■ GENERAL ORTHOPAEDICS

Defining accurate terminology for post-injury weightbearing instructions – a multidisciplinary, nationally approved consensus policy

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Aims

Weightbearing instructions after musculoskeletal injury or orthopaedic surgery are a key aspect of the rehabilitation pathway and prescription. The terminology used to describe the weightbearing status of the patient is variable; many different terms are used, and there is recognition and evidence that the lack of standardized terminology contributes to confusion in practice.

Methods

A consensus exercise was conducted involving all the major stakeholders in the patient journey for those with musculoskeletal injury. The consensus exercise primary aim was to seek agreement on a standardized set of terminology for weightbearing instructions.

Results

A pre-meeting questionnaire was conducted. The one-day consensus meeting, including patient representatives, identified three agreed terms only to be used in defining the weightbearing status of the patient: 1) non-weightbearing; 2) limited weightbearing; and 3) unrestricted weightbearing.

Conclusion

This study represents the first and only exercise in standardizing rehabilitation terminology in orthopaedics, as agreed by all major stakeholders in the patient pathway and the patients themselves. The standardization of language allows for higher-quality and more accurate research to be conducted, and is one small part of the bigger picture in increasing the mobility of patients after orthopaedic injury or surgery.

Introduction

Clinical and functional outcome after musculoskeletal injury and fracture surgery is in part determined by the rehabilitation journey for the patient. The rehabilitation instructions will often include recommendations around the amount of weight the patient is allowed to put through the affected limb(s) by the treating surgeon. These instructions are then received by the wider allied healthcare professional team, including physiotherapists, occupational therapists, nursing staff, and beyond. Furthermore, the patient should also be given these instructions after an episode of care, often as part of the discharge summary or similar.

A lack of agreed and accepted terminology adversely affects communication between healthcare professionals and patients. The use of a variety of phrases and acronyms, interpreted differently between healthcare professionals, impacts patients' rehabilitation regimens. This potentially has a bearing on their clinical outcome and recovery after injury. A lack of standardized terminology also negatively impacts research quality and development of national/local protocols and guidelines. For example, the acronym "PWB" can be interpreted as Partial, Protected, or Permissive weightbearing,[1-3] none of which really define the amount of weight to be allowed through

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the limb, and which may mean different things to different people, highlighting the issue of subjectivity.

Previous studies have reported not only a huge variation in weightbearing instructions after injury, but also a lack of agreement regarding what those instructions mean.[4,5] Many of the instructions, such as partial, touch, or protected, imply that only a portion of body weight is transmitted, but it has been shown there is no agreement on that amount. This issue was demonstrated in the multidisciplinary Weightbearing in Trauma Surgery (WiTS) study,[5] which surveyed over 700 healthcare professionals, only half of whom were orthopaedic surgeons, and thus represented the broad spectrum of individuals involved in injury rehabilitation in the UK. Furthermore, this study asked all respondents whether standardization of weightbearing terms would help communication between different healthcare professionals involved in the orthopaedic multidisciplinary team. Overall, 94% (664/707) either strongly agreed or agreed with this statement, with only 1% disagreeing. This confirms the need for standardization of terminology when it comes to post-injury rehabilitation instructions.

To address these issues, we performed a consensus exercise regarding the terms used when describing weightbearing rehabilitation instructions after musculoskeletal injury. The primary aim was to define an agreed set of terminology to be used for post-injury weightbearing instructions in the lower limb in adults. Secondary aims were to see if it was possible to extend this consensus to children, the upper limb, and elective (planned) surgery. The third aim was to see if any consensus agreements could be applied to mobilization in general after injury.

Methods

A nominal group technique was used to explore consensus.[6-9] The nominal group technique allows for open discussion between stakeholders, which is a recognized benefit in the development of policy guidelines to be used across several disciplines.[10-16] The nominal group technique is used widely both in academia and policy development, including by the World Health Organization.[17] The nominal group model was selected as it allows for face-to-face interactions between stakeholders, providing a better foundation for consensus around guidelines compared with online techniques such as the Delphi consensus method. Face-to-face discussion facilitates better understanding between stakeholders about why opinions may vary, and allows for the rationale of opinions to be shared within the group.

Patient and professional stakeholders. Patient representatives from the UK Musculoskeletal Trauma Patient and Public Involvement Group were actively involved throughout the process, from the initial stages of planning to participation in the final consensus meeting to ensure that the patient and carer 'voice' was represented in the final report. Four members of the group who volunteered to attend the meeting were selected to ensure patient diversity in terms of both demographics and experience. Professional stakeholders were the executive committee/presidential office of the British Orthopaedic Association (BOA), Getting it Right First Time for Trauma/Paediatrics, NHS England, BOA specialist societies (British Society for Children's Orthopaedics, Orthopaedic Trauma Society, British Limb Reconstruction Society, British Orthopaedic Foot and Ankle Society, and elective orthopaedic services (hip, knee, upper limb, spine)), the National Hip Fracture Database, NHS Allied Health Professionals, British Geriatric Society, Fragility Fracture Network, the Chartered Society of Physiotherapists, the Association of Trauma and Orthopaedic Chartered Physiotherapists, the Royal College of Occupational Therapists, and the Royal College of Nursing.

For a full list of stakeholder affiliations, and representative organizations, please refer to Supplementary Material 1. The representatives from each primary stakeholder were selected by their own organization, and their positions of responsibility align with their individual stakeholder organizational policies on equality, diversity, and inclusivity.

Pre-meeting evidence synthesis and survey. A review of the literature pertaining to weightbearing terminology (published separately; PROSPERO registration CRD42024515709) was undertaken and summarized ahead of the consensus meeting. The protocol for this evidence synthesis is described in full elsewhere but, in brief, we searched PubMed, the grey literature,[18] and published national guidelines related to weightbearing nomenclature. The summary of this was presented to participants.

The pre-meeting survey (Supplementary Material 2) asked stakeholders to define the importance of each indicative question on a nine-level Likert scale (1, not important, to 9, extremely important). The survey was available in print and online formats, and went through a pilot phase prior to launch. The responses to each question were summarized with a mean score per question based on the number of responses at each of the nine response levels. The results were reviewed by the nominal group at the beginning of the consensus meeting.

Consensus meeting. This was a one-day multi-stakeholder workshop involving patients and healthcare professionals. Participants worked in small groups to discuss the results of the evidence synthesis and pre-meeting survey, and then came together to summarize these discussions. This was followed by a series of closed votes on the questions raised by the evidence synthesis and survey (Questions 1 to 7, below). Each participant had one equal vote per question. Votes were expressed using a nine-point Likert Scale, with 1 representing disagreement, and 9 representing full agreement; the results were summarized with a mean score per question based on the number of responses at each of the nine response levels. A score of 7 or more was pre-specified to signal agreement.

Where agreement was not reached on any individual question, a further round of small-group and then whole-group discussion was held and a second round of voting took place. As this was a consensus process, ethical approval and institutional review was not required.

Results

Pre-meeting. The pre-meeting questionnaire demonstrated that all stakeholders, including patients, felt that the current descriptors for weightbearing were unclear and difficult to interpret (mean score 4.25 (1 to 9)).

All stakeholders including patients felt that standardizing weightbearing terminology was important for healthcare professionals (mean score 8.10 (5 to 9)); to patients (mean score

Table I. Questions discussed in the consensus process.

No.	Question	Consensus reached
1	That consensus exercise should focus on weightbearing as opposed to mobilization	Yes (8.24)
2	Whether the term 'weightbearing' is fit for purpose	No (6.59); consensus reached in repeat voting after discussion (9.00)
3	Two versus three terms for weightbearing prescription (1= two terms, 9= three terms)	Yes (7.88)
4	Use of 'non weightbearing' / 'limited weightbearing' / 'unrestricted weightbearing' as terminology for weightbearing instruction	Yes (8.94)
5	Information to be documented when 'non' or 'limited' weightbearing: quantification, justification, duration to be included	Yes (8.82)
6	Confirmation of wording that any rehabilitation prescription should include: - which activities are limited - why they are limited - how long they are limited for	Yes (8.82)
7	If weightbearing instructions are used for upper limbs, is the same terminology appropriate?	Yes (8.53)

8.05 (4 to 9)); for academic research (mean score 8.20 (5 to 9)); and for policy and guideline development (mean score 7.90 (6 to 9)).

Neither patients nor stakeholders felt that patients would reliably be able to self-regulate their own weight through a limb after injury. The mean score was 5.85, with a range from 1 to 9, indicating no agreement.

All stakeholders and patients felt that it was important that restrictions in weightbearing should have a clinical justification recorded in the notes (mean score 7.65 (2 to 9)). Similarly, stakeholders felt that it was important that any restrictions in weightbearing that delay discharge from hospital should be reviewed, and potentially changed, within 48 hours. Clinical stakeholders had a mean score in this instance of 7.05 (1 to 9), while the patient representatives had a mean score of 8.00 (7 to 9), indicating even stronger support for this statement.

The pre-meeting questionnaire demonstrated almost universally (19/20 stakeholder clinicians and 2/3 patient responders) that patients do not understand current weightbearing terminology and acronyms. There was universal agreement that the terms "full" and "non-weightbearing" were understandable; and there was universal agreement that all other terms/acronyms were not understandable.

Consensus meeting. An introductory explanation was given by the project leads (AJT, MLC) explaining the findings of the pre-meeting survey, the goals of the meeting, and the limitations of NHS resources, meaning that any recommendations or consensus need to be appropriate and reasonable in the current healthcare climate. Given the results of the pre-meeting survey, it was acknowledged that there was a need for the development of an agreed set of weightbearing terms.

It was agreed through discussion that any definitions and terminology should only apply to the affected limb. There may be areas of less clarity, such as in the upper limb where weightbearing can occur through pushing or lifting, and as such the initial view was that discussion should focus on the lower limb. Multiple injuries would mean multiple instructions – i.e. one set of instructions for each affected limb. The questions are listed in Table I.

The first round of specific questions was on the generality of the topic. These three questions identified that mobilization as a whole was a somewhat broad and unrealistic topic to distil into a set of agreed terminology. Bespoke mobilization regimens are commonplace, including bracing regimens, and differed depending on the nature of injury or surgery. Mobilization would, however, be discussed in relation to any limitations of weightbearing (see below).

Question 2 did not reach consensus at the first round of voting. There was further discussion as some felt the term "weightbearing" was confusing, particularly to patients. It was noted that this discussion was primarily for communication between healthcare professionals rather than patient-facing, the weightbearing instruction then being turned into advice about mobilization as a broader concept and this advice about mobilization being relayed to the patient. The group acknowledged that the term "weightbearing" has been used clinically for a long time, so it was preferable to keep this term as opposed to introducing a new term. Other suggestions were proposed, such as "can stand and walk" or "unrestricted weight through limb". After discussion on question 2 a second round of voting was conducted, and at this point agreement was unanimous (score 9.0).

Question 3 explored whether there would be a place for a simple binary instruction for weightbearing – patients either would be permitted to weightbear or not. There was consensus that three terms were necessary: one at each end of the spectrum, and one term to incorporate any other weightbearing protocol.

There was further discussion on the three terms for weightbearing (Question 3). Points included 1) the prescription should be given to the therapeutic team by the responsible clinician (most often – but not necessarily – surgeon); 2) it was suggested that percentage of body weight could be used as an indicator for restricted weightbearing, but after discussion it was decided this would be too problematic for healthcare professionals and patients to implement; and 3) there were suggestions for wording for the middle term (some form of restriction to weightbearing), including "assisted" and "protected", but eventual agreement was on "limited" weightbearing as the most appropriate terminology.

Voting then took place on two further questions. Question 4 explored whether consensus could be reached on the three specific terms to be used for weightbearing instructions. Question 5 explored the need for quantifiers of any restriction to weightbearing.

The primary aim of the consensus exercise was thus satisfied, in defining three specific terms only to be used in providing weightbearing instructions for patients with musculoskeletal injury or conditions. These were agreed as:

1) non-weightbearing; 2) limited weightbearing; and 3) unrestricted weightbearing.

The challenge around standardizing mobilization instructions, as opposed to just weightbearing, was then explored. Initial desire to have a degree of uniformity for mobilization instructions as a whole was met with challenges. All stakeholders and patients felt that the breadth of options for mobilization protocols (be it for upper limb, lower limb, bracing, splints, supports, or restrictions on range of motion and in certain activities) meant it was impossible to distil to just a few usable standardized phrases. Instead, it was felt that any restriction to weightbearing (and thus mobilization) should include a justification, a quantification, and a duration (Question 6).

Finally, there was discussion and debate regarding whether these newly suggested terms would be applicable to the upper limb as well as the lower limb. Extensive discussion was conducted around how upper limb rehabilitation may differ from that of the lower limb. Nonetheless, it was felt that specific to weightbearing, the same conditions and definitions apply regardless of the anatomical location.

Ultimately, the consensus exercise concluded with no areas of disagreement.

Discussion

This consensus process found agreement on a set of standard weightbearing terms to be used in clinical practice in relation to both the lower limb and upper limb: 1) non-weightbearing; 2) limited weightbearing; and 3) unrestricted weightbearing.

The terms have been specifically selected due to the lack of ambiguity and the fact they cannot be interpreted subjectively. “Non-weightbearing” is just that – no weight can be applied through the affected limb. “Unrestricted weightbearing” represents the other end of the spectrum – there are no limitations. This removes the issues of previously used terms such as “full weightbearing”, “weightbearing for rehabilitation”, and “weightbearing as tolerated” – all of which could be interpreted differently. The “middle ground”, or rather, all instructions that sit between non-weightbearing and unrestricted weightbearing, are by their very definition proposing some limitation in weight. As such, the term “limited weightbearing” was felt to be most appropriate. The separation between “limited” and “unrestricted” in terms of the use of English language allows for avoidance of confusion. That is to say, “limited” and “unlimited”, or “restricted” and “unrestricted” sound too close to each other as a pair and risk being misheard or incorrectly recorded.

The strengths of this exercise include that it was conducted using the validated nominal group technique. The professional stakeholders represent the wide spectrum of healthcare providers involved in the management of musculoskeletal conditions, as well as several of the overseeing organizations of healthcare in the UK. The patient voice was included and given equal weighting. The major limitation is that the number of participants was necessarily limited. We sought to mitigate this by asking each professional stakeholder group to nominate an individual to represent the breadth of that organization’s views.

It is important to note that when using the terms ‘non’ and ‘limited’ weightbearing, clinicians should provide quantifying information, justification, and duration: why is weightbearing restricted, in what way, and for how long. Certain historic and traditional descriptors are to be avoided. It was suggested that percentage of body weight would be too problematic, and is not recommended. Similarly, absolute weight values (e.g. 20 kg) are not appropriate. Functional limitations (i.e. no stairs, no sports, no driving) are reasonable, as are descriptors of walking distance, and represent examples of the quantifiers to be used for either non- or limited weightbearing instructions.

Weightbearing, mobilization, and rehabilitation in musculoskeletal medicine, notably orthopaedic trauma, has become a key topic in the last decade.[19] It remains a focal point of research recommendations for the James Lind Alliance, Fragility Fracture Network, the National Institutes of Health and Care Research, and many other funding bodies. The increasing numbers of scientific publications on the topic are undermined by the lack of standardized terminology. Meta-analysis and systematic reviews are hard to conduct when studies use different terminology. The hope is that with uniform language, research fidelity will improve.

Future work is required to address the terminology associated with the broader concept of patient mobilization. It was acknowledged that wording around mobilization includes many variables, and standardization may not be achievable. Mobilization (e.g. “distance can travel”) is separate to weightbearing. Accordingly, it is important for patients that they are given clarity on what they can and cannot do with their affected limb.

The need to standardize terminology was considered universal by the stakeholder group, regardless of the patients’ age. Mobilization in the upper limb is a challenging concept to standardize. It was agreed the upper limb should be subject to the same terminology as the lower limb. Similarly, pelvic injuries have the same requirements as lower limb injuries and are thus considered in the same group. While the exercise was focused on post-injury rehabilitation instructions, there is no reason that elective surgery should not be applied in the same manner. Mobilization is a much broader topic than weightbearing, but this work represents a starting point for the discussion around mobilization as a whole.

Dissemination of this new set of agreed terms and the recommendations that surround them will take the form of a national policy document (British Orthopaedic Association Standards (BOASt)), allowing for dissemination to the orthopaedic community. A BOASt is a clear and concise one-page document with key recommendations in relation to a specific clinical condition or process/pathway applicable to the generality of orthopaedics and all involved. This will provide clear guidance to all involved in the patient pathway after injury about the exact nature of the terminology to be used. It will also allow for local and national audits to demonstrate the scope and nature of the impact of standardizing language around injury rehabilitation. BOASts have a long history of influencing change in practice, and represent one of the most powerful vehicles we have for evolving UK clinical practice. BOASts are typically now published and citable, which allows for greater reach within the orthopaedic community and improved credibility of these standards.

All stakeholder organizations will be encouraged to disseminate the output of this exercise to their memberships. The

stakeholder organizations each sent a dedicated representative as part of the consensus exercise and then subsequently, on review of the summary output and proposed BOASt, have agreed to co-badge the documents. This empowers the stakeholders to disseminate the work to their memberships, and allows for credibility and authority to be given to such documents. Not only is the final policy document to be circulated to all stakeholder memberships, but presentation of the work and further dissemination of the message will occur at the national conferences for many of those involved.

Three specific terms regarding weightbearing can now be recommended and embedded in UK clinical practice based on consensus agreement from a multidisciplinary group of stakeholders and patients: 1) non-weightbearing; 2) limited weightbearing; and 3) unrestricted weightbearing.

Mobilization instructions and more detailed recommendations will be provided as part of a national guideline.

Take home message

- Weightbearing after orthopaedic injury or surgery remains a key topic for current research in musculoskeletal trauma.
- Despite this, no uniform language exists regarding the instructions shared between healthcare providers or patients.
- An agreed set of standardized terms will allow for better-quality service evaluation and audit, and more robust and impactful research.
- The consensus group agreed on the terms non-, limited, and unrestricted weightbearing as the only ones to be used.

Supplementary material

A list of each individual stakeholder and the organizations they represent, as well as their affiliations, along with the pre-meeting questionnaire circulated to all stakeholders.

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Data sharing:
The data that support the findings for this study are available to other researchers from the corresponding author upon reasonable request.

Ethical review statement:
Ethical approval was not required. This is a consensus exercise. All stakeholders had agreement of their relevant professional body to provide opinion on their behalf.

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