RESEARCH RAPORT

# POLISH CULTURAL ADAPTATION OF ELBOW ASSESSMENT SCORES: OXFORD ELBOW SCORE, AMERICAN SHOULDER AND ELBOW SURGEONS-ELBOW, MAYO ELBOW PERFORMANCE SCORE AND SUMMARY OUTCOME DETERMINATION QUESTIONNAIRE

## POLSKA ADAPTACJA KULTUROWA FORMULARZY OCENY ŁOKCIA: OXFORD ELBOW SCORE, AMERICAN SHOULDER AND ELBOW SURGEONS-ELBOW, MAYO ELBOW PERFORMANCE SCORE ORAZ KWESTIONARIUSZA SUMMARY OUTCOME DETERMINATION.

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ABSTRACT
**Introduction**
Elbow pain and related problems are commonly seen in doctors' or physiotherapists' general practice. Patient-rated questionnaires are a helpful tool in quantifying functional abilities and subjective feelings of patients who struggle with elbow problem. To the authors knowledge up to date there are no Polish versions of questionnaires related to elbow problems.

**Aim**
The purpose of this study is to translate and adapt four elbow questionnaires to suit Polish patients: Oxford Elbow Score (OES), American Shoulder and Elbow Surgeons-Elbow (ASES-E) and Mayo Elbow Performance Score (MEPS) and Summary Outcome Determination (SOD). This is initial phase and in the next, adapted questionnaires will be validated.

**Materials and methods**
Cultural adaptation of the selected questionnaires to the Polish culture has been conducted in five stages according to the international guidelines and was supervising by committee. Cultural adaptation process included translating each score from English into Polish, reverse-translation and testing of created version on a group of 30 people.

**Results**
There have been no major difficulties during cultural adaptation process. The only problem was certain words which had no equivalents in Polish. Testing of the prefinal versions did not bring any objections.

**Conclusions**
In conclusion, new Polish versions of OES, ASES-E, MEPS and SOD score will be very useful in elbow assessment, in daily practice of doctors and physiotherapists. They will help to unify evaluation of the patients and give a possibility of comparing the results of different treatment methods.

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**Key words:** polish cultural adaptation, elbow, OES, ASES-E, MEPS, SOD

STRESZCZENIE

**Wstęp**

Ból łokcia i problemy z nim związane są częstym zjawiskiem w pracy lekarzy i fizjoterapeutów. Kwestionariusze subiektywnej oceny są bardzo pomocnym narzędziem w określeniu ograniczeń funkcjonalnych oraz odczuć pacjenta zmagającego się z problemem z łokciem. Według wiedzy autorów, dotychczas nie ukazały się polskie wersje kwestionariuszy odnoszących się do stawu łokciowego.

**Cel**

Celem pracy było przetłumaczenie i adaptacja czterech kwestionariuszy oceny łokcia: „Oksfordzki Kwestionariusz Oceny Łokcia" (OES), „Formularz Oceny Łokcia Amerykańskiego Towarzystwa Chirurgów Barku i Łokcia" (ASES-E), „Kwestionariusz Oceny Łokcia Mayo" (MEPS), „Ocena Wyników Leczenia" SOD. Jest to wstępna faza pracy, w kolejnym etapie zaadaptowane kwestionariusze zostaną poddane procesowi walidacji.

**Materiał i metody**

Adaptacja kulturowa wybranych kwestionariuszy została przeprowadzona w pięciu etapach, według międzynarodowych standardów oraz była nadzorowana przez komisję. Proces obejmował: tłumaczenie każdej ankiety z języka angielskiego na język polski, tłumaczenie wsteczne oraz testowanie wstępne na grupie 30 osób.

**Wyniki**

W procesie adaptacji kulturowej nie pojawiły się większe trudności. Jedynym problemem były słowa, które nie mają bezpośredniego odpowiednika w języku polskim. Testowanie wersji przedfinałowej przebiegło bez zastrzeżeń.

**Wnioski**

W codziennej praktyce lekarzy i fizjoterapeutów polskie wersje OES, ASES-E, MEPS and SOD będą bardzo przydatne w ocenie łokcia. Pomogą ujednolicić sposób oceny pacjentów oraz umożliwią porównywanie wyników leczenia różnymi metodami.

**Słowa kluczowe:** polska adaptacja kulturowa, łokieć, OES, ASES-E, MEPS, SOD

## Introduction

Elbow pain and related problems are commonly seen in doctors' or physiotherapists' general practice. All of the elbow injuries such as elbow dislocations, fractures or their complications, ulnar nerve entrapment or soft tissue disorders are similar, as they all lead to loss of function (Okubo *et al.*, 2019; Sanders *et al.*, 2015; Tandon *et al.*, 2007; Uzunkulaoğlu *et al.*, 2016). Eliminating symptoms, restoring the range of motion and strength are obvious aims for the medical team. However, functional abilities and subjective feelings may be even more valuable for the individual patient. Patient-rated questionnaires are a helpful tool in assessing this. They allow the clinicians to quantify the pain and assess limitations of the joint in performing activities of daily living and sport, thanks to patient subjective evaluation. For the sake of more complete clinical picture, physician – rated questionnaires consist of more detailed and objective information such as range of motion,

symptoms and provocative tests. Moreover, the questionnaires give the clinicians the possibility to monitor the effectiveness of therapy and adjust the rehabilitation process to the demands of a particular patient. Additionally, they allow researchers to compare results of different treatment methods or rehabilitated with different exercise programs. Among numerous existing elbow questionnaires, most are only available in English (Longo *et al.*, 2008). In order to o use them properly in other language, they initially have to be adopted to a given culture to avoid misunderstandings, a then go through a validation process in terms of reliability and sensitivity (Beaton *et al.,* 2000; Guillemin *et al.,* 1993). This process is extremely important for consistent use of each questionnaire in different countries and then for performing cross- national and multi-center studies.

To the authors knowledge up to date there are no Polish versions of questionnaires related to elbow problems. We decided to include into the study Oxford Elbow Score (OES), American Shoulder and Elbow Surgeons-Elbow (ASES-E) and Mayo Elbow Performance Score (MEPS) which as a cluster will give the clinician the possibility to assess all of the aspects of elbow injury even the socio-psychological factors. Summary Outcome Determination (SOD) is the new concept of questionnaire. It will allow to assess the outcome of treatment from the new and probably the most important patient's perspective.

The purpose of this study is to translate and adapt four elbow questionnaires to suit Polish patients: OES, ASES-E, MEPS, SOD. This is initial phase and in the next, adapted questionnaires will be validated.

**Materials and methods**
Cultural adaptation of the selected questionnaires to the Polish culture has been conducted in five stages according to the guidelines set forth by Beaton *et al.* (Beaton *et al.*, 2000) with preservation of the sensitivity of the test described by Guilemin

*et al.* (Guillemin *et al.*, 1993). In the first stage, the original versions of the questionnaires have been translated from English into Polish by two translators: one with medical knowledge (physician) (T1) and second not related to any field of medicine (layman) (T2). Then, in the second stage, both versions have been merged into one (T12). The third stage is a reverse-translation committed by two English native speakers, again one with medical background (B1) and the layman (B2). In the fourth stage, the committee consisting of all translators, language professional, methodologist and health professionals has gathered. The role of the committee was to develop the prefinal version of the questionnaires by a consolidation of all of the five translations (T1, T2, T12, B1, B2). In the fifth stage, prefinal version has been tested on a group of 30 subjects. Each participant has filled out the questionnaire and was asked to mark confusing or incomprehensible phrases, thereafter the doubts as well as the other questions were discussed individually. The written report has been made for each stage.

Questionnaires
OES has been established in 2008. It is a specific questionnaire which reflects the quality of life of the patients who struggle with elbow problem from their own perspective (Dawson *et al.,* 2008). Evaluation of the effectiveness of treatment in some cases may differ from a patient and physician point of view (de Haan *et al.,* 2011; Longo *et al.,* 2008). Hence, OES has been created to focus only on a subjective evaluation of elbow condition. It consists of twelve questions related to pain, elbow function and socio-psychological function, four items for each domain. There are five possible answers for each question, scored from 0 to 4, where 0 stands for the most severe symptoms, 4 is a normal state. Maximal amount of points is 48, 16 points from each section. Final score is calculated and ranges from 0 (most severe symptoms) to 100 (normal elbow function) (Guyver *et al.,* 2013; Longo *et al.,* 2008).

ASES-E has been created by The Research Committee of American Shoulder and Elbow Surgeons (King *et al.*, 1999). The questionnaire allows to assess the elbow regardless of given diagnosis. It consists of two main parts: patient self-evaluation and physician assessment. First part, which is fulfilled by the patient, is a subjective evaluation of pain, function of the elbow and satisfaction with surgery. Five out of six questions about the pain describe its level with Visual Analog Scale (VAS) in different situations (John *et al.*, 2010; Longo *et al.*, 2008). Function of the elbow is assessed separately for right and left side with twelve questions. They define any difficulties in performance of activities of daily living. Patient selects the number from 0 (not able to perform) to 3 (no difficulties) in every given activity. The last part is the evaluation of the satisfaction with conducted surgery, again measured with VAS (John *et al.*, 2010; MacDermid, 2001). Score is calculated as summary of five answers about the pain (VAS) and function assessment (50/3 x (average from 12 answers in function section). The total score ranges between 0 and 100 (normal elbow function). The second part of ASES-E is the clinical assessment conducted by a physician. This part was not included in cultural adaptation process because it is the standard procedure of orthopedic examination and it does not require patient's interpretation.

MEPS is one of the most commonly used questionnaire in evaluation of effectiveness of treatment in different elbow joint conditions (Cusick *et al.*, 2014; Longo *et al.*, 2008). It was created by Morrey *et al.* in 1993 (Morrey 1993). It consists of four parts: pain (max. 45 points), range of motion (max. 20 points), stability (max. 10 points) and ability to perform five activities of daily living (max. 25 points). Pain is defined as 'none' (45 points); 'mild' (30 points) – patient sometimes takes painkillers, but it is not limiting the performance of activities of daily living; 'moderate' (15 points) – the patient regularly takes painkillers, some difficulties in performance of activities of daily lining exist; 'severe' (0 points). Range of

motion and stability are tested by the physician who conducts the examination. In the last section the examiner gives the patient five points for performing every out of five listed activities. The final score ranges from 5 to 100; total score is considered as 'excellent' if it falls between 90–100, 'good' between 75–89 'fair' between 60–74, 'poor' less than 60 points (Longo *et al.*, 2008; Schneeberger *et al.*, 2014).

SOD score, is a tool used to determine the outcome of an applied treatment from both the patient and physician perspective. It was developed by Shawn W. O'Driscoll in Mayo Clinic (Shukla *et al.*, 2018). Undoubtedly, the biggest advantage of this scoring is that it is not limited only to orthopedic procedures; it can be also applied to any type of treatment, almost in every field of medicine as well. SOD score is comprised of two parts, categorical and single numerical score. Patients do not fulfill the questionnaire on their own, it is a physician who leads the patient throughout this process. The person conducting the examination (MD or PT), asks the patient a set of questions in a given order. These questions are available in the aforementioned study. The result of SOD score is the option chosen by both patient and clinician ('normal', 'almost normal', 'greatly improved', 'improved', 'not improved', 'worse', 'profoundly worse', 'as bad as dying', 'death') and the number from numerical score. This scoring has been proven to be a reliable and repeatable tool with strong physician – patient agreement in determining the outcome of shoulder and elbow surgical treatment (Vaichinger *et al.*, 2019).

**Results**

Polish culturally adapted translations with of the selected elbow questionnaires have been depicted on Figures 1–4.

In OES (Fig. 1) the most challenging item was no. 5, in particular the phrase 'controlling your life'. The answer option 'Some of the time' was also vigorously discussed but we decided to choose 'for some period of time'.

Our team did not have problems with translation of the ASES-E (Fig. 2), but after the

testing of the prefinal version we decided to add some details in a some score's items. In the section 'PATIENT SELF-EVALUATION: PAIN' we have added '0', because there was no such option to choose in the table in spite of the fact that under the table '0' was explained as 'no pain'. In the section PATIENT SELF-EVALUATION: FUNCTION' we decided to change 'function' on 'activities of daily living'. In this table below we also have not left 'right' and 'left', but we added 'right elbow' and 'left elbow'. In 'PATIENT SELF-EVALUATION: SATISFATCTION' we have changed the question from 'Are you satisfied

instructions included in the Shukla *et al.* study (Fig. 4). After a debate of the committee, we have changed both tables – categorical and numerical. On the left hand side of the categorical table we have added the following descriptions: 'improvement' next to 'normal', 'almost normal', 'greatly improved', 'improved' and 'deterioration' next to 'worse', 'profoundly worse', 'as bad as dying', 'death'. Every cell has been also separated to each other in the categorical score. In the numerical score we placed each value at height of the corresponding category to make it clearer and easier to fulfill for the clinicians. Translation by itself did not bring major difficulties



**Figure 1.** Polish version of OES.

with elbow surgery' to 'Are you satisfied with the effect of the elbow surgery?'.

Translation and initial testing of MEPS (Fig. 3) has been performed without any inconsistencies.

We have decided to add an instruction paragraph for physicians to the SOD score,

for our translators. The category 'as bad as dying' was changed to one reflecting 'deadly bad'. Although, some participants have pointed out that 'death' or 'deadly bad' are too hard phrases for Polish people and they proposed some changes. Finally, our committee has decided to leave the first version unchanged.

**Formularz oceny łokcia Amerykańskiego Towarzystwa Chirurgów Barku i Łokcia**

| SAMOOCENA PACJENTA: BÓL | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Czy odczuwasz ból w łokciu? | | | | | | | | | | | TAK | NIE | |
| Określ poziom swojego bólu: | | | | | | | | | | | | | |
| 1) gdy jest najgorszy | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | | |
| 2) podczas odpoczynku | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | | |
| 3) przy podnoszeniu ciężkich przedmiotów | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | | |
| 4) wykonując czynności wymagające powtarzalnych ruchów łokcia | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | | |
| 5) w nocy | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | | |

0= brak bólu; 10= najgorszy ból z możliwych

| SAMOOCENA PACJENTA: CZYNNOŚCI ŻYCIA CODZIENNEGO | | |
|---|---|---|
| Zakreśl cyfrę, która wskazuje Twoją zdolność do wykonywania następujących czynności: 0= niezdolny do wykonania; 1= bardzo trudne do wykonania; 2= trochę trudne; 3= bez trudności | | |
| **CZYNNOŚCI** | **PRAWY ŁOKIEĆ** | **LEWY ŁOKIEĆ** |
| Zapięcie górnego guzika od koszuli | 0 1 2 3 | 0 1 2 3 |
| Czynności higieny osobistej w toalecie | 0 1 2 3 | 0 1 2 3 |
| Czesanie włosów | 0 1 2 3 | 0 1 2 3 |
| Wiązanie butów | 0 1 2 3 | 0 1 2 3 |
| Jedzenie z użyciem sztućców | 0 1 2 3 | 0 1 2 3 |
| Noszenie ciężkich przedmiotów | 0 1 2 3 | 0 1 2 3 |
| Wstanie z krzesła podpierając się na rękach | 0 1 2 3 | 0 1 2 3 |
| Wykonywanie ciężkich prac domowych | 0 1 2 3 | 0 1 2 3 |
| Przekręcenie klucza w drzwiach | 0 1 2 3 | 0 1 2 3 |
| Rzut piłką | 0 1 2 3 | 0 1 2 3 |
| Wykonanie codziennej pracy (opisz): ......... | 0 1 2 3 | 0 1 2 3 |
| Uprawianie sportu (opisz): ......... | 0 1 2 3 | 0 1 2 3 |

| SAMOOCENA PACJENTA: SATYSFAKCJA | |
|---|---|
| Czy jesteś zadowolony z efektów operacji łokcia? 1 2 3 4 5 6 7 8 9 10 | |
| Zupełnie niezadowolony | bardzo zadowolony |

| OCENA LEKARSKA: RUCH | | |
|---|---|---|
| **AKTYWNY ZAKRES RUCHU (stopnie)** | **PRAWY ŁOKIEĆ** | **LEWY ŁOKIEĆ** |
| Zgięcie | | |
| Wyprost | | |
| Amplituda ruchu (Zgięcie/Wyprost) | | |
| Pronacja | | |
| Supinacja | | |
| Amplituda ruchu (Pronacja/Supinacja) | | |

| OCENA LEKARSKA: STABILNOŚĆ | | |
|---|---|---|
| 0= stabilny; 1= łagodna wiotkość z dobrym punktem końcowym; 2= umiarkowana wiotkość bez punktu końcowego; 3= całkowita niestabilność | | |
| **NIESTABILNOŚĆ** | **PRAWY ŁOKIEĆ** | **LEWY ŁOKIEĆ** |
| Koślawość | 0 1 2 3 | 0 1 2 3 |
| Szpotawość | 0 1 2 3 | 0 1 2 3 |
| Tylno- boczna rotacyjna | 0 1 2 3 | 0 1 2 3 |

| OCENA LEKARSKA: SIŁA | | |
|---|---|---|
| 0= brak skurczu; 1= ślad skurczu; 2= ruch w odciążeniu; 3= ruch z pokonaniem siły grawitacji; 4= ruch z lekkim oporem; 5= prawidłowa siła | | |
| | **PRAWY ŁOKIEĆ** | **LEWY ŁOKIEĆ** |
| Ból w trakcie wykonywania testu? | T/N | T/N |
| Zgięcie | 0 1 2 3 4 5 | 0 1 2 3 4 5 |
| Wyprost | 0 1 2 3 4 5 | 0 1 2 3 4 5 |
| Pronacja | 0 1 2 3 4 5 | 0 1 2 3 4 5 |
| Supinacja | 0 1 2 3 4 5 | 0 1 2 3 4 5 |
| Siła chwytu (kg) | 0 1 2 3 4 5 | 0 1 2 3 4 5 |

| OCENA LEKARSKA: OBJAWY | | |
|---|---|---|
| 0= brak; 1= łagodny; 2= umiarkowany; 3= silny | | |
| **OBJAW** | **PRAWY ŁOKIEĆ** | **LEWY ŁOKIEĆ** |
| Tkliwość stawu ramienno- łokciowego | 0 1 2 3 | 0 1 2 3 |
| Tkliwość stawu ramienno- promieniowego | 0 1 2 3 | 0 1 2 3 |
| Tkliwość przyczepu zginaczy, przyśrodkowo | 0 1 2 3 | 0 1 2 3 |
| Tkliwość przyczepu prostowników, bocznie | 0 1 2 3 | 0 1 2 3 |
| Tkliwość więzadła pobocznego przyśrodkowego | 0 1 2 3 | 0 1 2 3 |
| Tkliwość nerwu międzykostnego tylnego | 0 1 2 3 | 0 1 2 3 |
| Inne (określ) | T/N | T/N |
| Bolesny konflikt podczas zgięcia | 0 1 2 3 | 0 1 2 3 |
| Bolesny konflikt podczas wyprostu | 0 1 2 3 | 0 1 2 3 |
| Ból w trakcie oporowanego wyprostu nadgarstka | T/N | T/N |
| Ból w trakcie oporowanego zgięcia nadgarstka | T/N | T/N |
| Ból w trakcie oporowanego wyprostu trzeciego palca | T/N | T/N |
| Ból w trakcie oporowanej pronacji | T/N | T/N |
| Ból w trakcie oporowanej supinacji | T/N | T/N |
| Krepitacje w stawie ramienno- łokciowym | T/N | T/N |
| Krepitacje w stawie ramienno- promieniowym | T/N | T/N |
| Blizny (lokalizacja) | T/N | T/N |
| Zaniki mięśniowe (lokalizacja) | T/N | T/N |
| Deformacje (opisz) | T/N | T/N |
| Objaw Tinela dla nerwu łokciowego | T/N | T/N |
| Test zgięcia łokcia (rowek nerwu łokciowego) | T/N | T/N |
| Ograniczenie aktywności innych stawów: bark/nadgarstek | T/N | T/N |
| Inne objawy | | |

**Figure 2.** Polish version of ASES-E.

**Kwestionariusz Oceny Łokcia Mayo**

| Parametr | Definicja | Liczba punktów |
|---|---|---|
| Ból (maks. 45 punktów) | • Brak<br>• Łagodny<br>• Umiarkowany<br>• Silny | 45<br>30<br>15<br>0 |
| Zakres ruchu (maks. 20 punktów) | • Amplituda ruchu >100 stopni<br>• Amplituda ruchu 50 do 100 stopni<br>• Amplituda ruchu <50 stopni | 20<br>15<br>5 |
| Stabilność (maks. 10 punktów) | • Stabilny<br>• Umiarkowanie niestabilny<br>• Całkowicie niestabilny | 10<br>5<br>0 |
| Funkcjonowanie (maks. 25 punktów) | • Jest w stanie uczesać włosy<br>• Jest w stanie samodzielnie zjeść<br>• Jest w stanie wykonać czynności higieny osobistej<br>• Jest w stanie samodzielnie założyć koszulę<br>• Jest w stanie samodzielnie założyć buty | 5<br>5<br>5<br>5<br>5 |

**Figure 3.** Polish version of MEPS.

## Discussion

The prerequisite for using the questionnaires in research and clinical work, in other language than the original version, is to complete a cultural adaptation and validation process. That is why OES, ASES-E, MEPS and SOD score were translated into Polish. OES, ASES-E and MEPS are widely used in literature (Cusick *et al.*, 2014; Guyver *et al.*, 2013; Matache *et al.*, 2016; McKee *et al.*, 2005; Öztürkmen *et al.*, 2019; Sochol *et al.*, 2019; Viveen *et al.*, 2017; Watkins *et al.*, 2018)2016; McKee *et al.*, 2005; Öztürkmen *et al.*, 2019; Sochol *et al.*, 2019; Viveen *et al.*, 2017; Watkins *et al.*, 2018. SOD score is relatively new tool in clinics and to our knowledge it is the first one to gather

## Ocena Wyników Leczenia

### instrukcja przeprowadzenia ankiety

Ankietę wypełnia lekarz/fizjoterapeuta na podstawie wywiadu, który przeprowadzany jest w następujący sposób:

1. „W porównaniu do stanu sprzed operacji, czy stan Twojego barku/łokcia/kolana/itp. poprawił się, pogorszył czy nie zauważasz różnicy?"
   - Jeśli stan się poprawił: „Czy nastąpiła poprawa, znaczna poprawa, jest niemal normalnie lub normalnie?"
   - Jeśli stan się pogorszył: „Czy jest gorzej, znacznie gorzej, śmiertelnie źle?"

2. Następnie pacjent, adekwatnie do swojej wcześniejszej odpowiedzi, przyporządkowuje cyfrę ze skali numerycznej bazując na swojej satysfakcji z przeprowadzonego leczenia.
   Skala zawiera wartości od -10 do 10.

3. Cyfra wskazana przez pacjenta w ankiecie (OWL) jest odnotowywana przez lekarza/fizjoterapeutę w dokumentacji medycznej.



**Figure 4.** Polish version of SOD.

and compare the patient's and physician's opinion on assessment of the effectiveness of the applied treatment (Shukla *et al.*, 2018; Vaichinger *et al.*, 2019).

Up to date there are no Polish versions of these questionnaires available in literature and to our knowledge no such process was underway. We decided to use the cultural adaptation protocol proposed by Guillemin *et al.* and Beaton *et al.*, as recommended by the American Academy of Orthopaedic Surgeons' Outcomes Committee. Among available

literature we found it the most accurate and detailed in this field. During the whole process our team has been strictly stuck to the rules described by mentioned authors to obtain the most reliable versions of questionnaires as possible.

Cultural adaptation process should not be focused only on direct and accurate translation but should be aimed to adjust the questionnaires to habits and customs of given population. That is why the testing procedure of the prefinal version is essential in obtaining the version which is clear and easy understandable for subjects.

The next stage is the validation of the adopted questionnaires is currently undergoing.

**Conclusion**
In conclusion, new Polish versions of OES, ASES-E, MEPS and SOD score will be very useful in elbow assessment, in daily practice of doctors and physiotherapists. They will help to unify evaluation of the patients and give a possibility of comparing the results of different treatment methods.

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