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Priority setting partnership to identify the top ten research priorities for the management of Parkinson's disease

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Abstract

Objectives: This priority setting partnership was commissioned by Parkinson's UK to encourage people with direct and personal experience of the condition to work together to identify and prioritise the top 10 evidential uncertainties that impact on everyday clinical practice for the management of Parkinson's disease (PD).

Setting: The United Kingdom (UK).

Participants: Anyone with experience of PD including: people with Parkinson's (PwP), carers, family and friends, health and social care professionals. Non-clinical researchers and employees of pharmaceutical or medical devices companies were excluded. 1000 participants (60% PwP) provided ideas on research uncertainties, 475 (72% PwP) initially prioritised them and 27 (37% PwP) stakeholders agreed a final top 10.

Methods: Using a modified nominal group technique, participants were surveyed to identify what issues for the management of PD needed research. Unique research questions unanswered by current evidence were identified and participants were asked to identify their top ten research priorities from this list. The top 26 uncertainties were presented to a consensus meeting with key stakeholders to agree the top 10 research priorities.

Results: 1000 participants provided 4100 responses, which contained 94 unique unanswered research questions that were initially prioritised by 475 participants. A consensus meeting with 27 stakeholders agreed the top 10 research priorities. The overarching research aspiration was an effective cure for PD. The top 10 research priorities for PD management included the need to address motor symptoms (balance and falls, and fine motor control), non-motor symptoms (sleep and urinary dysfunction), mental health issues (stress and anxiety, dementia, and mild cognitive impairments), side effects of medications (dyskinesia) and the need to develop interventions specific to the phenotypes of PD and better monitoring methods.

Conclusions: These research priorities identify crucial gaps in the existing evidence to address everyday practicalities in the management of the complexities of PD.

Strengths and limitations of this study

- In this Priority Setting Partnership 1000 people with Parkinson's, their carers and health and social care professionals were asked to identify everyday issues which currently lack firm evidence to direct their management.
- 475 participants prioritised these uncertainties, and 27 key stakeholders agreed the top 10 research priorities for the management of Parkinson's disease during a final consensus meeting.
- Very few participants were from minority ethnic populations or living in care homes which could limit the generalisability of these priorities to these populations.
- The top 10 research priorities for Parkinson's disease management included the need to address motor symptoms, non-motor symptoms, mental health issues, side effects of medications and the need to develop interventions specific to the phenotypes of Parkinson's disease and better monitoring methods.
- It is hoped that this top 10 will lead to future research that will address issues of importance for the clinical management of Parkinson's disease.

Introduction

Ensuring that research is effective in addressing the needs of patients and the clinicians treating them is critically important. The research agenda has been accused of being overly influenced by the pharmaceutical and medical devices industries,[1-3] and of not addressing the questions about treatments that are of greatest importance to patients, their carers and clinicians.[4-6] Research needs to focus on whether treatments are doing more harm than good, or whether one treatment is better than another, and ensure the outcomes reflect issues that have impact on the patient's wellbeing and participation.[7-9]

Treatment uncertainties are defined as questions about the effectiveness of treatments which are not adequately answered by systematic reviews of existing research evidence.[10] The James Lind Alliance[11] (JLA) was established to encourage collaboration between patients and clinicians to ensure that uncertainties that impact on everyday clinical practice are addressed in research. One of JLA's approaches is Priority Setting Partnerships[12] which aim to identify the top 10 research priorities in a given area from the perspectives of patients, carers, and healthcare professionals. These research priorities can then inform research funding policies.[13]

A number of research funders have indicated that they wish to incorporate the findings of priority setting partnerships into their prioritisation processes.[13] Parkinson's UK[14] identified four priority research areas with the specific aim to find a cure for Parkinson's disease (PD). This project expands this initial work and identifies the top ten research priorities for the management of PD.

Methods

The project was led by Parkinson's UK, with the University of East Anglia and the University of Birmingham acting as academic partners. The James Lind Alliance (JLA) provided an independent chair, advised on the methodology, and facilitated the process. The project was instigated by Parkinson's UK's Research Support Network[15] who tasked the steering group to oversee the project.

Ethics and Data Protection

We took advice from the National Research Ethics Service[16] who advised that priority setting partnerships are service evaluations and therefore did not need approval from an NHS ethics committee. We did get approval for the project from the University of East Anglia's ethics committee. The reasoning was that we were asking about research preferences and research is a "standard" part of NHS treatment protocols.[17] Therefore the project recruited participants via multiple routes including direct from the NHS. It was assumed that any participants able to complete the survey had sufficient mental competence to take part in the project. Our safeguarding expert (BP) provided advice on any responses that raised concerns.

Participants could answer the initial survey anonymously. Participants who provided their contact details were re-contacted for the prioritisation survey. Respondents' personal details were kept by Parkinson's UK in line with the Data Protection Act, and the UEA team were provided with an anonymised database of responses.

The Priority Setting Partnership Stages:

Initiation

The first stage involved the identification of potential partner organisations which provided access to a wide range of participants. Anyone living in the UK with experience and understanding of living with PD was eligible to participate in the identification of uncertainties and their prioritisation. This included: people with Parkinson's (PwP); carers and former carers; family members and friends; health and social care professionals who work, or have worked, with people living with the condition. Non-clinical researchers and employees of pharmaceutical or medical devices companies were excluded from the survey.

Consultation

The steering group had a broad spectrum of representatives and they identified the scope of the Priority Setting Partnership. All aspects of the management of PD such as health care, surgery, rehabilitation, medication, complementary therapies, nutrition, carer support, service provision and design were included. Excluded issues were curative therapies, prevention, diagnostic tests, aetiology, epidemiology, and prognosis. It was agreed that the overarching research aspiration was an effective cure for PD, and that the specifics of how this could be addressed had been identified previously by Parkinson's UK.[14]

A simple survey was created that asked about four areas where respondents would like to see issues answered by research: The symptoms of PD; Day-to-day life with PD; The treatment of PD; Anything else.

The exact phrasing of the survey was refined after a pilot survey involving 57 PwP and 20 carers, in order to ensure clarity of meaning and encourage the generation of relevant responses.

Participants were invited to complete the survey on the Parkinson's UK website or by post. Parkinson's UK advertised the study in their membership magazine which goes out to more than 35,000 people affected by Parkinson's, on their website and targeted relevant groups at meetings and conferences including: 13 Parkinson's UK regional events, PD Nurse Specialists Association conference 2013, British Movement Disorders Group (BritMODIS) Conference 2014, National Parkinson's UK Research Supporters Conference 2013, Oxford Parkinson's Disease Centre Open Day 2013, South West Research Supporters day (Bristol), North West information day (St Helens). Parkinson's UK also advertised the project directly to centres of clinical excellence throughout the country, the Tracking Parkinson's centres[18] and the Oxford Parkinson's Disease Centre.

We contacted relevant charities such as Cure Parkinson's UK, the Alzheimer's Society and the Alzheimer's Research Trust who promoted participation of their members via flyers, magazine articles and social media. We contacted professional groups with an interest in Parkinson's disease such as The British Geriatrics Society, The Specialist Section for Neurological Practice at the College of Occupational Therapists, PD Specialist Interest Group of the Royal College of Speech and Language Therapists and the Parkinson's Nurse Specialists Association. We contacted the National Institute for Health Research's Dementias and Neurodegeneration (DeNDRoN)[19] Specialty Clinical Research Network and the

Enabling Research In Care Homes group (ENRICH)[20] in order to ask them to encourage participation in the survey by neurological clinicians and the care home sector and residents. We used Parkinson's UK's database of people from black and minority ethnic populations who have an interest in PD to enhance our outreach to these communities. When sending out the survey we noted that we could take responses over the phone and provide a translation service if needed. Representatives from Parkinson's UK visited a couple of movement disorder clinics to promote the survey.

Collation

The "raw" treatment uncertainties were entered onto the database verbatim.

Statements not associated with management uncertainties were coded as being 'out of remit'. In order to maximise the value of respondents' comments we also coded "treatment dissatisfactions" where we were provided with stories regarding poor treatment provision. These were shared with Parkinson's UK's Policy and Service Improvement and Professional Engagement and Education departments in order for them have anonymised anecdotes to demonstrate the impact of poor care on PwP.

The Cochrane Library, MEDLINE, EMBASE, CINAHL, PsychInfo were searched from inception to January 2014 for systematic reviews of interventions for the management of Parkinson's. The major systematic review's certainties were agreed by the core team (KD, CC, CS, DD, RP, HF) before the submissions were received. However all submissions were checked subsequently against the evidence base to determine if there were any further certainties in unanticipated areas. Submissions which related to management certainties were labelled as "evidence found" and forwarded to Parkinson's UK as this was deemed to identify a lack of knowledge of effective treatments, and so demonstrating a need for education.

In order to standardise the format each uncertainty was transformed into population, intervention, comparator, and outcome (PICO) format. Frequently we derived more than one PICO question from a single submission. The PICO questions were expressed as individual research questions, which were then assembled and duplicates combined. The frequency of duplicated uncertainties was recorded. The resulting PICO questions were checked again against the evidence base by KD, CC and CS.

Prioritisation

The steering group met to examine the uncertainties identified. Uncertainties were checked for specificity in order that they could be adequately investigated and were phrased in a manner understandable to participants. Uncertainties with less than three duplicate submissions were considered for exclusion.

The final set of uncertainties were then sent to participants who had provided their contact details and to the members of the Research Support Network.[15] It was also advertised in an article in the Parkinson's UK membership magazine and promoted through social media. Participants were asked to read the list of uncertainties and identify their own top 10 priorities. The rankings were summated and shortlists created. These included the top 26 priorities for each set of participants (PwP, carers, family and friends, and professionals). These four sets of prioritisations were then summated to identify the top 26 for all participants.

The final consensus meeting to agree the top 10 research priorities had participants from a range of populations impacted by PD and used consensus-reaching decision making methods. Prior to the meeting participants were asked to prioritise the top 26 uncertainties which were presented in random order and labelled A-Z.

At the final workshop, ground rules were agreed about confidentiality and respecting alternative viewpoints. The processes' intent was to identify a set of prioritised recommendations whilst preventing the domination of the discussions by a single person and encouraging quieter group members to participate. Expectations were managed by highlighting that consensus meant that people were unlikely to leave the meeting with all of their views being represented in the top 10, and that compromise would be necessary.

Participants were divided into three groups with mixed representation and led by an independent chairperson from JLA and two facilitators from Parkinson's UK. Participants were asked to prioritise all 26 uncertainties which were printed onto A4 cards. Where there was disagreement about the level of priority, each card had the interim prioritisation for each group (PwP, carers, family and friends, and professionals) written on the back, and this information assisted decisions about rankings. The three sets of rankings were combined. Participants were then divided into three different groups again with mixed representation. In the second round they were presented with the joint prioritisation from round one and focussed mainly on identifying whether the correct uncertainties were in the top 10, and had the right prioritisation. The three group's prioritisations were combined and the final top 15 presented in a final round to the entire group. The final group were reminded that all of the uncertainties presented had insufficient evidence at present to inform clinical practice. In the final round participants reached consensus on which items should be in the top 10.

Databases

The complete list of all of the uncertainties identified were prepared and formatted for inclusion in the UK Database of Uncertainties about the Effects of Treatments (UK DUETs).[10] This will allow researchers to examine the all of the research uncertainties identified in this project.

A searchable database of the anonymised responses of the participants regarding their concerns about the management of PD will be made available to researchers via Parkinson's UK. This will allow researchers to include quotes that highlight the impact of a particular issue on PwP in their grant applications and research.

Results

Steering Group

The project's steering group consisted of representatives from Parkinson's UK (n=8), and the Cure Parkinson's Trust (n=1), PwP (n=2), carers (n=2), clinical consultants (n=2), and a PD nurse specialist (n=1). Those from Parkinson's UK included representatives with expertise in research development, policy and campaigns (n=5), information and support worker services (n=1), advisory services (n=1) and resources and diversity (n=1).

Consultation

One thousand participants generated 4100 responses which contained 2632 research uncertainties, of which 112 were unique. Around 40% of responses were returned by post (n=397), the remainder were submitted online.

Insert Figure 1 around here

The 600 respondents with PD mostly lived at home either with support from carers or family (51%), or independently (41%), 1% lived in nursing or residential accommodation (the remainder were in other accommodation or did not respond). Professionals (n=140) consisted of consultants (24%), PD nurse specialists (19%), nurses and care assistants (9%), allied health professionals (31%), social workers (1%) and others (16%). Thirty-one respondents classified themselves as “other” and 7 respondents did not provide information on their role.

Insert Table 1 around here

Research Certainties

The academic team agreed a-priori that monotherapy with levodopa, dopamine agonists, COMT-inhibitors, MAOB-inhibitors and anticholinergics all have evidence of efficacy with motor symptoms, at the expense of side effects.[21-25] The evidence is mostly from short term studies so longer term efficacy and adverse effects are uncertain. There is no good evidence regarding the optimal time for treatment initiation or dosage increase. A recent very large randomised controlled trial did show very small but persistent benefits for patient-rated mobility scores when treatment is initiated with levodopa compared with levodopa-sparing therapy.[26]
For the treatment of motor complications with adjuvant therapies, the evidence supports that levodopa plus dopamine agonists, or COMT-inhibitors or MAOB-inhibitors all reduce patients’ off-time, reduce the required L-dopa dose, and improve motor and activities of daily living scores in PwP with motor complications on L-dopa.[27] Again, the evidence is mostly from short term studies so longer term efficacy

and adverse effects are uncertain. Which adjuvant drug is best is mostly uncertain, although the MAOB-inhibitor tolcapone overall has greater efficacy than entacapone but is associated with a worse adverse event profile. For the small subset of PwP able to tolerate deep brain stimulation (DBS) (estimated at 1-10%),[28] DBS to the subthalmic nucleus improves self-reported quality of life and reduces motor complications of PD up to two years when compared to best treatment with medications but at a higher risk of severe adverse events.[29] Physiotherapy has short term benefits in PD (up to three months), but there is no evidence regarding the best sort of physiotherapy.[30] Unfortunately there is insufficient research evidence for any "certainties" in speech therapy[31,32] and occupational therapy[33] for PD.

As a result of checking the uncertainties against current evidence we identified evidence to refute a number of submissions such as ethnicity affecting the response to medications,[22,27] and immunosuppression being a side-effect of rasagaline.[34]

As can be seen there are relatively few evidential certainties to inform the day-to-day management of Parkinson's disease.

Prioritisation

Eighteen uncertainties were excluded from the prioritisation by the steering group (although they were still entered onto the UK DUETS database) as they were deemed to be unlikely to be important enough to reach the top 10 priorities.

The 94 uncertainties were then sent to the 409 participants that had provided their contact details, 302 members of the Research Support Network, and respondents to the magazine article and social media. The 94 uncertainties were prioritised by 475 participants consisting of 342 PwP; 57 carers; 34 friends and family; and 42 health and social care professionals.

Insert Table 2 around here

The final prioritisation workshop to agree the top 10 research priorities had 27 participants including 10 PwP, 5 carers and family, 5 consultants, 4 PD nurse specialists and 3 allied health professionals. One word change was allowed on the fourth uncertainty; where it was changed from treatments being "tailored" to "developed" to suit phenotypes of PD. This was agreed with KD who had read all of the original responses that had generated this uncertainty and felt that this change of wording was still representative of the original respondents' intent. Although proposals were made to combine uncertainties, these were resisted as it was felt that this would have made the scope of the research questions too broad.

Discussion

This study has identified the paucity of evidence currently available to address the everyday practicalities of managing a complex disease such as PD. The top 10 research priorities included the need to address motor symptoms (balance and falls, and fine motor control), non-motor symptoms (sleep and urinary dysfunction), mental health issues (stress and anxiety, dementia, and mild cognitive impairments), side effects of medications (dyskinesia) and the need to develop interventions specific to the phenotypes of PD and better monitoring methods. These results will help funders identify future priorities for research that have greatest relevance to patients and the clinicians that treat them.

The fact that research around balance and falls was the top priority underscores the frequency of falls in PwP and the impact falls and fear of falling can have on more global issues such as function, quality of life and care home admission.[35] Exercise can improve balance, but reducing falls is more challenging.[36,37] Although medications can improve overall motor performance which may reduce risk factors for falls, balance and falls are rarely measured or reported specifically in medication trials.[22,27] Additionally there may be problems accessing appropriately trained physiotherapists[38,39] and poor medication adherence[40,41] may impact on effectiveness. Therefore there is a great need for research for effective interventions to improve balance and reduce falls in PwP.

Specificity of research questions

One criticism of Priority Setting Partnerships is that they generate research questions that are too broad and vague to inform researchable questions and funder priorities.[13] We ensured the uncertainties in this study were as specific as possible, and did not allow similar uncertainties to be merged. Each uncertainty was informed by a number of initial statements, and each one was phrased so as to represent their overall intent. Therefore the use of the term “treatments” was intended to cover a wide range of specific interventions such as pharmacological, behavioural and rehabilitation interventions.

Sometimes the lack of specificity of the question highlights the general lack of evidence around the issue. For example, the 9th uncertainty, “improving dexterity”, might be addressed by current medications but this is rarely recorded as an outcome in clinical trials.[22,27] Occupational therapy interventions might be helpful for specific issues e.g. adapted computer mice, but there is very limited research in this area.[33,42] We are even unsure of the impact of poor fine motor control and what assessments would best measure not only the amelioration of the impairment but improvements in activities and participation.

Links with other research priority projects

A Dutch study[43] recently tried to identify patient-relevant research topics by interviews and focus groups with 57 people with Parkinson’s (PwP), carers and researchers. These were then prioritised by 1360 PwP. The topics covered all areas of Parkinson’s disease (PD) research including cure, diagnosis, psychological aspects, relationships and healthcare. The research topics identified were broad and their prioritisation unclear. Overall they reported that research into effective strategies for living and coping with the disease were the priority of PwP.

Many of the top 10 priorities identified in this project could be said to address the need for effective strategies for living and coping with PD.[43] Priority Setting Partnerships have been previously conducted for dementia and urinary incontinence.[44,45] Although some of the priorities from these projects might have relevance to PwP they did not prioritise Parkinson’s-specific aspects of these conditions. This is almost certainly because the population of PwP with these problems is relatively small compared to the overall populations with these issues.

Risk management

This project raised a number of risk management challenges which should be considered in the design of future Priority Setting Partnerships.

We were only able to follow up safeguarding issues where participants had provided their contact details. One response raised concerns about suicidality, and as we did not have the contact details for this participant, we had no way to contact the participant to ensure they had appropriate support. Future Priority Setting Partnerships should consider making the provision of contact details mandatory for participants so that issues like this can be followed up and support offered.

A number of other responses raised concerns about potential abuse (of both PwP and their carers), lack of appropriate service provision, and families failing to cope. We consulted with safeguarding experts who advised that safeguarding referrals were not appropriate or necessary but we responded to these participants and ensured they were aware of the support provided by Parkinson's UK. It would be best practice in future to let participants know in advance that if their responses cause concern for the research team there is likely to be some form of follow-up.

In response to the first survey, a couple of patients admitted to taking "medication holidays" or erratically (e.g. every other day) and it was clear that these patients were unaware of the risks associated with this.[46] As a result of this finding, Parkinson's UK are improving their information leaflets on this issue.

Finally potential mental health needs of the research team transforming the responses into PICO questions and possible needs for support should be considered. Some of the responses describe distressing situations and team members need to feel they can discuss issues that concern them, and take breaks when needed in order to manage this stress and to obtain appropriate levels of support.

Study Limitations

Although great efforts were made to include participants from black and minority ethnic and care home populations we were not very successful at recruiting these populations. It is also unlikely that those with literacy issues would participate in a project like this. Most respondents with PD were likely to be members of charities whose membership tends to be white, middle class and to have higher levels of education. Therefore the study results are more likely to be relevant to white PwP who live in their own homes either independently or with some assistance. This means that priorities of relevance to people with more severe disease (either palliative stage PD or with significant co-morbidities) or to ethnic minorities may not have been identified, or if identified not given the priority that these populations would have given if fully represented in this exercise. Consideration should be given to identify the research priorities of these groups separately.

Conclusions

This top 10 list of research priorities for the management of PD was generated using a systematic, transparent and inclusive method. The research priorities covered a wide range of topics of importance to those affected by the impact of PD; motor symptoms (balance and falls, and fine motor control), non-motor symptoms (sleep and urinary dysfunction), mental health issues (stress and anxiety, dementia, and mild cognitive impairments), side effects of medications (dyskinesia) and the need to develop interventions specific to the phenotypes of PD and better monitoring methods. It is hoped that the findings will lead to future research that will address issues of importance for the clinical management of PD.

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Contributorship statement

KD and HF prepared the first version of the manuscript. DD, RP, KD, and HF transformed responses into PICO questions. CC and CS provided expert clinical research advice. BP provided expert safeguarding advice. SS oversaw the data collection and input. All authors reviewed the manuscript and edited it for content and interpretation.

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Data sharing statement

All surveys are available from the corresponding author. The anonymised dataset of the 4100 responses will be available from Parkinson's UK.

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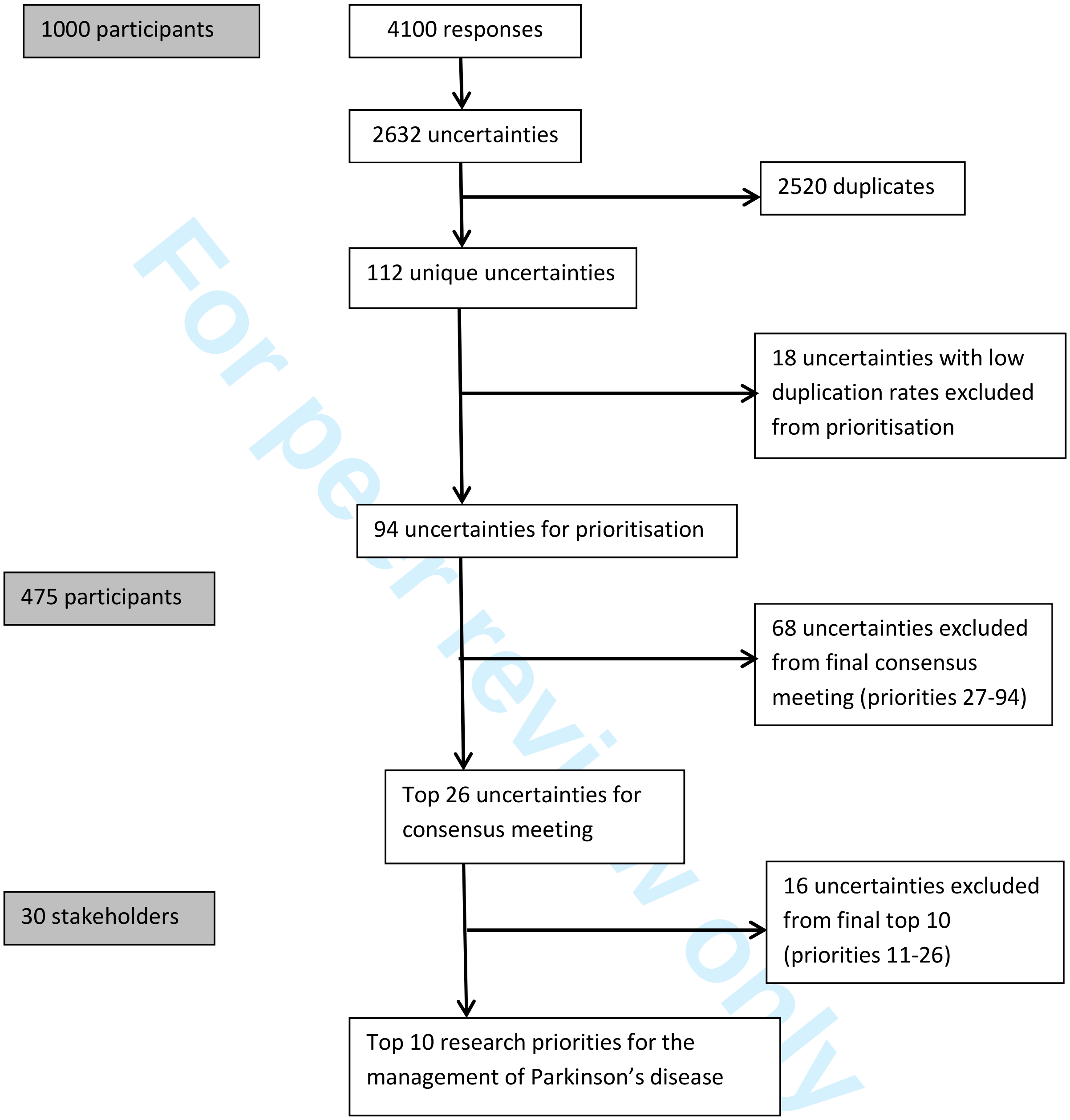
Table 1: Table of participant characteristics

		People with Parkinson's	Carers	Family and friends
Number		600	136	86
Median age range		65-74	65-74	55-64
Ethnicity:	White	86%	90%	90%
	Black or Asian	5%	1%	7%
	Other	2%	1%	2%
	Not stated	7%	8%	1%

Table 2: Final prioritised and ranked uncertainties for the management of Parkinson's Disease

Overarching research aspiration: An effective cure for Parkinson's Disease.	
1.	What treatments are helpful for reducing balance problems and falls in people with Parkinson's?
2.	What approaches are helpful for reducing stress and anxiety in people with Parkinson's?
3.	What treatments are helpful for reducing dyskinesias (involuntary movements, which are a side effect of some medications) in people with Parkinson's?
4.	Is it possible to identify different types of Parkinson's e.g. tremor dominant? And can we develop treatments to address these different types?
5.	What best treats dementia in people with Parkinson's?
6.	What best treats mild cognitive problems such as memory loss, lack of concentration, indecision and slowed thinking in people with Parkinson's?
7.	What is the best method of monitoring a person with Parkinson's response to treatments?
8.	What is helpful for improving the quality of sleep in people with Parkinson's?
9.	What helps improve the dexterity (fine motor skills or coordination of small muscle movements) of people with Parkinson's so they can do up buttons, use computers, phones, remote controls etc.?
10.	What treatments are helpful in reducing urinary problems (urgency, irritable bladder, incontinence) in people with Parkinson's?

Figure 1: Flow chart of responses



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Priority setting partnership to identify the top ten research priorities for the management of Parkinson's disease

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Abstract

Objectives: This priority setting partnership was commissioned by Parkinson's UK to encourage people with direct and personal experience of the condition to work together to identify and prioritise the top 10 evidential uncertainties that impact on everyday clinical practice for the management of Parkinson's disease (PD).

Setting: The United Kingdom (UK).

Participants: Anyone with experience of PD including: people with Parkinson's (PwP), carers, family and friends, health and social care professionals. Non-clinical researchers and employees of pharmaceutical or medical devices companies were excluded. 1000 participants (60% PwP) provided ideas on research uncertainties, 475 (72% PwP) initially prioritised them and 27 (37% PwP) stakeholders agreed a final top 10.

Methods: Using a modified nominal group technique, participants were surveyed to identify what issues for the management of PD needed research. Unique research questions unanswered by current evidence were identified and participants were asked to identify their top ten research priorities from this list. The top 26 uncertainties were presented to a consensus meeting with key stakeholders to agree the top 10 research priorities.

Results: 1000 participants provided 4100 responses, which contained 94 unique unanswered research questions that were initially prioritised by 475 participants. A consensus meeting with 27 stakeholders agreed the top 10 research priorities. The overarching research aspiration was an effective cure for PD. The top 10 research priorities for PD management included the need to address motor symptoms (balance and falls, and fine motor control), non-motor symptoms (sleep and urinary dysfunction), mental health issues (stress and anxiety, dementia, and mild cognitive impairments), side effects of medications (dyskinesia) and the need to develop interventions specific to the phenotypes of PD and better monitoring methods.

Conclusions: These research priorities identify crucial gaps in the existing evidence to address everyday practicalities in the management of the complexities of PD.

Strengths and limitations of this study

- A key strength of this Priority Setting Partnership was that 1000 people with Parkinson's, their carers and health and social care professionals identified everyday issues which currently lack firm evidence to direct their management.
- 475 participants prioritised these uncertainties, and 27 key stakeholders agreed the top 10 research priorities for the management of Parkinson's disease during a final consensus meeting.
- Very few participants were from minority ethnic populations or living in care homes which could limit the generalisability of these priorities to these populations.
- The top 10 research priorities for Parkinson's disease management were identified by a wide range of people affected by the disease. These included the need to address motor symptoms, non-motor symptoms, mental health issues, side effects of medications and the need to develop interventions specific to the phenotypes of Parkinson's disease and better monitoring methods.
- It is hoped that this top 10 will lead to future research that will address issues of importance for the clinical management of Parkinson's disease.

Introduction

Ensuring that research is effective in addressing the needs of patients and the clinicians treating them is critically important. The research agenda has been accused of being overly influenced by the pharmaceutical and medical devices industries,[1-3] and of not addressing the questions about treatments that are of greatest importance to patients, their carers and clinicians.[4-6] Research needs to focus on whether treatments are doing more harm than good, or whether one treatment is better than another, and ensure the outcomes reflect issues that have impact on the patient's wellbeing and participation.[7-9]

Treatment uncertainties are defined as questions about the effectiveness of treatments which are not adequately answered by systematic reviews of existing research evidence.[10] The James Lind Alliance[11] (JLA) was established to encourage collaboration between patients and clinicians to ensure that uncertainties that impact on everyday clinical practice are addressed in research. One of JLA's approaches is Priority Setting Partnerships[12] which aim to identify the top 10 research priorities in a given area from the perspectives of patients, carers, and healthcare professionals. These research priorities can then inform research funding strategies and policies.[13]

A number of research funders have indicated that they wish to incorporate the findings of priority setting partnerships into their prioritisation processes.[13] Parkinson's UK[14] identified four priority research areas with the specific aim to find a cure for Parkinson's disease (PD). This project expands this initial work and identifies the top ten research priorities for the management of PD.

Methods

The project was led by Parkinson's UK, with the University of East Anglia and the University of Birmingham acting as academic partners. The James Lind Alliance (JLA) provided an independent chair, advised on the methodology, and facilitated the process. The project was instigated by Parkinson's UK's Research Support Network[15] who tasked the steering group to oversee the project.

Ethics and Data Protection

We took advice from the National Research Ethics Service[16] who advised that priority setting partnerships are service evaluations and therefore did not need approval from an NHS ethics committee. We did get approval for the project from the University of East Anglia's research ethics committee. The reasoning was that we were asking about research preferences and research is a "standard" part of NHS treatment protocols.[17] Therefore the project recruited participants via multiple routes including direct from the NHS. It was assumed that any participants able to complete the survey had sufficient mental competence to take part in the project. Our safeguarding expert (BP) provided advice on any responses that raised concerns in relation to the responses provided.

Participants could answer the initial survey anonymously. Participants who provided their contact details were re-contacted for the prioritisation survey. Respondents' personal details were kept by Parkinson's UK in line with the Data Protection Act, and the UEA team were provided with an anonymised database of responses.

The Priority Setting Partnership Stages:

This method is summarised in Figure 1.

Initiation

The first stage involved the identification of potential partner organisations which provided access to a wide range of participants. Anyone living in the UK with experience and understanding of living with PD was eligible to participate in the identification of uncertainties and their prioritisation. This included: people with Parkinson's (PwP); carers and former carers; family members and friends; health and social care professionals who work, or have worked, with people living with the condition. Non-clinical researchers and employees of pharmaceutical or medical devices companies were excluded from the survey.

Consultation

The steering group had a broad spectrum of representatives and they identified the scope of the Priority Setting Partnership. All aspects of the management of PD such as health care, surgery, rehabilitation, medication, complementary therapies, nutrition, carer support, service provision and design were included. Excluded issues were curative therapies, prevention, diagnostic tests, aetiology, epidemiology, and prognosis. Curative and preventive therapies were agreed to be those that halted or reversed the neurodegenerative processes seen in Parkinson's disease. It was agreed that the overarching research aspiration was an effective cure for PD, and that the specifics of how this could be addressed had been identified previously by Parkinson's UK.[14]

A simple survey was created that asked about four areas where respondents would like to see issues answered by research: The symptoms of PD; Day-to-day life with PD; The treatment of PD; Anything else.

The exact phrasing of the survey was refined after a pilot survey involving 57 PwP and 20 carers, in order to ensure clarity of meaning and encourage the generation of relevant responses. A copy of the final version of the survey is provided in supplementary material.

Participants were invited to complete the survey on the Parkinson's UK website or by post. Parkinson's UK advertised the study in their membership magazine which goes out to more than 35,000 people affected by Parkinson's, on their website and targeted relevant groups at meetings and conferences including: 13 Parkinson's UK regional events, PD Nurse Specialists Association conference 2013, British Movement Disorders Group (BritMODIS) Conference 2014, National Parkinson's UK Research Supporters Conference 2013, Oxford Parkinson's Disease Centre Open Day 2013, South West Research Supporters day (Bristol), North West information day (St Helens). Parkinson's UK also advertised the project directly to centres of clinical excellence throughout the country, the Tracking Parkinson's centres[18] and the Oxford Parkinson's Disease Centre.

We contacted relevant charities such as Cure Parkinson's UK, the Alzheimer's Society and the Alzheimer's Research Trust who promoted participation of their members via flyers, magazine articles and social media. We contacted professional groups with an interest in Parkinson's disease such as The British Geriatrics Society, The Specialist Section for Neurological Practice at the College of Occupational Therapists, PD Specialist Interest Group of the Royal College of Speech and Language Therapists and the Parkinson's Nurse Specialists Association. We contacted the National Institute for Health Research's Dementias and Neurodegeneration (DeNDRoN)[19] Specialty Clinical Research Network and the Enabling Research In Care Homes group (ENRICH)[20] in order to ask them to encourage participation in the survey by neurological clinicians and the care home sector and residents. We used Parkinson's UK's database of people from black and minority ethnic populations who have an interest in PD to enhance our outreach to these communities. When sending out the survey we noted that we could take responses over the phone and provide a translation service if needed. Representatives from Parkinson's UK visited a couple of movement disorder clinics to promote the survey.

Collation

The "raw" treatment uncertainties were entered onto the database verbatim.

Statements not associated with management uncertainties were coded as being 'out of remit'. In order to maximise the value of respondents' comments we also coded "treatment dissatisfactions" where we were provided with information regarding poor treatment provision. These were shared with Parkinson's UK's Policy and Service Improvement and Professional Engagement and Education departments in order for them have anonymised anecdotes to demonstrate the impact of poor care on PwP.

The Cochrane Library, MEDLINE, EMBASE, CINAHL, PsychInfo were searched from inception to January 2014 for systematic reviews of interventions for the management of Parkinson's. The major systematic review's certainties were agreed by the core team (KD, CC, CS, DD, RP, HF) before the submissions were received. However all submissions were checked subsequently against the evidence base to determine if there were any further certainties in unanticipated areas. Submissions which related to management certainties were labelled as "evidence found" and forwarded to Parkinson's UK as this assisted in the identification of a lack of knowledge of effective treatments, and so demonstrating a need for education.

In order to standardise the format each uncertainty was transformed into population, intervention, comparator, and outcome (PICO) format by the coding team (KD, DD, RP and HF). The coding team met fortnightly to discuss coding issues and ensure consistency. KD double checked the coding of the majority of the statements to ensure consistency. Respondents were able to provide multiple statements in response to each of the four prompts (The symptoms of PD; Day-to-day life with PD; The treatment of PD; Anything else). Frequently we derived more than one PICO question from a single statement. The PICO questions were expressed as individual research questions, which were then assembled and duplicates combined. The frequency of duplicated uncertainties was recorded. The resulting PICO questions were checked again against the evidence base by KD, CC and CS.

Prioritisation

The steering group met to examine the uncertainties identified. Uncertainties were checked for specificity in order that they could be adequately investigated and were phrased in a manner understandable to participants. Uncertainties with less than three duplicate submissions were considered for exclusion. This was in order to reduce the number of uncertainties for prioritisation to a manageable level, and is recommended by the James Lind Alliance's methodology.[12]

The final set of uncertainties were then sent to participants who had provided their contact details and to the members of the Research Support Network.[15] It was also advertised in an article in the Parkinson's UK membership magazine and promoted through social media. Participants were asked to read the list of uncertainties and identify their own top 10 priorities. A copy of the survey is provided in supplementary materials. The ratings for each uncertainty statement were scored in reverse i.e. a priority rated 1st would have 10 points assigned. These were then summated and divided by the number of respondents from each group of participants (PwP, carers, family and friends, and professionals) and ranked in order of priority. These four sets of ratings were then added together and again ranked to identify the top 26 for all participants. The top 26 uncertainties were chosen because the experience of the

James Lind Alliance[12] is that this is a sufficient number of uncertainties to identify the top 10, and in order to be able to label them A-Z.

The final consensus meeting to agree the top 10 research priorities involved participants from a range of populations impacted by PD and used consensus-reaching decision making methods. Prior to the meeting participants were asked to prioritise the top 26 uncertainties which were presented in random order and labelled A-Z.

At the final workshop, ground rules were agreed about keeping participants' opinions and disclosures confidential to the workshop participants alone and respecting alternative viewpoints. The process' intent was to identify a set of prioritised recommendations whilst preventing the domination of the discussions by a single person and encouraging quieter group members to participate. Expectations were managed by highlighting that consensus meant that people were unlikely to leave the meeting with all of their views being represented in the top 10, and that compromise would be necessary.

Participants were divided into three groups with mixed representation and led by an independent chairperson from JLA and two facilitators from Parkinson's UK. Participants were asked to prioritise all 26 uncertainties which were printed onto A4 cards. Where there was disagreement about the level of priority, each card had the interim prioritisation for each group (PwP, carers, family and friends, and professionals) written on the back, and this information assisted decisions about rankings. The three sets of rankings were combined. Participants were then divided into three different groups, again with mixed representation. In the second round they were presented with the joint prioritisation from round one and focussed mainly on identifying whether the correct uncertainties were in the top 10, and had the right prioritisation. The three groups' prioritisations were combined and the final top 15 presented in a final round to the entire group. The final group were reminded that all of the uncertainties presented had insufficient evidence at present to inform clinical practice. In the final round participants reached consensus on which items should be in the top 10.

Databases

The complete list of all of the uncertainties identified were prepared and formatted for inclusion in the UK Database of Uncertainties about the Effects of Treatments (UK DUETs).[10] This will allow researchers to examine the all of the research uncertainties identified in this project.

A searchable database of the anonymised responses of the participants regarding their concerns about the management of PD will be made available to researchers via Parkinson's UK. This will allow researchers to include quotes that highlight the impact of a particular issue on PwP in their grant applications and research.

Results

Steering Group

The project's steering group consisted of representatives from Parkinson's UK (n=8), and the Cure Parkinson's Trust (n=1), PwP (n=2), carers (n=2), clinical consultants (n=2), and a PD nurse specialist (n=1). Those from Parkinson's UK included representatives with expertise in research development, policy and campaigns (n=5), information and support worker services (n=1), advisory services (n=1) and resources and diversity (n=1).

Consultation

Respondents could provide more than one uncertainty for each of the four areas asked about (The symptoms of PD; Day-to-day life with PD; The treatment of PD; Anything else). Hence 1000 participants generated 4100 responses which contained 2632 research uncertainties, of which 112 were unique (Figure 2). Around 40% of responses were returned by post (n=397), the remainder were submitted online. No one used the translation service, but a representative from Parkinson's UK did assist some PwP recruited in movement disorders clinics to complete the form when they had limited English literacy.

The 600 respondents with PD mostly lived at home either with support from carers or family (51%), or independently (41%), 1% lived in nursing or residential accommodation (the remainder were in other accommodation or did not respond) (Table 1). Professionals (n=140) consisted of consultants (24%), PD nurse specialists (19%), nurses and care assistants (9%), allied health professionals (31%), social workers (1%) and others (16%). Thirty-one respondents classified themselves as “other” and 7 respondents did not provide information on their role.

Research Certainties

The academic team agreed a-priori that monotherapy with levodopa, dopamine agonists, COMT-inhibitors, MAOB-inhibitors and anticholinergics all have evidence of efficacy with motor symptoms, at the expense of side effects.[21-25] The evidence is mostly from short term studies so longer term efficacy and adverse effects are uncertain. There is no good evidence regarding the optimal time for treatment initiation or dosage increase. A recent very large randomised controlled trial did show very small but persistent benefits for patient-rated mobility scores when treatment is initiated with levodopa compared with levodopa-sparing therapy.[26] For the treatment of motor complications with adjuvant therapies, the evidence supports that levodopa plus dopamine agonists, or COMT-inhibitors or MAOB-inhibitors all reduce patients’ off-time, reduce the required L-dopa dose, and improve motor and activities of daily living scores in PwP with motor complications on L-dopa.[27] Again, the evidence is mostly from short term studies so longer term efficacy and adverse effects are uncertain. Which adjuvant drug is best is mostly uncertain, although the MAOB-inhibitor tolcapone overall has greater efficacy than entacapone but is associated with a worse adverse event profile. For the small subset of PwP able to tolerate deep brain stimulation (DBS) (estimated at 1-10%),[28] DBS to the subthalmic nucleus improves self-reported quality of life and reduces motor complications of PD up to two years when compared to best treatment with medications but at a higher risk of severe adverse events.[29] Physiotherapy has short term benefits in PD (up to three months), but there is no evidence regarding the best sort of physiotherapy.[30] Unfortunately there is insufficient research evidence for any “certainties” in speech therapy[31,32] and occupational therapy[33] for PD.

As a result of checking the uncertainties against current evidence we identified evidence to refute a number of submissions. One respondent suggested that ethnicity may affect the response to medications;[22,27] however anti-Parkinson's medications have been tested worldwide and no differences in efficacy or safety have been noted in relation to ethnicity. Another respondent suggested that immunosuppression was a side-effect of rasagaline; this is not a side effect that has ever been reported for rasagaline.[34]

As can be seen there are relatively few evidential certainties to inform the day-to-day management of Parkinson's disease.

Prioritisation

Eighteen uncertainties were excluded from the prioritisation by the steering group (although they were still entered onto the UK DUETS database) as they had less than three duplicate submissions and were deemed to be unlikely to be important enough to reach the top 10 priorities. Those statements that did reach the final top 10 had a range of 20-83 duplicate submissions.

The 94 uncertainties were then sent to the 409 participants that had provided their contact details, 302 members of the Research Support Network, and respondents to the magazine article and social media. The 94 uncertainties were prioritised by 475 participants consisting of 342 PwP; 57 carers; 34 friends and family; and 42 health and social care professionals. The top 26 priorities of the four groups were summated, ranked and labelled A-Z and presented to the final prioritisation workshop (Table 2).

The final prioritisation workshop to agree the top 10 research priorities (Table 3) had 27 participants including 10 PwP, 5 carers and family, 5 consultants, 4 PD nurse specialists and 3 allied health professionals. One word change was allowed on the fourth uncertainty; where it was changed from treatments being "tailored" to "developed" to suit phenotypes of PD. This was agreed with KD who had read all of the original responses that had generated this uncertainty and felt that this change of wording was still representative of the original respondents' intent. Although proposals were made to combine uncertainties, these were resisted as it was felt that this would have made the scope of the research questions too broad.

Discussion

This study has identified the paucity of evidence currently available to address the everyday practicalities of managing a complex disease such as PD. The top 10 research priorities (Table 3) included the need to address motor symptoms (balance and falls, and fine motor control), non-motor symptoms (sleep and urinary dysfunction), mental health issues (stress and anxiety, dementia, and mild cognitive impairments), side effects of medications (dyskinesia) and the need to develop interventions specific to the phenotypes of PD and better monitoring methods. These results will help funders identify future priorities for research that have greatest relevance to patients and the clinicians that treat them.

The fact that research around balance and falls was the top priority underscores the frequency of falls in PwP and the impact falls and fear of falling can have on more global issues such as function, quality of life and care home admission.[35] Exercise can improve balance, but reducing falls is more challenging.[36,37] Although medications can improve overall motor performance which may reduce risk factors for falls, balance and falls are rarely measured or reported specifically in medication trials.[22,27] Additionally there may be problems accessing appropriately trained physiotherapists[38,39] and poor medication adherence[40,41] may impact on effectiveness. Therefore there is a great need for research for effective interventions to improve balance and reduce falls in PwP.

Specificity of research questions

One criticism of Priority Setting Partnerships is that they generate research questions that are too broad and vague to inform researchable questions and funder priorities.[13] We ensured the uncertainties in this study were as specific as possible, and did not allow similar uncertainties to be merged. Each uncertainty was informed by a number of initial statements, and each one was phrased so as to represent their overall intent. Therefore the use of the term “treatments” was intended to cover a wide range of specific interventions such as pharmacological, behavioural and rehabilitation interventions.

Sometimes the lack of specificity of the question highlights the general lack of evidence around the issue. For example, the 9th uncertainty, “improving dexterity”, might be addressed by current medications but this is rarely recorded as an outcome in clinical trials.[22,27] Occupational therapy interventions might be helpful for specific issues e.g. adapted computer mice, but there is very limited research in this area.[33,42] We are even unsure of the impact of poor fine motor control and what assessments would best measure not only the amelioration of the impairment but improvements in activities and participation.

Links with other research priority projects

A Dutch study[43] recently tried to identify patient-relevant research topics by interviews and focus groups with 57 people with Parkinson’s (PwP), carers and researchers. These were then prioritised by 1360 PwP. The topics covered all areas of Parkinson’s disease (PD) research including cure, diagnosis, psychological aspects, relationships, and healthcare. The research topics identified were broad and their prioritisation unclear. Overall they reported that research into effective strategies for living and coping with the disease were the priority of PwP. Many of the top 10 priorities identified in this project could be said to address the need for effective strategies for living and coping with PD.[43] Priority Setting Partnerships have been previously conducted for dementia and urinary incontinence.[44,45] Although some of the priorities from these projects might have relevance to PwP they did not prioritise Parkinson’s-specific aspects of these conditions. This is almost certainly because the population of PwP with these problems is relatively small compared to the overall populations with these issues.

Risk management

This project raised a number of risk management challenges which should be considered in the design of future Priority Setting Partnerships.

We were only able to follow up safeguarding issues where participants had provided their contact details. One response raised concerns about suicidality, and as we did not have the contact details for this participant, we had no way to contact the participant to ensure they had appropriate support. Future Priority Setting Partnerships should consider making the provision of contact details mandatory for participants so that issues like this can be followed up and support offered. However we recognise that this may inhibit participation, so it may be considered sufficient to provide participants with links to appropriate sources of support.

A number of other responses raised concerns about potential abuse (of both PwP and their carers), lack of appropriate service provision, and families failing to cope. We consulted with safeguarding experts who advised that safeguarding referrals were not appropriate or necessary but we responded to these participants and ensured they were aware of the support provided by Parkinson's UK. It would be best practice in future to let participants know in advance that if their responses cause concern for the research team there is likely to be some form of follow-up.

In response to the first survey, a couple of patients admitted to taking "medication holidays" or adhering to their medication regime erratically (e.g. every other day) and it was clear that these patients were unaware of the risks associated with this.[46] As a result of this finding, Parkinson's UK are improving their information leaflets on this issue.

Finally potential mental health needs of the research team transforming the responses into PICO questions and possible needs for support should be considered. Some of the responses described distressing situations and team members need to feel they can discuss issues that concern them, and take breaks when needed in order to manage this stress and to obtain appropriate levels of support.

Study Limitations

Although great efforts were made to include participants from black and minority ethnic and care home populations we were not very successful at recruiting these populations. It is also unlikely that those with literacy issues would participate in a project like this. Most respondents with PD were likely to be members of charities whose membership tends to be white, middle class and to have higher levels of education. Therefore the study results are more likely to be relevant to white PwP who live in their own homes either independently or with some assistance. This means that priorities of relevance to people with more severe disease (either palliative stage PD or with significant co-morbidities) or to ethnic minorities may not have been identified, or if identified not given the priority that these populations would have given if fully represented in this exercise. Consideration should be given to identify the research priorities of these groups separately.

Another limitation was the relatively small proportion of social care professionals (1%) who participated in this study. It is possible that as this professional group works mainly outside of healthcare settings they could have raised different unique research uncertainties.

Theoretically the exclusion of statements with less than three duplicate submissions could have introduced bias. However by keeping the survey as short as possible we enhanced its accessibility. Also those statements that did reach the final top 10 had a range of 20-83 duplicate submissions, so it is unlikely that a statement with less than three duplicate submissions would have reached the final top 10.

Conclusions

This top 10 list of research priorities for the management of PD was generated using a systematic, transparent and inclusive method. The research priorities covered a wide range of topics of importance to those affected by the impact of PD; motor symptoms (balance and falls, and fine motor control), non-motor symptoms (sleep and urinary dysfunction), mental health issues (stress and anxiety, dementia, and mild cognitive impairments), side effects of medications (dyskinesia) and the need to develop interventions specific to the phenotypes of PD and better monitoring methods. It is hoped that the findings will lead to future research that will address issues of importance for the clinical management of PD.

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Contributorship statement

KD and HF prepared the first version of the manuscript. DD, RP, KD, and HF transformed responses into PICO questions. CC and CS provided expert clinical research advice. BP provided expert safeguarding advice. SS oversaw the data collection and input. All authors reviewed the manuscript and edited it for content and interpretation.

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Data sharing statement

All surveys are available in supplementary materials. The anonymised dataset of the 4100 responses will be available from Parkinson’s UK. The 108 uncertainties will be available from UK DUETS.

FIGURE LEGENDS

Fig 1 Flow chart of methods

Fig 2 Flow chart of responses

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Table 1: Table of participant characteristics

		People with Parkinson’s	Carers	Family and friends
Number		600	136	86
Median age range		65-74	65-74	55-64
Ethnicity:	White	86%	90%	90%
	Black or Asian	5%	1%	7%
	Other	2%	1%	2%
	Not stated	7%	8%	1%

Table 2: Interim Prioritisation of the top 26 uncertainties

Uncertainty	PwP Score	Carer Score	F & F Score	HSCP Score	TOTAL	Interim rank	A-Z ID
What treatments are helpful in reducing tremor in people with Parkinson's?	93	83	92	91	359	1	T
What treatments are helpful for reducing balance problems and falls in people with Parkinson's?	92	93	80	94	359	1	E
Is it possible to identify different types of Parkinson's eg tremor dominant? And can we tailor treatments best according to these different types?	88	88	89	88	353	3	U
What treatments would ensure the medications were equally effective each day (prevented/managed wearing off, variability, on/off states) in people with Parkinson's?	89	94	88	81	352	4	H
Would the monitoring of dopamine levels in the body (eg with blood tests) be helpful in determining medication timing and amount (dose)?	91	89	86	86	352	4	L
What is helpful for improving the quality of sleep in people with Parkinson's?	94	79.5	93	84	350.5	6	G
What best treats mild cognitive problems such as memory loss, lack of concentration, indecision and slowed thinking in people with Parkinson's?	87	91	77	89.5	344.5	7	D
What treatments are helpful in reducing urinary problems (urgency, irritable bladder, incontinence) in people with Parkinson's?	90	77	94	79	340	8	I
What drug treatments are best for the different stages of Parkinson's?	83	87	87	77.5	334.5	9	X
What approaches are helpful for reducing stress and anxiety in people with Parkinson's?	75	77	82	92	326	10	M
What treatments are helpful for reducing dyskinesias (involuntary movements, which are a side effect of some medications) in people with Parkinson's?	80	90	73.5	77.5	321	11	J
What best treats dementia in people with Parkinson's?	56	92	75	93	316	12	Z
What interventions are effective for reducing or managing unexplained fatigue in people with Parkinson's?	78	65	85	85	313	13	Y

What best helps prevent or reduce freezing (of gait and in general) in people with Parkinson's?	79	71.5	76	82	308.5	14	O
What treatments are helpful for swallowing problems (dysphagia) in people with Parkinson's?	66	74.5	81	80	301.5	15	C
What is the best method of monitoring a person with Parkinson's response to treatments?	81	52.5	83.5	83	300	16	F
What training, techniques or aids are needed for hospital staff, to make sure patients with Parkinson's get their medications correctly and on time?	53	86	64.5	89.5	293	17	W
What treatments are helpful in reducing bowel problems (constipation, incontinence) in people with Parkinson's?	77	85	90	40	292	18	K
What is the best type and dose of exercise (physiotherapy) for improving muscle strength, flexibility, fitness, balance and function in people with Parkinson's?	84	68	64.5	67.5	284	19	Q
Can medications be developed to allow fewer doses per day for people with Parkinson's? (For example combinations of medications in one pill, slow release pills.)	73	84	56	69	282	20	S
What helps improve the dexterity (fine motor skills or coordination of small muscle movements) of people with Parkinson's so they can do up buttons, use computers, phones, remote controls etc?	85	59.5	73.5	54.5	272.5	21	A
What treatments are effective in reducing hallucinations (including vivid dreams) in people with Parkinson's?	52	79.5	71.5	61	264	22	P
What is the best treatment for stiffness (rigidity) in people with Parkinson's?	86	67	63	46	262	23	B
At which stage of Parkinson's is deep brain stimulation (a surgical treatment that involves implanting a 'brain pacemaker' that sends signals to specific parts of the brain) most helpful?	69	59.5	91	42	261.5	24	N
What training to improve knowledge and skills do informal carers (family and friends) need in order to best care for people with Parkinson's?	42	82	70	63.5	257.5	25	V
What is the best treatment for pain in people with Parkinson's?	82	54	60.5	57.5	254	26	R

Key: PwP = people with Parkinson's; F&F = family and friends; HSCP = health and social care professionals

Table 3: Final prioritised and ranked uncertainties for the management of Parkinson's Disease

Overarching research aspiration: An effective cure for Parkinson's Disease.	
1.	What treatments are helpful for reducing balance problems and falls in people with Parkinson's?
2.	What approaches are helpful for reducing stress and anxiety in people with Parkinson's?
3.	What treatments are helpful for reducing dyskinesias (involuntary movements, which are a side effect of some medications) in people with Parkinson's?
4.	Is it possible to identify different types of Parkinson's e.g. tremor dominant? And can we develop treatments to address these different types?
5.	What best treats dementia in people with Parkinson's?
6.	What best treats mild cognitive problems such as memory loss, lack of concentration, indecision and slowed thinking in people with Parkinson's?
7.	What is the best method of monitoring a person with Parkinson's response to treatments?
8.	What is helpful for improving the quality of sleep in people with Parkinson's?
9.	What helps improve the dexterity (fine motor skills or coordination of small muscle movements) of people with Parkinson's so they can do up buttons, use computers, phones, remote controls etc.?
10.	What treatments are helpful in reducing urinary problems (urgency, irritable bladder, incontinence) in people with Parkinson's?

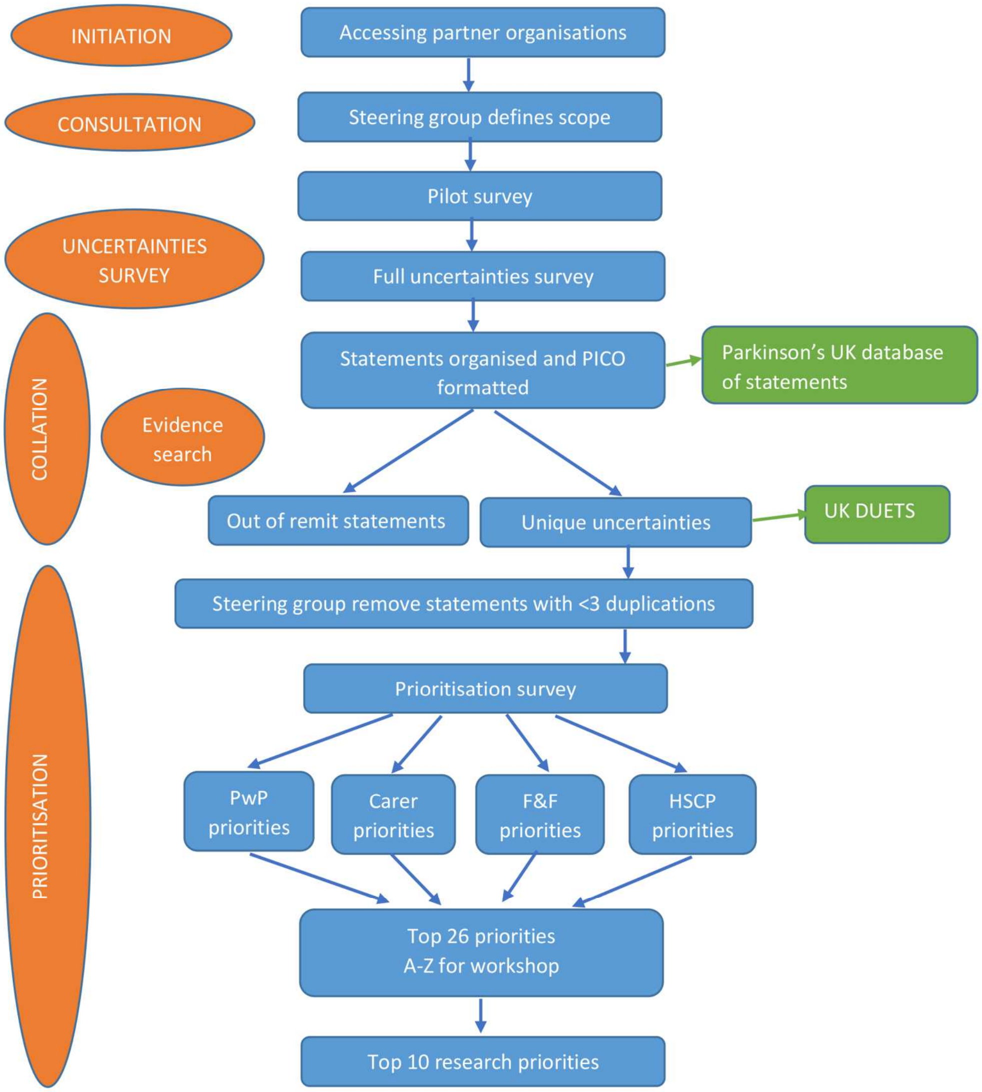

Figure 1: Flow chart of method
194x216mm (300 x 300 DPI)

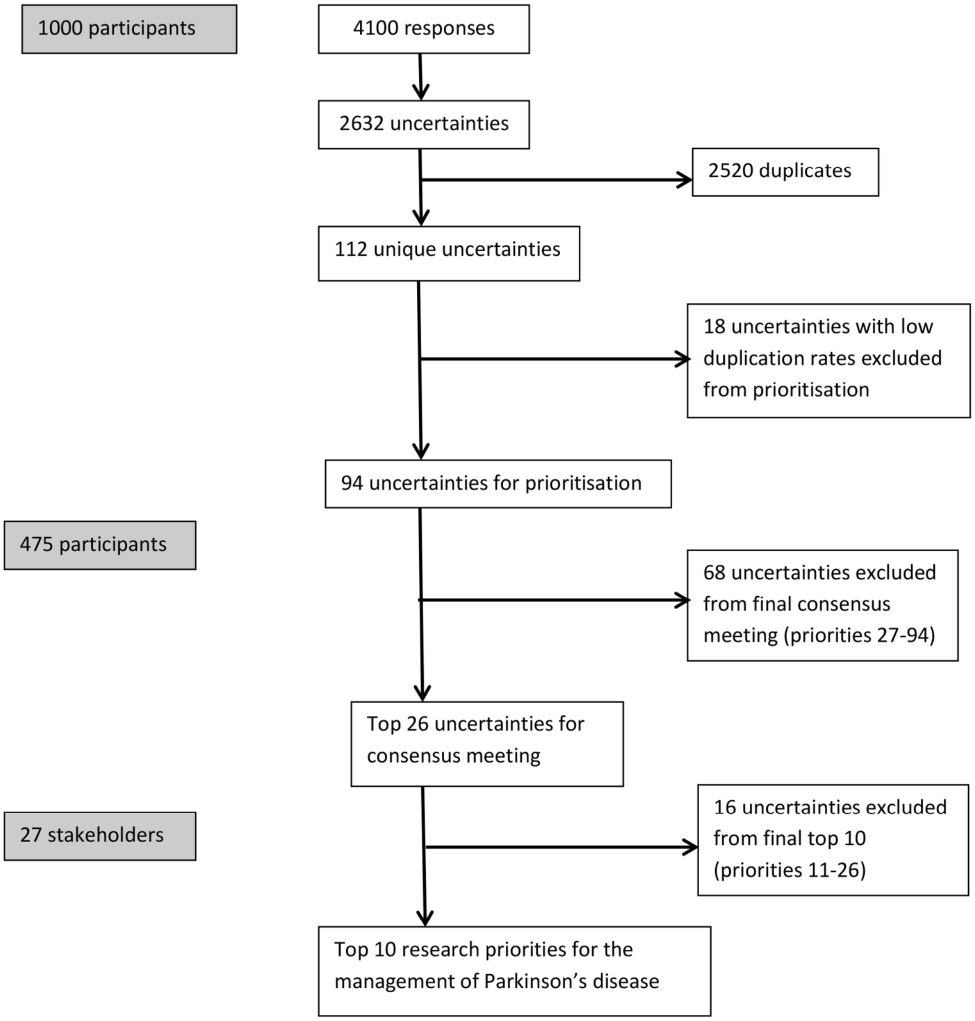

Figure 2: Flow chart of respones
173x186mm (300 x 300 DPI)

PARKINSON'S UK

CHANGE ATTITUDES. FIND A CURE. JOIN US.

TELL US

What questions would you like to see answered by Parkinson's research?

020 7963 9398
research@parkinsons.org.uk
parkinsons.org.uk/researchquestions

In Partnership with

The James Lind Alliance
Priority Setting Partnerships

The Cure Parkinson's Trust

King's College Hospital NHS
NHS Foundation Trust

UEA
University of East Anglia

University College London Hospitals NHS
NHS Foundation Trust

We're asking people affected by Parkinson's and health and social care professionals to help us identify the top 10 unanswered questions they want Parkinson's research to address. This will help to guide Parkinson's research and make sure that researchers focus on the most urgent needs of people living with the condition.

What do we mean by unanswered questions?

We're looking for questions about symptoms, day-to-day life and treatments that, if addressed and fully answered by research, could make a real difference to people living with Parkinson's. Examples of unanswered questions from other health conditions have included:

- Can we develop a vaccine to prevent prostate cancer?
- How can stroke survivors and their families be helped to cope with a speech problem?

Do I have to write a research question and check that it is unanswered?

No. The most important thing is to draw on your personal experience of Parkinson's. It is enough to write a short sentence about something that is important to you, but for which you haven't been able to find an answer. The team collecting your responses will turn them into questions. They will then check against existing research to find out whether they have been answered or not.

What will we do with the results?

We will use the results of this survey to guide future research and inform our wider work as a charity.

By sharing what we find with the international Parkinson's research community, we hope to shape research into the condition not just in the UK but all over the world.

What will happen with my information?

Unanswered questions will be published but not linked to you or your organisation. All personal data will remain confidential.

> “Our research aims to improve life for people living with Parkinson’s now, and ultimately find a cure. But we need the input of people who have direct and personal experience of Parkinson’s to make sure we’re addressing the right questions to help us achieve this”
>
> Dr Kieran Breen, Director of Research and Innovation, Parkinson’s UK

Please use Section 1 to write your unanswered questions or areas important to you. There are categories for symptoms, day-to-day life, treatment, and any other questions that you may have. You can submit as many or as few questions as you wish for each category.

Please use Section 2 (overleaf) to provide some information about yourself to help us understand who is responding to the survey.

SECTION 1

1 What question(s) about dealing with the **symptoms** of Parkinson’s would you like to see answered by research?

....

....

....

....

....

To complete the survey online visit **parkinsons.org.uk/researchquestions**

2 What question(s) about managing **day-to-day life** with Parkinson's would you like to see answered by research?

....

....

....

....

....

3 What question(s) about the **treatment** of Parkinson's would you like to see answered by research?

....

....

....

....

....

4 Do you have any other questions that you feel are important but do not fall into the areas above?

....

....

....

....

....

If you complete the survey online, please help us get more responses by passing this copy on.

SECTION 2

1 Which of the following best describes you?

Person with Parkinson's ☐

Carer/former carer of someone with Parkinson's ☐

Friend/family member of someone with Parkinson's ☐

Health or social care professional ☐

Other ....

2 Your age? ....

3 Gender

Male ☐ Female ☐ Other ☐ Prefer not to say ☐

4 What is your ethnic background?

Asian/Asian British ☐ Arab ☐ Black ☐ White ☐

Mixed/multiple ethnic groups ☐ Prefer not to say ☐

Other ....

5 If you have Parkinson's, what are your living arrangements?

Own home (independently) ☐

Own home (supported by family or carers) ☐ Residential home ☐

Nursing home ☐ Other ....

....

6 Health and social care professionals only. What is your main profession?

....

Would you like to help us with the next step?

Once the survey has closed we would like to get back in touch for your help with putting the research topics into order of importance or urgency. If you would like to take part in this please provide your contact details below.

Name ....

Address ....

Email .... Phone ....

Freepost Plus RTGA-XAJJ-CYZH
Research Team
Parkinson's UK
215 Vauxhall Bridge Road
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PARKINSON'S UK

CHANGE ATTITUDES. FIND A CURE. JOIN US.

TELL US

What questions would you like to see answered by Parkinson's research?

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NHS Foundation Trust

University College London Hospitals NHS
NHS Foundation Trust

UEA
University of East Anglia

Getting to the heart of your unanswered research questions

Background

In 2013 Parkinson's UK launched an exciting new project to find the top 10 research questions about Parkinson's that people living with the condition and health and social care professionals would like to see answered.

We want to use this information to guide future research and make sure researchers focus on the most urgent needs of people affected by Parkinson's.

The results so far

We created a simple survey asking about three key aspects of the condition:

- the symptoms of Parkinson's
- day-to-day life with Parkinson's
- the treatment of Parkinson's

More than 1,000 people took part in the survey. Our team of researchers looked through the responses, picking out questions which have not been answered by research already and removing repeats.

We now have 94 questions which our supporters would like to be answered by research that will go forward to the next stage.

We need your help

We now need to narrow down the list of 94 questions. To start with, we would like to ask volunteers to let us know their 'top 10'.

Please read through the enclosed list of 94 questions to choose the 10 you feel are most important and then rank them in order of importance.

What happens next?

In June we will be holding workshops to discuss and decide the final 10 questions. Your scores will be used during the workshop to identify those most important to our supporters.

We will announce the final list of 'Top 10' unanswered questions in Parkinson's research in July 2014.

More information

To find our more information about the whole project, please contact the research team on **0207 963 9398** or visit **parkinsons.org.uk/researchquestions**

> "Our research aims to improve life for people living with Parkinson's now, and ultimately find a cure. But we need the input of people who have direct and personal experience of Parkinson's to make sure we're addressing the right questions to help us achieve this."

Dr Katie Le Blond, Research Development Manager, Parkinson's UK

Movement symptoms

Question number		Notes
1	What treatments are helpful in reducing tremor in people with Parkinson's?	
2	What interventions are best for improving slowness of movement (bradykinesia) in people with Parkinson's?	
3	What is the best treatment for stiffness (rigidity) in people with Parkinson's?	
4	What best helps prevent or reduce freezing (of gait and in general) in people with Parkinson's?	
5	What treatments are helpful for reducing muscle cramps (dystonia) in people with Parkinson's?	
6	What treatments are helpful for reducing balance problems and falls in people with Parkinson's?	
7	What interventions are best for improving posture in people with Parkinson's?	
8	What treatments are helpful for restless legs (an overwhelming urge to move the legs) in people with Parkinson's?	

Non-motor symptoms

Question number		Notes
9	What treatments are helpful in reducing urinary problems (urgency, irritable bladder, incontinence) in people with Parkinson's?	

10	What treatments are helpful in reducing bowel problems (constipation, incontinence) in people with Parkinson's?	
11	What treatments are helpful for reducing drooling (and the associated dehydration) in people with Parkinson's?	
12	What treatments are helpful for low blood pressure (hypotension) in people with Parkinson's?	
13	What treatments can help people with Parkinson's regulate their temperature better?	
14	What treatments are effective for excessive sweating in people with Parkinson's?	
15	What is the best treatment for pain in people with Parkinson's?	
16	What is the best treatment for lack of ability to smell (anosmia) in people with Parkinson's?	
17	What is the best treatment for erectile dysfunction (sexual problems) in men with Parkinson's?	
18	What is helpful for improving the quality of sleep in people with Parkinson's?	
19	What interventions are effective for reducing or managing unexplained fatigue in people with Parkinson's?	
20	How best to manage symptoms for women with Parkinson's who still have a menstrual cycle?	

Our helpline

If you would like to talk to about any of the symptoms and problems highlighted in the questions, please contact our confidential helpline on **0808 800 0303**.

Psychiatric/psychological

Question number		Notes
21	What approaches are helpful for reducing stress and anxiety in people with Parkinson's ?	
22	What treatments are helpful for reducing depression in people with Parkinson's?	
23	What therapies are helpful for improving the confidence (self esteem) of people with Parkinson's?	
24	Is cognitive behavioural therapy, (a talking therapy that helps people to manage problems by changing the way they think about them) effective for anxiety, confidence or depression in people with Parkinson's?	
25	What therapies are helpful for reducing apathy, (feeling a lack of interest or concern) in people with Parkinson's?	
26	What interventions are helpful for impulsive and compulsive behaviours (e.g. addiction, gambling, impulse control disorders) in people with Parkinson's?	
27	What best treats mild cognitive problems such as memory loss, lack of concentration, indecision and slowed thinking in people with Parkinson's?	
28	What best treats dementia in people with Parkinson's?	
29	What treatments are most helpful for reducing challenging behaviours (agitation, wandering, anger, aggression) in people with Parkinson's?	
30	What treatments are effective in reducing hallucinations (including vivid dreams) in people with Parkinson's?	
31	What treatments are best for the prevention and management of delirium (psychosis) in people with Parkinson's?	

Medication – delivery

Question number		Notes
32	What treatments would ensure the medications were equally effective each day (prevented/managed wearing off, variability, on/off states) in people with Parkinson's?	
33	Can medications be developed to allow fewer doses per day for people with Parkinson's? (For example combinations of medications in one pill, slow release pills.)	
34	Can medications be delivered in non-pill form for people with Parkinson's? (For example, skin patches, liquid preparations, inhalers.)	

Medication – side effects

Question number		Notes
35	What treatments are helpful for reducing dyskinesias (involuntary movements, which are a side effect of some medications) in people with Parkinson's?	

Medication – patient adherence

Question number		Notes
36	What treatments are best at helping people with Parkinson's to keep taking their medications correctly?	
37	What information do people with Parkinson's need in order to use their medications to best effect?	
38	Are decision aids (information resources that help people make decisions) useful for clinicians and patients when deciding what medications to take?	

Medication – personalisation

Question number		Notes
39	Is it helpful for patients to be able to control how much medication they take – either proactive (ie before a particularly busy day) or reactive (ie for an 'off' day)?	
40	How can medication regimens be personalised for best effect?	
41	Is it possible to identify different types of Parkinson's eg tremor dominant? And can we tailor treatments best according to these different types?	
42	Can looking at an individual's genes inform decisions about medication or treatment choices in people with Parkinson's?	

Medication – stage

Question number		Notes
43	What drug treatments are best for the different stages of Parkinson's?	
44	Does delaying starting medications for a newly diagnosed person with Parkinson's help improve long term outcomes (eg reduce dyskinesia, side effects)?	
45	What medications are helpful in the later stages of Parkinson's?	

Medication – assessment

Question number		Notes
46	Would the monitoring of dopamine levels in the body (eg with blood tests) be helpful in determining medication timing and amount (dose)?	
47	What is the best method of monitoring a person with Parkinson's response to treatments?	

Non drug treatments – speech and language therapy

Question number		Notes
48	What treatments improve stiffness in the muscles of the face (masking) and could improve facial expression and communication in people with Parkinson's?	
49	What treatments are helpful for swallowing problems (dysphagia) in people with Parkinson's?	
50	What speech therapy techniques (including Lee Silverman Voice Therapy) are helpful for communication problems in people with Parkinson's?	
51	Is singing helpful for improving communication in people with Parkinson's?	

Non drug treatments – physical training and exercise

Question number		Notes
52	Does exercise have long term benefits (more than three months) for improving muscle strength, flexibility, fitness, balance and function for people with Parkinson's?	
53	What is the best type and dose of exercise (physiotherapy) for improving muscle strength, flexibility, fitness, balance and function in people with Parkinson's?	
54	What helps people with Parkinson's stick with (adhere) an exercise programme?	
55	What treatments and aids improve walking (indoors, outdoors, rough ground, crowds, stairs) in people with Parkinson's?	
56	Is yoga helpful for flexibility, tremor and quality of sleep in people with Parkinson's?	
57	Is the Alexander technique (a technique that teaches the better use of muscles) helpful for people with Parkinson's?	
58	Is T'ai Chi (a Chinese martial art that uses slow fluid movements) helpful for improving mobility and balance in people with Parkinson's?	
59	Is dance helpful for improving mobility and balance in people with Parkinson's?	
60	Is cycling helpful for improving the fitness of people with Parkinson's?	
61	Is cueing (prompts) helpful for people with Parkinson's? (Cueing includes rhythmic music, lines on the floor, 'ready, steady, go,' prompts.)	
62	Is conductive education (a specialised rehabilitation system) helpful for people with Parkinson's?	

Non drug treatment – occupational therapy

Question number		Notes
63	What helps improve writing in people with Parkinson's?	
64	What helps improve the dexterity (fine motor skills or coordination of small muscle movements) of people with Parkinson's so they can do up buttons, use computers, phones, remote controls etc?	
65	What best helps someone with Parkinson's get out and about socially (promoting social participation)?	
66	What aids, adaptations, and strategies are most helpful for improving people with Parkinson's ability to undertake activities of daily living eg dressing, eating and drinking, food preparation?	
67	What aids or strategies help people with Parkinson's move in bed, and get in and out of a bed or a chair (transfers)?	
68	Can occupational therapy help people with Parkinson's to remain in work?	

Non drug treatment – complementary

Question number		Notes
69	Is meditation (mindfulness) helpful for people with Parkinson's?	
70	Are relaxation techniques (including biofeedback, guided imagery) helpful for people with Parkinson's?	
71	Is massage helpful for stiffness, pain, tremor, and mobility in people with Parkinson's?	
72	Is acupuncture helpful for people with Parkinson's?	

Non-drug treatment – surgery

Question number		Notes
73	At which stage of Parkinson's is deep brain stimulation (a surgical treatment that involves implanting a 'brain pacemaker' that sends signals to specific parts of the brain) most helpful?	
74	Is ultrasound lesioning of the brain (damaging certain cells within specific areas of the brain) helpful for people with Parkinson's?	

Non-drug treatment – other

Question number		Notes
75	What diets help improve appetite and prevent weight loss in people with Parkinson's?	
76	What diets are helpful for general improvement in people with Parkinson's?	
77	Do low protein diets help medications to work better (reducing motor fluctuations) in people with Parkinson's?	

Carers

Question number		Notes
78	What training to improve knowledge and skills do informal carers (family and friends) need in order to best care for people with Parkinson's?	
79	How should health and social care services be best organised to support the carers of people with Parkinson's?	

Information – tools and resources

Question number		Notes
80	What tools/resources can help people with Parkinson’s manage their condition on their own?	
81	What tools (used from diagnosis onwards) can help healthcare professionals have conversations with and meet the information needs of people with Parkinson’s?	
82	Do decision aids – information resources that help people make decisions – help people with Parkinson’s make choices about care (including respite care, home care, sheltered accommodation, and care homes)?	

Information – hospital

Question number		Notes
83	What training, techniques or aids are needed for hospital staff, to make sure patients with Parkinson's get their medications correctly and on time?	
84	What training do hospital care staff need in order to best treat people with Parkinson’s (other than getting medications on time)?	

Information – primary care

Question number		Notes
85	What training helps General Practitioners (GPs) have the knowledge to support people with Parkinson’s?	
86	What training do care home staff and homecare staff need in order to best care for someone with Parkinson’s?	

Service provision – Parkinson's nurse specialists

Question number		Notes
87	Are Parkinson's nurses needed to give people with Parkinson's the best care possible?	
88	What is the optimum number of patients that a Parkinson's nurse specialist should have on their care list?	

Service provision – multidisciplinary teams

Question number		Notes
89	How to best improve communication and co-ordination of care between consultants for people with Parkinson's who also have another health problem (co-morbidity)?	
90	What helps improve communication and better coordinates services between and within health care teams and social care teams that deal with people with Parkinson's?	
91	What frequency of appointments (level of provision) with hospital staff (consultants, Parkinson's nurse specialists, physiotherapists, occupational therapists) is best for the care of people with Parkinson's?	
92	Are multidisciplinary teams effective for people with Parkinson's? (Including who should be in them and their expertise.)	
93	Is an inpatient rehabilitation program helpful to assess the effect of medications and/or improve daily activities for people with Parkinson's?	
94	Are services specific for different ethnic minorities helpful for the management of Parkinson's?	

More about the project

How were the areas symptoms, day-to-day life and treatments chosen?

The process is being guided by a steering group of people with direct experience of living with Parkinson's, health and social care professionals, a representative from the Cure Parkinson's Trust and Parkinson's UK staff.

Aren't you focused on finding a cure?

Yes. Our research aims to improve life for people living with Parkinson's now, and ultimately find a cure.

What do we mean by unanswered questions?

We worked with researchers at the University of East Anglia to establish whether or not these questions were adequately answered by existing research.

We know that some of the questions have been looked at in individual studies. However, instead of using single studies to give answers, we used systematic reviews that bring together all the existing evidence on a particular question. Systematic reviews show how reliable the evidence is and whether further research is required.

What will we do with the results?

The results of this survey will guide future research and inform our wider work as a charity. By sharing what we find with the international Parkinson's research community, we hope to shape research into the condition not just in the UK but all over the world.

When will the results be announced?

We will publish the results in July 2014.

Every hour, someone in the UK is told they have Parkinson's. Because we're here, no one has to face Parkinson's alone.

We bring people with Parkinson's, their carers and families together via our network of local groups, our website and free confidential helpline. Specialist nurses, our supporters and staff provide information and training on every aspect of Parkinson's.

As the UK's Parkinson's support and research charity we're leading the work to find a cure, and we're closer than ever. We also campaign to change attitudes and demand better services.

Our work is totally dependent on donations. Help us to find a cure and improve life for everyone affected by Parkinson's.

Parkinson's UK
215 Vauxhall Bridge Road
London SW1V 1EJ

Free* confidential helpline **0808 800 0303**
Monday to Friday 9am–8pm,
Saturday 10am–2pm. Interpreting available.
Text Relay **18001 0808 800 0303**
(for textphone users only)
hello@parkinsons.org.uk
parkinsons.org.uk
*calls are free from UK landlines and most mobile networks.

Getting to the heart of your unanswered research questions

TELL US

Please use this sheet to let us know your top 10 questions from the list in the booklet. Remember to rank your top 10 in order of importance.

If you are someone with Parkinson's, a carer, friend or family member, please let us know the ones that are most important to you.

If you are a health or social care professional, please let us know which questions you think need to be researched further so you can help manage symptoms and improve quality of life of those you support.

We have added space for notes at the end of each question so you can make notes as you read through the questions if you need to.

SECTION 1

Which of the following best describes you?

Person with Parkinson's ☐

Carer/former carer of someone with Parkinson's ☐

Friend/family member of someone with Parkinson's ☐

Health or social care professional ☐

Health and social care professionals only. What is your main profession?

....

SECTION 2

Gender

Male ☐ Female ☐ Other ☐ Prefer not to say ☐

SECTION 3

What is your ethnic background?

Asian/Asian British ☐ Arab ☐ Black ☐ White ☐

Mixed/multiple ethnic groups ☐ Prefer not to say ☐

Other ....

SECTION 4

If you have Parkinson's, what are your living arrangements?

Own home (independently) ☐

Own home (supported by family or carers) ☐ Residential home ☐

Nursing home ☐ Other..

Please turn over ▶

SECTION 5

Referring to the list of 94 questions, use the table below to let us know your 'top 10' questions and rank them in order of importance.

Please write the number of your chosen questions in the column on the right.

Top 10	Your chosen questions
1 (most important)	
2	
3	
4	
5	
6	
7	
8	
9	
10	

Please return this form to us in the freepost envelope provided, or send it to:

Freepost RTGA-XAJJ-CYZH, Stacey Storey, Parkinson's UK Research Team, 215 Vauxhall Bridge Road, London SW1V 1EJ

Title Page

Title: Priority setting partnership to identify the top ten research priorities for the management of Parkinson's disease

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Abstract

Objectives: This priority setting partnership was commissioned by Parkinson's UK to encourage people with direct and personal experience of the condition to work together to identify and prioritise the top 10 evidential uncertainties that impact on everyday clinical practice for the management of Parkinson's disease (PD).

Setting: The United Kingdom (UK).

Participants: Anyone with experience of PD including: people with Parkinson's (PwP), carers, family and friends, health and social care professionals. Non-clinical researchers and employees of pharmaceutical or medical devices companies were excluded. 1000 participants (60% PwP) provided ideas on research uncertainties, 475 (72% PwP) initially prioritised them and 27 (37% PwP) stakeholders agreed a final top 10.

Methods: Using a modified nominal group technique, participants were surveyed to identify what issues for the management of PD needed research. Unique research questions unanswered by current evidence were identified and participants were asked to identify their top ten research priorities from this list. The top 26 uncertainties were presented to a consensus meeting with key stakeholders to agree the top 10 research priorities.

Results: 1000 participants provided 4100 responses, which contained 94 unique unanswered research questions that were initially prioritised by 475 participants. A consensus meeting with 27 stakeholders agreed the top 10 research priorities. The overarching research aspiration was an effective cure for PD. The top 10 research priorities for PD management included the need to address motor symptoms (balance and falls, and fine motor control), non-motor symptoms (sleep and urinary dysfunction), mental health issues (stress and anxiety, dementia, and mild cognitive impairments), side effects of medications (dyskinesia) and the need to develop interventions specific to the phenotypes of PD and better monitoring methods.

Conclusions: These research priorities identify crucial gaps in the existing evidence to address everyday practicalities in the management of the complexities of PD.

Strengths and limitations of this study

- A key strength of ~~In~~ this Priority Setting Partnership was that 1000 people with Parkinson’s, their carers and health and social care professionals ~~were asked to~~ identified~~y~~ everyday issues which currently lack firm evidence to direct their management.
- 475 participants prioritised these uncertainties, and 27 key stakeholders agreed the top 10 research priorities for the management of Parkinson’s disease during a final consensus meeting.
- Very few participants were from minority ethnic populations or living in care homes which could limit the generalisability of these priorities to these populations.
- The top 10 research priorities for Parkinson’s disease management were identified by a wide range of people affected by the disease. These included the need to address motor symptoms, non-motor symptoms, mental health issues, side effects of medications and the need to develop interventions specific to the phenotypes of Parkinson’s disease and better monitoring methods.
- It is hoped that this top 10 will lead to future research that will address issues of importance for the clinical management of Parkinson’s disease.

Introduction

Ensuring that research is effective in addressing the needs of patients and the clinicians treating them is critically important. The research agenda has been accused of being overly influenced by the pharmaceutical and medical devices industries,[1-3] and of not addressing the questions about treatments that are of greatest importance to patients, their carers and clinicians.[4-6] Research needs to focus on whether treatments are doing more harm than good, or whether one treatment is better than another, and ensure the outcomes reflect issues that have impact on the patient's wellbeing and participation.[7-9]

Treatment uncertainties are defined as questions about the effectiveness of treatments which are not adequately answered by systematic reviews of existing research evidence.[10] The James Lind Alliance[11] (JLA) was established to encourage collaboration between patients and clinicians to ensure that uncertainties that impact on everyday clinical practice are addressed in research. One of JLA's approaches is Priority Setting Partnerships[12] which aim to identify the top 10 research priorities in a given area from the perspectives of patients, carers, and healthcare professionals. These research priorities can then inform research funding strategies and policies.[13]

A number of research funders have indicated that they wish to incorporate the findings of priority setting partnerships into their prioritisation processes.[13] Parkinson's UK[14] identified four priority research areas with the specific aim to find a cure for Parkinson's disease (PD). This project expands this initial work and identifies the top ten research priorities for the management of PD.

Methods

The project was led by Parkinson's UK, with the University of East Anglia and the University of Birmingham acting as academic partners. The James Lind Alliance (JLA) provided an independent chair, advised on the methodology, and facilitated the process. The project was instigated by Parkinson's UK's Research Support Network[15] who tasked the steering group to oversee the project.

Ethics and Data Protection

We took advice from the National Research Ethics Service[16] who advised that priority setting partnerships are service evaluations and therefore did not need approval from an NHS ethics committee. We did get approval for the project from the University of East Anglia's research ethics committee. The reasoning was that we were asking about research preferences and research is a "standard" part of NHS treatment protocols.[17] Therefore the project recruited participants via multiple routes including direct from the NHS. It was assumed that any participants able to complete the survey had sufficient mental competence to take part in the project. Our safeguarding expert (BP) provided advice on any responses that raised concerns in relation to the responses provided.

Participants could answer the initial survey anonymously. Participants who provided their contact details were re-contacted for the prioritisation survey. Respondents' personal details were kept by Parkinson's UK in line with the Data Protection Act, and the UEA team were provided with an anonymised database of responses.

The Priority Setting Partnership Stages:

This method is summarised in Figure 1.

Insert Figure 1 around here

Initiation

The first stage involved the identification of potential partner organisations which provided access to a wide range of participants. Anyone living in the UK with experience and understanding of living with PD was eligible to participate in the identification of uncertainties and their prioritisation. This included: people with Parkinson's (PwP); carers and former carers; family members and friends; health and social care professionals who work, or have worked, with people living with the condition. Non-clinical researchers and employees of pharmaceutical or medical devices companies were excluded from the survey.

Consultation

The steering group had a broad spectrum of representatives and they identified the scope of the Priority Setting Partnership. All aspects of the management of PD such as health care, surgery, rehabilitation, medication, complementary therapies, nutrition, carer support, service provision and design were included. Excluded issues were curative therapies, prevention, diagnostic tests, aetiology, epidemiology, and prognosis. Curative and preventive therapies were agreed to be those that halted or reversed the neurodegenerative processes seen in Parkinson's disease. It was agreed that the overarching research aspiration was an effective cure for PD, and that the specifics of how this could be addressed had been identified previously by Parkinson's UK.[14]

A simple survey was created that asked about four areas where respondents would like to see issues answered by research: The symptoms of PD; Day-to-day life with PD; The treatment of PD; Anything else.

The exact phrasing of the survey was refined after a pilot survey involving 57 PwP and 20 carers, in order to ensure clarity of meaning and encourage the generation of relevant responses. A copy of the final version of the survey is provided in supplementary material.

Participants were invited to complete the survey on the Parkinson's UK website or by post. Parkinson's UK advertised the study in their membership magazine which goes out to more than 35,000 people affected by Parkinson's, on their website and targeted relevant groups at meetings and conferences including: 13 Parkinson's UK regional events, PD Nurse Specialists Association conference 2013, British Movement Disorders Group (BritMODIS) Conference 2014, National Parkinson's UK Research Supporters Conference 2013, Oxford Parkinson's Disease Centre Open Day 2013, South West Research Supporters day (Bristol), North West information day (St Helens). Parkinson's UK also advertised the project directly to centres of clinical excellence throughout the country, the Tracking Parkinson's centres[18] and the Oxford Parkinson's Disease Centre.

We contacted relevant charities such as Cure Parkinson's UK, the Alzheimer's Society and the Alzheimer's Research Trust who promoted participation of their members via flyers, magazine articles and social media. We contacted professional groups with an interest in Parkinson's disease such as The British Geriatrics Society, The Specialist Section for Neurological Practice at the College of Occupational Therapists, PD Specialist Interest Group of the Royal College of Speech and Language Therapists and the Parkinson's Nurse Specialists Association. We contacted the National Institute for Health Research's Dementias and Neurodegeneration (DeNDRoN)[19] Specialty Clinical Research Network and the Enabling Research In Care Homes group (ENRICH)[20] in order to ask them to encourage participation in the survey by neurological clinicians and the care home sector and residents. We used Parkinson's UK's database of people from black and minority ethnic populations who have an interest in PD to enhance our outreach to these communities. When sending out the survey we noted that we could take responses over the phone and provide a translation service if needed. Representatives from Parkinson's UK visited a couple of movement disorder clinics to promote the survey.

Collation

The "raw" treatment uncertainties were entered onto the database verbatim.

Statements not associated with management uncertainties were coded as being 'out of remit'. In order to maximise the value of respondents' comments we also coded "treatment dissatisfactions" where we were provided with information~~stories~~ regarding poor treatment provision. These were shared with Parkinson's UK's Policy and Service Improvement and Professional Engagement and Education departments in order for them have anonymised anecdotes to demonstrate the impact of poor care on PwP.

The Cochrane Library, MEDLINE, EMBASE, CINAHL, PsychInfo were searched from inception to January 2014 for systematic reviews of interventions for the management of Parkinson's. The major systematic review's certainties were agreed by the core team (KD, CC, CS, DD, RP, HF) before the submissions were received. However all submissions were checked subsequently against the evidence base to determine if there were any further certainties in unanticipated areas. Submissions which related to management certainties were labelled as “evidence found” and forwarded to Parkinson’s UK as this assisted in the identification~~was deemed to identify~~ of a lack of knowledge of effective treatments, and so demonstrating a need for education.

In order to standardise the format each uncertainty was transformed into population, intervention, comparator, and outcome (PICO) format by the coding team (KD, DD, RP and HF). The coding team met fortnightly to discuss coding issues and ensure consistency. KD double checked the coding of the majority of the statements to ensure consistency. Respondents were able to provide multiple statements in response to each of the four prompts (The symptoms of PD; Day-to-day life with PD; The treatment of PD; Anything else). Frequently we derived more than one PICO question from a single statement~~ubmission~~. The PICO questions were expressed as individual research questions, which were then assembled and duplicates combined. The frequency of duplicated uncertainties was recorded. The resulting PICO questions were checked again against the evidence base by KD, CC and CS.

Prioritisation

The steering group met to examine the uncertainties identified. Uncertainties were checked for specificity in order that they could be adequately investigated and were phrased in a manner understandable to participants. Uncertainties with less than three duplicate submissions were considered for exclusion. This was in order to reduce the number of uncertainties for prioritisation to a manageable level, and is recommended by the James Lind Alliance’s methodology.[12]

The final set of uncertainties were then sent to participants who had provided their contact details and to the members of the Research Support Network.[15] It was also advertised in an article in the Parkinson’s UK membership magazine and promoted through social media. Participants were asked to read the list of uncertainties and identify their own top 10 priorities. A copy of the survey is provided in supplementary materials. The ratings~~ankings~~ for each uncertainty statement were scored in reverse i.e. a priority rated 1st would have 10 points assigned. These were then summated and divided by the number of respondents from each group of participants (PwP, carers, family and friends, and professionals) and ranked in order of priority. These four sets of ratings were then added together and again ranked~~,~~ ~~were summated and shortlists created. These included the top 26 priorities for each set of participants (PwP, carers, family and friends, and professionals). These four sets of prioritisations were then summated~~ to identify the top 26 for all participants. The top 26 uncertainties were chosen because the experience of the James Lind Alliance[12] is that this is a sufficient number of uncertainties to identify the top 10, and in order to be able to label them A-Z.~~,~~

The final consensus meeting to agree the top 10 research priorities involved~~had~~ participants from a range of populations impacted by PD and used consensus-reaching decision making methods. Prior to the meeting participants were asked to prioritise the top 26 uncertainties which were presented in random order and labelled A-Z.

At the final workshop, ground rules were agreed about keeping participants' opinions and disclosures confidential~~ity~~ to the workshop participants alone and respecting alternative viewpoints. The process~~es~~' intent was to identify a set of prioritised recommendations whilst preventing the domination of the discussions by a single person and encouraging quieter group members to participate. Expectations were managed by highlighting that consensus meant that people were unlikely to leave the meeting with all of their views being represented in the top 10, and that compromise would be necessary.

Participants were divided into three groups with mixed representation and led by an independent chairperson from JLA and two facilitators from Parkinson's UK. Participants were asked to prioritise all 26 uncertainties which were printed onto A4 cards. Where there was disagreement about the level of priority, each card had the interim prioritisation for each group (PwP, carers, family and friends, and professionals) written on the back, and this information assisted decisions about rankings. The three sets of rankings were combined. Participants were then divided into three different groups, again with mixed representation. In the second round they were presented with the joint prioritisation from round one and focussed mainly on identifying whether the correct uncertainties were in the top 10, and had the right prioritisation. The three group~~'~~s' prioritisations were combined and the final top 15 presented in a final round to the entire group. The final group were reminded that all of the uncertainties presented had insufficient evidence at present to inform clinical practice. In the final round participants reached consensus on which items should be in the top 10.

Databases

The complete list of all of the uncertainties identified were prepared and formatted for inclusion in the UK Database of Uncertainties about the Effects of Treatments (UK DUETs).[10] This will allow researchers to examine the all of the research uncertainties identified in this project.

A searchable database of the anonymised responses of the participants regarding their concerns about the management of PD will be made available to researchers via Parkinson's UK. This will allow researchers to include quotes that highlight the impact of a particular issue on PwP in their grant applications and research.

Results

Steering Group

The project's steering group consisted of representatives from Parkinson's UK (n=8), and the Cure Parkinson's Trust (n=1), PwP (n=2), carers (n=2), clinical consultants (n=2), and a PD nurse specialist (n=1). Those from Parkinson's UK included representatives with expertise in research development, policy and campaigns (n=5), information and support worker services (n=1), advisory services (n=1) and resources and diversity (n=1).

Consultation

Respondents could provide more than one uncertainty for each of the four areas asked about (The symptoms of PD; Day-to-day life with PD; The treatment of PD; Anything else). Hence 1000~~One thousand~~ participants generated 4100 responses which contained 2632 research uncertainties, of which 112 were unique (Figure 1).

Around 40% of responses were returned by post (n=397), the remainder were submitted online. No one used the translation service, but a representative from Parkinson's UK did assist some PwP recruited in movement disorders clinics to complete the form when they had limited English literacy.

Insert Figure 1 around here

The 600 respondents with PD mostly lived at home either with support from carers or family (51%), or independently (41%), 1% lived in nursing or residential accommodation (the remainder were in other accommodation or did not respond) (Table 1). Professionals (n=140) consisted of consultants (24%), PD nurse specialists (19%), nurses and care assistants (9%), allied health professionals (31%), social workers (1%) and others (16%). Thirty-one respondents classified themselves as "other" and 7 respondents did not provide information on their role.

Insert Table 1 around here

Research Certainties

The academic team agreed a-priori that monotherapy with levodopa, dopamine agonists, COMT-inhibitors, MAOB-inhibitors and anticholinergics all have evidence of efficacy with motor symptoms, at the expense of side effects.[21-25] The evidence is mostly from short term studies so longer term efficacy and adverse effects are uncertain. There is no good evidence regarding the optimal time for treatment initiation or dosage increase. A recent very large randomised controlled trial did show very small but persistent benefits for patient-rated mobility scores when treatment is initiated with levodopa compared with levodopa-sparing therapy.[26] For the treatment of motor complications with adjuvant therapies, the evidence supports that levodopa plus dopamine agonists, or COMT-inhibitors or MAOB-inhibitors all reduce patients' off-time, reduce the required L-dopa dose, and improve motor and activities of daily living scores in PwP with motor complications on L-dopa.[27] Again, the evidence is mostly from short term studies so longer term efficacy and adverse effects are uncertain. Which adjuvant drug is best is mostly uncertain, although the MAOB-inhibitor tolcapone overall has greater efficacy than entacapone but is associated with a worse adverse event profile. For the small subset of PwP able to tolerate deep brain stimulation (DBS) (estimated at 1-10%),[28] DBS to the subthalmic nucleus improves self-reported quality of life and reduces motor complications of PD up to two years when compared to best treatment with medications but at a higher risk of severe adverse events.[29] Physiotherapy has short term benefits in PD (up to three months), but there is no evidence regarding the best sort of physiotherapy.[30] Unfortunately there is insufficient research evidence for any "certainties" in speech therapy[31,32] and occupational therapy[33] for PD.

As a result of checking the uncertainties against current evidence we identified evidence to refute a number of submissions. One respondent suggested that ~~such as~~ ethnicity may affect~~sing~~ the response to medications;~~,~~[22,27] however~~as~~ anti-Parkinson's medications have been tested~~rialled~~ worldwide and no differences in efficacy or safety~~responses~~ have been noted in relation~~related~~ to ethnicity. Another respondent suggested that~~and~~ immunosuppression was~~being~~ a side-effect of rasagaline; this is not a side effect that has ever been reported for rasagaline.~~.~~[34]

As can be seen there are relatively few evidential certainties to inform the day-to-day management of Parkinson's disease.

Prioritisation

Eighteen uncertainties were excluded from the prioritisation by the steering group (although they were still entered onto the UK DUETS database) as they had less than three duplicate submissions and were deemed to be unlikely to be important enough to reach the top 10 priorities. Those statements that did reach the final top 10 had a range of 20-83 duplicate submissions.

The 94 uncertainties were then sent to the 409 participants that had provided their contact details, 302 members of the Research Support Network, and respondents to the magazine article and social media. The 94 uncertainties were prioritised by 475 participants consisting of 342 PwP; 57 carers; 34 friends and family; and 42 health and social care professionals. The top 26 priorities of the four groups were summated, ranked and labelled A-Z and presented to the final prioritisation workshop (Table 2).

Insert Tables 2 and ~~2~~ 3 around here

The final prioritisation workshop to agree the top 10 research priorities (Table 3) had 27 participants including 10 PwP, 5 carers and family, 5 consultants, 4 PD nurse specialists and 3 allied health professionals. One word change was allowed on the fourth uncertainty; where it was changed from treatments being “tailored” to “developed” to suit phenotypes of PD. This was agreed with KD who had read all of the original responses that had generated this uncertainty and felt that this change of wording was still representative of the original respondents’ intent. Although proposals were made to combine uncertainties, these were resisted as it was felt that this would have made the scope of the research questions too broad.

Discussion

This study has identified the paucity of evidence currently available to address the everyday practicalities of managing a complex disease such as PD. The top 10 research priorities (Table 3) included the need to address motor symptoms (balance and falls, and fine motor control), non-motor symptoms (sleep and urinary dysfunction), mental health issues (stress and anxiety, dementia, and mild cognitive impairments), side effects of medications (dyskinesia) and the need to develop interventions specific to the phenotypes of PD and better monitoring methods. These results will help funders identify future priorities for research that have greatest relevance to patients and the clinicians that treat them.

The fact that research around balance and falls was the top priority underscores the frequency of falls in PwP and the impact falls and fear of falling can have on more global issues such as function, quality of life and care home admission.[35] Exercise can improve balance, but reducing falls is more challenging.[36,37] Although medications can improve overall motor performance which may reduce risk factors for falls, balance and falls are rarely measured or reported specifically in medication trials.[22,27] Additionally there may be problems accessing appropriately trained physiotherapists[38,39] and poor medication adherence[40,41] may impact on effectiveness. Therefore there is a great need for research for effective interventions to improve balance and reduce falls in PwP.

Specificity of research questions

One criticism of Priority Setting Partnerships is that they generate research questions that are too broad and vague to inform researchable questions and funder priorities.[13] We ensured the uncertainties in this study were as specific as possible, and did not allow similar uncertainties to be merged. Each uncertainty was informed by a number of initial statements, and each one was phrased so as to represent their overall intent. Therefore the use of the term "treatments" was intended to cover a wide range of specific interventions such as pharmacological, behavioural and rehabilitation interventions.

Sometimes the lack of specificity of the question highlights the general lack of evidence around the issue. For example, the 9th uncertainty, "improving dexterity", might be addressed by current medications but this is rarely recorded as an outcome in clinical trials.[22,27] Occupational therapy interventions might be helpful for specific issues e.g. adapted computer mice, but there is very limited research in this area.[33,42] We are even unsure of the impact of poor fine motor control and what assessments would best measure not only the amelioration of the impairment but improvements in activities and participation.

Links with other research priority projects

A Dutch study[43] recently tried to identify patient-relevant research topics by interviews and focus groups with 57 people with Parkinson's (PwP), carers and researchers. These were then prioritised by 1360 PwP. The topics covered all areas of Parkinson's disease (PD) research including cure, diagnosis, psychological aspects, relationships, and healthcare. The research topics identified were broad and their prioritisation unclear. Overall they reported that research into effective strategies for living and coping with the disease were the priority of PwP.

Many of the top 10 priorities identified in this project could be said to address the need for effective strategies for living and coping with PD.[43] Priority Setting

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Partnerships have been previously conducted for dementia and urinary incontinence.[44,45] Although some of the priorities from these projects might have relevance to PwP they did not prioritise Parkinson's-specific aspects of these conditions. This is almost certainly because the population of PwP with these problems is relatively small compared to the overall populations with these issues.

Risk management

This project raised a number of risk management challenges which should be considered in the design of future Priority Setting Partnerships.

We were only able to follow up safeguarding issues where participants had provided their contact details. One response raised concerns about suicidality, and as we did not have the contact details for this participant, we had no way to contact the participant to ensure they had appropriate support. Future Priority Setting Partnerships should consider making the provision of contact details mandatory for participants so that issues like this can be followed up and support offered. However we recognise that this may inhibit participation, so it may be considered sufficient to provide participants with links to appropriate sources of support.

A number of other responses raised concerns about potential abuse (of both PwP and their carers), lack of appropriate service provision, and families failing to cope. We consulted with safeguarding experts who advised that safeguarding referrals were not appropriate or necessary but we responded to these participants and ensured they were aware of the support provided by Parkinson's UK. It would be best practice in future to let participants know in advance that if their responses cause concern for the research team there is likely to be some form of follow-up.

In response to the first survey, a couple of patients admitted to taking "medication holidays" or adhering to their medication regime erratically (e.g. every other day) and it was clear that these patients were unaware of the risks associated with this.[46] As a result of this finding, Parkinson's UK are improving their information leaflets on this issue.

Finally potential mental health needs of the research team transforming the responses into PICO questions and possible needs for support should be considered. Some of the responses described distressing situations and team members need to feel they can discuss issues that concern them, and take breaks when needed in order to manage this stress and to obtain appropriate levels of support.

Study Limitations

Although great efforts were made to include participants from black and minority ethnic and care home populations we were not very successful at recruiting these populations. It is also unlikely that those with literacy issues would participate in a project like this. Most respondents with PD were likely to be members of charities whose membership tends to be white, middle class and to have higher levels of education. Therefore the study results are more likely to be relevant to white PwP who live in their own homes either independently or with some assistance. This means that priorities of relevance to people with more severe disease (either palliative stage PD or with significant co-morbidities) or to ethnic minorities may not have been identified, or if identified not given the priority that these populations would have given if fully represented in this exercise. Consideration should be given to identify the research priorities of these groups separately.

Another limitation was the relatively small proportion of social care professionals (1%) who participated in this study. It is possible that as this professional group works mainly outside of healthcare settings they could have raised different unique research uncertainties.

Theoretically the exclusion of statements with less than three duplicate submissions could have introduced bias. However by keeping the survey as short as possible we enhanced its accessibility. Also those statements that did reach the final top 10 had a range of 20-83 duplicate submissions, so it is unlikely that a statement with less than three d~~s~~u~~p~~plicate submissions would have reached the final top 10.

Conclusions

This top 10 list of research priorities for the management of PD was generated using a systematic, transparent and inclusive method. The research priorities covered a wide range of topics of importance to those affected by the impact of PD; motor symptoms (balance and falls, and fine motor control), non-motor symptoms (sleep and urinary dysfunction), mental health issues (stress and anxiety, dementia, and mild cognitive impairments), side effects of medications (dyskinesia) and the need to develop interventions specific to the phenotypes of PD and better monitoring methods. It is hoped that the findings will lead to future research that will address issues of importance for the clinical management of PD.

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Contributorship statement

KD and HF prepared the first version of the manuscript. DD, RP, KD, and HF transformed responses into PICO questions. CC and CS provided expert clinical research advice. BP provided expert safeguarding advice. SS oversaw the data collection and input. All authors reviewed the manuscript and edited it for content and interpretation.

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Data sharing statement

All surveys are available in supplementary materials~~from the corresponding author~~. The anonymised dataset of the 4100 responses will be available from Parkinson's UK. The 108 uncertainties will be available from UK DUETS.

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Table 1: Table of participant characteristics

		People with Parkinson's	Carers	Family and friends
Number		600	136	86
Median age range		65-74	65-74	55-64
Ethnicity:	White	86%	90%	90%
	Black or Asian	5%	1%	7%
	Other	2%	1%	2%
	Not stated	7%	8%	1%

Table 2: Interim Prioritisation of the top 26 uncertainties

Uncertainty	PwP Score	Carer Score	F & F Score	HSCP Score	TOTAL	Interim rank	A-Z ID
What treatments are helpful in reducing tremor in people with Parkinson's?	93	83	92	91	359	1	T
What treatments are helpful for reducing balance problems and falls in people with Parkinson's?	92	93	80	94	359	1	E
Is it possible to identify different types of Parkinson's eg tremor dominant? And can we tailor treatments best according to these different types?	88	88	89	88	353	3	U
What treatments would ensure the medications were equally effective each day (prevented/managed wearing off, variability, on/off states) in people with Parkinson's?	89	94	88	81	352	4	H
Would the monitoring of dopamine levels in the body (eg with blood tests) be helpful in determining medication timing and amount (dose)?	91	89	86	86	352	4	L
What is helpful for improving the quality of sleep in people with Parkinson's?	94	79.5	93	84	350.5	6	G
What best treats mild cognitive problems such as memory loss, lack of concentration, indecision and slowed thinking in people with Parkinson's?	87	91	77	89.5	344.5	7	D
What treatments are helpful in reducing urinary problems (urgency, irritable bladder, incontinence) in people with Parkinson's?	90	77	94	79	340	8	I
What drug treatments are best for the different stages of Parkinson's?	83	87	87	77.5	334.5	9	X
What approaches are helpful for reducing stress and anxiety in people with Parkinson's?	75	77	82	92	326	10	M
What treatments are helpful for reducing dyskinesias (involuntary movements, which are a side effect of some medications) in people with Parkinson's?	80	90	73.5	77.5	321	11	J
What best treats dementia in people with Parkinson's?	56	92	75	93	316	12	Z
What interventions are effective for reducing or managing unexplained fatigue in people with Parkinson's?	78	65	85	85	313	13	Y

What best helps prevent or reduce freezing (of gait and in general) in people with Parkinson's?	79	71.5	76	82	308.5	14	O
What treatments are helpful for swallowing problems (dysphagia) in people with Parkinson's?	66	74.5	81	80	301.5	15	C
What is the best method of monitoring a person with Parkinson's response to treatments?	81	52.5	83.5	83	300	16	F
What training, techniques or aids are needed for hospital staff, to make sure patients with Parkinson's get their medications correctly and on time?	53	86	64.5	89.5	293	17	W
What treatments are helpful in reducing bowel problems (constipation, incontinence) in people with Parkinson's?	77	85	90	40	292	18	K
What is the best type and dose of exercise (physiotherapy) for improving muscle strength, flexibility, fitness, balance and function in people with Parkinson's?	84	68	64.5	67.5	284	19	Q
Can medications be developed to allow fewer doses per day for people with Parkinson's? (For example combinations of medications in one pill, slow release pills.)	73	84	56	69	282	20	S
What helps improve the dexterity (fine motor skills or coordination of small muscle movements) of people with Parkinson's so they can do up buttons, use computers, phones, remote controls etc?	85	59.5	73.5	54.5	272.5	21	A
What treatments are effective in reducing hallucinations (including vivid dreams) in people with Parkinson's?	52	79.5	71.5	61	264	22	P
What is the best treatment for stiffness (rigidity) in people with Parkinson's?	86	67	63	46	262	23	B
At which stage of Parkinson's is deep brain stimulation (a surgical treatment that involves implanting a 'brain pacemaker' that sends signals to specific parts of the brain) most helpful?	69	59.5	91	42	261.5	24	N
What training to improve knowledge and skills do informal carers (family and friends) need in order to best care for people with Parkinson's?	42	82	70	63.5	257.5	25	V
What is the best treatment for pain in people with Parkinson's?	82	54	60.5	57.5	254	26	R

Key: PwP = people with Parkinson's; F&F = family and friends; HSCP = health and social care professionals

Table 3~~2~~: Final prioritised and ranked uncertainties for the management of Parkinson's Disease

Overarching research aspiration: An effective cure for Parkinson's Disease.	
1.	What treatments are helpful for reducing balance problems and falls in people with Parkinson's?
2.	What approaches are helpful for reducing stress and anxiety in people with Parkinson's?
3.	What treatments are helpful for reducing dyskinesias (involuntary movements, which are a side effect of some medications) in people with Parkinson's?
4.	Is it possible to identify different types of Parkinson's e.g. tremor dominant? And can we develop treatments to address these different types?
5.	What best treats dementia in people with Parkinson's?
6.	What best treats mild cognitive problems such as memory loss, lack of concentration, indecision and slowed thinking in people with Parkinson's?
7.	What is the best method of monitoring a person with Parkinson's response to treatments?
8.	What is helpful for improving the quality of sleep in people with Parkinson's?
9.	What helps improve the dexterity (fine motor skills or coordination of small muscle movements) of people with Parkinson's so they can do up buttons, use computers, phones, remote controls etc.?
10.	What treatments are helpful in reducing urinary problems (urgency, irritable bladder, incontinence) in people with Parkinson's?