^{10; 12; 13; 14; 25; 26; 27}. In the present study, 97.87% of physicians reported that they take a medical history and perform a physical examination on patients with LBP, which is in accordance with the CPG recommendations for this health condition.

On the medical history log and physical examination, the healthcare professional should perform a neurological assessment in order to identify or rule out specific diseases, such as radicular syndrome, investigate warning signs (red flags), and psychosocial factors (yellow flags)

²⁸.

Although 70.21% of doctors responded that they are unaware of the CPG recommendations regarding the management of LBP, when asked specifically about the recommendations provided by the AMB/CFM guideline on neurological tests in LBP management, of the 9 recommendations/statements derived from this guideline regarding the physical examination of patients with LBP, 67.74% of doctors reported that they are familiar with this information. However, despite this knowledge, 67.37% reported that they do not adhere to them in their clinical practice, ignoring them. Studies have shown that one of the possible barriers to primary care physicians' adherence to LBP clinical guidelines is their perception and understanding of CPGs, believing that the guidelines

restrict professional practice as they consider them categorical and prescriptive ²⁹. Other barriers reported by doctors were the lack of sufficient time to perform a complete medical history and physical examination, making it difficult to have a dialogue with patients about the diagnosis of low back pain and regarding the recommendation that imaging tests are not necessary in many situations ³⁰.

The AMB/CFM Guideline (2008) recommends that, in the physical examination of patients with low back pain, movements such as lumbar spine flexion and extension should be assessed, as well as maneuvers like Valsalva, Lasègue, and Romberg, tests such as the Sezè Tip Sign, the "Bowstring" Sign (Macnab), and non-organic signs of psychosomatic low back pain (Waddellsigns)¹⁰.

Of the tests discussed above, the one that achieved the highest percentage of knowledge and adherence among the doctors interviewed was the Lasègue maneuver, since 91.49% of the doctors reported being familiar with these recommendations, and 76.59% reported that they adhere to this test in their clinical practice.

The Lasègue maneuver is recommended by many guidelines to identify radicular pain and radiculopathy ^{25;31;32}. However, some guidelines indicate that they cannot make recommendations for or against this test ^{21; 22}, because although it is seemingly simple to perform and interpret, and is also considered one of the standard diagnostic tests for radiculopathy, there is no consensus on the interpretation of the results. Therefore, clinicians and researchers should interpret this test with caution ²¹. A study reported that the Slump Test and the Lasègue test are the two tests with the highest clinical diagnostic value for LBP ³³.

Regarding other neurological tests brought up by the AMB/CFM Guideline, it was found that most doctors are unaware of them and do not apply them in their clinical practice, such as the Sèze's Finger Sign (51.06%) and Macnab's "rope arch" test (61.6%). The Virtual Health Library, responsible for disseminating bibliographic publications produced by the Ministry of Health, provides a document on the Spine (Low Back Pain/ Lumbosciatalgia) that addresses these tests, highlighting the importance of knowledge and adherence to them.

After conducting the anamnesis and physical examination of the patient with low

back pain, the doctor must decide whether to request imaging exams. In order to investigate whether requests for imaging exams in the management of low back pain are consistent with the DPC, the interviewed doctors were asked to indicate which radiographic exam they would request based on the signs, symptoms, and history of the patient with low back pain. Among the signs and symptoms presented to doctors during the interview, there were conditions related to red flags (warning signs or symptoms), which deserve special attention in the management of low back pain.

National guidelines^{10;11} and international guidelines^{12;13;14;15;26} recommend that imaging tests should be avoided unless there is clinical suspicion of red-flag pathology, such as fracture, infection, or malignancy, or if the imaging result would guide further management, for example, a surgical procedure^{11;12;31}, and/or if pain persists beyond 4 to 6 weeks^{31;34}. These causes are rare, accounting for approximately 5% of cases in patients with low back pain¹⁶. Clinical practice guidelines for low back pain recommend that in cases indicating the presence of red flags, diagnostic confirmation with imaging tests is advised, and referral to medium- and high-complexity services is recommended^{12;14;22;26}.

Of the situations analyzed, only in two did the conduct regarding the request for imaging exams not align with the CPGs of low back pain (LBP). The first was in the case of signs and symptoms indicative of a cancer history with a new onset of LBP, for which less than half of the physicians (46.81%) would recommend an MRI. The second was in the case of infection, where 40.42% of physicians would not request any imaging exam. The VA/DoD Guideline recommends requesting an MRI for both of the above situations.

Another situation of great importance in the history and physical examination of patients with LBP is the assessment of yellow flags (psychosocial factors). In this study, 76.59% of physicians reported that they perform this assessment. Thus, the primary care physicians interviewed in this study act in accordance with the CPG recommendations for LBP regarding the assessment of yellow flags.

Biopsychosocial factors such as catastrophizing, kinesiophobia, anxiety, depression, stress, poor sleep quality, and job dissatisfaction may be associated with the onset and chronicity of low back pain^{35;36;37}. Therefore, psychosocial factors should be addressed by physicians in the evaluation and treatment of patients with low back pain,

especially when the symptoms do not fit any known diagnostic profile or when the patient does not show improvement ²⁵.

Imaging exams may reveal benign findings, such as disc abnormalities like bulging discs or degenerative disc disease, which are commonly observed on imaging but may not be the source of pain, as they are also seen in imaging in up to 97% of asymptomatic patients ³⁸. Such findings tend to cause fear, disability, and unnecessary therapeutic interventions ³⁹. Thus, the doctor should use language that reduces fear and anxiety, should advise patients to stay active, and provide information on self-care options ^{14;22;31}.

The big challenge for primary care doctors is that LBP is just one of many conditions they manage.

HEALTH INFORMATION SYSTEMS

Although the average prevalence of LBP involving the total population of the municipalities that make up AMERIOS/SC was 11.54% (2019-2023) and increased by 18.01% from 2019 to 2023, it was found that spending on imaging exam requests increased substantially by 147.62% (SISREG data) and 163.80% (CIS/AMERIOS/SC data), increasing the economic burden on the public health service.

Such data are consistent with the results of the study by Mendonça et al. (2021), in which the direct costs for the treatment of LBP in Brazilian public hospitals nearly doubled between the years of 2013 to 2018. According to some guidelines, the vast majority of people with acute LBP should be treated in a primary care setting, with less than 10% requiring specialized evaluation, imaging tests, or complex interventions.

The total expenditure on imaging tests for LBP from 2019 to 2023 was R\$ 900,580.88, according to SISREG, and R\$ 763,440.43, according to CIS/AMERIOS/SC. A recent study in the year 2024 showed that the cost associated with LBP continues to rise faster than the inflation rate and the overall growth of healthcare expenses. Governments in the USA have long attempted to address the burden of high LBP costs through early measures. Despite these efforts, costs (~US\$ 40 billion; ~US\$ 2,000 per

patient per year) continue to increase with rising rates of imaging tests, high surgical rates, and no corresponding reduction in LBP prevalence. Cost-containment methods should focus on careful and comprehensive clinical assessment of patients to better understand when interventions requiring greater resources are indicated ⁴².

Lack of knowledge and non-adherence to CPGs, involving the diagnosis and imaging exams of LBP, are likely contributors to the higher request for imaging tests in primary care. Various factors may lead to an increase in spending on imaging exams, such as responding to the patient's own requests to provide reassurance, fear of missing a serious underlying spinal pathology, as well as concerns about lawsuits due to negligence ^{39,44}.

Although magnetic resonance imaging provides anatomical data, the relationship between pathoanatomy and clinical symptoms is controversial, as it is not known which details of the anatomical image are relevant and which findings may manifest clinically. It is known that the use of sophisticated diagnostic tests allows for greater accuracy in detecting diseases; however, it can lead to excessive and invasive procedures, as well as often unnecessary treatments⁴⁶.

In this research, 91.49% of doctors stated that they assess red flags. However, when asked through an open-ended question to cite what these red flags would be, a large percentage of the participants in this study demonstrated a lack of knowledge about the red flag signs of LBP, which may lead to requests for imaging exams that are often unnecessary.

Studies have shown that early imaging exams are associated with the potential for worse clinical outcomes. Using a large retrospective cohort (n = 405,965) to evaluate patients with nonspecific low back pain, it was found that lumbar spine MRI performed shortly after the onset of low back pain symptoms was associated with a higher likelihood of surgery, greater use of prescribed opioids, increased care costs, and higher pain scores.

Considering the growing impact on public budgets resulting from spending on imaging exams in the management of LBP in primary health care, associated with the increasing prevalence of this health condition, strategies to ensure the proper management of LBP based on scientific evidence become essential, which leads to the dissemination

to primary health care professionals about CPGs involving the diagnosis and request of imaging exams.

CONCLUSION

Most primary healthcare physicians in the municipalities that make up the Association of Municipalities of Entre Rios of Santa Catarina (AMERIOS/SC) reported that they are unaware of (70.21%) and do not adhere to (93.62%) the recommendations of the Clinical Practice Guidelines (diagnosis and imaging exams) for LBP in their clinical practice. Specifically, regarding the recommendations of Guideline II from the Brazilian Medical Association and the Federal Council of Medicine, which addresses the clinical diagnosis and physical examination of LBP, 67.74% of physicians reported that they are aware of these recommendations; however, 67.37% reported that they do not adhere to these recommendations in their clinical practice.

Lack of knowledge and non-bonding to the DPC recommendations (diagnosis and imaging exams) for DL may be one of the factors responsible for the high costs of imaging tests (an increase of 147.62% and 163.80% recorded by SISREG and CIS/AMERIOS/SC, respectively), and the increase in the prevalence of DL (18.01%) between 2019 and 2023.

Strategies that promote dialogue between the obtained epidemiological data and health management become essential.

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APPENDIX

TABLE 1 - Knowledge and adherence to the recommendations of Guideline II: Clinical diagnosis of low back pain (2008) by the Brazilian Medical Association/Federal Council of Medicine (AMB/CFM).

Guidelines – Clinical Diagnosis II: Physical Examination	Has knowledge		Does not have knowledge		Adheres to clinical practice		Does not adhere to clinical practice	
	N	%	N	%	N	%	N	%
1	38	80,85	9	19,14	21	44,68	26	55,32
2	38	80,85	9	19,15	5	10,63	42	89,36
3	36	75,59	11	23,4	6	12,76	41	87,23
4	43	91,49	4	8,51	36	76,59	11	23,40
5	26	55,32	21	44,68	26	55,32	21	44,68
6	34	72,34	13	27,65	31	70,45	16	34,04
7	31	65,96	16	34,04	4	8,51	43	91,49
8	23	48,94	24	51,06	4	8,51	43	91,49
9	18	38,3	29	61,7	5	10,64	42	89,36
MEAN	31,89	67,74	15,11	32,15	15,33	33,12	31,67	67,37

1- The flexion movement of the lumbar spine pushes the disc in the anteroposterior direction, which tends to worsen pain in disc herniation. In arthritic narrowing of the spinal canal, pain tends to worsen with extension.

2- In root compression, the Valsalva maneuver tends to provoke exacerbation of pain or its radiation down to the foot.

3- The combination of the Valsalva maneuver with lumbar spine flexion is considered positive if there is an increase in pain along the dermatomal path of the sciatic nerve, much more intense than that experienced with simple flexion alone.

4- The Lasègue maneuver is generally considered positive when pain radiates along the dermatome path of the L5 and S1 roots, exacerbating as soon as the elevation of the lower limb forms an angle of 35° to 70° with the horizontal plane.

5- In extruded or large hernias, the Lasègue maneuver may be positive below 35° and/or above 5°.

6- When there is only lower back pain, without radiation, and the angle of the affected lower limb is above 70° with the horizontal plane, the Lasègue maneuver is considered

negative, which may indicate the absence of a radicular compressive process (for example, in 7 central hernias).

7- The Romberg maneuver is considered positive if compensatory body movement is necessary to keep the feet fixed in the same place and touching each other. This sign is usually positive in spinal canal stenosis.

8- Sèze's tip sign: when the patient cannot walk on one of the heels: compression of the L5 root; on one of the toes: compression of the S1 root.

9- 'Bowstring' sign (Macnab): the patient's leg is lifted, as in the Lasègue maneuver, until pain appears; at this point, the knee is flexed. If there is a reduction and/or disappearance of the pain, the sign is considered positive for the diagnosis of disc herniation.

Source: Author himself.

TABLE 2 - Variables evaluated in open and closed questions involving guidance/recommendations from AMB/CFM and VA/DoD Guidelines.

Variables	Categories	n.	Relative frequency (%)
Conducts anamnesis and physical examination	Yes	46	97,87
	No	1	2,13
Assesses neurological deficits	Yes	40	85,1
	No	2	4,25
	Sometimes	5	10,64
Tests used	Lasègue	34	72,34
	Muscle strength	18	38,3
	Sensibility	18	38,3
	Movements	5	10,64
	Asymmetry	1	2,13
	Fabere/Patrich	7	14,89
	Adams	1	2,13
	PPR	5	10,64
	Reflex	7	14,89
	Gait/posture	3	6,38
	Palpation	5	10,64
	Applies tests but does not know the names	3	6,38
	Pulse	1	2,13
	Limb circumference	1	2,13
Red flags	No	4	8,51
	Yes	43	91,49

		1- Cancer/history of malignancy/weight loss	10	21,28
		2- Fracture/Trauma	7	14,89
		3- Infection	6	12,76
		4- Cauda equina syndrome/perineal paresthesia	12	25,53
		5- Incorrect answer	18	38,30
		6- Does not remember	2	4,25
Yellow flags	No		10	21,28
	Yes		36	76,59
	Unknown		1	2,13
Requests imaging exams to reassure	Yes		21	44,68
	No		20	42,55
	Sometimes		6	12,76

Source: Author himself.

PPR = percussion of the kidneys

malig. = malignancy