# Protocol for Assessing the Capacity and Return to Work of Workers With RSI/WMSD

## Protocolo para Avaliação de Capacidade e Retorno Laboral de Trabalhadores Com LER/DORT

## Protocolo para Evaluación de Capacidad y Regreso Laboral de Trabajadores con RSI/WMSD

**RESUMO**

**Objetivo:** O estudo analisou criticamente o Protocolo para Avaliação de Capacidade de Trabalho e Retorno Laboral em trabalhadores com lesões relacionadas ao esforço repetitivo e distúrbios osteomusculares. **Método:** O protocolo foi aplicado em 17 trabalhadores nos serviços de Saúde do Trabalhador do CEREST de Piracicaba e no ambulatório de Medicina do Trabalho do Hospital de Clínicas da Unicamp. **Resultado:** Os resultados indicam que o protocolo é abrangente e funcional, exigindo equipe multidisciplinar e cerca de três horas para aplicação. **Conclusão:** A aplicação do protocolo requer treinamento especializado, atenção à saúde mental, compreensão dos trabalhadores e readequação de espaços para registros. Conclui-se que é uma ferramenta eficaz para o retorno laboral, contribuindo para a reabilitação ocupacional e prevenção de incapacidades.

**DESCRITORES:** Retorno laboral. Lesão por esforço repetitivo. Doença osteomuscular relacionada ao trabalho.

**ABSTRACT**

**Objective:** This study critically analyzed the Protocol for Work Capacity Assessment and Return to Work in workers with repetitive strain injuries and musculoskeletal disorders. **Method:** The protocol was applied to 17 workers at the Occupational Health Services of CEREST in Piracicaba and the Occupational Medicine outpatient clinic of the Hospital de Clínicas at Unicamp. **Result:** Results indicate that the protocol is comprehensive and functional, requiring a multidisciplinary team and approximately three hours for full application. **Conclusion:** Application of the protocol requires specialized training, attention to mental health, worker comprehension, and space adjustments for record-keeping. The study concludes that it is an effective tool for work reintegration, contributing to occupational rehabilitation and the prevention of work-related disabilities.

**DESCRIPTORS:** Return to work; Repetitive strain injury; Work-related musculoskeletal disease**.**

**RESUMEN**

**Objetivo:** El estudio analizó críticamente el Protocolo para la Evaluación de la Capacidad Laboral y el Retorno al Trabajo en trabajadores con lesiones por esfuerzos repetitivos y trastornos musculoesqueléticos. **Método:** El protocolo se aplicó a 17 trabajadores en los servicios de Salud del Trabajador del CEREST de Piracicaba y en la clínica de Medicina del Trabajo del Hospital de Clínicas de la Unicamp. **Resultado:** Los resultados indican que el protocolo es integral y funcional, requiriendo un equipo multidisciplinario y aproximadamente tres horas para su aplicación completa. **Conclusión:** La aplicación del protocolo requiere capacitación especializada, atención a la salud mental, comprensión de los trabajadores y adaptación de espacios para el registro de información. Se concluye que es una herramienta eficaz para el retorno al trabajo, contribuyendo a la rehabilitación ocupacional y **LA PREVENCIÓN DE** discapacidades laborales.

**DESCRIPTORES:** Vuelve al trabajo. Lesión or esfuerzo repetitivo. Enfermedad musculoesquelética relacionada con el trabajo.

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## INTRODUCTION

Work-related diseases have been described since ancient times and the Industrial Revolution. In the 1980s, with the advent of globalization and new technologies, the pace of work and labor demands intensified. Due to the lack of breaks and the increase in demands above the individual capacity of workers, a global epidemic was observed, including in Brazil, of a group of diseases due to Repetitive Strain Injuries (RSI) and Work-Related Musculoskeletal Disorders (WRMD). [1]

In Brazil, the prevalence of RSI/WMSD varies between 15% and 40% in workers exposed to ergonomic risk factors, depending on the activity and working conditions, [2;3] and represent a group of musculoskeletal disorders, which affect the upper and lower limbs and the cervical and lumbar spine triggered or aggravated by working conditions, [4] being the second main cause of absence from work among formal workers and those insured by Social Security, [5] associated with ergonomic, psychosocial and organizational risk factors such as: repetitive movements, static contraction of musculoskeletal structures, excessive demands, lack of breaks, overtime, [6] which evolve into chronic musculoskeletal pain and functional limitations that compromise quality of life and productivity. [7]

The high potential for chronicity of injuries, aggravated by the lack of change in the environment, triggering work activities, difficulties in taking time off, adequate treatment and lack of monitoring upon return to work contribute to discriminatory attitudes among these affected workers. This vicious and perverse cycle of sickening work situations and lack of actions to prevent these injuries perpetuate the high prevalence of RSI/WMSDs and their impact on the loss of work capacity among workers in all economic sectors of the industry and service sectors, takes on a public health dimension. [8;9;10]

Studies show that interdisciplinary occupational rehabilitation is essential for returning to work in cases of RSI/WMSD. [11] The use of clinical protocols based on scientific evidence and technologies is of fundamental importance, as it contributes to the qualification of the team and the quality of the report to improve treatment, return to work and prevention. [12] The effectiveness of the protocol also includes ensuring worker safety, preventing relapses and being able to direct safe work. In addition to practical guidelines aimed at adaptation, reintegration and rehabilitation in the work environment.

This study aims to critically analyze the Protocol for assessing the work capacity and return to work of workers with RSI/WMSDs in specialized occupational medicine and worker health services. [13]

## METHOD

In this qualitative study, the protocol developed by Melleiro (2024) was applied cross-sectionally, [11] to assess the work capacity and return to work of 17 workers with RSI/WMSDs at the Occupational Health Services of CEREST in Piracicaba and at the occupational medicine outpatient clinic of the Hospital de Clínicas da Unicamp in Campinas-SP. The protocol consists of four stages: 1. Health assessment aimed at RSI/WMSDs. 2. Functionality assessment: core sets of the International Classification of Functioning, Disability and Health (ICF) for RSI/WMSDs and low back pain. 3. Work capacity assessment: Work Ability Index (WAI): Assessment of work capacity using a Likert scale with scores from 1 to 5 and 1 to 10; Calculation of the Work Ability Index (WAI) and WCI result: low, moderate, good or excellent. [4]. Guidelines/recommendations of the assessment team: Team discussion, considering the previous stages; Guidelines for return to work when applicable and discussion of the assessment results with the worker. [13]

Seventeen patients with RSI/WMSD were selected by health professionals from both services who, after prior training, applied the aforementioned protocol between August 2024 and November 2024.

At CEREST in Piracicaba, 9 cases were selected by the multidisciplinary team, consisting of occupational therapists, physicians, and physiotherapists. The application was carried out in two stages: the first with the application of the core sets of the Interna-


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tional Classification of Functioning, Disability, and Health (ICF) and the Work Ability Index (WAI), and the second with a medical evaluation with a script and specific clinical evaluation maneuvers.

During the application of the protocol at CEREST, the researchers provided online technical support to ensure its uniformity. After the application of 9 cases in this service, the professionals were interviewed by the researchers. The flow of care involved the following stages: reception, medical consultation, application of the International Classification of Functioning (ICF) and the Work Ability Index (WAI).

At the HC UNICAMP outpatient clinic, the application was carried out by occupational medicine residents in a single stage. Eight patients from the RSI/WMSD outpatient clinic were selected. The application time in both services was three hours.

At CEREST in Piracicaba, the health professionals were interviewed collectively in two 3-hour sessions. At UNICAMP, the two residents were interviewed individually. In addition, the patients' perception regarding the application of the protocol was assessed through an opinion survey. The interviews with the health professionals and the opinion survey of the workers were conducted after their respective prior signatures of the Free and Informed Consent Form (FICF).

The researchers' observations were recorded in a field diary and the revised protocol was presented and discussed with teams from each service to obtain additional contributions. The research project was approved by the Research Ethics Committee under CAAE number 78795124.5.0000.5404.

## RESULTS

At CEREST Piracicaba, nine patients were selected by the team, one of whom was unable to attend the second stage of the medical evaluation due to post-surgical convalescence. At UNICAMP, eight patients participated in the study. Considering the two services, 16 were men, 15 had active employment contracts, 12 of whom were on leave from work receiving social security benefits, and two were unemployed. The average age was 41 years. In both services, the average time to complete all stages of the protocol was three hours.

The protocol is structured in four well-defined stages: reception, medical evaluation, application of the International Classification of Functioning, Disability and Health (ICF) and the Work Ability Index (WAI), considerations and recommendations from the team regarding the case, facilitating monitoring of the worker's progress and ensuring that all relevant areas are addressed during the evaluation. The results indicated that this systematic approach not only improves the efficiency of care, but also provides a greater understanding of the workers' functional limitations.

The main comments and suggestions from the teams of both services are summarized in Table 2.

| Step | Considerations |
|---|---|
| 1.Health assessment aimed at RSI/WMSDs | - The work process needs to be a leading factor in this stage, considering areas such as work pace, breaks, level of physical and mental effort required, and overload of muscle groups.<br>- Mental health and psychosocial factors are addressed very superficially in this stage of the protocol, containing generic questions that make understanding difficult.<br>- The physical examination is very complete, with maneuvers to assess all body segments, and the range of motion of the joints provides a concrete basis for assessing limitations |
| 2. Functioning assessment: core sets of the International Classification of Functioning, Disability and Health (ICF) for RSI/WMSDs and low back pain | - The team needs to be trained in advance to use the instrument.<br>- Reassess the environmental issues, such as access to equipment, medications, prostheses, family members, caregivers, work, employment, social life, etc., that impact the practice.<br>- Use the core sets indicated in the protocol to create a checklist of the most important codes for that service. |
| 3. Work ability assessment: Work Ability Index (WAI) | - It is very suitable, however, it is suggested to include this step in the initial part of the protocol. |
| 4. Guidelines/ recommendations of the assessment team | - Each professional makes written observations of their stage in the protocol.<br>- Difficulties were highlighted in bringing together the professionals who participated in each stage of the protocol to complete the process as a whole. |

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## DISCUSSION

There are protocols for RSI/WMSDs, but none as complete as the one presented. The inclusion of the physical assessment, the International Classification of Functioning, Disability and Health (ICF) and the Work Ability Index (WAI) makes the protocol more extensive, but also more comprehensive. The considerations of the health professionals involved in the application of the protocol in both services were similar, resulting in the suggestions presented in Table 2.

In the work activities, the team suggested some improvements in the structure of the protocol: expanding the space allocated to the description of work activities to collect essential information for the recognition and connection of occupational diseases, such as work pace, workstation, degree of physical and mental effort required, overload of muscle groups, breaks; the lack of adequate fields for these observations prevents a complete assessment of the worker's work context, which is essential to understand the origin of the injuries and adapt the recommendations for return to work. [14]

In mental health and psychosocial factors, the application of the protocol revealed significant gaps. Although these elements play a central role in occupational rehabilitation, the results indicated that the current protocol does not address them in a sufficiently comprehensive and effective manner. [15]

When referring to the agents and risk factors related to work recognized by the worker, the protocol raises questions about work organization, harassment, working hours, task content and its relationship with the worker. The extensive and comprehensive texts presented difficulties in interpretation, generating confusion and compromising the accuracy of the answers. Although the surveillance team reported greater ease in answering the questions, it was observed that the application of the protocol, regarding mental health issues, was not sufficient to adequately map this issue.

Some workers reported that the protocol, although extensive, made them feel heard, highlighting the need for instruments that provide a space to share experiences and emotional difficulties. Recent studies show that occupational stressors associated with musculoskeletal disorders can aggravate conditions such as depression and burnout, making it difficult to return to work. [15;16]

Regarding the physical assessment, the protocol revealed a strong point in the inclusion of steps focused on physical examination and assessment of range of motion. These components are highly relevant for identifying functional limitations and for guiding recommendations for occupational rehabilitation. During the physical examination, it is essential to evaluate anatomical structures such as tendons, muscles, ligaments and nerves, which are frequently involved in the pathophysiology of RSI/WMSDs. Identifying changes in these structures allows a more precise understanding of the worker's functional limitations. [17]

The detailed physical examination, which includes inspection, palpation and specific joint mobility tests, was highly valued by the professionals involved in the application of the protocol. This aspect was considered essential for the differential diagnosis and for the objective understanding of the musculoskeletal conditions of the workers evaluated. Among the elements analyzed, the tests targeted at specific joints stand out: shoulders, elbows, wrists, hips, knees and spine; range of motion measurements: the systematic assessment of mobility limits allowed for the precise recording of the extent of functional limitations.

These steps contributed to the preparation of clear and objective reports, which are essential for planning adaptations in the work environment and for the reintegration of workers.

The physical examination and range of motion assessment are pillars of the protocol's functional approach, providing objective data on the worker's physical condition. These components were highlighted as highly practical and effective for their ability to provide support for functional diagnosis, which helped to identify specific impairments, allowing for targeted interventions; guide therapeutic planning which, based on the results, makes it possible to propose ergonomic adaptations and specific therapies to promote functional recovery; record progress and results since periodic reassessment allows monitoring improvements over time, offering concrete evidence of the effectiveness of interventions.

These results are corroborated by the literature, [14;18] which recognizes the value of detailed physical examination and range of motion analysis as fundamental elements for the management of work-related musculoskeletal conditions.

The International Classification of Functioning (ICF) is recognized as a comprehensive tool for assessing functionality, but its practical implementation presented limitations in the context studied. Due to the complexity of the ICF and the wide range of aspects it covers, the World Health Organization (WHO) developed the ICF core sets. These sets of categories were designed to describe the functionality of people with specific health conditions. Instead of assessing the 1,454 aspects of functionality, only the most relevant categories and characteristics of a given disease are considered. [19]

At the time of application, difficulties were identified by both the applicators and the workers, related


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to limitations in understanding and operationalizing the instrument. Regarding the use of the qualifier, the need to record the number nine (not applicable) or leave the non-applicable fields blank was discussed.

The multidisciplinary teams emphasize that comprehensive instruments such as the ICF are important for more complete assessments, although their implementation requires specialized training and contextual adaptations. 20 Among the difficulties, they highlighted the length of the process and the large volume of questions, often with little relevance to the cases analyzed, which requires prior preparation by those who apply it.

In the context of the study, it became clear to the professionals involved in the application that the instrument cannot be used in the unit's routine, since in addition to the knowledge to apply it, it requires time, where time and staff resources are limited, and the information collected is often of little use. This observation is also in line with the difficulties reported in the literature on ergonomic interventions in the occupational environment. [13]

After deliberation by the team, it was concluded that it is not essential to fully complete the ICF table contained in the protocol. However, it was considered highly relevant to keep the document separate for reference purposes. The proposal is to use it as a reference to note and grade only the codes relevant to the case analyzed, in the checklist format, which was used in some studies and proved to be successful.[21]

As for environmental factors, it is important to understand how they impact in practice, they correspond to line (e) of the codes present and should be qualified only if relevant so that exhaustion does not occur when using the document. [22] The results also indicate that it is essential to develop a tool aligned with the reality of the service, capable of reflecting local needs.

The Work Ability Index (WAI) is essential for directing interventions upon return to work, as it allows for the precise identification of the worker's level of functional capacity. Based on this assessment, it is possible to propose specific adaptations in the work environment, reduce the risk of relapses and promote a safer and more efficient reintegration. [23]

In the ICT assessment, 14 of the workers interviewed showed low capacity, two showed moderate capacity, one showed good capacity and none showed excellent work capacity. This data reflects the severity of the functional limitations associated with RSI/WMSDs and reinforces the need for effective interventions to improve work aptitude.

During the ICT, no significant difficulties were observed. Workers showed greater clarity in understanding when using graduated scales from one to five and from one to ten. However, it was found that questions related to expectations and hopes for the future could generate more positive responses if they were addressed at the beginning of the protocol. This observation is due to the fact that this step is carried out at the end, at which point the interviewees' fatigue became noticeable.

To maximize the benefits of the ICT in the protocol, some improvements can be implemented, such as reorganizing the order of application and positioning the ICT at a strategic time, avoiding the impact of worker fatigue, in addition to including questions that address mental health and emotional factors directly related to work capacity.

The last stage involves the assessment team providing guidance and recommendations on the case in question. Initially, it was proposed that this stage take place in a meeting, in which the professionals involved in each case could discuss and provide guidance together. Multidisciplinary assessment is essential in the management of Repetitive Strain Injuries/Work-Related Musculoskeletal Disorders (RSI/WMSDs), due to the multifactorial nature of these conditions. Studies indicate that an approach that integrates professionals from different areas is essential for a comprehensive assessment and effective treatment of patients. [14]

Due to the professionals' busy schedules, it was difficult to hold these meetings. In view of this, it was suggested that each professional record their comments in the protocol after applying the stage that was their responsibility, making the process less dependent on meetings to conclude the case.

As a limitation of the study, due to the overload of services, the sample was small. The long time required to apply the questionnaire was also a determining factor for the small sample size. In addition, the scope of the suggestions depends on the qualifications of the teams involved. More consistent results could be obtained with an expansion of the sample and longitudinal monitoring. [18;24] These measures would allow for a more robust assessment of the impact of the protocol on reintegration into work and prevention of relapses.

After signing the informed consent form and applying the protocol, workers were interviewed to ask them to comment on their experience. It was clear to both workers and healthcare professionals that the protocol should be applied in an interview format, and that self-completion was not possible. Common comments regarding the length were: “I didn’t have any difficulty answering, it was extensive but useful”. They also reported asking too many questions: “It was quite extensive, there were unnecessary questions; it could have been more

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objective about what was important". Contrary to the previous narrative, there were positive comments regarding the length of the protocol: "No doctor has ever bothered to ask me so many questions about my life and not just the disease, I felt listened to".

An internal restructuring of the protocol was suggested, with the prior definition of the sectors and companies to be evaluated, aiming to optimize its application and promote greater alignment with the normative data.

The average time taken to apply the protocol, three hours, generated complaints from workers regarding the length and complexity of the process. Although some participants recognized the value of detailing the questions, the general perception was that long and unobjective questionnaires compromise engagement.

A restructuring of the protocol is suggested to prioritize essential information, eliminating redundancies and maintaining focus on the most relevant aspects for occupational rehabilitation.

## CONCLUSION

The physical examination and range of motion assessment stand out as one of the main strengths of the protocol, providing objective and guiding data for the occupational rehabilitation of workers with RSI/WMSDs. Their contribution to functional diagnosis and intervention planning reinforces the importance of their inclusion in the protocol, while adjustments in training and recording can further increase their effectiveness. These elements, aligned with an interdisciplinary approach, strengthen the protocol as an essential tool for promoting worker health and a safe and efficient return to work.

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