Translation and Cross-cultural Adaptation of the *Constant-Murley Score* into Argentine Spanish

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ABSTRACT

Introduction: Few questionnaires to quantify and categorize subjective and objective functional limitations in shoulder pathology have been translated into Argentine Spanish. **Objective:** To carry out the standardization, translation and cross-cultural adaptation of the Constant-Murley Score into Argentine Spanish. **Materials and Methods:** The cross-cultural adaptation was carried out following the steps proposed in the guide of the International Society of Pharmacoeconomic and Outcomes Research which establishes the guidelines for the translation and cultural adaptation of patient-reported outcome measures. **Results:** The version resulting from the translation process into Spanish was evaluated through cognitive interviews in two stages. Subsequently, the questions were reformulated for a better understanding of the elements and their response options, and specific modifications were made. **Conclusion:** We carried out the cross-cultural adaptation of the Constant-Murley score, obtaining a useful tool for the population of Argentina with shoulder pathologies.

Keywords: Constant-Murley score; shoulder.

Level of Evidence: II

Traducción y adaptación transcultural del Constant-Murley Score al español de la Argentina

RESUMEN

Introducción: Pocos cuestionarios para cuantificar y categorizar las limitaciones funcionales subjetivas y objetivas en la patología de hombro han sido traducidos al español de la Argentina. **Objetivo:** Realizar la estandarización, traducción y adaptación transcultural del *Constant-Murley Score* al español de la Argentina. **Materiales y Métodos:** La adaptación cultural se realizó siguiendo las etapas propuestas en la guía de la *International Society of Pharmacoeconomic and Outcomes Research* que establece las directrices para la traducción y adaptación cultural de medidas reportadas por los pacientes. **Resultados:** La versión traducida al español fue evaluada mediante entrevistas cognitivas en dos etapas. Posteriormente se reformularon preguntas para el mejor entendimiento de los elementos y sus opciones de respuesta y, dentro de cada apartado, se realizaron modificaciones específicas. **Conclusión:** Se logró realizar la traducción y adaptación transcultural del *Constant-Murley Score*, con lo que se obtuvo una herramienta para aplicar en la población argentina con patologías de hombro.

Palabras clave: Escala de Constant-Murley; cuestionario; hombro.

Nivel de Evidencia: II

INTRODUCTION

Shoulder pain is one of the most frequent causes of orthopedic consultation, with a prevalence of up to 66% in the general population. This condition is often associated with a restricted range of motion and limitation of activities of daily living.[1]

There are multiple questionnaires to quantify and categorize the subjective and objective functional limitations of shoulder disease. However, at present, only the SPADI (*Shoulder Pain and Disability Index*), the EQ-5D (*European Quality of Life Five Dimensions*), the Short Form-36 and the ASES scale (*American Shoulder and*

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Elbow Surgeons) have been validated in Argentine Spanish.[2-5] The rest of the tools are published in English, and the translation and validation into Argentine Spanish are not available. For this reason, when they are used in our environment, translation errors occur and altered results are obtained due to interpretation and application errors. That is why the use of scales with translation, cultural adaptation and validation for use in Spanish speakers is suggested.[5]

The *Constant-Murley Score* (CMS) was described in 1987 as an instrument to assess general shoulder function.[6] The ESSSE (*European Society for Surgery of the Shoulder and Elbow*) recommends it for use in research, which is why it has been widely used in recent decades.[7,8]

The CMS has been criticized for its imprecise terminology and fuzzy methodological definitions. In recent decades, multiple studies have been published aimed at standardizing measurement tools in an accurate and reproducible way.[8] In 2008, Constant published a guide with additional recommendations, without including a standardized protocol, thus leaving room for different interpretations in its application, especially on the measurement of strength.[7,9] Aside from the methodological difficulties, there is no validated translation, which is why today the use of this tool is criticized for its wide measurement variations.[9] Thus, it is important to carry out a translation and a cultural adaptation that allow its standardized application and methodology in our country.

OBJECTIVE

The objective was to carry out the standardization, translation and cross-cultural adaptation of the CMS to Argentine Spanish for the population of our country.

MATERIALS AND METHODS

Tool

The original version of the questionnaire in English used to perform the translation and cultural adaptation is divided into four sections (A, B, C, D). The first two correspond to the subjective part, and total 35 points, while the other two make up the objective exam, worth 65 points. The maximum total is 100 points.[10]

The first section corresponds to "Pain", in which the patient must indicate, on a line, the maximum degree of pain felt in the last 24 hours.

Section B comprises four items referring to the activities carried out in the last week, in terms of sleep quality, the ability to work regularly and the ability to perform leisure activities without limitation.

Section C includes four individual tests that assess active range of motion in anterior elevation, abduction, external rotation, and internal rotation.

Finally, section D evaluates force with a dynamometer.

Translation and cultural adaptation

The cultural adaptation of the tool was carried out following the steps proposed in the guide published by the ISPOR (International Society of Pharmacoeconomic and Outcomes Research) that establishes the guidelines for the translation and cultural adaptation of patient-reported outcomes measures:[11] 1) preparation; 2) translation; 3) reconciliation; 4) back translation; 5) back translation review; 6) harmonization; 7) cognitive debriefing; 8) review of cognitive debriefing results; 9) proofreading; 10) final report.[11]

In stage 1, preparation, permission was requested from the authors of the original tool to carry out the cultural adaptation. For this, an email was sent to Ilija Ban, main author of the Danish adaptation and standardization version of CMS[10] and to Roger Emery, co-author of the 2008 version of Constant,[7] who granted permission. In this phase, the doubts and ambiguities related to the conceptual meaning of the conflicting items of the questionnaire were also clarified with the authors. The authors were invited to actively participate as advisors throughout the process. The working group was made up of two traumatologists with extensive experience in the use of this tool, two bilingual professional translators and an expert methodologist in tool adaptation and validation.

In stage 2, translation, two native Argentine translators with experience in translating medical texts independently translated the original English version into Argentine Spanish. In turn, both translators were asked to write a report assessing the level of difficulty in translating each item (where 1 indicates "very easy to translate" and 10 "very difficult to translate"), with comments on challenging phrases that highlight, or uncertainties, and the rationale for their choices to resolve them.

In stage 3, reconciliation, a unified version of the aforementioned translations into Argentine Spanish was reached by consensus. Any doubts or discrepancies that arose during the translation were discussed with the authors of the original questionnaire.

In stage 4, the back translation into English of the version that emerged in the previous stage was carried out. This was done by a native English language translator who did not have access to the original document. The purpose of back translation is to provide a quality assurance step that is used to ensure that the reconciled translation is conceptually equivalent to the original version. As with the previous translators, he was asked for a report in which he communicated the level of difficulty in translating each item, with comments on the conflicting phrases and the reasoning behind his choice to resolve them.

In stage 5, back-translation review, the English back-translation was compared with the original version. The original authors were asked, through a form sent by email, to issue their degree of agreement on the adequacy of the back translation with respect to the original version, scoring between 1 (totally disagree) and 10 (totally agree) for each item, including the observations that they considered pertinent. Scores less than or equal to 3 indicate that the translation is not considered appropriate; between 4 and 6, doubtful, and between 7 and 9, appropriate. The translation is defined as consensual when 70% of scores equal to or greater than 7 are reached.[12] Any conceptual discrepancies or other problematic elements identified were presented to the translators for review and discussion. Updates to the reconciled translation were made as needed.

In the same way as Ban et al.,[10] we added an illustrated example of the correct position of the patient and the dynamometer with respect to the wrist to facilitate understanding of the section.

During the exchanges of information between the work team and the authors of the original version, we integrated stage 6 (harmonization) which, instead of being seen as an isolated step, was included as continuous quality control to guarantee the conceptual equivalence of the translations.

Stage 7, cognitive debriefing, aims to assess and guarantee an adequate level of comprehensibility and cognitive equivalence of the new translation. The guidelines proposed by the COSMIN guidelines (Consensus-based Standards for the selection of health Measurement Instruments) suggest carrying out 7 or more cognitive interviews to obtain a "very good" rating.[13] For this stage, a series of cognitive interviews were conducted with 5 traumatologists and 5 patients from the target population. After a detailed explanation by the research team about the type of study, its objective and the characteristics of the questionnaire, they were presented with the information sheet to participate.

The interviews were conducted by videoconference following the probing method, which consists of additional questions to unravel each stage of the question-answer process.[14] For its preparation, a structured script was followed according to which the participants read the instructions and, subsequently, each of the questions, answering them one by one. Throughout this process, they were asked to try to explain in their own words the meaning of each item and its possible answers and to identify those parts or words that were difficult for them to understand or were confusing. During the interview, participants' body language expressions and comments that might indicate difficulties in reading or understanding the questionnaire format were recorded. In addition, we recorded the degree of comprehension of the format, the instructions, and the questions (Annex). In case of identifying any word, phrase or answer option in the survey as confusing, they were asked to propose an alternative expression on how to rewrite the statements in order to improve understanding.

A detailed and literal annotation of each of these aspects was made in order to be evaluated later. The interviews were recorded.

In stage 8, review of the cognitive interviews, the results of the comprehension test were reviewed and the translation was finalized. The instructions, the response format and the elements of the instrument that were not clear in at least 20% had to be reassessed.[15] Therefore, the comprehensibility requirement is set at a minimum inter-rater agreement of ≥80%. This step is used to support the conceptual, semantic and content equivalence of the sentences used in the survey, so that they are easily understood by the target population.

Stage 9, proofreading, was not carried out as such because it is a brief tool and because during the previous stages the correct wording (grammar and spelling) of the tool was always ensured.

ETHICAL CONSIDERATIONS

The study complies with current ethical and confidentiality requirements, including obtaining informed consent from participants in cognitive interviews. Their identity was preserved by hosting data in Excel spreadsheets on the computers of the Orthopedics and Traumatology Service with an alphanumeric code; only the authors of this study had access through their institutional user.

In addition, the informed consents were filed in an office to which only members of the work team had access.

RESULTS

The version resulting from the Spanish translation process was evaluated through cognitive interviews in two stages. In the first, five specialists in traumatology of the upper limb were interviewed and, in the second, five patients with omalgia evaluated in the office were evaluated in the office. All interviews were conducted within the private care setting. The characteristics of the interviewees are detailed in Tables 1 and 2. The participants stated that the instructions were understandable and easy to carry out, but that, in some cases, the questions needed additional words or phrases for better understanding. For this reason, words were added or deleted and questions were reformulated for a better understanding of the elements and their response options.

Table 1. Characteristics of the professionals interviewed

Age	Sex	Years of experience
42	Male	13
52	Male	28
33	Male	3
38	Male	7
34	Male	4

Table 2. Characteristics of the patients interviewed

Profession	Age	Sex	Diagnosis
Retired	76	Female	Rotator cuff injury
Retired	81	Male	Glenohumeral osteoarthritis
Professor	56	Female	Adhesive capsulitis
Mason	63	Male	Rotator cuff injury
Retired	69	Male	Rotator cuff injury

All the interviewees mentioned that, in the patient's personal data section, it must be specified that the requested information concerns name, surname, age and occupation. In addition, they suggested that the order of the items implies that the item "número de teléfono" (telephone number) be located in the same sector as the personal data, and then continue with the options regarding the date and the reason for consultation.

In the interviews, it was suggested to separate the questionnaire from the instructions. For this reason, we decided to create a simple and agile questionnaire containing only the measurements, free of redundant instructions, and a separate annex of instructions. The objective of the annex is that the interviewer, in case of doubt, has access to a segment with clear measurement rules endorsed in the literature.

Within each section of the CMS (Pain, Activities of Daily Living, Range of Motion, and Strength) specific modifications were made.

Pain Section ("Dolor")

Unlike the original version, the line was divided into 15 proportional segments/gaps, without using exact measurements. In this way, measurement errors and the difficulty of printing a form with an exact 15 cm line are avoided. At the beginning of this section, we decided to add the instruction "Se lee al paciente la pregunta y se le entrega la hoja para que él mismo realice una marca en el segmento elegido" ("The question is read to the patient and the sheet is given to him so that he can make a mark on the chosen segment"), since the original instructions were not understood by most of the interviewees. At the suggestion of the participants, illustrations corresponding to the different degrees of pain were added to simulate a visual analog scale and facilitate understanding.

The sentence "Califique el nivel máximo de dolor que haya sentido en el hombro al realizar sus actividades habituales en las últimas 24 horas" was reformulated for better understanding to: "¿Cuál fue el máximo de dolor que tuvo usted en el hombro en las últimas 24 horas para realizar sus actividades habituales?"

Activities of Daily Living Section ("Actividades de la vida diaria")

In this section, as in the previous section, it was measured on a segmented line with proportional distances.

In the question regarding sleep interruption, three out of five of the professionals suggested modifying the third option ("Todas las noches") for "Interrupción todas las noche"; therefore, said modification was introduced.

The question "¿Cuánto de sus tareas diarias habituales le permite realizar su hombro?" was rephrased to "¿Cuántas de sus tareas diarias habituales le permite realizar su hombro?" because it was previously a literal translation from English to Spanish without grammatical agreement. In this way, the options were modified according to the question: "todo/nada" was changed to "todas/ninguna". In the options of the answer to question number 3, a similar modification was made; from "todas/ninguna" to "todo/nada".

With the intention of simplifying the instructions, the questions that involved making a mark on the line were grouped, and then the questions with multiple choice answers were placed.

Range of Motion Section ("Movimiento")

The first section, referring to "Elevación anterior y abducción" was reformulated, because the original text was not clear to any of the interviewees. For each movement, exemplary photos were added.

It was decided to replace the long arm goniometer with a standard goniometer, which is available in our daily practice.

Strength Section ("Fuerza")

A clarification on the use of the dynamometer was added: "La fuerza se mide con un dinamómetro digital validado para estos fines o con una balanza de resorte analógica o digital." Another clarification was made on the position of the arm and the situation of the dynamometer or the scale when performing strength.

At the end of sections A and B, and C and D, a sentence was added for the annotation of the respective score subtotals.

DISCUSSION

The CMS has been translated, adapted and validated into numerous languages.[10,16-18] This version is the first with translation into Argentine Spanish and adaptation to the Argentine culture. It was performed strictly in accordance with the guidelines published by ISPOR.[11] During the translation and adaptation process, modifications were made to the original questionnaire with the aim of achieving a version more in line with the cultural understanding of our country and in order to standardize the steps of the evaluation protocol.

The Danish model on which our translation and adaptation was based was the first to incorporate the recommendations of Gerber et al., in 2008,[7,10] and to produce a standardized version in English.[10] Regarding the translation, modifications were introduced in the formulation of certain questions in order to achieve a more colloquial and understandable language for our population. Regarding cultural adaptation, during the interviews it was observed that no difficulties arose because the CMS does not include elements that may vary significantly with the Argentine idiosyncrasy. In accordance with the suggestions made by the professionals interviewed in this adaptation, it was decided to separate the questionnaire for the patients from the instructions for the interviewer, unlike other versions.[10,16]This scale has been questioned for various reasons, including the difficulty in assessing the degree of pain, the subjective interpretation of range of motion during daily activities by the patient, and the initial lack of a standardized way of measuring strength.[7,10,19] It is divided into four sections: Pain, Activities of Daily Living, Range of Motion, and Strength. Modifications were made in each of the sections.

Pain Section ("Dolor")

At the beginning of the Pain section, it was decided to clarify that the question should be read to the patient and then the sheet should be handed over to him/her so that he or she can make a mark on the segment. The original versions fail to specify this step, it is not clear whether the question should be asked by the evaluator or read by the patient. The exact question to be asked is also not referenced, which can make it difficult to standardize the questionnaire.[5,10] Ntourantonis et al. did not find the original score practical and reported that the patients did not understand how to answer the section.[16]

Ban et al.[10] scored pain on a 0-15 cm line using a ruler. However, when printing the questionnaire, the scale may be lost, so it may be subject to errors. That is why we decided to use a form of measurement by segments and proximity regardless of the total length of the line.

Also, to facilitate understanding, we added images simulating faces with different degrees of discomfort, that is, a visual analog scale for pain. This new way of assessing pain differs from that of the original CMS, [5] where it was a visual pain scale without values, as well as the 2008 modification,[8] where it recommends using a tool with two sides, one with values of one side and no values on the other.

Range of Motion Section ("Movimiento")

In the modified version, it is specified that the movements must be performed without pain and in a sitting position.[8] In agreement with other authors, such as Ban et al., and Çelik,[10,16,17] and at the suggestion of the interviewed participants, we believe that evaluating rotations in a sitting position could be complex and impractical to perform, thus we clarify in the instructions that all movements must be performed in a standing position with a separation of the width of the shoulders.

In addition, we believed it important to add images of each of the movements in order to facilitate the understanding of the evaluators and standardize the physical examination.[10]

Strength Section ("Fuerza")

The way of evaluating strength changed from that of the original version of the CMS.[5] We standardized the use with endorsed digital dynamometers and also with an analog or digital spring balance, as described by Bankes et al. and Johansson et al., among others.[20,21] There are variations within the literature regarding the measuring instrument and the position where it should be placed.[19] This lack of standardization leads to difficulties when comparing published results. The equipment used to assess strength in different studies varies between digital and analog dynamometers. Bankes et al. used the Isobex® dynamometer, validated and created by Gerber et al., and compared it to a fixed spring balance and an unsecured spring balance. They did not find significant differences with the results obtained with the fixed spring balance.[20,22] They discouraged the use of the unsecured spring balance due to the variability in the records. In 2005, Johansson and Adolfsson validated the use of digital scales, which are commonly used to weigh bags on tourist trips.[21]

The position of the patient when evaluating strength conditions the result obtained.[23] However, numerous studies do not specify the necessary position.[23] The original method to assess strength was described by Moseley,[24] who used a spring balance in 90º flexion and 90º abduction. Maximum isometric strength is measured in 90º abduction, since, according to electromyographic reports, this is the moment of greatest supraspinatus and deltoid recruitment.[10,25] Due to the lack of specification of the strength evaluation plane, Bankes et al. proposed a standardized method in 1998[20] and finally, in 2008, the exact position was detailed.[7] In our adapted questionnaire, we implemented the recommendations described by Bankes et al., positioning the patient standing with the arm at 90º abduction in the scapular plane, the elbow extended and the forearm pronated, and performing three repetitions one minute apart.[20] Those patients who do not achieve the indicated position receive a score of zero, thus solving the inconsistencies in the measurements.[7,16,20]

Despite being the only version adapted to Spanish, it is not without limitations. First, it should be mentioned that the number of interviewees was small (5 professionals and 5 patients) and may not represent the entire population capable of using this questionnaire. However, the number of interviewees is similar to that used in previous versions.[16] There is currently controversy regarding the ideal number of interviewees, however, the guide used to carry out this version suggests that the translation should be tested in a cognitive interview by at least 5 to 8 individuals, who should speak the language into which the translation will be made.[11]

Second, all the professionals interviewed were traumatologists, which represents a bias at the professional level. However, it is important to note that traumatologists specializing in the shoulder apply questionnaires such as the CMS on a daily basis and that other translations have been made based on interviews only with traumatologists.[26]

Despite the fact that the CMS is widely used in Argentina for the evaluation of numerous shoulder pathologies, there is still no standardized protocol in Spanish that allows a correct measurement of the CMS, without leaving room for the free interpretation of results. For this reason, having this new tool available can contribute to a better understanding of the functional deterioration of patients and unify the way in which they are evaluated. This results in a benefit for both the treating surgeon and the patient, and for the generation of future scientific studies.

The translation and adaptation of this score can contribute to the scientific community and improve the quality of patient care. However, it has not yet been validated and compared with other questionnaires for the functional study of the shoulder. An evaluation of the psychometric properties of the CMS is still pending, so a study that includes this analysis is recommended in order to achieve the maximum benefit of this scale.

CONCLUSIONS

It was possible to carry out the translation and cross-cultural adaptation of the CMS and a tool was obtained to apply to the population of Argentina with shoulder diseases. In this way, there will be a standardized protocol in our language in order to facilitate care activity and the quality of care and treatment provided to patients. We believe it is particularly important that other evaluation tools should be translated and adapted to our language in order to have more study elements.

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Annex: Guía entrevistas cognitivas

Fecha: .....

Identificador del participante: .....

Minuto de Inicio: .....

Minuto de Finalización: .....

Instrucciones

¿Puede decirme con sus propias palabras qué se le explica en las instrucciones?
¿Puede describir algo confuso o alguna dificultad que tuvo para comprender estas instrucciones?
¿Hay alguna palabra o frase que cambiaría para mejorar las instrucciones?

Ítem

¿Qué significa [ítem] para usted?
Con sus propias palabras, ¿cómo explicaría lo que significa esta pregunta?

Opciones de Respuesta

Lea cada opción de respuesta y dígame qué significa para usted.
En relación a [ítem], ¿sugiere modificar alguna opción de respuesta?
¿Alguna vez podrían elegir la primera opción de respuesta? ¿Por qué o por qué no? ¿Puede describir una experiencia en la que se podría elegir la última opción de respuesta?
¿Qué otras opciones de respuesta no están cubiertas en este ítem?

Cobertura del Contenido

¿Qué otras opciones relacionadas a [ítem] no están cubiertas en este cuestionario?

Formato

Observar al encuestado completando el cuestionario. Tenga en cuenta las expresiones faciales, las indicaciones de dificultad para leer, si pasa las páginas de un lado a otro. Escuche los comentarios sobre la dificultad para leer o preguntas que indiquen falta de claridad o facilidad de uso.
Por ejemplo, "He notado que ha vacilado, ¿Qué sugerencias tiene para que el cuestionario sea más fácil de completar?"

Extensión

¿Qué le pareció la cantidad de tiempo que le llevó completar el cuestionario?

Comentarios: .....

Ítems Confusos: .....

CUESTIONARIO - ESCALA DE CONSTANT-MURLEY

- Datos personales:
  Nombre
  Apellido
  Edad
  Número de teléfono
- Diagnóstico:
- Lado:
  Derecho ☐
  Izquierdo ☐
- Fecha de consulta:
  Preoperatoria ☐
  3 meses ☐
  6 meses ☐
  1 año ☐
  ..... años
  Otro .....

Sección de evaluación subjetiva

A. Dolor.
¿Cuál fue el máximo dolor que tuvo usted en el hombro en las últimas 24 horas para realizar sus actividades habituales? (Indíquelo seleccionando un segmento) (Figura 1)

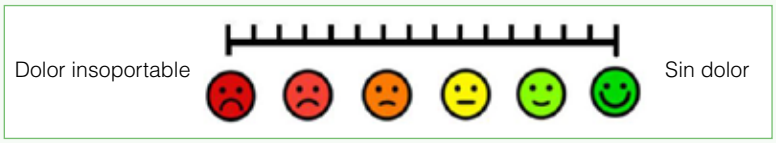

Figura 1. Escala visual análoga del dolor.

B. Actividades de la vida diaria.
Las siguientes 4 preguntas se refieren a las actividades de la vida diaria que haya realizado en la última semana.

1. ¿Cuántas de sus tareas diarias habituales le permite realizar su hombro? (Indíquelo seleccionando un segmento) (Figura 2)

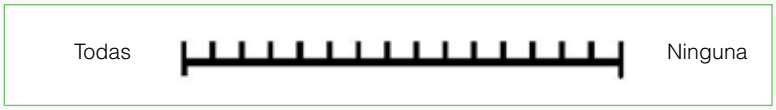

Figura 2.

2. ¿Cuánto de su actividad recreativa habitual le permite realizar su hombro? (Indíquelo seleccionando un segmento) (Figura 3)

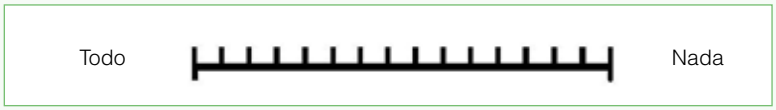

Figura 3.

3. ¿Su sueño se ve interrumpido a causa del hombro? (Marque un casillero)
   ☐ Sueño sin interrupciones
   ☐ Interrupción ocasional
   ☐ Interrupción todas las noches

4. ¿Hasta qué altura puede usar la mano cómodamente? (Marque un casillero)
   ☐ Por debajo de la cintura
   ☐ Hasta la cintura
   ☐ Hasta el esternón
   ☐ Hasta el cuello
   ☐ Hasta la parte superior de la cabeza
   ☐ Por encima de la cabeza

SECCIÓN DE EVALUACIÓN OBJETIVA

C. Movilidad
1 y 2: Elevación anterior y abducción (Tabla 3)

Tabla 3.

Rango	0°-30°	31°-60°	61°-90°	91°-120°	121°-150°	151°-180°
Elevación anterior						
Abducción						
Puntos	0	2	4	6	8	10

3. Rotación externa

☐ Manos detrás de la cabeza, codos hacia delante
☐ Manos detrás de la cabeza, codos hacia atrás
☐ Manos en la parte superior de la cabeza, codos hacia delante
☐ Manos en la parte superior de la cabeza, codos hacia atrás
☐ Elevación completa de los brazos

4. Rotación interna

☐ Región lateral del muslo
☐ Detrás del glúteo
☐ Articulación sacroilíaca
☐ Cintura
☐ 12.ª vértebra torácica
☐ Nivel interescapular (entre los omóplatos)

D. Fuerza: ..... puntos.

INSTRUCCIONES

A. Dolor.

Se lee al paciente la pregunta y se le entrega la hoja para que él mismo seleccione un segmento de la línea. La línea contiene 15 segmentos. Cada uno vale un punto. En caso de ser puntuado en el medio de dos segmentos, se redondea hacia arriba o hacia abajo, según cercanía con el segmento más próximo. (Figura 4)

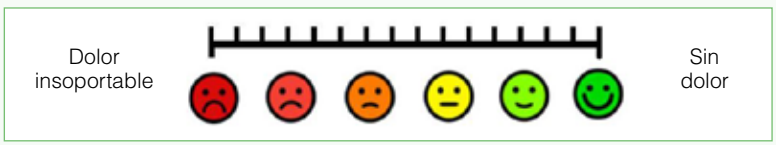

Figura 4.

B. Actividades de la vida diaria.

En las siguientes dos preguntas el entrevistador leerá las preguntas y el paciente realizará una marca en el segmento elegido.

El puntaje se determina según el segmento seleccionado. Segmentos 1-3 = 4 puntos, 4-6 = 3 puntos, 7-9 = 2 puntos, 10-12 = 1 punto, 13-15 = 0 puntos. (Figuras 5 y 6)

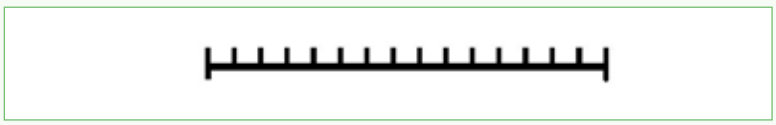

Figura 5.

1. ¿Cuántas de sus tareas diarias habituales le permite realizar su hombro?

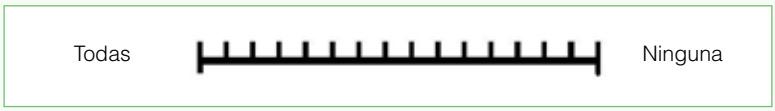

Figura 6.

2. ¿Cuánto de su actividad recreativa habitual le permite realizar su hombro?

En las preguntas 3 y 4, el entrevistador leerá las preguntas y dará verbalmente las opciones al paciente.

3. ¿Su sueño se ve interrumpido a causa del hombro?
   - ☐ Sueño sin interrupciones (2 puntos)
   - ☐ Interrupción ocasional (1 punto)
   - ☐ Interrupción todas las noches (0 puntos)

4. ¿Hasta qué altura puede usar la mano cómodamente?
   - ☐ Por debajo de la cintura (0 puntos)
   - ☐ Hasta la cintura (2 puntos)
   - ☐ Hasta el esternón (4 puntos)
   - ☐ Hasta el cuello (6 puntos)
   - ☐ Hasta la parte superior de la cabeza (8 puntos)
   - ☐ Por encima de la cabeza (10 puntos)

Puntaje total para las secciones A+B (subtotal de la evaluación subjetiva, 0-35 puntos): ____ puntos

SECCIÓN DE EVALUACIÓN OBJETIVA

C. Movilidad

Se evalúa la movilidad activa indolora máxima alcanzada en cada plano de movimiento. En caso de registrar una mayor movilidad con dolor, esta no será tenida en cuenta.

Primero, el evaluador muestra el movimiento deseado y luego el sujeto lo realiza. Para todos los ejercicios, el sujeto debe estar parado y con los pies apuntando hacia delante y separados a la distancia entre hombros.

1 y 2: Elevación anterior y abducción (Tabla 3) (Figuras 7 y 8)

La elevación anterior y la abducción son registradas con un goniómetro de brazos largos. El sujeto debe realizar los movimientos sólo con el brazo afectado. (0-20 puntos) La referencia del goniómetro se coloca en el brazo y en el eje de las apófisis espinosas de la columna dorsal.

Tabla 3.

Rango	0°-30°	31°-60°	61°-90°	91°-120°	121°-150°	151°-180°
Elevación anterior						
Abducción						
Puntos	0	2	4	6	8	10

Figura 7. Elevación anterior, dividido por rangos.

Figura 8. Abducción, dividido por rangos

3. Rotación externa (Figura 9)

El sujeto debe realizar la rotación externa sin ayuda, y las manos deben estar ubicadas por encima y por detrás de la cabeza sin tocarla. El sujeto debe realizar los movimientos con ambos brazos simultáneamente, pero solo se registran los realizados con el brazo afectado. Se comienza por "manos por detrás de la cabeza, codos hacia delante". Se otorgan 2 puntos por cada movimiento completo por separado. (0-10 puntos)

☐ Manos detrás de la cabeza, codos hacia delante

☐ Manos detrás de la cabeza, codos hacia atrás

☐ Manos en la parte superior de la cabeza, codos hacia delante

☐ Manos en la parte superior de la cabeza, codos hacia atrás

☐ Elevación completa de los brazos

Figura 9. Rotación externa

4. Rotación interna (Figura 10)

El sujeto debe realizar la rotación interna sin ayuda y debe señalar con el dedo pulgar los puntos de referencia anatómica indicados. El sujeto debe realizar los movimientos solo con el brazo afectado. Se comienza por "región lateral del muslo". Los movimientos deben realizarse sin dolor. (0-10 puntos)

☐ Región lateral del muslo (0 puntos)

☐ Detrás del glúteo (2 puntos)

☐ Articulación sacroilíaca (4 puntos)

☐ Cintura (6 puntos)

☐ 12.ª vértebra torácica (8 puntos)

☐ Nivel interescapular (entre los omóplatos) (10 puntos)

Figura 10. Rotación interna

D. Fuerza (0-25 puntos): ..... puntos.
La fuerza se mide con un dinamómetro digital validado para estos fines o con una balanza de resorte analógica o digital. Para realizar la evaluación, el sujeto debe estar parado, con los pies apuntando hacia delante y separados a la distancia entre hombros.
El brazo debe estar en 90 grados de abducción en el plano escapular. Si el brazo no puede elevarse a 90 grados, el puntaje es 0. La muñeca debe estar en pronación, de modo que la palma mire hacia abajo, y el codo en máxima extensión. La correa superior del dinamómetro debe colocarse alrededor de la muñeca del sujeto de manera que quede sobre la cabeza del cúbito. La correa o punto de fijación inferior del dinamómetro debe estar fija a la altura de la cintura, sobre por ejemplo, una mesa o escritorio. no debe sostener el evaluador ninguna de las correas del dispositivo. Se le pide al sujeto que empuje hacia arriba lo máximo posible durante 5 segundos. Al mismo tiempo, se lo estimula de manera verbal: Listo 3-2-1 empuje… empuje... empuje.
El puntaje se calcula a partir del mejor de un total de 3 intentos, cada uno de los cuales se realiza con un intervalo mínimo de 1 minuto entre ellos. El puntaje corresponde a la fuerza en libras (máximo 25 puntos). Si la fuerza se mide en kilogramos, el puntaje se calcula multiplicando por 2.2.

Puntaje total para las secciones C+D (subtotal de la evaluación objetiva, 0-65 puntos): ___ puntos

Puntaje total de Constant A+B+C+D (0-100 puntos): ..... **puntos.**