What do healthcare professionals want from a resource to support person-centred conversations on physical activity? A mixed-methods, user-centric approach to developing educational resources

Hamish Reid 1,2, Jessica Caterson,3 Ralph Smith,4 James Baldock,4 Natasha Jones,1,4 Robert Copeland,2 on behalf of the Moving Medicine development group

ABSTRACT

Objectives Healthcare is a fundamental action area in population efforts to address the global disease burden from physical inactivity. However, healthcare professionals lack the knowledge, skills and confidence to have regular conversations about physical activity. This study aimed to: (1) understand the requirements of healthcare professionals and patients from a resource to support routine physical activity conversations in clinical consultations and (2) develop such a resource.

Methods This study used codeign principles across two phases, actively involving relevant stakeholders in an iterative development process. The preparatory phase included a scoping literature review and workshops with multidisciplinary healthcare professionals and patients. The Delphi phase included the development of a draft resource, a three-stage modified online Delphi study and an external review.

Results The scoping review highlighted the importance of addressing time restrictions, a behaviour change skill deficit, the need for resources to fit into existing systems and meeting patient expectations. Consultation included 69 participants across two clinical workshops. They recommended using the internet, valued guidance on all aspects of physical activity conversations and were concerned about how to use a person-centred approach. The Delphi phase, including 15 expert participants, met agreement criteria in two stages to develop the resource.

Conclusion This mixed-methods study developed an online resource that was co-designed with and based on the requirements of healthcare professionals and patients. The resource presents condition-specific ‘1-minute’, ‘5-minute’ and ‘more minute’ person-centred and evidence-based conversation templates on physical activity in an accessible and usable format to meet the needs of real-life clinical practice.

WHAT IS ALREADY KNOWN ON THIS Topic

- Healthcare professionals are essential contributors to population efforts to increase physical activity.
- The physical activity knowledge, skills and confidence of healthcare practitioners are low.
- There is a lack of physical activity tools and educational resources available to help healthcare professionals.

WHAT THIS STUDY ADDS

- Healthcare professionals want in-depth evidence on physical activity and specific conditions that are available and presented in an accessible hierarchy using hyperlinks on a web platform so they can choose what they need.
- ‘1-minute’, ‘5-minute’ and ‘more minute’ person-centred conversations are flexible enough to meet the demands of healthcare professionals and patients.

HOW THIS STUDY MIGHT AFFECT RESEARCH, PRACTICE AND/OR POLICY

- The resource developed during this study will help healthcare professionals talk to people about physical activity and is freely available online at www.movingmedicine.ac.uk
- Future research should seek to test the resources developed during this study to determine efficacy and help improve the format and function of resources to better support conversations on physical activity in the management of long term conditions.
- Comprehensive evaluation is required of system-wide implementation projects to understand how to use these resources to improve continuity and support people as they journey through healthcare services in their long-term management of health conditions.

INTRODUCTION

A strong and rapidly developing body of evidence defines the health risks of physical inactivity and the role of therapeutic physical activity in treating chronic medical conditions.1–3 The WHO recognises physical

Open access

inactivity as the fourth leading risk factor for global morbidity and premature mortality, being directly responsible for 6% of deaths globally and the cause of more deaths than smoking.8

Healthcare is a fundamental component of population-level approaches to addressing the inactivity burden and is essential due to the sector’s contact with, and potential to influence, people living with health conditions.5 6 Individuals living with health conditions are among the least active in society and generally become even less active following diagnosis.2 Consequently, this group stands to gain the most from even small increases in physical activity to treat existing and prevent new medical conditions.2

Healthcare professionals are a central part of the systems-wide approach required to drive change and improve the delivery of physical activity.6 8 Routine person-centred conversations between healthcare professionals and their patients offer a vital intervention area.9 10 Healthcare professionals repeatedly report lacking the skills and confidence required to effectively counsel people living with a health condition on physical activity.11

There is a lack of tools and education platforms to operationalise physical activity conversations in healthcare.12 13 Furthermore, generic resources and efforts to improve behaviour change skills in other domains such as smoking cessation and weight loss do not appear to translate to improved physical activity confidence and skills.14 15 Meaningful patient involvement in quality improvement initiatives helps drive quality and innovation and is recommended for novel approaches to clinical resource development.16 Codesign (also called coproduction or cocreation) is an approach that focuses on actively involving all relevant stakeholders to help ensure a design process meets their needs so that educational resources and service provision models are usable in real-life scenarios.17 18 Codesign principles were used in this study to address the following aims:

1. Understand the requirements of healthcare professionals and patients from a resource to support routine physical activity conversations in clinical consultations

2. Develop and test such a resource.

METHODS

Study design

Two study phases, reflecting the two study aims, are outlined in figure 1. To understand the requirements of healthcare professionals around physical activity conversations, the preparatory phase included a scoping literature review and consultation workshops with multidisciplinary healthcare professionals and patients. The Delphi phase aimed to iteratively develop and test such a resource over three rounds.

Codesign principles were employed throughout, engaging multidisciplinary healthcare professionals who will use the resource and people living with medical conditions with whom the healthcare professionals will use it. The Delphi method was chosen for its ability to collate a diverse set of expert opinions anonymously and without social pressure or a ‘bandwagon effect’.19 20 Codesign enabled the Delphi phase of the study to focus on the iterative development of a resource that repackage the physical activity evidence base into a clinically relevant and accessible format with input from a range of stakeholders through the generation of ideas and solutions rather than just in-depth analysis.21 22

Patient and public involvement

Patient representatives identified through patient support groups of local charities attended the workshops. In the workshops, they were spread between groups to help understand and discuss the balance of perspectives required for conversations on physical activity in clinical practice. Their opinions directly informed resource design, and they subsequently contributed to external review and the development and dissemination of patient-facing information resources.

Preparatory phase

Scoping review

We undertook a scoping review following the five-stage protocol by Arksey and O’Malley reported according to the Preferred Reporting Items for Systematic Reviews

Figure 1 Structure and objectives of each Delphi study phase.
and Meta-Analyses extension for scoping reviews checklist.\textsuperscript{33–35} The review explored published literature, guidelines and online resources, aiming to gain a broad overview of the context of physical activity consultation in healthcare. It addressed two research questions: (1) what is known about the effectiveness and acceptability of physical activity consultations in healthcare? and (2) what is known about strategies to implement routine physical activity conversations in healthcare?\textsuperscript{35}

Consultation
We led two focused, interactive workshops informed by results from the scoping review (see online supplemental file 2). The workshops aimed to identify and rationalise the components of a resource judged to be important by healthcare professionals and identify acceptable delivery formats. Through professional contacts, we identified two multidisciplinary regional specialist networks to participate in the workshops. The first workshop focused on inflammatory rheumatic disease and the second on musculoskeletal pain. We summarised results from the workshops and organised them thematically to inform the development of a draft resource in the Delphi phase.

Delphi phase
We used a modified electronic Delphi process to collect data from remote contributors and facilitate automated data collection.\textsuperscript{36, 37} We used the commercial software ‘SurveyMonkey’\textsuperscript{38} for the survey rounds and followed the Conducting and REporting Delphi Studies guidelines throughout.\textsuperscript{39}

Building a draft resource
We commissioned a design agency and gave them a design brief based on findings of the preparatory phase. Design agency members also attended preparatory phase workshops to improve their understanding of the content and objectives. We developed a wireframe draft resource in conjunction with the design team through meetings, phone calls and email communication. The wireframe resource enabled the exploration of content, navigation and function during round 1 of the Delphi study without requiring the investment of a complete website build.

Developing and testing the survey
We developed and tested an online survey based on the structure and content of the wireframe resource, which reflected the development priorities outlined during the preparatory phase. Three clinicians not involved in the study piloted the survey before distribution to ensure usability by testing the structure and wording.\textsuperscript{28, 39} We kept the completion time target below 30 min to reduce participant fatigue.\textsuperscript{40}

Participant recruitment
We formed an expert panel by purposive sample to generate a deliberately heterogeneous group of multidisciplinary participants with expertise covering healthcare, physical activity, behavioural change and digital education.

According to recommendations for a Delphi study requiring in-depth feedback and continuity, 15 is a sufficient number of participants.\textsuperscript{31, 41, 42} We identified potential participants through professional and academic networks and established research interests with relevant publications. We invited participation by direct email, and where participants did not reply to the initial contact, we sent one further invitation email.

Following round 1, we contacted all participants by email and invited them to participate in round 2. In addition, three reminder emails were sent out for those who had not completed the second-round questionnaire: (1) a repeat of the initial invitation 2 weeks before the survey closing, (2) a reminder at 1 week and (3) a final reminder 2 days before survey closure.

Delphi rounds
Round 1 of the online Delphi aimed to test the structural components of the wireframe website and appraise preliminary design concepts. Round 2 involved testing a website built following round 1. Finally, round 3 enabled the resolution of any persistent disagreement if necessary.

Between-round feedback
Following each round, we prepared and distributed individualised feedback comparing individual responses to the group average for each question. This was a straight reproduction of the participant’s own words to avoid biasing responses in subsequent rounds.\textsuperscript{42} We also provided all participants with a summary of free-text feedback and a comprehensive list of and rationale for all actions taken (see figure 2).

Delphi consensus criteria
In keeping with described methods,\textsuperscript{32, 39, 42} we defined satisfactory agreement (consensus) ‘a priori’ according to the criteria outlined in figure 3.

External review
We identified three external groups to review the Delphi study’s outputs and circulated resources electronically to these groups after completing the Delphi rounds requesting open-text feedback via email. The objective of this feedback was to review the content and assess the feasibility and applicability of the approach recommended by the Delphi group. The groups were:

► An academic external validation group appointed through the Moving Medicine initiative.

► Funding and commissioning bodies at the Faculty of Sport and Exercise Medicine, Sport England and Public Health England.

► Collaborating professional bodies including the Royal College of Physicians, Royal College of Nurses, Royal College of General Practitioners, Chartered Society of Physiotherapists, Academy of Medical Royal Colleges, the British Association of Sport and Exercise Medicine, Sport England and Public Health England.
Exercise Medicine and the patient representatives of charities who had participated in the working groups.

RESULTS
Preparatory phase
Scoping review
The scoping review identified 616 references for screening (n=596 from databases and n=20 from hand searching). Following screening and removal of duplicates, 48 studies were included for analysis. Narrative results were synthesised thematically as they emerged from the data.35 Online supplemental file 1 presents a summary of relevant findings.

Figure 2  Format for individualised feedback on each question.

Consultation
A total of 70 attendees took part in the face-to-face clinical workshops that took place in Oxford (autoimmune rheumatic disease) and Birmingham (musculoskeletal pain) in 2018 (see table 1). Healthcare professionals from a range of rheumatology, musculoskeletal and chronic pain services across England attended the workshops. The groups included doctors, nurses, physiotherapists, clinical academics and medical students. In addition, we identified patient representatives through local patient groups from the National Rheumatoid Arthritis Society and the Arthritis and Musculoskeletal Alliance,
Table 1: Professional mix in the preparatory workshops

<table>
<thead>
<tr>
<th>Role</th>
<th>Autoimmune rheumatic disease workshop (n=37)</th>
<th>Musculoskeletal pain workshop (n=32)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Consultant</td>
<td>12</td>
<td>9</td>
</tr>
<tr>
<td>Specialist registrar</td>
<td>12</td>
<td>15</td>
</tr>
<tr>
<td>Physiotherapist</td>
<td>1</td>
<td>4</td>
</tr>
<tr>
<td>Nurse</td>
<td>4</td>
<td>0</td>
</tr>
<tr>
<td>Academic</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Medical student</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>Lay representative</td>
<td>4</td>
<td>1</td>
</tr>
<tr>
<td>Designer</td>
<td>2</td>
<td>1</td>
</tr>
</tbody>
</table>

| Gender | | |
|--------| | |
| Female | 24 | 17 |
| Male   | 13 | 16 |

As outlined in Table 2, the headline themes identified were components to support healthcare professionals directly, clinical considerations for translating evidence into practice and developing a mechanism to support access to knowledge in routine clinical care.

Delphi phase

Building a draft resource

Workshop participants identified the internet as an acceptable and scalable environment to host a resource to support conversations in everyday clinical practice. Using a website also enables delivery of the complexity of information identified as necessary. Table 3 maps preparatory phase recommendations onto solutions generated during the iterative build of the wireframe website (see figure 4).

Developing and testing the survey

We identified the following problems during survey piloting:
- Errors in question format, including mistakes in a matrix table
- Confusing question layouts when viewed on mobile devices.
- Testing recommended that the classically used nine-point scale as per the original RAND UCLA method was an inappropriately long set of numbers for the digital screen. We selected a six-point scale instead, with the added advantage that it obliged participants to commit to either agreeing or disagreeing with statements.

Table 2: Summary of consultation workshop recommendations

| Components identified to support healthcare professionals having conversations on physical activity | Condition-specific and general benefits (including symptoms).
|---------------------------------------------------------------------------------------------------|
|                                                                                                   | Directive messages to address common misconceptions.
|                                                                                                   | Safety messages addressing common concerns.
|                                                                                                   | Categories of activity (including what counts, practical suggestions and logistical considerations).
|                                                                                                   | Resources to give to patients.
|                                                                                                   | Activity recommendations that reflect disease activity.
|                                                                                                   | Gain an understanding of physical activity levels and physical activity history.
|                                                                                                   | Address perceived barriers and negative aspects of activity, for example, financial/access/time.
|                                                                                                   | Signposting to appropriate resources for support of condition management and activity opportunities.

Clinical considerations for translating the evidence into practice

A resource that cut out important information due to an arbitrary design consideration would significantly reduce usefulness and uptake among healthcare professionals, so all identified components need to be included.

- Time and prioritisation are prevalent barriers to physical activity conversations.
- Messages should be positively rather than negatively framed.
- Clinical recommendations should focus on the individual rather than reference national guidelines. Specifically, healthcare professionals and patients perceive 150 min of moderate-intensity activity per week as an unnecessary barrier to conversations with inactive people.

Developing a mechanism to support access to knowledge in routine clinical care

A person-centred approach to physical activity decision making is considered fundamental by clinicians and patients. However, clinicians lack confidence in achieving this. Both clinicians and patients recommend explicit guidance on how to approach person-centred decision making in behavioural change conversations.

- Disease-specific infographics were presented as a potential solution. Workshop participants unanimously agreed that flat infographics would not deliver the complexity of information healthcare professionals and patients require in clinical practice to support physical activity conversations.
- A resource must be flexible enough to be helpful in both a short or long period of time.
- To support conversations in practice, suggested responses to help address common concerns, such as the risks of physical activity, are helpful.

The internet provides an accessible, acceptable and feasible route of delivery.
Navigation of the wireframe website confused users, so we included images with detailed instructions to improve navigability.

**Participant recruitment**

We contacted 29 individuals, and 19 agreed to partake in round 1 of the study. Only 15 of 19 participants completed the survey in round 1 despite reminder emails, so only these participants were sent the round 2 survey. Ten of 15 of these participants responded to the round 2 survey. Table 4 demonstrates participant demographics.

**Delphi round 1**

Overall, agreement levels were high in round 1 (see table 5, full results are available in online supplemental file 3). However, there were two instances of participants registering a score or set of scores out of keeping with their free-text responses. We contacted these respondents directly to clarify their responses, and in each instance, there was an error or misunderstanding. For example, one respondent answered the scale of 1–6 the wrong way around, and another failed to open the design mock-ups.

**Table 3** Generating design solutions from preparatory phase recommendations

<table>
<thead>
<tr>
<th>Preparatory phase recommendation</th>
<th>Design solution</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>General features</strong></td>
<td></td>
</tr>
<tr>
<td>Provide guidance on a conversation structure that supports different timeframes.</td>
<td>Three time-framed conversation templates were developed to host disease-specific information.</td>
</tr>
<tr>
<td>Prioritise information to make it easily digestible.</td>
<td>Critical information is presented with hyperlinks to more detail.</td>
</tr>
<tr>
<td>Include links to the evidence base.</td>
<td>A theory and evidence section included.</td>
</tr>
<tr>
<td>Support a person-centred approach and individualised advice.</td>
<td>Conversation templates were developed to provide healthcare professionals with guidance on how to deliver individualised advice.</td>
</tr>
<tr>
<td>Include positive and clear directive messaging.</td>
<td>‘Did you know’ posts created as stand-alone messages.</td>
</tr>
<tr>
<td>Deliver via the internet.</td>
<td>Wireframe resource developed as a website.</td>
</tr>
<tr>
<td><strong>Components</strong></td>
<td></td>
</tr>
<tr>
<td>Physical activity history.</td>
<td>Include open questions and a screening tool.</td>
</tr>
<tr>
<td>Include evidence on benefits for specific conditions.</td>
<td>Provide condition-specific resources with a summary of the relevant narrative evidence review.</td>
</tr>
<tr>
<td>Address patient concerns and provide safety advice.</td>
<td>Enable customisation of concerns and safety advice for each condition by specialist healthcare professionals.</td>
</tr>
<tr>
<td>Enable making a plan.</td>
<td>Include planning resources that can be shared with and given to patients.</td>
</tr>
<tr>
<td>Signpost other resources and organisations.</td>
<td>Catalogue and hyperlink disease-specific resources from trusted sources and physical activity networks.</td>
</tr>
<tr>
<td>Provide resources for patients to take away.</td>
<td>Include PDF output.</td>
</tr>
<tr>
<td>Explain how physical activity is beneficial.</td>
<td>Include mechanistic explanations of symptom benefit.</td>
</tr>
<tr>
<td>Suggest appropriate activities.</td>
<td>Include a list of example activities people find beneficial for each condition.</td>
</tr>
</tbody>
</table>

**Figure 4** Landing page for the UX-PIN wireframe website.
Table 4  Demographic and professional characteristics of Delphi expert panel

<table>
<thead>
<tr>
<th>No.</th>
<th>Gender</th>
<th>Professional background</th>
<th>Professional role</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>M</td>
<td>Consultant</td>
<td>Clinical/physical activity academic</td>
</tr>
<tr>
<td>2*</td>
<td>F</td>
<td>Pharmacist</td>
<td>Clinical/education</td>
</tr>
<tr>
<td>3</td>
<td>F</td>
<td>Physiotherapist</td>
<td>Clinical</td>
</tr>
<tr>
<td>4*</td>
<td>M</td>
<td>Consultant</td>
<td>Clinical/physical activity</td>
</tr>
<tr>
<td>5</td>
<td>M</td>
<td>Consultant</td>
<td>Clinical</td>
</tr>
<tr>
<td>6</td>
<td>F</td>
<td>Academic</td>
<td>Intervention design/health policy</td>
</tr>
<tr>
<td>7</td>
<td>F</td>
<td>GP</td>
<td>Clinical</td>
</tr>
<tr>
<td>8*</td>
<td>M</td>
<td>Consultant</td>
<td>Clinical/academic</td>
</tr>
<tr>
<td>9</td>
<td>M</td>
<td>CEO</td>
<td>Digital communication/ physical activity</td>
</tr>
<tr>
<td>10</td>
<td>M</td>
<td>Consultant</td>
<td>Clinical</td>
</tr>
<tr>
<td>11*</td>
<td>F</td>
<td>Nurse</td>
<td>Clinical/education</td>
</tr>
<tr>
<td>12</td>
<td>F</td>
<td>Midwife</td>
<td>Clinical/education</td>
</tr>
<tr>
<td>13</td>
<td>M</td>
<td>Academic</td>
<td>Physical activity researcher</td>
</tr>
<tr>
<td>14</td>
<td>M</td>
<td>Consultant</td>
<td>Clinical/academic</td>
</tr>
<tr>
<td>15*</td>
<td>F</td>
<td>Psychologist</td>
<td>Behavioural change/health policy</td>
</tr>
</tbody>
</table>

*Did not participate in the second Delphi round. F, female; M, male.

answering the design-specific questions on the strength of the wireframe website. These issues were rectified and were not ongoing issues for other participants.

We analysed and collated free-text responses thematically (online supplemental file 3). Where free-text responses were relevant but unclear or incomplete, we telephoned to further clarify the meaning. Given the high levels of agreement, free-text responses identified most changes required following round 1. We made the following major changes following round 1:

- Revision of the conversation thread to further encourage patient-led decision making incorporating motivational interviewing theory and focusing on a ‘guiding’ rather than ‘telling’ approach.
- Shortening the ‘2 min’ conversation.
- Inclusion of patient-facing outputs for clinicians to hand out.
- Removal of the ‘theory and evidence’ page in favour of evidence statement ‘pop-ups’ to make navigation and accessibility more straightforward.
- Inclusion of a pop-up for out-of-date browsers advising software update and optimisation for mobile devices to make usage less reliant on National Health Service (NHS) IT infrastructure.

Delphi round 2

We built a draft website incorporating recommendations from round 1 for testing in round 2 of the Delphi (see figure 5).

Reflecting the high levels of consensus in round 1 of the Delphi (table 5), we dropped 10 questions for the second survey. However, despite achieving consensus in round 1, we repeated question 11 because of significant changes to the relevant content due to free-text feedback.

In round 2, 12 consensus areas achieved high agreement; 6 moderate agreement and 1 low agreement. In addition, we observed moderate agreement for navigation, the achievability of content, the physical activity calculator and the signposting of organisations. See online supplemental file 4 for full results.

Delphi round 3

The inclusivity of design elements recorded low agreement (59%) in round 2. Free-text responses demonstrated that this was because the draft website only included one image. We did this intentionally to reduce build complexity at the draft stage. Ultimate plans were for a socioethnically diverse photograph carousel to feature in the final site, but we did not share this detail with respondents through oversight. We informed respondents of this solution by email, who were satisfied with the approach, and we did not need to proceed to a formal third round of the Delphi.

We revised the website following the amendments suggested in round 2. We then shared the website with the Delphi participants via email, inviting them to comment on the revisions. We received no further comments.

External review

After completing the Delphi study, we distributed the website to the predetermined external review groups. We invited feedback via open comments by email. Responses were unanimously positive, and no content changes were recommended. We received advice on launch, dissemination and engagement.

DISCUSSION

This mixed-methods study represents a unique effort to understand and address the requirements of healthcare professionals and people living with health conditions regarding conversations on physical activity in clinical practice. Results from an extensive preparatory phase, including scoping review and workshops, informed the development of an open-access online resource developed iteratively with expert Delphi consensus. The resultant resource combines published evidence, consensus opinion and practical advice from clinical specialists in a time-sensitive, person-centred, practical format to bridge the gap between evidence and clinical practice.

Codesign

Despite convincing evidence and numerous national guidelines defining the vital role of physical activity across UK healthcare,1-5 11 21 43-45 the translation of knowledge from research to clinical practice remains limited across professional disciplines.14-18 21 46 To address this, we employed codesign principles, which ‘offers the chance for clinicians to reconsider the purposes of medicine and
Table 5  Overview of Delphi consensus results

<table>
<thead>
<tr>
<th>No.</th>
<th>Question</th>
<th>Round 1</th>
<th>Round 2</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>% agreement</td>
<td>Any disagreement?</td>
</tr>
<tr>
<td>1</td>
<td>The information is laid out in a coherent manner that supports clinical consultation</td>
<td>77</td>
<td>Yes</td>
</tr>
<tr>
<td>2</td>
<td>Using patient quotes is an engaging way to make the content clinically meaningful</td>
<td>86</td>
<td>Yes</td>
</tr>
<tr>
<td>3</td>
<td>Navigation of the resource is straightforward</td>
<td>79</td>
<td>Yes</td>
</tr>
<tr>
<td>4</td>
<td>The theory and evidence page contains a satisfactory amount of educational information</td>
<td>85</td>
<td>No</td>
</tr>
<tr>
<td>5</td>
<td>Presenting the options ‘no minutes consultation’, ‘2 min consultation’, and ‘more minutes consultation’ is a useful approach for the busy clinician</td>
<td>94</td>
<td>No</td>
</tr>
<tr>
<td>6</td>
<td>The menu page makes it clear what to expect from the resource</td>
<td>77</td>
<td>Yes</td>
</tr>
<tr>
<td>7</td>
<td>The ‘no minutes consultation’ contains the most important messages for a healthcare professional to share in a very short space of time</td>
<td>85</td>
<td>No</td>
</tr>
<tr>
<td>8</td>
<td>The ‘no minutes consultation’ page includes an appropriate amount of information</td>
<td>85</td>
<td>Yes</td>
</tr>
<tr>
<td>9</td>
<td>The ‘2 min consultation’ contains appropriate information</td>
<td>91</td>
<td>No</td>
</tr>
<tr>
<td>10</td>
<td>Covering these objectives is achievable in a 2 min consultation</td>
<td>80</td>
<td>Yes</td>
</tr>
<tr>
<td>11†</td>
<td>The subheadings of the more minutes consultation (ask, share benefits, explain how it works, address concerns, plan and next steps) clearly signpost the content of each page</td>
<td>91</td>
<td>Yes</td>
</tr>
<tr>
<td>12</td>
<td>The four questions provide useful prompts for eliciting a patient-focused physical activity history</td>
<td>91</td>
<td>No</td>
</tr>
<tr>
<td>13</td>
<td>The ‘physical activity vital sign’ is a useful screening tool for a brief intervention in physical activity</td>
<td>83</td>
<td>Yes</td>
</tr>
<tr>
<td>14</td>
<td>It is useful to present symptom reduction as primary benefits and prevention of further morbidity as secondary benefits</td>
<td>87</td>
<td>No</td>
</tr>
<tr>
<td>15</td>
<td>It is necessary to display individual references at the bottom of the benefits page in addition to a clear link through to an explanation of the evidence with references on the ‘evidence and theory’ page</td>
<td>82</td>
<td>Yes</td>
</tr>
<tr>
<td>16</td>
<td>The positive/negative cycle of activity graphics will help healthcare professionals explain to their patients how physical activity will benefit their symptoms</td>
<td>91</td>
<td>No</td>
</tr>
<tr>
<td>17</td>
<td>This information is presented in a clinically meaningful way</td>
<td>79</td>
<td>Yes</td>
</tr>
<tr>
<td>18</td>
<td>Key safety messages, such as addressing cardiac risk, are adequately addressed and explained</td>
<td>86</td>
<td>No</td>
</tr>
<tr>
<td>19</td>
<td>This is a logical sequence of questions to support individualised physical activity prescription</td>
<td>82</td>
<td>Yes</td>
</tr>
<tr>
<td>20</td>
<td>‘Building activity into all aspects of daily life’ is an appropriate premise on which to base physical activity prescription</td>
<td>95</td>
<td>No</td>
</tr>
<tr>
<td>21</td>
<td>‘General Practice, the local social prescribing network, and county sports partnerships’ are important organisations to signpost for further support</td>
<td>83</td>
<td>Yes</td>
</tr>
<tr>
<td>22</td>
<td>Do you have any suggestions for other national physical activity providers or resources we should signpost?</td>
<td>Freetext response</td>
<td>Freetext response</td>
</tr>
<tr>
<td>23</td>
<td>Please arrange the following by the importance of including them in a patient information leaflet – drag and drop each component to your preferred position</td>
<td>Freetext response</td>
<td>Freetext response</td>
</tr>
</tbody>
</table>

Continued
for patients and other stakeholders to have their voices heard and respected'.

We listened to a wide range of healthcare professionals and patients to understand clinical practice requirements.27 We interpreted this in the context of published evidence and recommendations to make a draft solution that we tested and refined through the Delphi study. This iterative, user-centric approach enabled us to create a novel person-centred solution designed to adapt to day-to-day practice challenges that are not just scientifically right but also responsive to real

### Table 5 Continued

<table>
<thead>
<tr>
<th>No.</th>
<th>Question</th>
<th>Round 1</th>
<th>Round 2</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>% agreement</td>
<td>Any disagreement?</td>
</tr>
<tr>
<td>24</td>
<td>Do you have any recommendations/comments for the patient information section?</td>
<td>Free-text response</td>
<td>Freetext response</td>
</tr>
<tr>
<td>25</td>
<td>The general ‘look and feel’ of the designed pages make the resource:</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(A) Credible</td>
<td>81</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>(B) Distinctive</td>
<td>82</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>(C) Inclusive</td>
<td>79</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>(D) Energetic</td>
<td>82</td>
<td>Yes</td>
</tr>
<tr>
<td>26</td>
<td>The design helps discriminate between different types of information, for example, core content and patient quotes</td>
<td>81</td>
<td>Yes</td>
</tr>
<tr>
<td>27</td>
<td>The design helps prioritise information</td>
<td>87</td>
<td>Yes</td>
</tr>
</tbody>
</table>

Statements meeting consensus criteria are coloured green and statements not meeting agreement are coloured red.

*Question 4 was included in round 2 despite meeting agreement criteria because we changed the mechanism for delivering the evidence statements.

†Question 11 was asked again in round 2 despite meeting agreement criteria because the subheadings changed.

Figure 5  Condition-specific landing page for a 0 min conversation on the draft website for phase 2.
life.\textsuperscript{48} Our resource will help address the lack of tools and training opportunities on physical activity counselling for staff in the NHS and elsewhere.\textsuperscript{18, 22}

Undertaking codesign is challenging. We worked hard on finding a balance between the development of the delivery mechanism alongside the evolution of the content. At times, this confused participants and led to mixed survey responses. A strength of the Delphi process was the ability to gain clarity and consensus on a wide range of options taking into account various individual opinions.\textsuperscript{30}

### Structuring information

Integrating a design team from the outset enhanced the design process, helping make sense of feedback and translating it into functional solutions. For example, time is an ever-present barrier to conversations on physical activity,\textsuperscript{23, 49, 50} and user groups recommended addressing this barrier at the outset of a resource designed to support clinical practice. The Delphi group recommended a time-based approach on conversations templates of 1, 5 and more minutes, reflecting behavioural change approaches recommended by the National Institute for Health and Care Excellence (NICE)\textsuperscript{10} and other physical activity initiatives.\textsuperscript{21} Working through solutions to this with the design team enabled the production of practical solutions that we then tested and refined through the Delphi process.

Given the long list of components required by clinicians (table 2), we were unclear on how to prioritise information. Although a novel approach to conversational design, ranking systems are recommended and successfully used tool in Delphi studies.\textsuperscript{51, 52} We used a drag and drop mechanism to develop a practical conversation sequence combining all the workshop groups’ requirements, and a web-based solution helped us deliver on all aspects.\textsuperscript{6, 25}

The overwhelming volume of evidence around physical activity in the management of long-term conditions can present an imposing barrier to the practice of evidence-based medicine.\textsuperscript{14} Information is understood and retained better when delivered in small chunks following sound design principles.\textsuperscript{55, 56} A web platform enabled the refinement of a system capable of publishing information in layers to address these two factors. An example was moving the supporting evidence base from long-text format to ‘pop-ups’ on the strength of Delphi feedback.

The Delphi group reinforced the importance of getting the wording right for a conversation guide to move away from a ‘telling’ language style and meet the healthcare requirements identified in the consultation phase. A traditional didactic style of consultation runs the risk of ‘victim blaming’ and fails to support successful behavioural change.\textsuperscript{48} This shift in approach can also help healthcare practitioners foster supportive relationships and facilitate improvements in care delivery, benefitting users outside the realm of conversations on physical activity.\textsuperscript{57}

### Limitations

The Delphi group’s skill mix ensured a balance of clinical, behavioural and academic input. However, the group did not represent all healthcare practitioners, potentially limiting the resource’s usefulness for unrepresented groups such as social prescribers. In addition, consultation was only undertaken with two groups of medical specialists. Therefore, it is possible that the structure developed to suit autoimmune rheumatic disease and musculoskeletal pain does not best support conversations in other long-term conditions. As a UK-focused study, we reviewed clinical guidelines published in English, but this may reduce applicability to global healthcare environments. We do not know if searching published manuscripts and clinical guidelines in other languages would have generated additional insights or messages that would have impacted this work.

Survey fatigue is an inherent risk of Delphi studies and may explain participants’ observed dropout rate through the rounds.\textsuperscript{26} Removing 10 questions for the second round had a minimal impact on the average completion time, which changed from 32 min in round 1 to 28 min in round 2. This may reflect that users put aside 30 min to fill out the questionnaire or that the 10 respondents who completed round 2 were more committed to giving feedback on the project. Despite being lower than the average reported dropout rate in Delphi studies,\textsuperscript{28} the loss of five participants limited the range of opinions contributing to round 2. Dropout risks regression to the mean and may have contributed to the very high agreement levels seen in round 2.\textsuperscript{29}

Future research should seek to test the resources developed during this study to determine efficacy, understand implementation strategies and help improve the format and function of resources to better support conversations on physical activity in the management of long-term conditions. In addition, future Delphi studies focusing on similarly complex topics may benefit from recruiting a larger panel.

### CONCLUSION

This mixed-methods study represents a unique effort to understand and address the requirements of healthcare professionals and people living with health conditions to improve their conversations on physical activity. The preparatory phase identified limited time, a lack of knowledge around physical activity and low confidence in behaviour change skills as fundamental challenges for healthcare professionals. Addressing these requirements, the Delphi phase led to the development of a resource offering ‘1-minute’, ‘5-minute’ and ‘more minute’ person-centred and evidence-based conversation templates for healthcare professionals. The resource is now freely available online at www.movingmedicine.ac.uk.

### Author affiliations

\textsuperscript{1}Moving Medicine, Faculty of Sport And Exercise Medicine, Edinburgh, UK

\textsuperscript{2}Institute of Sport and Exercise Science, University of Strathclyde, Glasgow, UK
Acknowledgements

We are grateful to our collaborating partners, Sport England and Public Health England, for their support of this work and all clinicians and patients who contributed to the workshops in the preparatory phase. We would like to thank David Nunan for his advice and support on how to address the aims of this study critically. The successful realisation of this project has been in large part due to the energy, skills and creativity of the design team One Ltd. We are hugely grateful for their tireless work and passionate commitment.

Collaborators

We would like to thank the Moving Medicine development group who gave their time and expertise to this Delphi study: Andrew Murray, Beverley Hall, Clare Scott-Dempster, George Bowmes, Jim Kerss, Jo Foster-Stead, Joanna Lambert, John Rogers, Joseph Lightfoot, Jumbo Jenner, Lisa Stephens, Mark Batt, Martyn Standage, Paul Kelly and Vicky Lawson.

Contributors

HR and NJ conceptualised, planned and led the delivery of this study. HR, RS and JB led the workshops. HR and JC designed and delivered the Delphi study. All authors contributed to decision making between Delphi rounds and the write up of the manuscript, which HR, JC and RC led. HR accepts full responsibility for the work and/or the conduct of the study, had access to the data, and controlled the decision to publish.

Funding

Sport England provided funding to support this work through money from the National Lottery as part of the Moving Health Professionals Programme. £823 was spent during the preparatory phase of this project, with costs allocated to participant travel, consumables and hire of facilities. Staff costs totalled £17 000, while £408 was spent on software.

Competing interests

None declared.

Patient and public involvement

Patients and/or the public were involved in the design, or conduct, or reporting, or dissemination plans of this research. Refer to the Methods section for further details.

Patient consent for publication

Not applicable.

Ethics approval

The research proposal was submitted to the UK National Health Service (NHS) Research Authority and Medical Research Council decision-making tool, which confirmed that NHS Research Ethics Committee review was not required. All participants of the Delphi and workshop groups provided informed consent by agreeing to participate in the study following a detailed description of what participation entailed. No research team or Delphi members stood to gain financially or otherwise from decisions taken in the Delphi study and all feature as authors of this manuscript. Participants gave informed consent to participate in the study before taking part.

Provenance and peer review

Not commissioned; externally peer reviewed.

Data availability statement

All data relevant to the study are included in the article or uploaded as supplementary information.

Supplemental material

This content has been supplied by the author(s). It has not been vetted by BMJ Publishing Group Limited (BMJ) and may not have been peer-reviewed. Any opinions or recommendations discussed are solely those of the author(s) and are not endorsed by BMJ. BMJ disclaims all liability and responsibility arising from any reliance placed on the content. Where the content includes any translated material, BMJ does not warrant the accuracy and reliability of the translations (including but not limited to local regulations, clinical guidelines, terminology, drug names and drug dosages), and is not responsible for any error and/or omissions arising from translation or adaptation otherwise.

Open access

This is an open access article distributed in accordance with the Creative Commons Attribution Non Commercial (CC BY-NC 4.0) license, which permits others to distribute, remix, adapt, build upon this work non-commercially, and license their derivative works on different terms, provided the original work is properly cited, appropriate credit is given, any changes made indicated, and the use is non-commercial. See: http://creativecommons.org/licenses/by-nc/4.0/.

ORCID iD

Hamish Reid http://orcid.org/0000-0003-2094-5506

REFERENCES

11. NICE. Physical activity - encouraging activity in all people in contact with the NHS, 2015.
29 Thompson M. Considering the implication of variations within Delphi research miles Thompson, 2009.
35 Reid H, Caterson J, Copeland RJ. What makes a good clinical conversation on physical activity? A scoping review exploring what is known to inform the development of physical activity resources to support healthcare professionals in routine practice. OSF Prepr 2021.
38 SurveyMonkey: The World’s Most Popular Free Online Survey Tool.
56 Stoney C, Gent M. 7 graphic principles of public health infographic accessible: https://visualisinghealth.com/design-
Supplementary file 1. Summary of relevant findings from scoping review

### Current practice

- Healthcare professionals view physical activity as an important part of clinical care.  
- Healthcare professionals frequently lack knowledge and skills around physical activity and behaviour change counselling, reflecting historically inadequate training and education.  
- Healthcare professionals with low confidence in behaviour change skills seldom talk about physical activity, missing most of the opportunities they identify, often avoiding them for fear of offending people.  
- Physically active healthcare professionals talk more frequently and effectively about physical activity.  
- Many healthcare professionals resort to communication styles that make people less likely to become active and engage with support.  
- Physical activity conversations are observed less frequently with lower socioeconomic groups, non-white ethnic groups, and those without private health insurance in countries without state-delivered healthcare.

### Patient perspective

- The majority of people attending healthcare are interested in physical activity and welcome conversations.  
- Patients value integrated multidisciplinary support, the use of common language and consistent messaging.  
- Patients recommend healthcare professionals avoid a ‘preaching’ style of conversation or give unsolicited advice to reduce defensive responses.  
- Patient initiation promotes more frequent conversations on physical activity and increases exploration of individual values and agendas.  
- Being non-judgemental and spending time to build confidence are skills that patients value.

### Training considerations

- Time is the primary barrier to conversations on physical activity.  
- Lack of training on behaviour change skills is a more prevalent barrier for healthcare professionals than knowledge around physical activity and disease.  
- Healthcare professionals are typically trained to provide information and direction rather than to establish collaborative relationships with patients.  
- Traditional training and engrained consulting models make it hard for clinicians to change their consultation approach.  
- Healthcare professionals value counselling strategies such as motivational interviewing, but many have reservations that they too complicated and time consuming.  
- Well-designed post-graduate education on physical activity is well received by healthcare professionals and can be transformative in the way they approach conversations.  
- Professional leaders, personal contacts and partnerships with professional bodies improve engagement in education programmes.

### Conversational structure
• A flexible approach addressing knowledge and skill deficits and balancing physical activity conversations with other clinical objectives is of fundamental importance.

• A range of conceptual frameworks exists to support physical activity conversations. It remains unclear what is most effective or the best fit for clinical practice.

• Reported approaches include motivational interviewing, physical activity screening tools, behaviour change techniques, multimodal approaches and consultation constructs such as the ‘5As’ strategy.

• Motivational interviewing is an effective and increasingly popular framework to support the development of self-efficacy and patient-led behavioural change in clinical practice.

• Screening tools can provide useful prompts for physical activity and can help systems capture physical activity data.

**Clinical practice**

• Prompt strategies can be useful for both healthcare professionals and patients.

• Patients and clinicians value information booklets, workbooks and practical instructions to support consultation.

• Walking interventions and motivational support appear to be the most efficacious and time-efficient interventions.

• Integration of physical activity counsellors into care pathways can help save clinical time, impart physical activity and health knowledge that healthcare professionals may not have, and deliver good quality behavioural change support.

• Healthcare professionals using frameworks such as 5 As and FRAMES generally focus on Assess and Advise stages, delivering premature, clinician-driven plans. This approach omits key steps for long term behavioural change, such as building self-efficacy and confidence.

• The confidence around the risks of physical activity is low for both healthcare professionals and people living with health conditions.

**Designing pathways**

• Keeping workload low and considering time implications is critical for acceptability amongst healthcare professionals, so interventions should integrate with existing care pathways.

• Straightforward, time-efficient protocols are well received and may be vital for supporting healthcare professionals with limited skills and experience.

• Care pathways benefit from simplicity and intersectoral cooperation.

• Healthcare professionals need their role in physical activity pathways clarified.

**System considerations**

• Blanket physical activity promotion and over-reliance on the impact of individual practitioner advice (particularly physicians) are ineffective strategies when employed in isolation.

• Strategic and organisationally driven approaches are essential to achieve an extensive cultural shift in healthcare.

• System reimbursement is essential, driving adequate resourcing and powerfully impacting healthcare professional behaviour.

• Interventions costing less than £30,000 per Quality of Life Year (QALY) are considered cost-effective to commission. NICE estimate that the cost of a QALY through a brief physical activity conversation is between £20 and £440, making it a highly cost-effective intervention compared to usual care.
References

1. Reid H, Caterson J, Copeland RJ. What makes a good clinical conversation on physical activity? A Scoping review exploring what is known to inform the development of physical activity resources to support healthcare professionals in routine practice. *OSF Prepr*. 2021. doi:10.31219/OSF.IO/WBPXA


13. Connaughton A V, Weiler RM, Connaughton DP. Graduating medical students’ exercise


Supplementary file 2. Consultation phase methods and results

Methods

Workshop 1

The aim of this workshop was to define what content healthcare professionals want from a resource supporting conversations on physical activity. The approach and questions were informed by a scoping review of the context of physical activity conversations in healthcare and deliberately kept open to avoid biasing responses. Prior to the workshop a narrative evidence review was undertaken on physical activity in inflammatory rheumatic disease and distributed to the group prior to the workshop.

The workshop was undertaken at a regional meeting for healthcare professionals specialising in the management of inflammatory rheumatic disease in England. 32 attendees came from 8 different rheumatology services regionally and compromised consultant rheumatologists, specialist registrars, specialist nurses, specialist physiotherapists, clinical academics and research nurses. In addition, four patients attended from the local patient group of the National Rheumatoid Arthritis Society.

The workshop was split into three sessions and the attendees were split into four mixed discipline groups, with a patient representative and facilitator allocated to each.

Session 1

The following question was put to the groups:

- What are the main headings that should be included in a resource to support your conversations on physical activity? Please list 5 and prioritise them
Session 2

The following headings were identified from session 1 and shared across the four groups in session 2. Each group presented how they felt a particular heading should be addressed prior to group discussion on each section.

- Benefits and how to frame the messages around them
- Safety messages including risk of harm
- Directive messaging
- Myth busters

Session 3

All groups worked on the following questions during the final session and results were recorded by a group scribe:

- What types/categories of activity should be recommended?
- What practical aspects of activity should be addressed for people with inflammatory disease?
- What recommendation should be made?
- What would be an appropriate title?

Following the workshop, summary points were shared with the group for further comments via email.

Workshop 2

Workshop 2 built on conclusions made in workshop 1, aiming to refine the content valued by clinicians in the resource. Workshop 2 was undertaken at a regional meeting for healthcare professionals specialising in the management of musculoskeletal pain in England. 34 people attended the workshop, representing a broad range of healthcare professionals in the care of
musculoskeletal pain including pain consultants, sport and exercise medicine consultants, specialist registrars, specialist physiotherapists, specialist nurses and patient representatives.

As with workshop 1, a narrative evidence review of physical activity in musculoskeletal pain was shared with attendees prior to the meeting. Attendees were split into four groups and the workshop was split into the following sessions:

Session 1
This session was split into two phases. In the first, all groups were asked to consider the following question:

- What are the most important physical activity questions to address during a clinical consultation? Please list five and prioritise them

Subsequently the groups considered the following questions separately prior to presenting to the other groups:

- Groups 1 and 2 – What key information should clinicians relay to patients with MSK pain about physical activity? Please list the 5 points you feel are most important
- Groups 3 and 4 – What key information would a patient with MSK pain like to know when discussing physical activity with their clinician? Please list the 5 points you feel are most important

Session 2
During this session individuals broke from group work. They were given a series of stickers with statements on them taken from the qualitative and quantitative evidence review. Posters defining the six key areas for the resource identified during workshop 1 were displayed around the room. Participants stuck the stickers to relevant areas of the resource and rated the item 1-5 according to their opinion on the importance of the statement. The rationale for this was to identify where
specific components should sit in the resource and how they should be prioritised. The action areas were:

1. Physical activity history
2. Why PA – Benefits
3. Why PA – Mechanisms
4. Risk and Safety
5. What to do & where
6. Condition specific advice

Posters were collated, and summary statement distribution and weighting analysed.

Session 3

This session was split into two tasks:

- What specific messages would help you counsel patients on physical activity? E.g. Cycle of decline/mechanisms, aerobic vs resistance vs both, motivators/barriers, CMO guidance, general health physical activity benefits, Others
- Are there any safety considerations we need to include? E.g. co-morbidities, significant adverse events, how do we frame any safety messages?

Each task was opened to facilitated discussion after group work. Results from this workshop informed the development of the draft resource for phase 1 of the Delphi study.

Results

Workshop 1

Background work from the narrative evidence review was shared with the group prior to the workshop and presented along with the aims of the project at the start of the session on 2nd November 2017.
Session 1

What are the main headings we should have on this infographic? Please list 5 and prioritise them

Key headings were defined by groups, ranked and shared. Agreement levels were high on the most important components, but participants found it very hard to rank them as they felt they should all feature.

Table 1. Key headings identified in session 1, workshop 1 with rankings

<table>
<thead>
<tr>
<th>Core component</th>
<th>Ranking of importance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Benefits including symptoms (positive and negative)</td>
<td>1(^{st}) equal</td>
</tr>
<tr>
<td>Directive message &amp; myth busters</td>
<td></td>
</tr>
<tr>
<td>Safety messages</td>
<td></td>
</tr>
<tr>
<td>Type of activity (including what counts, practical suggestions, logistics)</td>
<td>2(^{nd}) equal</td>
</tr>
<tr>
<td>Tools and resources to give to patients</td>
<td></td>
</tr>
<tr>
<td>Define Categories of activity – Medically framed reflecting disease activity</td>
<td></td>
</tr>
<tr>
<td>Current activity levels and recommendation</td>
<td>3(^{rd}) equal</td>
</tr>
<tr>
<td>Physical activity history</td>
<td></td>
</tr>
<tr>
<td>Perceived barriers and negative aspects e.g. financial /access /time</td>
<td></td>
</tr>
</tbody>
</table>

The group were adamant that all these components needed to be included when challenged about how they would fit into a single infographic, as was the intention of the project at that stage. This was a strong suggestion that the objective of producing disease specific infographics was unlikely to be able to deliver what clinical staff and patients want in clinical practise to support physical activity.
consultations. A further suggestion from this session was that the resource should prompt clinicians to think about what their patients would like to do.

Session 2

Consensus on key components for each topic heading was achieved through moderated group discussion.

Benefits

Specific:

- Fights fatigue (no. 1 symptom)
- Combats pain
  - Natural pain killer (Equivalent to medication)
- Promotes independence
  - Improved Function
  - More mobile
  - Stronger
- Tackles stiffness
- Live Better and Longer
- Reduces Co-Morbidities

General:

- Self esteem
- Depression (mood)
- Promotes restorative sleep

Safety messages including risk of harm

N.B. A strong emphasis was made that safety messages should be positively framed

- No evidence of harm
• Doesn’t damage joints
• Works well with medicine you take
• Additional considerations:
  o Avoid strenuous exercises during acute flares
  o Progression in duration of activity should be emphasized over increased intensity
  o Adequate warm up and cool down can help minimise pain
  o Discomfort during or immediately after exercise can be expected and does not mean
    your joints are being further damaged
  o Encourage individual with Arthritis to exercise during the time of day when pain is
    typically least severe and in conjunction with peak activity of pain medication
  o Appropriate shoes and clothing

Directive messaging & ‘myth busters’

Important messages were grouped into themes:

• Start at low level and build up gradually (Reassurance - build your confidence - ‘Do your best’,
  Do the best you can)
• Enjoyment (Make it fun, it can be fun, do it with friends)
• Personalisation enable advice specific to patient (realistic/tailored ‘Something for
  everyone’/Start somewhere/Something is better than nothing)
• PA in context of your treatment – core component, as good as medicines
• Don’t worry if it hurts - hurt doesn’t mean harm
• Find something you like – Range of PA ideas, redefine what exercise is – PA not exercise, Find
  a (virtual)friend)
• Empowerment message: ‘take control’ ‘get back function’. Permission to get back to ‘normal’
  activity (‘Restart’ - but need to be careful it’s not too positive!)
Session 3

All groups worked on the following questions during the final session:

What types/categories of activity should be recommended?

- Walk
- Climb stairs
- Cycle
- Swim
- Nordic walking
- Yoga
- Pilates
- Tai chi
- Carry bags
- Bowls
- Golf
- Specific muscles e.g. quads
- SARAH exercise (hand exercise from physiotherapist and OTs)

What practical aspects of activity should be addressed for people with inflammatory disease?

- Anything and Everything: Examples:
  - Variety of types of activity (including day to day) (e.g. Shopping bag, gardening, stairs)
  - Individual or Group based
- Intensity message
  - Talk test, pulse rate, sweaty
- Time: Start with 5-minute bouts building up ten
• Local, enjoyable, affordable
• Joint specific advice (see patient education)

What recommendation should be made?

• Strong opinion emerged against using the 150-minute recommendation as this was felt to be a significant barrier when talking to patients
• Challenge 5 - ask patient to do an additional 5 minutes on top of what they currently do.
• Ask patients what they can agree to do (not using the word commit) that day to start the change.

What would be an appropriate title?

The most popular title was voted as “Physical Activity for People with inflammatory Rheumatic Disease”. Debate focussed around how specific the title should be and it was decided that a title that spoke specifically to the patient group would add weight and importance for clinicians and patients.

Further suggestions included:

• Get going
• Moment to move
• Rheum to improve/move
• Benefit of PA for people with rheumatic conditions
• Get off your R’s
• Jiggle your joints
• Get up and go

Conclusions from Workshop 1

The group were adamant that the full range of topics recorded above need to feature in the resource to make it valuable to clinical practise. A resource that cut out important information due to an arbitrary design consideration would significantly reduce usefulness and uptake amongst
clinical staff. The discussion was taken to the design team and Moving Medicine working group and a decision made to deliver an interactive website rather than a series of infographics.

Promoting patient centred decision making was emphasised as something that people find difficult when influencing physical activity behaviours. The group would value guidance on this in the resource as well and were not familiar with published behavioural change frameworks like the 5As (NICE, 2014a).

Following the workshop, the key themes and core content was built into the brief for workshop 2 with the aim of testing the ideas amongst another group of clinicians and moulding the shape of the resource.

Workshop 2

Building on workshop 1, workshop 2 was undertaken on 6th December 2017 with a multidisciplinary group of healthcare professionals specialising in musculoskeletal pain management. As with workshop 1 evidence summaries were presented to the group prior and at the start of the session. Participants were advised that the objective was to create a website to support physical activity consultations.

Session 1

What are the most important physical activity questions to address during a clinical consultation and what are patient and clinical priorities?

Between the groups a wide range of questions and priorities were identified. The group declined to prioritise questions emphasising that all components were equally important to be included in the resource. Groups concentrating on patient perspectives emphasised symptoms and the challenges of behaviour change whilst clinician perspectives also reported the importance of meeting expectations and restraints of practise. Responses included:

- Current activity and physical activity history
- Previous attempts
- Enjoyment
- FITT

- Life goals
  - Values based

- Current understanding
  - Benefits
  - Recommendations
  - Local resources
    - Pathway and follow up
  - What is physical activity?

- Behavioural change stage
- Personalise pathway options
- Risk/safety
- Motivators
  - Symptom based

- Barriers
- Relationships and support
- Clinician engagement and where to go
- Training and skills
- What can I do today?
- What would you like to be doing?
- Where would you like to be?
Session 2

Results from sticker identification and weighting were analysed the importance of different qualitative and quantitative evidence statements ranked. A key output for resource development was the allocation of evidence statements to the key domains identified in workshop 1. Committing group members to allocate statements to domains indicates how the contents should be distributed through the resource to make it most useful and intuitive for users in clinical practise. See table 2.

Table 2. Mapping evidence statements to proposed resource domains

<table>
<thead>
<tr>
<th>Theme: Severity of Pain</th>
<th>Why</th>
<th>Why physical activity?</th>
<th>What to do PA History</th>
<th>Risk and safety</th>
<th>Condition specific</th>
<th>Total score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total score</td>
<td>12</td>
<td>1</td>
<td>0</td>
<td>7</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>Theme: Frequency/Exacerbations of Pain</td>
<td>Why</td>
<td>Why physical activity?</td>
<td>What to do PA History</td>
<td>Risk and safety</td>
<td>Condition specific</td>
<td>Total score</td>
</tr>
<tr>
<td>Total score</td>
<td>6</td>
<td>1</td>
<td>1</td>
<td>5</td>
<td>4</td>
<td>3</td>
</tr>
<tr>
<td>Theme: Stiffness</td>
<td>Why</td>
<td>Why physical activity?</td>
<td>What to do PA History</td>
<td>Risk and safety</td>
<td>Condition specific</td>
<td>Total score</td>
</tr>
<tr>
<td>Total score</td>
<td>10</td>
<td>2</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>5</td>
</tr>
<tr>
<td>Theme: Fatigue</td>
<td>Why</td>
<td>Why physical activity?</td>
<td>What to do PA History</td>
<td>Risk and safety</td>
<td>Condition specific</td>
<td>Total score</td>
</tr>
<tr>
<td>Total score</td>
<td>10</td>
<td>2</td>
<td>1</td>
<td>2</td>
<td>2</td>
<td>6</td>
</tr>
<tr>
<td>Theme: Quality of Life</td>
<td>Why</td>
<td>Why physical activity?</td>
<td>What to do PA History</td>
<td>Risk and safety</td>
<td>Condition specific</td>
<td>Total score</td>
</tr>
<tr>
<td>Total score</td>
<td>15</td>
<td>2</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Theme: Self Efficacy</td>
<td>Why</td>
<td>Why physical activity?</td>
<td>What to do PA History</td>
<td>Risk and safety</td>
<td>Condition specific</td>
<td>Total score</td>
</tr>
<tr>
<td>Total score</td>
<td>6</td>
<td>4</td>
<td>0</td>
<td>2</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Theme: Wellbeing</td>
<td>Why</td>
<td>Why physical activity?</td>
<td>What to do PA History</td>
<td>Risk and safety</td>
<td>Condition specific</td>
<td>Total score</td>
</tr>
<tr>
<td>Total score</td>
<td>11</td>
<td>1</td>
<td>0</td>
<td>2</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>Theme: Fitness</td>
<td>Why</td>
<td>Why physical activity?</td>
<td>What to do PA History</td>
<td>Risk and safety</td>
<td>Condition specific</td>
<td>Total score</td>
</tr>
<tr>
<td>Total score</td>
<td>7</td>
<td>6</td>
<td>0</td>
<td>3</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>Theme: Mental Health</td>
<td>Why</td>
<td>Why physical activity?</td>
<td>What to do PA History</td>
<td>Risk and safety</td>
<td>Condition specific</td>
<td>Total score</td>
</tr>
<tr>
<td>Total score</td>
<td>9</td>
<td>3</td>
<td>0</td>
<td>2</td>
<td>0</td>
<td>5</td>
</tr>
<tr>
<td>Theme: Physical Function</td>
<td>Why</td>
<td>Why physical activity?</td>
<td>What to do PA History</td>
<td>Risk and safety</td>
<td>Condition specific</td>
<td>Total score</td>
</tr>
<tr>
<td>Total score</td>
<td>9</td>
<td>1</td>
<td>0</td>
<td>3</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>Theme: Absence of Adverse Events</td>
<td>Why</td>
<td>Why physical activity?</td>
<td>What to do PA History</td>
<td>Risk and safety</td>
<td>Condition specific</td>
<td>Total score</td>
</tr>
<tr>
<td>Total score</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>17</td>
<td>0</td>
</tr>
<tr>
<td>Theme: Work Absence</td>
<td>Why</td>
<td>Why physical activity?</td>
<td>What to do PA History</td>
<td>Risk and safety</td>
<td>Condition specific</td>
<td>Total score</td>
</tr>
<tr>
<td>Total score</td>
<td>8</td>
<td>0</td>
<td>0</td>
<td>2</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Improved Pain</td>
<td>Why</td>
<td>Why physical activity?</td>
<td>What to do PA History</td>
<td>Risk and safety</td>
<td>Condition specific</td>
<td>Total score</td>
</tr>
<tr>
<td>Total score</td>
<td>13</td>
<td>4</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>Variable</td>
<td>8</td>
<td>5</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>-------------------------------</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>Improved Wellbeing</td>
<td>8</td>
<td>8</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Improved Self Esteem</td>
<td>6</td>
<td>6</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Improved Fitness</td>
<td>10</td>
<td>5</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Improved Self Confidence</td>
<td>8</td>
<td>9</td>
<td>2</td>
<td>0</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>HCP Support</td>
<td>0</td>
<td>2</td>
<td>11</td>
<td>0</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Social Support</td>
<td>0</td>
<td>0</td>
<td>14</td>
<td>4</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Meeting Others</td>
<td>5</td>
<td>3</td>
<td>10</td>
<td>2</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Access to Facilities</td>
<td>0</td>
<td>0</td>
<td>22</td>
<td>2</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Appropriate PA</td>
<td>0</td>
<td>2</td>
<td>11</td>
<td>0</td>
<td>4</td>
<td>1</td>
</tr>
<tr>
<td>Education</td>
<td>0</td>
<td>1</td>
<td>15</td>
<td>1</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Personalised Programmes</td>
<td>10</td>
<td>4</td>
<td>7</td>
<td>2</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Positive Prior Experience</td>
<td>1</td>
<td>3</td>
<td>4</td>
<td>14</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Return to Previous Function</td>
<td>9</td>
<td>2</td>
<td>0</td>
<td>8</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>Symptom - Pain</td>
<td>4</td>
<td>0</td>
<td>0</td>
<td>7</td>
<td>6</td>
<td>3</td>
</tr>
<tr>
<td>Symptom - Fatigue</td>
<td>3</td>
<td>2</td>
<td>0</td>
<td>4</td>
<td>3</td>
<td>6</td>
</tr>
<tr>
<td>Symptom - Stress</td>
<td>4</td>
<td>5</td>
<td>2</td>
<td>4</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td>Fear of Exacerbating Symptoms</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>4</td>
<td>15</td>
<td>4</td>
</tr>
<tr>
<td>Low Self Efficacy</td>
<td>0</td>
<td>3</td>
<td>2</td>
<td>4</td>
<td>4</td>
<td>0</td>
</tr>
<tr>
<td>Inadequate Education About PA</td>
<td>0</td>
<td>0</td>
<td>7</td>
<td>1</td>
<td>12</td>
<td>2</td>
</tr>
<tr>
<td>Co-morbidities</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>4</td>
<td>10</td>
<td>5</td>
</tr>
<tr>
<td>Inadequate Resources</td>
<td>1</td>
<td>0</td>
<td>16</td>
<td>1</td>
<td>3</td>
<td>0</td>
</tr>
<tr>
<td>Lack of Time</td>
<td>0</td>
<td>0</td>
<td>11</td>
<td>6</td>
<td>5</td>
<td>0</td>
</tr>
</tbody>
</table>
Differences between patient and clinician perspectives were also analysed in the sticker feedback session by looking at difference in importance rating between groups. Domains with large differences (defined as a greater than 5-point difference in cumulative clinician vs patient scores) were self-efficacy, inadequate resources, lack of support/personalisation and cost. All these factors were weighted as more important by patients.

**Session 3**

*What specific messages would help you counsel patients on physical activity?*

Key messages that were deemed important to include by the group are listed below. They were keen for the resource to explore alternative information delivery strategies such as metaphor and clinical reports. Helping clinicians explain why and how physical activity can improve pain was felt as important and the group agreed that explaining this by cycles of conditioning/deconditioning would be a good way to do this as has been done by the British Lung Foundation to explain the relationship between breathlessness and physical activity in COPD (Spathis et al., 2017).

- **Personalisation**
  - Find enjoyable and low-cost activities
  - If the first doesn’t work, try another
  - What happens to people like me? (+ answers)
• Something is better than nothing
• Start small and build gradually
  o Possibly reflect/suggest percentage increases
• Pain does not have to mean bad
• Improved function and reduced pain and improved pain perception
• PA is a better treatment than any drug/injection
• Being active is medicine
  o Natural healing
  o Stimulate regeneration
• You might feel worse when you start
• Function improves before pain
  o Stronger before better
• Hard work
  o Not a quick fix
• Don’t stop because of bad days

Are there any safety considerations we need to include?

Clinicians felt comfortable recommending physical activity as safe for the vast majority of people and felt this should be made clear. However, they felt the wording around this needs to be very clear and qualified with advice on when it is not safe.

• Choose words carefully
  o Clear messaging against words like degeneration, damage, crumbling spine
  o Structural change language
• Symptoms can change even if...
• You won’t make your condition worse by being active
• PA is safe
Very few contra-indications
  - List these on the resource
Safe compared to other treatments
The risk from inactivity is greater

Workshop 2 Conclusions

Session one confirmed that the domains identified during workshop 1 were both appropriate and important to be included in the resource. The group went further than workshop 1 in recommending that core components should not be prioritised as they are all equally important in supporting clinical consultations.

The ability to prioritise information according to the individual patient and helping clinicians facilitate patient driven consultations were strong themes throughout the workshop.
## Supplementary file 3: Results from Delphi phase 1

<table>
<thead>
<tr>
<th>No.</th>
<th>Question</th>
<th>% agreement</th>
<th>Any disagreement?</th>
<th>Consensus criteria met?</th>
<th>Freetext feedback</th>
<th>Action taken</th>
</tr>
</thead>
</table>
| 1   | The information is laid out in a coherent manner that supports clinical consultation | 77          | yes               | no                     | ● Multiple browsers did not work.  
 ● Too much text                                                                   | ● Use graphics where possible                                                                                      |
| 2   | Using patient quotes is an engaging way to make the content clinically meaningful | 86          | yes               | no                     | ● Some clinicians find these strongly negative  
 ● Recognised as an important part of the patient journey                          | ● Display patient quotes in an expandable speech bubble                                                           |
| 3   | Navigation of the resource is straightforward                           | 79          | yes               | no                     | ● “high number of tabs some of which are more relevant than others - too many choices to gauge what is most useful without spending a lot of time on the site deciding what is most useful to me at this point in time”  
 ● Browser incompatibility a problem                                             | ● consider options to simplify layout  
 ● Is browser compatibility going to be such a problem for website?            |
| 4   | The theory and evidence page contains a satisfactory amount of educational information | 85          | no                | yes                    | ● Include NICE guidance on individual behaviour change  
 ● Style not person centred enough – telling not MI focussed  
 ● Signpost from this page  
 ● Too text heavy - infographicalise  
 ● Remove stages of change as per NICE individual behaviour change  
 ● Add a contact us section                                                     | ● Discuss options for contact us capability  
 ● Need to review content  
 ● How will we improve navigation of this section – menu links up and down page?  
 break into sections. Links need to go to particular areas                      |
| 5   | Presenting the options "no minutes consultation", "2-minute consultation" and "more minutes consultation" is a useful approach for the busy clinician | 94          | no                | yes                    | ● Overall popular  
 ● ‘add to complexity of navigating the site’  
 ● Could put no minutes on previous page  
 ● 30s may be better than 0 mins                                                | ● brainstorm options to modify this. Ideas include 2 rather than three options or bringing 0 minutes to front of resource  
 ● Decide if we still like 0 mins                                              |
<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>6</strong></td>
<td><strong>The menu page makes it clear what to expect from the resource</strong></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>7</strong></td>
<td><strong>The ‘no minutes consultation’ contains the most important messages for a healthcare professional to share in a very short space of time</strong></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>8</strong></td>
<td><strong>The ‘no minutes consultation’ page includes an appropriate amount of information</strong></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>9</strong></td>
<td><strong>The ‘two minutes consultation’ contains appropriate information</strong></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>10</strong></td>
<td><strong>Covering these objectives is achievable in a two-minute consultation</strong></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>11</strong></td>
<td><strong>The subheadings of the more minutes consultation (Ask, Share Benefits, explain how it works, Address concerns, plan, Next steps) clearly signpost the content of each page</strong></td>
</tr>
</tbody>
</table>

**Row 1:**
- **yes** for providing more clarity about what to expect from the resource from headings and navigation prompts.
- **no** for making sure it remains as least cluttered as possible.

**Row 2:**
- **yes** for reviewing the message stating what the project aim is rather than the info about Faculty/sport England involvement which Drs won’t be as interested in.
- **no** for “I would have the ‘no minutes’, ‘two minutes’, ‘more minutes’ as subheadings with one heading to encompass all as initially it is unclear what is meant by these. For example, main heading could be ‘Consultation Reviews’ or something along those lines and then underneath the 3 subheadings.”

**Row 3:**
- **yes** for reviewing mcmillan phrases for alternatives.
- **no** for this does not take no minutes.

**Row 4:**
- **yes** for reviewing wording.
- **no** for reconsidering wording.

**Row 5:**
- **yes** for suggesting removing PA assessment as this is not achievable.
- **no** for everyone needs to move more.

**Row 6:**
- **yes** for suggesting removing PA assessment as this is not achievable.
- **no** for drop down dead not ideal.

**Row 7:**
- **yes** for reviewing wording.
- **no** for reconsidering wording.

**Row 8:**
- **yes** for reviewing wording.
- **no** for considering moving to homepage.

**Row 9:**
- **yes** for reviewing VBI literature - HR.

**Row 10:**
- **yes** for reviewing PA calculator.
- **no** for removing PA calculator.

**Row 11:**
- **yes** for reviewing where social support messages can be improved.
| 12 | The four questions provide useful prompts for eliciting a patient-focused physical activity history | 91 | no | yes | • Well supported  
• Patient activation measure could be important here  
• Strength and balance are very important for some conditions  
• Maybe could offer some support how clinicians could respond if they get a negative response to the first question? E.g. some patients are going to never have been very active, and/or their illness perceptions are going to colour their memory of this. Sometimes patients do hold a very strong ‘I’m not a physically active person’ identity which can be a barrier and off putting to clinicians not used to this. | • edit intro question & improve wording  
• consider how we can include strength and balance – is this condition specific? |
| 13 | The ‘physical activity vital sign’ is a useful screening tool for a brief intervention in physical activity | 83 | yes | no | • Is screening question a barrier? Conversation opener? What’s the purpose? How will it be recorded?  
• ?print out  
• Do people understand graphs? | • Update on latest plans for calculator build |
| 14 | It is useful to present symptom reduction as primary benefits and prevention of further morbidity as secondary benefits | 87 | no | yes | • Get back control if previously active, but message doesn’t work if previously inactive.  
• Add headline of MI prompt to frame language  
• Risk of frightening people into inactivity  
• Anything that can be personalised is useful  
• “Yes but does this need to be more MI orientated? Would have a slight concern clinicians will get into a ‘yes but’ tennis match with their patients, trying to convince them of all the benefits but actually resulting in greater resistance. Needs to be very patient led and at the very least framed as ‘other patients have told us xxx i’m wondering if those are the sort of benefits you would be hoping for?’ type dialogue”  
• Important to include prevention | • Reformat section with additional wording to present options for solutions  
• Display relative risks for disease prevention? as per improvement academy |
| 15 | It is necessary to display individual references at the bottom of the benefits page in addition to a clear link through to an explanation of the evidence with references on the ‘evidence and theory’ page | 82 | yes | no | • Will people be updated with new research  
• Could be a dropdown link  
• Offputting in the consultation section  
• Makes page too busy  
• Yes definitely | • review method of presenting references? just show in evidence and theory or have expandable box |
| 16 | The positive/negative cycle of activity graphics will help healthcare professionals explain to their patients how physical activity will benefit their symptoms | 91 | no | yes | • Yes good  
• Can we use ask section to explore what might be stopping them from engaging in activity?  
• Visual imagery is taken up 6x as often as text-the more of this the better-think of air safety cards etc-signpost the critical moves  
• Include mood  
• Drop downs confusing  
• Thumbs up/down not clear to all | • discuss linking to other sections eg Ask, review dropdown menu as method for displaying symptoms |
| 17 | This information is presented in a clinically meaningful way | 79 | yes | no | • Needs to be presented in person centred way using MI style  
• Needs design and graphics to improve engagement  
• Maybe have more flex in the order of the questions  
• ? put before explain how it works to focus on listening  
• I don’t think we know enough about how to translate PA in a clinically meaningful way to answer this question  
• The content is ok- but straight text doesn’t work on websites. suggest avoid straight text- perhaps speech bubbles  
• Again, slightly concerned might get in to a back and forth tennis match with patient about this. I think sometimes framing this as being curious and experimenting with PA and seeing if it makes a differences/has negative consequences. Would also suggest that important for clinician and patient to make a clear plan about how the patient can get practical and psychological support for increased activity. All of this needs to be clearly linked back to goal setting and self monitoring | • review language & MI framing  
• how can we improve presentation?  
• How can we address visibility of questions?  
• Include links to goal setting, self-monitoring and pacing |
| 18 | Key safety messages, such as addressing cardiac risk, are adequately addressed and explained | 86 | no | yes | • It’s a good stat- maybe have a traffic light with a green light next to it or something like that | • improve graphic for CV risk |
| 19 | This is a logical sequence of questions to support individualised physical activity prescription | 82 | yes | no | • Review lets get moving pack.  
• Need to be able to manage those who aren’t ready to change  
• At the moment it’s a telling style “if you were to become more active, what would life look like to you, what would the benefits to you of becoming more active, what are the benefits of not changing; how motivated are you to make a | • Rethink presentation of info to address questions, actions, goal-setting, setbacks  
• HR to review literature and discuss further with experts |
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th>change, how confident are you that you can make that change ... all before setting goals • Include dance • Address setbacks/hurdles and action planning • Tie in to social support/connections • More on self monitoring/ rewards • &quot;Play&quot; might seem childish to some. Not sure? Is &quot;leisure-time&quot; too American?</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>20</td>
<td>&quot;Building activity into all aspects of daily life&quot; is an appropriate premise upon which to base physical activity prescription</td>
<td>95</td>
<td>no</td>
<td>yes</td>
</tr>
<tr>
<td>21</td>
<td>&quot;General Practice, the local social prescribing network, and county sports partnerships&quot; are important organisations to signpost for further support</td>
<td>83</td>
<td>yes</td>
<td>no</td>
</tr>
<tr>
<td>22</td>
<td>Do you have any suggestions for other national physical activity providers or resources we should signpost?</td>
<td>Freetext response</td>
<td>All health charity patient resources about physical activity • macmillan.org.uk/movemore • Social care web offers locally • 23.5 hrs video • CMO infographics • National organisations that promote walking- examples rammers, paths for all • UK Cycling • BBC Get Inspired campaign online • BBC Get Inspired Activity Finder</td>
<td>HR review these resources Discuss how we can present these options. This page seems to be splitting into Charities supporting people being active with your disease, and finding local options</td>
</tr>
<tr>
<td>23</td>
<td>Please arrange the following by the importance of including them in a patient information leaflet - DRAG</td>
<td>Freetext response</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&amp; DROP each component to your preferred position</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>------------------------------------------------</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>24</th>
<th>Do you have any recommendations/comments for the patient information section?</th>
</tr>
</thead>
</table>
| Freetext response | • Make person centred, use existing resources  
• Make it infographic pictorial style information  
• Provide some concrete actions that can help eg 'take the stairs, sit less, walk more' |
|                | • Discuss patient facing infographic development plan  
• Agree on components and format for this |

<table>
<thead>
<tr>
<th>25</th>
<th>The general 'look and feel' of the designed pages make the resource:</th>
</tr>
</thead>
<tbody>
<tr>
<td>a) credible</td>
<td>81 yes no</td>
</tr>
</tbody>
</table>
|• Not yet way to go  
• NHS logo would help  
• Excellent visuals  
• Very attractive  
• Looks like an advert for the partner orgs, I’d make the logos smaller and on one line if poss. Also they don’t need to be on every page |
|• Discuss representation of logos and partner organisations? only show some at front  
• Discuss image bank and how we can display variety  
• Revisit NHS central branding |

<table>
<thead>
<tr>
<th>26</th>
<th>The design helps discriminate between different types of information, for example core content and patient quotes</th>
</tr>
</thead>
</table>
|• I found the page a bit muddled, I found the patients quotes and facts easy to skip over and not notice as the page was already so colourful and busy  
• Patient quotes lost a bit |
|• Signpost to patient quotes? popout speech bubbles |

| b) distinctive | 82 yes no |
|• Not yet – way to go  
• Needs more colour |

| c) inclusive | 79 yes no |
|• Recommend images of very frail older adults, BME groups  
• Sorry can’t see what you’re referring to  
• Found it easy to use and liked it very much  
• The models are all a similar body size (slim) and looks a tiny bit couple or family skewed |

| d) energetic | 82 yes no |
|• But at a realistic level  
• Not yet – way to go  
• More colour  
• Might be a little bit daunting... |

<table>
<thead>
<tr>
<th>27</th>
<th>The design helps prioritise information</th>
<th>87</th>
<th>yes</th>
<th>no</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>• Generally agree</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• When it goes live will it be on different pages? found scrolling down a bit confusing, i wasn't sure if i was missing anything</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• But I'm not fully convinced of the order to maximise engagement. Listening first/more.. is what the evidence is saying.. then give the info.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Supplementary file 4. Results from Delphi phase 2

<table>
<thead>
<tr>
<th>No.</th>
<th>Question</th>
<th>% agreement</th>
<th>Level of agreement</th>
<th>Feedback theme</th>
<th>Action taken</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>The information is laid out in a coherent manner that supports clinical consultation</td>
<td>83</td>
<td>High agreement</td>
<td>Compatibility with multiple browsers</td>
<td>N/A</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Much more user-friendly</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Home return button on each page</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Lots of clicks to navigate</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Lots of scrolling</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Using patient quotes is an engaging way to make the content clinically meaningful</td>
<td>85</td>
<td>High agreement</td>
<td>Helps as a prompt</td>
<td>N/A</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Use “physical activity” instead of “exercise”</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Navigation of the resource is straightforward</td>
<td>77</td>
<td>Moderate agreement</td>
<td>Need to be able to return to the home page, or get back to the previous page</td>
<td>• ‘Back’ button</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Lots of clicks to navigate</td>
<td>• Reference to current disease area to be ever-present and work as a resource</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Add a back button</td>
<td>• ‘home’ button</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>• Upper level navigation to be added with drop down menus</td>
<td>• ‘How to use this resource’ added</td>
</tr>
<tr>
<td>4</td>
<td>The information pop-ups contain a satisfactory amount of educational information</td>
<td>82</td>
<td>High agreement</td>
<td>A lot to digest if new to physical activity as a healthcare professional</td>
<td>N/A</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Very helpful, makes pages a lot less overwhelming</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>The menu page makes it clear what to expect from the resource</td>
<td>77</td>
<td>Moderate agreement</td>
<td>Lots of scrolling on the page</td>
<td>• Landing page of each disease resource changed with more direct instructions</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Covers everything, comprehensive</td>
<td>• To capitalise on navigation revisions, supporting elements added to the</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>website including materials, campaign</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>resources and other components such as an ‘about us’ page.</td>
</tr>
<tr>
<td>6</td>
<td>The 'no minutes consultation' page includes an appropriate amount of information</td>
<td>75</td>
<td>Moderate agreement</td>
<td>Still a lot to cover in “0” minutes</td>
<td>• “0 minutes” changed to “1-minute conversation”</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>“1 minute” seems a lot more reasonable</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Covering these objectives is achievable in a two-minute consultation</td>
<td>77</td>
<td>Moderate agreement</td>
<td>Covering in 2 minutes might not be achievable</td>
<td>• “2 minutes” changed “5-minute conversation”</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>In 2 minutes would be superficial conversations</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>The subheadings of the more minutes consultation (Ask, Explore Benefits, Explore Concerns, Build Readiness, agree a Plan, Arrange Support) clearly signpost the content of each page</td>
<td>87</td>
<td>High agreement</td>
<td>Difficulty navigating back to the home page A lot of information, but this is helpful to tailor to the individual A good flow of information</td>
<td>See point 3</td>
</tr>
<tr>
<td>9</td>
<td>The 'physical activity calculator' is a useful screening tool for a brief intervention in physical activity</td>
<td>78</td>
<td>Moderate agreement</td>
<td>Not easy to input information for every patient’s needs Great visual</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>The summary evidence statements and referencing are useful and appropriate</td>
<td>83</td>
<td>High agreement</td>
<td>Some icons not appropriate</td>
<td>Changed icons for certain text boxes</td>
</tr>
<tr>
<td>11</td>
<td>This information in 'explore concerns' is presented in a clinically meaningful way</td>
<td>85</td>
<td>High agreement</td>
<td>Very good section</td>
<td>N/A</td>
</tr>
<tr>
<td>12</td>
<td>This is a logical sequence to support individualised physical activity prescription</td>
<td>87</td>
<td>High agreement</td>
<td>Appropriateness of terminology e.g. “play” - would leisure time be better?</td>
<td>N/A</td>
</tr>
<tr>
<td>13</td>
<td>Key organisations are appropriately signposted to help arrange further support</td>
<td>77</td>
<td>Moderate agreement</td>
<td>Good to have locally based referral schemes Hyperlinks instead of URLs</td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>Do you have any further recommendations/comments for the patient information section?</td>
<td>Freetext response</td>
<td>Different colours for different diseases</td>
<td>Patient action planning, goal setting and stepping workbooks added to information for patients</td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>The general ‘look and feel’ of the designed pages make the resource:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>a) credible</td>
<td>83</td>
<td>High agreement</td>
<td>Some icons not appropriate More quotes</td>
<td>Change certain icons to be more appropriate</td>
</tr>
<tr>
<td></td>
<td>b) distinctive</td>
<td>81</td>
<td>High agreement</td>
<td>-</td>
<td>N/A</td>
</tr>
<tr>
<td></td>
<td>c) inclusive</td>
<td>59</td>
<td>Low agreement</td>
<td>Some uncertainty who the website was targeted for by the images</td>
<td>Change stock images to match diseases/purpose of website more appropriately</td>
</tr>
<tr>
<td></td>
<td>d) energetic</td>
<td>81</td>
<td>High agreement</td>
<td>Really like the graphics and pictures</td>
<td>N/A</td>
</tr>
<tr>
<td>16</td>
<td>The design helps discriminate between different types of information, for example core content and patient quotes</td>
<td>82</td>
<td>High agreement</td>
<td>-</td>
<td>Increase colour variety added to resources and greater contrast to patient information leaflets</td>
</tr>
<tr>
<td>17</td>
<td>The design helps prioritise information</td>
<td>82</td>
<td>High agreement</td>
<td>Navigation still a bit complicated</td>
<td>See point 3</td>
</tr>
</tbody>
</table>
As with phase 1, free text feedback was very influential in refining the tool. It also helped to illustrate why some domains had scored moderate or low agreement.

Fundamental changes, including resolution of cases low to moderate agreement, following phase 2 were as follows:

- Rethink of navigation of the site to include:
  - ‘Back’ button
  - Reference to current disease area to be ever-present and work as a resource ‘home’ button
  - Upper level navigation to be added with drop down menus
- To capitalise on navigation revisions, supporting elements added to the website including materials, campaign resources and other components such as an ‘about us’ page.
- Conversation components re-written to improve the flow between the ‘envelope’ of the conversation common content and the ‘stuffing’ of the page details
- Landing page of each disease resource changed with more direct instructions
- ‘How to use this resource’ added
- “0 minutes” changed to “1-minute conversation”
- “2 minutes” changed “5-minute conversation”
- Increase colour variety added to resources and greater contrast to patient information leaflets
- Patient action planning, goal setting and stepping workbooks added to information for patients
- Site review and standardisation by external scientific editor