Search Strategy

Database: Ovid MEDLINE(R) and Epub Ahead of Print, In-Process & Other Non-Indexed
Citations, Daily and Versions(R) <1946 to April 26, 2019> Search Strategy:
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1   exp Psychosurgery/ (5853)
2   (psychosurg* or psycho-surg*).mp. (6006)
3   cingulotom*.mp. (175)
4   capsulotom*.mp. (2987)
5   tractotom*.mp. (331)
6   leucotom*.mp. (675)
7   limbic surg*.mp. (3)
8   exp Deep Brain Stimulation/ (7591)
9   deep brain stimulation*.mp. (11681)
10   or/1-9 (20903)
11   ((preoperat* or pre-operat* or preprocedur* or pre-procedur* or presurg* or pre-surg*) adj2 (neuroimag* or neuro-imag* or imaging or (brain adj2 scan*))).mp. (6805)
12   exp Tomography, X-Ray Computed/ (402741)
13   (CT scan or cat scan or computed tomography).mp. (275869)
14   exp Positron-Emission Tomography/ (54124)
15   (PET scan or positron emission tomography).mp. (83899)
16   exp Magnetic Resonance Imaging/ (419613)
17   (MRI or fMRI or magnetic resonance imaging or functional magnetic resonance imaging).mp. (528014)
18   exp Tomography, Emission-Computed, Single-Photon/ (30643)

Appendix 1 to Davidson B, Suresh H, Goubran M, et al. Predicting response to psychiatric surgery: a systematic review of neuroimaging findings. *J Psychiatry Neurosci* 2020.

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19   (SPECT or SPET or single-photon emission computed tomography or single photon emission computed tomography).mp. (32741)
20   or/11-19 (1025042)
21   10 and 20 (2454)
22   limit 21 to yr="1972 -Current" (2453)

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Database: Embase Classic+Embase <1947 to 2019 Week 17> Search Strategy:
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1   exp psychosurgery/ (2817)
2   (psychosurg* or psycho-surg*).mp. (3081)
3   cingulotom*.mp. (303)
4   exp capsulotomy/ (3704)
5   capsulotom*.mp. (5379)
6   tractotom*.mp. (560)
7   leucotom*.mp. (1113)
8   limbic surg*.mp. (5)
9   exp brain depth stimulation/ (39508)
10   deep brain stimulation*.mp. (16748)
11   or/1-10 (50336)
12   ((preoperat* or pre-operat* or preprocedur* or pre-procedur* or presurg* or pre-surg*) adj2 (neuroimag* or neuro-imag* or imaging or (brain adj2 scan*))).mp. (10280)
13   exp x-ray computed tomography/ (38869)
14   (CT scan or cat scan or computed tomography).mp. (451964)
15   exp positron emission tomography/ (144401)

16   (PET scan or positron emission tomography).mp. (157626)
17   exp nuclear magnetic resonance imaging/ (869237)
18   exp functional magnetic resonance imaging/ (70130)
19   (MRI or fMRI or magnetic resonance imaging or functional magnetic resonance imaging).mp. (872172)
20   exp single photon emission computed tomography/ (10217)
21   (SPECT or SPET or single-photon emission computed tomography or single photon emission computed tomography).mp. (54693)
22   or/12-21 (1387521)
23   11 and 22 (8208)
24   limit 23 to yr="1972 -Current" (8201)
25   limit 24 to (editorial or erratum or letter) (439)
26   24 not 25 (7762)

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Database: EBM Reviews - Cochrane Central Register of Controlled Trials <March 2019> Search Strategy:
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1   exp Psychosurgery/ (12)
2   (psychosurg* or psycho-surg*).mp. (23)
3   cingulotom*.mp. (8)
4   capsulotom*.mp. (426)
5   tractotom*.mp. (7)
6   leucotom*.mp. (36)
7   limbic surg*.mp. (0)
8   exp Deep Brain Stimulation/ (258)
9   deep brain stimulation*.mp. (1038)

10   or/1-9 (1511)
11   ((preoperat* or pre-operat* or preprocedur* or pre-procedur* or presurg* or pre-surg*) adj2 (neuroimag* or neuro-imag* or imaging or (brain adj2 scan*))).mp. (354)
12   exp Tomography, X-Ray Computed/ (4674)
13   (CT scan or cat scan or computed tomography).mp. (14258)
14   exp Positron-Emission Tomography/ (905)
15   (PET scan or positron emission tomography).mp. (4447)
16   exp Magnetic Resonance Imaging/ (7691)
17   (MRI or fMRI or magnetic resonance imaging or functional magnetic resonance imaging).mp. (29604)
18   exp Tomography, Emission-Computed, Single-Photon/ (1017)
19   (SPECT or SPET or single-photon emission computed tomography or single photon emission computed tomography).mp. (2232)
20   or/11-19 (47499)
21   10 and 20 (148)
22   limit 21 to yr="1972 -Current" (148)

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Meta-analysis of Observational Studies in Epidemiology (MOOSE) Checklist

Criteria		Brief description of how the criteria were handled the review
Reporting of background should include		
√	Problem definition	Interest in psychiatric surgery (DBS and lesional) has been reinvigorated. Despite an enormous wealth of neuroimaging research, there have been no established neuroimaging biomarkers to predict which patients are most likely to respond to these treatments. Several studies have attempted to address this issue, but there has not been a systematic review to appraise the existing literature.
√	Hypothesis statement	Only a few studies have attempted to analyze preoperative neuroimaging for predictors of response. Given the likely heterogeneity of methodologies, there will be variability, possibly even contradiction, between studies.
√	Description of study outcomes	Number of included studies Analysis of each study Comparison of study approaches, statistical models, patient populations
√	Type of exposure or intervention used	Radiofrequency cingulotomy Radiofrequency capsulotomy Gamma-knife radiosurgery capsulotomy Anterior limb of the internal capsule stimulation
√	Type of study designs used	Retrospective case series. Some studies divided patients into two groups (responders and non-responders) and essentially performed a case-control study, whereas others used the patient group as a whole and performed regression analyses.
√	Study population	Refractory major depressive disorder and obsessive compulsive disorder

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Reporting of search strategy should include		
√	Qualifications of searchers	The credentials of the three investigators who contributed to the search (BD, HS, NL) are indicated in the "Author Information" section
√	Search strategy, including time period included in the synthesis and keywords	Medline from 1972 – April 2019 EMBASE from 1972 – April 2019 Cochrane from 1972 – April 2019 See Supplementary figure 1
√	Databases and registries searched	Medline, EMBASE, and Cochrane
√	Search software used, name and version, including special features	OvidSP, see Supplementary figure 1
√	Use of hand searching	References of included studies. Several authors are content experts who also searched the literature independently to confirm no additional articles were missed
√	List of citations located and those excluded, including justifications	See figure 1 for PRISMA flow chart and details of literature search. Citation list of excluded articles is available upon request
√	Method of addressing articles published in languages other than English	There was no language restriction placed on the search. All articles which survived title screen had an English summary available, but in-house translation was available upon request
√	Method of handling abstracts and unpublished studies	Excluded. Only articles which were fully-published in peer-reviewed journals were included
√	Description of any contact with authors	Nil. The objective of this systematic review was to appraise available evidence which has been published in peer-reviewed journals, and highlight any need for further work in this area

Reporting of methods should include	
√ Description of relevance or appropriateness of studies assembled for assessing the hypothesis to be tested	See methodology for inclusion and exclusion criteria used
√ Rationale for the selection and coding of data	A standardized data extraction sheet was constructed a priori (available upon request) The sheet focused on collection of details regarding imaging protocols, analysis techniques, statistical analysis, and primary findings
√ Assessment of confounding	Potential bias and confounding of included studies was discussed qualitatively in the discussion section.
√ Assessment of study quality, including blinding of quality assessors; stratification or regression on possible predictors of study results	Each study was described in depth in the results section.
√ Assessment of heterogeneity	Study heterogeneity was described qualitatively. Results were too heterogeneous to allow quantative comparison, let alone quantitative assessment of heterogeneity
√ Description of statistical methods in sufficient detail to be replicated	This study did not make use of statistical methods
√ Provision of appropriate tables and graphics	A PRISMA flow chart was included (figure 1). Table 1 shows a summary of included studies. Figure 2 displays some regions of interest overlaid on a standardize template brain
Reporting of results should include	

√	Graph summarizing individual study estimates and overall estimate	Not applicable
√	Table giving descriptive information for each study included	Table 1
√	Results of sensitivity testing	Not applicable
√	Indication of statistical uncertainty of findings	Not applicable
Reporting of discussion should include		
√	Quantitative assessment of bias	Although quantitative assessment of bias was not possible, qualitative description of bias was included in discussion, including a discussion of undoubted presence of a publication bias.
√	Justification for exclusion	Reasons for exclusion can be found in figure 1 (PRISMA chart). The primary reason was a lack of neuroimaging analysis in a clinical report of a psychiatric surgery trial. The second leading reason for exclusion was for reviews/commentaries
√	Assessment of quality of included studies	This is included in the discussion
Reporting of conclusions should include		
√	Consideration of alternative explanations for observed results	We describe that the uncharted heterogeneity of depression and OCD combined with the small size of these trials, means these results could reflect different subtypes of features with large umbrella diseases
√	Generalization of the	The generalization of the conclusion was that there was shockingly few studies which actually

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	conclusions	assessed preoperative neuroimaging predictors of response to psychiatric surgery.
√	Guidelines for future research	Next steps should focus on the sharing of data to build predictive models, and then for them to be tested prospectively in ongoing trials
√	Disclosure of funding source	No funding was required for conducting this review

Appendix 1 to Davidson B, Suresh H, Goubran M, et al. Predicting response to psychiatric surgery: a systematic review of neuroimaging findings. *J Psychiatry Neurosci* 2020.

DOI: 10.1503/jpn.190208

Section/topic	#	Checklist item	Reported on page #
TITLE			
Title	1	Identify the report as a systematic review, meta-analysis, or both.	1
ABSTRACT			
Structured summary	2	Provide a structured summary including, as applicable: background; objectives; data sources; study eligibility criteria, participants, and interventions; study appraisal and synthesis methods; results; limitations; conclusions and implications of key findings; systematic review registration number.	2
INTRODUCTION			
Rationale	3	Describe the rationale for the review in the context of what is already known.	3-4
Objectives	4	Provide an explicit statement of questions being addressed with reference to participants, interventions, comparisons, outcomes, and study design (PICOS).	2
METHODS			
Protocol and registration	5	Indicate if a review protocol exists, if and where it can be accessed (e.g., Web address), and, if available, provide registration information including registration number.	5
Eligibility criteria	6	Specify study characteristics (e.g., PICOS, length of follow-up) and report characteristics (e.g., years considered, language, publication status) used as criteria for eligibility, giving rationale.	5-6
Information sources	7	Describe all information sources (e.g., databases with dates of coverage, contact with study authors to identify additional studies) in the search and date last searched.	5-6
Search	8	Present full electronic search strategy for at least one database, including any limits used, such that it could be repeated.	Supplementary

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Study selection	9	State the process for selecting studies (i.e., screening, eligibility, included in systematic review, and, if applicable, included in the meta-analysis).	5-6
Data collection process	10	Describe method of data extraction from reports (e.g., piloted forms, independently, in duplicate) and any processes for obtaining and confirming data from investigators.	5-6
Data items	11	List and define all variables for which data were sought (e.g., PICOS, funding sources) and any assumptions and simplifications made.	5-6
Risk of bias in individual studies	12	Describe methods used for assessing risk of bias of individual studies (including specification of whether this was done at the study or outcome level), and how this information is to be used in any data synthesis.	6, Supplementary
Summary measures	13	State the principal summary measures (e.g., risk ratio, difference in means).	N/A
Synthesis of results	14	Describe the methods of handling data and combining results of studies, if done, including measures of consistency (e.g., I^2) for each meta-analysis.	6

Risk of bias across studies	15	Specify any assessment of risk of bias that may affect the cumulative evidence (e.g., publication bias, selective reporting within studies).	12
Additional analyses	16	Describe methods of additional analyses (e.g., sensitivity or subgroup analyses, meta-regression), if done, indicating which were pre-specified.	N/A
RESULTS			
Study selection	17	Give numbers of studies screened, assessed for eligibility, and included in the review, with reasons for exclusions at each stage, ideally with a flow diagram.	Fig 1
Study characteristics	18	For each study, present characteristics for which data were extracted (e.g., study size, PICOS, follow-up period) and provide the citations.	Table 1
Risk of bias within studies	19	Present data on risk of bias of each study and, if available, any outcome level assessment (see item 12).	Qualitatively presented in results, pg 7-10

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Results of individual studies	20	For all outcomes considered (benefits or harms), present, for each study: (a) simple summary data for each intervention group (b) effect estimates and confidence intervals, ideally with a forest plot.	N/A
Synthesis of results	21	Present results of each meta-analysis done, including confidence intervals and measures of consistency.	N/A
Risk of bias across studies	22	Present results of any assessment of risk of bias across studies (see Item 15).	N/A
Additional analysis	23	Give results of additional analyses, if done (e.g., sensitivity or subgroup analyses, meta-regression [see Item 16]).	N/A
DISCUSSION			
Summary of evidence	24	Summarize the main findings including the strength of evidence for each main outcome; consider their relevance to key groups (e.g., healthcare providers, users, and policy makers).	10-11
Limitations	25	Discuss limitations at study and outcome level (e.g., risk of bias), and at review-level (e.g., incomplete retrieval of identified research, reporting bias).	11-12
Conclusions	26	Provide a general interpretation of the results in the context of other evidence, and implications for future research.	10-12
FUNDING			
Funding	27	Describe sources of funding for the systematic review and other support (e.g., supply of data); role of funders for the systematic review.	15

From: Moher D, Liberati A, Tetzlaff J, Altman DG, The PRISMA Group (2009). Preferred Reporting Items for Systematic Reviews and Meta-Analyses: The PRISMA Statement. PLoS Med 6(7): e1000097. doi:10.1371/journal.pmed1000097

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