



## **USE OF THE ERGONOMICS REGULATORY STANDARD (NR17) FOR LIFTING, TRANSPORTING AND MOVEMENT OF PEOPLE: A BLIND SPOT AND EVIDENT NORMATIVE PARADOX**

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### **Abstract**

The Brazilian Regulatory Standard related to ergonomics (NR17) underwent an update process at the Permanent Tripartite Joint Commission. A regulatory gap is the non-application of the chapter on "individual lifting, transport and unloading of loads" to activities that require people movement. Would it be appropriate for a general standard to present a blind spot that excludes a specific set of activities? Couldn't the NR17 guidelines for tasks that require physical overload be useful for healthcare workers? What is the reason for an express exclusion, where there are known administrative, epidemiological and social security problems? Is the application of NR32 (sectoral standard for health services) requirements sufficient to prevent biomechanical risks caused by physical overload in tasks involving people? Considering these questions, this critical-reflective essay aims to support the debate for full coverage of NR17. The systematic interpretation was used as a study method. The arguments were divided into four topics: 1- study of the stages of NR17 review; 2- analysis of the legality of item 17.5.6; 3- relations between NR17, NR01, and NR32; 4- relationship between biomechanical risks and diseases recognized by the Ministry of Health and Social Security. It was observed that item 17.5.6 of NR17 is in conflict with a provision of the Consolidation of Labor Laws. Therefore, revisions of NR17 and NR32 are necessary to avoid this normative paradox. The regulations must adhere to the principles of legality and accountability to exercise good regulatory practices.

**Keywords:** Government Regulation, Regulatory Standard, Occupational biomechanics, Patient transport, Consolidation of Labor Laws.

### **1. INTRODUCTION**

Although illnesses and accidents related to ergonomic factors result in the absence and absenteeism of healthcare professionals (Alexandre, 1996; Diniz & Guimarães, 2001; Freire et al., 2017; Rocha et al., 2019), knowledge of these aspects and training correspondents are often absent or insufficient (Duarte & Mauro, 2010; Cunha & Mauro, 2010; Clock & Concepción Batiz, 2016). These problems result in cases of occupational low back pain (Helfenstein Junior et al., 2010), ergonomic constraints (Diniz & Guimarães, 2001) and disorders in the management of human resources in hospitals (Marques et al., 2015). In the period from 2014 to 2021, hospital care activities were identified as those with the highest prevalence of accidents

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in Brazil, totaling 456,806 records, of which 312,611 (68.4%) correspond to nursing technicians and assistants (Secretaria de Inspeção do Trabalho, 2024). Episodes of low back pain with functional limitation in nursing workers were associated with carrying out activities that require significant physical effort, such as transferring and lifting patients (Henriques et al., 2020). Therefore, it is crucial to evaluate and implement preventive measures to deal with the occurrence of complaints and absenteeism resulting from musculoskeletal disorders in this group of professionals (Bayerl, 2021; Duarte et al., 2023). This encompasses the analysis of legislation applied by supervisory bodies (Clock & Concepción Batiz, 2016) and scientific literature related to the analysis of ergonomic problems in hospital environments (Pompermaier et al., 2023). Aligning standards with available scientific evidence and implementing legal requirements in practice represent challenges for professionals working in the field of ergonomics.

The Regulatory Standards (NR) represent complementary provisions to the Consolidation of Labor Laws - CLT (Brazil, 1977). These provisions define the rules for "reducing the risks inherent to work, through health, hygiene and safety standards" as required by the Federal Constitution of 1988 (Brazil, 1988). The current 35 standards in force are classified as general, special or sectoral, and despite being separate, they are part of an interrelated system (Ministério da Economia, 2018). Such requirements and procedures present employers' and workers' duties related to health and safety in the workplace.

The International Labor Organization (ILO) recommends that the development and updating of these standards be conducted through a parity tripartite system. In Brazil, the Permanent Tripartite Joint Commission (CTPP) is the forum for this purpose (Ministério do Trabalho e Emprego, 2024). In this way, committees made up of government representatives, employers and workers work to review these standards to exercise good regulatory practices. These actions "*aim to increase the effectiveness and efficiency of the State in meeting its objectives through continuous improvement in the quality of regulations. It means promoting the updating and adaptation of existing legislation, as well as the prior analysis of proposals for new legislation to ensure, in both cases, that they are consistent, coherent, uniform, transparent, accessible and applicable*" (Ministério da Economia, 2018).

There is no critical analysis in the literature of the relationship between standards 17 (NR17) - a general standard that deals with ergonomics (Ministério da Economia, 2021) and NR32 (sectoral standard related to safety and health at work in health services, Brazil, 2005). The



NR17 Regulatory Impact Analysis showed that, of the 7,676 accident analyzes (fatal, serious and minor) carried out between 2016 and 2020 by Labor Tax Auditors, 66% (5,068) are related to ergonomic causal factors (Ministério da Economia, 2021 ). Furthermore, almost a third of the total irregularities detected in 2019 refer to the lack of Ergonomic Work Analysis (AET). This evidence reveals an important indication of a lack of effectiveness in the application of the standard (Ministério da Economia, 2021). Tottoli et al. (2019) highlighted the lack of compliance with NR17 in different sectors of a federal public hospital and a high prevalence of back pain and fatigue among healthcare professionals. On the other hand, there are positive experiences with a reduction in absenteeism after using NR17 to adopt preventive measures by an Ergonomics Committee to manage workers' health problems within a philanthropic hospital ( Duarte et al., 2023). Furthermore, there is the development of low-cost technologies that can minimize workers' efforts to lift, transport and move people (Muniz et al., 2017).

There is no Regulatory Impact Analysis study of NR32 and the available studies related to this standard mainly analyze the biological risks present in healthcare establishments (Marziale et al., 2012). The existence of a Technical Guide on Biological Risks prepared by the Labor Inspection Secretariat highlights the greater concern with these risks (Ministério da Economia, 2008).

According to Muller (2023) " *the norm is the result of a technical-political construction process of social participation, having limits and possibilities* ". Considering this context, this critical-reflective essay aims to support the debate for the full coverage of NR17 for tasks that require the lifting, handling and individual transport of loads.

## 2. METHODS

Systematic interpretation was used to analyze the relationships between NR17 and other legal provisions (NR01, NR32 and CLT). This method is relevant to the present study, because " *any legal norm is placed within a regulatory set, formed by rules and principles included in the same law, in hierarchically equal laws, superior or inferior, whose reading can gain decisive importance in the interpretation of a device* " (Krell, 2014). Therefore, item 17.5.6 of NR17 was evaluated according to the following procedures:

1- Study of the steps and available content related to the recent revision of NR17;



2- **Analysis of the legality of item 17.5.6** (“ *Chapter 17.5 Individual lifting, transport and unloading of loads of this NR does not apply to lifting, transport and movement of people*”) in accordance with the CLT ;

3- Study of the content of NR17 and relationships with NR01 and NR32 for application in tasks that require the movement of patients;

4- Identification of the relationship between biomechanical risks and diseases recognized by the Ministry of Health and Social Security

### **3. STEPS OF REVISION OF THE ERGONOMICS REGULATORY STANDARD (NR17)**

NR 17 went through a review process with the participation of government representatives, workers and employers in the Tripartite Technical Group and the Permanent Tripartite Joint Commission (Muller, 2023). Society participated through consultation and a public hearing held at Fundacentro. Table 1 presents the steps taken that began with the characterization of NR17 as a general standard until the publication of the new text of the standard. During this period, there were demonstrations by society through technical notes from the Public Ministry of Labor and a document signed by different professionals and institutions (Brazilian Association of Labor Studies - ABET; Brazilian Association of Workers' Health - ABRASTT; Association of Workers' IBGE - São Paulo; Regional Union Council of Baixada Santista, Litoral Sul and Vale do Ribeira, Work Accident Forum - FORUMAT; Instituto Trabalho Digno and Union of federal public servants in the State of São Paulo - SINDSEF-SP).

	<b>Documents, meetings, consultation and public hearing</b>	<b>Dates</b>
01	New structuring for NR 17 - SIT Ordinance N° 787 - General Standard	November 28, 2018
02	Regulatory agenda established - 97th Ordinary Meeting	June 4, 2019
03	Public Consultation N° 06/2019	August 30th to September 28th, 2019
04	Public Hearing - Fundacentro - Available at: <a href="https://www.youtube.com/watch?v=EndE2VqHhYY">https://www.youtube.com/watch?v=EndE2VqHhYY</a>	September 13, 2019
05	Presentation of technical note by different institutions - Revision of NR 17/2019: it is necessary to modernize and further protect Workers' Health	September 13, 2019
06	Technical Note on the government proposal to change Regulatory Standard 17 - NR 17: Ergonomics - Public Ministry of Labor	January 30, 2020
07	Permanent Tripartite Joint Committee - 1st Extraordinary Meeting "Item 17.5 had its title changed to: "Individual lifting, transport and unloading of loads", proposed by the government to clarify that it does not apply to the transport of people" (record of meeting minutes).	February 5th and 6th, 2020
08	Permanent Tripartite Joint Commission. 5th Ordinary Meeting	March 10th and 11th, 2020
09	Report - Regulatory Impact Analysis - NR17	June 15, 2021
10	Permanent Tripartite Joint Committee - 10th Ordinary Meeting - Approval of the text of the current NR17.	June 29th and 30th, 2021
11	New valid wording of NR17 - <u>MTP Ordinance N° 423</u>	October 7, 2021
12	Validity of the current NR17 with the inclusion of Item 17.5.6 – "Chapter 17.5 Lifting, transporting and individual unloading of loads of this NR does not apply to lifting, transporting and moving people"	January 3, 2022

Table 1: Acts related to the review of NR17

It is important to highlight that the justification for the exclusion of people for the issue of lifting, individual transport of loads (Item 17.5.6 of NR17) was not recorded in the documents analyzed (minutes of meetings, contents of technical notes or statements at the public hearing). Therefore, there is no formal evidence on the reasons for this exclusion. The context of labor reform with setbacks in regulatory support for occupational safety (Fernandes, 2023) and companies' interests in cost reduction may have led to the inclusion of this item in NR17.



However, current labor legislation, CLT, must be respected to comply with the principle of legality.

#### **4. ITEM 17.5.6 IN THE LIGHT OF THE CLT: THE ILLEGALITY OF AN NR17 DEVICE**

Legality represents one of the principles for good regulatory practice (Ministério da Economia, 2018). Would it be appropriate for a general standard to present a blind spot that excludes a specific set of activities?

According to section II of article 5 of the Federal Constitution, which deals with individual and collective rights and duties, “ *no one will be obliged to do or not do anything, except by virtue of Law* ”. In this way, the complementary provisions established in regulatory standards with an infra-legal characteristic must not conflict with the CLT, as they must respect the provisions provided for by legislation.

Under this premise, the CLT determinations cannot be forgotten. The sole paragraph of article 182 of the CLT - included by Law nº 6,514 (Brazil, 1977) , establishes that: “ *The provisions relating to the transport of materials also apply, where applicable, to the transport of people in workplaces* ” . Given this provision, item 17.5.6 of NR17 does not present legal validity as it contradicts a legal precept set out in the CLT. The standard must strictly comply with the law (Ministério da Economia, 2018) and cannot contain provisions that do not comply with the CLT.

#### **5. NR17 AS A REFERENCE FOR ERGONOMIC INTERVENTIONS AND THE NEED FOR HARMONIZATION WITH NR 01 AND NR32.**

There are three dimensions to load analysis - physical, mental and cognitive (Luvizoto, 2023) and despite the known biomechanical risks caused by the overload of healthcare professionals (Abdalla et al., 2014, Jacquier-Bret et al., 2023 ), chapter 17.5.6 (Individual lifting, transport and unloading of loads) of NR17 does not apply to the movement of people. Therefore, this exclusion is in conflict with the CLT and opens a regulatory gap for professionals who care for patients in different contexts.

Standards that: “ *regulate aspects arising from the legal relationship provided for in the Law without being conditioned to other requirements, such as activities, facilities, equipment* ”



*or specific sectors and economic activities* " are considered general (Ministério do Trabalho, 2018). Would it therefore be appropriate for a general standard to present a blind spot that excludes a specific set of activities? This gap in NR17 leads to the fragmentation of information on the risk inventory and action plan as required by NR01, which presents the general provisions for occupational risk management. In other words, under what arguments can ergonomic measures be applied for lifting, moving and transporting patients/people, when the standard excludes these activities?

The Regulatory Impact Analysis of NR17 (Ministério da Economia, 2021) identified some problems in applying the standard, such as:

- *" low effectiveness in applying ergonomic guidelines and requirements;*
- *lack of technical review of NR 17, data updating and technological innovations;*
- *misalignment of the text of NR 17 with other OSH standards; and*
- *existence of conflicts in the application of the standard "*.

Under this perspective, the normative paradox is characterized by the exclusion of specific activities in NR17, maintenance of problems identified in the Regulatory Impact Analysis , disarticulation with NR01 and NR32 and conflict with a legal provision in activities with known ergonomic, social security and epidemiological problems.

Table 2 presents the NR32 requirements for activities related to the movement and transport of patients.

32.10.12 Health service workers must be:

a) trained to adopt correct body mechanics when moving patients or materials, in order to preserve their health and physical integrity;

32.10.10 In procedures for moving and transporting patients, the use of devices that minimize the effort made by workers must be privileged.

Table 2 - NR32 items related to the movement and transport of patients.

What would be correct body mechanics and how to minimize the effort made by health workers to comply with items 32.10.10 and 32.10.12 of NR32? Studies on this topic were developed by Alexandre (1998), Alexandre & Rogante (2000), Batiz et al. (2012), Cantarella et al. (2020) and Bergman & Jesus (2022). The literature presents guidelines for "correct body mechanics", such as:



- a. " *pick up and carry the load as close as possible to the trunk with a straight spine; eliminate or avoid turning and tilting as much as possible; provide enough space to carry out the activity* " (Batiz et al., 2012);
- b. " *Space cannot limit movements* " (Alexandre & Rogante (2000)).

Chapter 17.5 of Individual Lifting, Transport and Unloading of Loads can contribute to meeting the requirements of NR32 and recommendations of the *International Organization for Standardization* (ISO 12.296/2012), as it presents the necessary actions to comply with the standard related to health and safety of health services (NR32) and international guidelines. Furthermore, overloads can be reduced with the use of ergonomic principles (Moore et al., 2011) and components of the National *Institute for Occupational Safety and Health equation* for lifting loads (NIOSH, 1994), such as:

- 1- Adaptation of workstations to a better standard location for lifting and adaptation to human capabilities (efficient operating modes);
- 2- Distribution of loads with more people according to the weight to be transferred and determined protocols;
- 3- Reduction of the asymmetry of movements for transfers of people;
- 4- Improvement of the hands-load interface for weight distribution ("grip quality");
- 5- Decrease in horizontal displacement movements to reduce the compression force on the vertebral disc (L5/S1) and upper limbs;
- 6- Reduction in the duration of the activity;
- 7- Elimination of vertical movements for people to move on non-level surfaces;
- 8- Elimination of unstable postures and guarantee of bilateral weight distribution;
- 9- Development of standard operating procedures with work organization measures (breaks, rotations, etc.) to divide the load among workers and to achieve comfort, safety, health and efficient performance of tasks related to postural changes and transfers of people.

According to Alexandre & Rogante (2000) " *there is no safe way to perform a manual transfer from the bed to a stretcher* " without risks. What exists is equipment that must be used in conjunction with furniture and an environment that allows for the best survey location to reduce existing risks. Therefore, the suggestions of this essay involve: 1- exclusion of device





17.5.6 from NR17 and 2) inclusion of specific requirements for the manual movement of people on NR-32 (Table 3).

- 1- Exclusion of item 17.5.6 - "Chapter 17.5 Individual lifting, transport and unloading of loads of this NR does not apply to lifting, transporting and moving people".
- 2- Inclusion of specific requirements for the manual movement of people in NR-32

Table 3 - Suggested revision of NR17 and NR32

Under this normative paradox, there is a need to harmonize the determinations of NR32 with the requirements of NR17. But how can NR17 be applied to patient movement? NR17 presents guidelines that may be useful for moving patients, especially when considering the devices described in Table 4:

17.5.2 When lifting, handling and transporting individual and non-occasional loads, the following requirements must be observed:

a) the places for picking up and depositing loads, based on the preliminary ergonomic assessment or AET, must be organized in such a way that the loads, access, spaces for movement, heights for picking up and depositing do not force the worker to perform flexions, extensions and excessive trunk rotations and other forced and harmful positioning and movements of body segments; and

b) loads and equipment must be positioned as close as possible to the worker, providing sufficient space for the feet, so as to facilitate reach, not hinder movement or cause other risks.

17.5.2.1 Non-occasional lifting of loads that could compromise the safety and health of the worker is prohibited when the horizontal reach distance of the handle is greater than 60 cm (sixty centimeters) in relation to the body

Table 4 - NR17 items related to the lifting, handling and individual transport of loads.

It is important to highlight that biomechanical risks in the activities of healthcare professionals are recognized by the Ministry of Health and Social Security. In this context, it is necessary to exclude item 17.5.6, as physical loads during the movement and transfer of people can be eliminated or reduced with the application of the devices in the individual lifting, transport and unloading of loads chapter of NR17.

## **6. BIOMECHANICAL RISKS AND DISEASES RECOGNIZED BY THE MINISTRY OF HEALTH AND SOCIAL SECURITY**

The biomechanical risks associated with lifting and transporting loads are recognized by the Ministry of Health and Social Security, through the List of Work-Related Diseases (Brazil,



2023) and the Epidemiological Technical Nexus (Brazil, 2009) which presents the presumed link of diseases related to the area of hospital care.

Decree n° 6,957 (Brazil, 2009), established the Epidemiological Technical Nexus of the relationships between the morbid entity indicated in the ICD-10 ranges and the National Classification of Economic Activities (CNAE) classes indicated. In other words, a social security epidemiological technical nexus (NTEP) was established to establish the relationships between diseases and different economic activities. This instrument can be used to prepare and review standards for preventive measures. Diseases of the musculoskeletal system and connective tissue, related to work (ICD 10 M), for example, are included in hospital care activities (CNAE 8610).

It is important to highlight that item 17.5.6 may give rise to different interpretations between managers and labor courts, as it represents a gap in relation to the risks and illnesses already recognized by the area of health and social security. In other words, although the impacts on health are known, the regulatory protection is not complete, as it is known that the Technical Epidemiological Nexus provided for in social security legislation implies the merely relative presumption of a link between the worker's illness and professional activities. The absence of normative protection related to the application of force and manual manipulation of people (item 17.5.6) within NR17 inhibits the development of assessments and preventive actions within health institutions and for professional caregivers who are subjected to physical overload during their working day ( Eishima et al., 2010).

## 7. FINAL CONSIDERATIONS:

The gap in NR17 for patient lifting and movement activities causes a normative paradox, when seeking coherence and harmony in the legal system. NR32 directs attention to " *correct body mechanics* ", but what does this mean in practice for healthcare professionals, caregivers, ergonomists and managers? The breadth of interpretations makes it difficult to protect and repair ergonomic risks in labor courts. The harmonization of regulatory standards is essential for simplified application by supervisory bodies and professionals in the areas of occupational safety and medicine.

With this biomechanical vision of reducing manual efforts and expanding regulatory protection, there will be greater support for proposals for ergonomic interventions in health services. The debate on the application of NR17 and NR32 can be better substantiated based on



this essay. Furthermore, a future review of standards can be triggered based on the technical, scientific and legal arguments presented. A technical guide on ergonomic risks in healthcare services must be prepared based on international standards (ISO 12,296/2012) to contribute to the prevention of risks to which healthcare professionals are exposed when caring for people with temporary or permanent physical disabilities. These guidelines will be useful for the effective operationalization of the requirement of Article 183 of the CLT, which defines that: “*People who work in the movement of materials must be familiar with the rational methods of lifting loads*”.

Under these arguments, the Ministry of Labor and CTPP must comply with the principle of responsibility and take steps to fill this gap quickly and effectively to implement good regulatory practices. It should be noted that studies are necessary to evaluate the effects of labor reform on the review process and impact of updated regulatory standards.

In any case, “*civil, administrative, criminal, ethical and political liability is a reality that can affect any professionals who work in the capital-labor relationship, which is conflictual by its nature, due to being an ambivalent link, since while the worker sells the only thing he has, which is his labor power, to guarantee survival, the entrepreneur is more than seeking his survival, he is accumulating wealth. And, this profit can never be sustained based on non-compliance with a legal and moral obligation, which is to guarantee the best ergonomic conditions in the work environment*” (Soares & Soares, 2018).

From this perspective, CTPP members and professionals working in the area of occupational health and safety must consider workers' health, legal determinations and scientific knowledge for future reviews and applications of regulatory standards.



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