Systematic review of disability in Parkinson's disease
Protocol

Background:
Disability and dependency are important clinically relevant outcomes in Parkinson's disease (PD) and have been reported in several studies. No systematic review of disability has been published.

Aim:
1. To perform a systematic review and meta-analysis of studies of disability in PD.
2. To assess what factors influence heterogeneity between studies.
3. To assess potential predictors of disability in PD.

Methods:
Inclusion/exclusion criteria
We will include studies meeting the following criteria:

1. Cohorts of idiopathic PD (or studies of parkinsonism with a large proportion of patients with idiopathic PD) with or without a control group;

2. Reporting the following outcome measures:
    (a) Reaching dependency/other defined level of disability (e.g. Schwab and England Activites of Daily Living Scale (S&E) <80%; Hoehn and Yahr (H&Y) stage > 3; modified Rankin Score > 3; Webster Score, self care item score 3); or
    (b) Reporting scores of scales of disability or ability to perform basic activities of daily living (ADLs) (e.g. S&E; Unified Parkinson Disease Rating Scale part II, Northwestern University Disability Scale).

We will exclude studies in which fewer than 75% of included patients have idiopathic PD and we will not use data from scales in which more than 50% of items relate to pathology, impairment, or handicap, (e.g. average Hoehn and Yahr stage, Webster score or UPDRS total score) or data relating predominantly to instrumental ADLs.

Identification of relevant studies
We will perform electronic searches of MEDLINE (1946 to latest update), EMBASE (1947 to latest update) CINAHL (1989 to latest update) and Web of Science (1970 to latest update). We will also review reference lists and validate our electronic searches against handsearches of selected journals. The electronic search strategies are as follows, including the numbers of results for each search string on 3/10/12:

MEDLINE

1	exp parkinsonian disorders/	53371
2	parkinson:.tw.	64261
3	1 or 2	73117
4	Disability Evaluation/	32148
5	(disability or disabled).tw.	83810
6	Disabled Persons/	29883
7	"Activities of Daily Living"/	46421
8	Activities of daily living.tw.	12504
9	ADL.tw.	5128
10	dependence?.tw.	153142
11	(Schwab and England).tw.	228

12	barthel.tw.	2970
13	(Unified park: disease rating scale adj3 II).tw.	71
14	(UPDRS II or UPDRSII or UPDRS 2 or UPDRS2).tw.	64
15	((Hoehn and Yahr) or H&Y).tw.	2961
16	Webster.tw.	2398
17	Rankin.tw	2883
18	"Severity of Illness Index"/	147478
19	or/4-18	452031
20	3 and 19	6435
21	exp animals/ not humans.sh.	3785951
22	20 not 21	6178

EMBASE

1	exp parkinson disease/	82591
2	extrapyramidal syndrome/	5269
3	exp parkinsonism/	20393
4	parkinson:.tw.	90605
5	or/1-4	119004
6	disability/ or adl disability/ or invalidity/ or physical disability/ or social disability/ or disability severity/	85320
7	(disability or disabled).tw.	122350
8	daily life activity/	50061
9	activities of daily living.tw.	16870
10	ADL.tw.	7567
11	dependenc?.tw.	205807
11	(Schwab and England).tw.	334
12	Barthel index/	2396
13	Barthel.tw.	4708
14	(Unified park: disease rating scale adj3 II).tw.	108
15	(UPDRS II or UPDRSII or UPDRS 2 or UPDRS2).tw.	203
20	or/6-19	424694
21	5 and 20	7926
22	exp animal/ not human/	1349994
23	21 not 22	7895

CINAHL

S1	TX Parkinson*	8709
S2	(MH "Parkinsonian Disorders+")	6567
S3	S1 or S2	8790
S4	TX disability	49236
S5	TX disabled	36029
S6	TX dependenc*	18365
S7	TX activites of daily living	19190
S8	TX adl	2813
S9	S4 or S5 or S6 or S7 or S8	104631
S10	S3 and S9	946

Web of Science
Topic=(Parkinson*) AND Topic=("Disability" or "disabled" or "dependence" or "activities of daily living" or "ADL") 3177

We will examine whether adding certain terms to our search strategy increases the sensitivity of the search (for example, disease severity/, UPDRS.tw, exp prognosis/ or prognosis.tw, indpendence). We will do this by searching with the additional terms included on a restricted time period (one or two years). If additional relevant studies are found, we will run the search with the additional terms over the full time period.

Titles and abstracts will be assessed for relevance. The full text of the articles will be obtained for all relevant studies and where it is unclear from the abstract whether a study should be included. Foreign language studies will be translated if necessary.

Data extraction and analysis
We will create a data extraction form which will be piloted on a selection of studies and modified as necessary before being used for the rest of the group. We will describe the methods of the studies and assess quality using a checklist modified from the Newcastle-Ottawa Scale.

Meta-analysis will be performed, where possible, using Stata with a random effects model of the following data: (i) time from diagnosis to dependence (or other specified level of disability), (ii) time from diagnosis to death or dependence, (iii) proportion of patients dependent (or having reached specified level of dependence) at specific time points, (iv) proportion of patients dead or dependent at specific time points, (v) relative risk (RR) or hazard ratio (HR) of becoming dependent (or reaching specified level of disability), (vi) RR or HR of becoming dead or dependent and (vii) average score of disability scale in patients alive at defined time points.

We will explore heterogeneity with meta-regression, if sufficient data are available. We will assess several covariates including (i) study type (inception vs non-inception cohort), (ii) study setting (community-based or specialist clinic-based), (iii) adequacy of diagnostic confirmation, (iv) year (v) median age, (vi) gender, (vii) median disease duration at study baseline, (viii) baseline disease severity, (ix) duration of follow-up at which measure taken, (x) geographical location and (xi) disability scale used.

We will also assess which variables have been studied for their independent predictive impact in included studies and which of those were found to independently predict mortality.