1. * Review title.
Give the working title of the review, for example the one used for obtaining funding. Ideally the title should state succinctly the interventions or exposures being reviewed and the associated health or social problems. Where appropriate, the title should use the PI(E)COS structure to contain information on the Participants, Intervention (or Exposure) and Comparison groups, the Outcomes to be measured and Study designs to be included.

Perioperative and oncological outcomes of minimally invasive versus open pancreatoduodenectomy for pancreatic carcinoma: a systematic review and meta-analysis

2. Original language title.
For reviews in languages other than English, this field should be used to enter the title in the language of the review. This will be displayed together with the English language title.

3. * Anticipated or actual start date.
Give the date when the systematic review commenced, or is expected to commence.
01/09/2019

4. * Anticipated completion date.
Give the date by which the review is expected to be completed.
31/12/2019

5. * Stage of review at time of this submission.
Indicate the stage of progress of the review by ticking the relevant Started and Completed boxes. Additional information may be added in the free text box provided.

Please note: Reviews that have progressed beyond the point of completing data extraction at the time of initial registration are not eligible for inclusion in PROSPERO. Should evidence of incorrect status and/or completion date being supplied at the time of submission come to light, the content of the PROSPERO record will be removed leaving only the title and named contact details and a statement that inaccuracies in the stage of the review date had been identified.
This field should be updated when any amendments are made to a published record and on completion and publication of the review. If this field was pre-populated from the initial screening questions then you are not able to edit it until the record is published.

The review has not yet started: No
Review stage

| Activity                                                                 | Started | Completed |
|-------------------------------------------------------------------------|---------|-----------|
| Preliminary searches                                                     | Yes     | No        |
| Piloting of the study selection process                                  | No      | No        |
| Formal screening of search results against eligibility criteria          | No      | No        |
| Data extraction                                                          | No      | No        |
| Risk of bias (quality) assessment                                        | No      | No        |
| Data analysis                                                            | No      | No        |

Provide any other relevant information about the stage of the review here (e.g. Funded proposal, protocol not yet finalised).

Funded proposal, protocol not yet finalised. Started preliminary searches

6. * Named contact.

The named contact acts as the guarantor for the accuracy of the information presented in the register record.

Rui Sun

Email salutation (e.g. "Dr Smith" or "Joanne") for correspondence:

Miss Sun

7. * Named contact email.

Give the electronic mail address of the named contact.

719484238@qq.com

8. Named contact address

Give the full postal address for the named contact.

NO.2, Yabao street, Capital Institute of Pediatrics, Beijing, China

9. Named contact phone number.

Give the telephone number for the named contact, including international dialling code.

008618813019657

10. * Organisational affiliation of the review.

Full title of the organisational affiliations for this review and website address if available. This field may be completed as 'None' if the review is not affiliated to any organisation.

Peking Union Medical College Hospital, Chinese Academy of Medical Sciences and Peking Union Medical College

Organisation web address:
11. * Review team members and their organisational affiliations.*

Give the personal details and the organisational affiliations of each member of the review team. Affiliation refers to groups or organisations to which review team members belong. **NOTE:** email and country are now mandatory fields for each person.

Miss Rui Sun. Peking Union Medical College Hospital, Chinese Academy of Medical Sciences and Peking Union Medical College

Dr Mengqing Sun. Peking Union Medical College Hospital

Professor Xianlin Han. Peking Union Medical College Hospital

12. * Funding sources/sponsors.*

Give details of the individuals, organizations, groups or other legal entities who take responsibility for initiating, managing, sponsoring and/or financing the review. Include any unique identification numbers assigned to the review by the individuals or bodies listed.

None

Grant number(s)

13. * Conflicts of interest.*

List any conditions that could lead to actual or perceived undue influence on judgements concerning the main topic investigated in the review.

None

14. Collaborators.

Give the name and affiliation of any individuals or organisations who are working on the review but who are not listed as review team members. **NOTE:** email and country are now mandatory fields for each person.

15. * Review question.*

State the question(s) to be addressed by the review, clearly and precisely. Review questions may be specific or broad. It may be appropriate to break very broad questions down into a series of related more specific questions. Questions may be framed or refined using PI(E)COS where relevant.

How does laparoscopic and robotic surgery impact on perioperative outcome and survival of pancreatic cancer compared to open excision?

16. * Searches.*

State the sources that will be searched. Give the search dates, and any restrictions (e.g. language or publication period). Do NOT enter the full search strategy (it may be provided as a link or attachment.)

We will search databases, including PubMed, Embase, WOS, Cochrane, and clinical trials from 1995 to September 2019. Language is not limited.

17. URL to search strategy.

Give a link to a published pdf/word document detailing either the search strategy or an example of a search strategy for a specific database if available (including the keywords that will be used in the search strategies), or upload your search strategy. Do NOT provide links to your search results.
Alternatively, upload your search strategy to CRD in pdf format. Please note that by doing so you are consenting to the file being made publicly accessible. Do not make this file publicly available until the review is complete.

18. * Condition or domain being studied.
Give a short description of the disease, condition or healthcare domain being studied. This could include health and wellbeing outcomes.
With 279,000 new diagnoses each year worldwide, pancreatic carcinoma is the 4th leading cause of cancer-related deaths in the western world. With its rapidly increasing incidence, it should become the second cause of cancer mortality after 2030. Pancreatic carcinoma remains a dismal prognosis and surgery is the only chance for cure. There was a tremendous development of minimally invasive laparoscopic and robotic techniques in the last years and those were also implemented in pancreatic surgery. While advantages of minimally invasive techniques in terms of hospital stay and blood loss could be shown, it is debatable if those techniques are adequate concerning oncologic outcome.

19. * Participants/population.
Give summary criteria for the participants or populations being studied by the review. The preferred format includes details of both inclusion and exclusion criteria.
Inclusion: adults with pancreatic cancer and undergoing pancreaticoduodenectomies
Exclusion: children, and adults with pancreatic using no-invasive treatment

20. * Intervention(s), exposure(s).
Give full and clear descriptions or definitions of the nature of the interventions or the exposures to be reviewed.
Pancreatectoduodenectomy, including open, laparoscopic, and robotic excision.

21. * Comparator(s)/control.
Where relevant, give details of the alternatives against which the main subject/topic of the review will be compared (e.g. another intervention or a non-exposed control group). The preferred format includes details of both inclusion and exclusion criteria.
Minimally invasive pancreatoduodenectomy (including laparoscopic and robotic surgery) vs open pancreatoduodenectomy

22. * Types of study to be included.
Give details of the types of study (study designs) eligible for inclusion in the review. If there are no restrictions on the types of study design eligible for inclusion, or certain study types are excluded, this should be stated. The preferred format includes details of both inclusion and exclusion criteria.
We will include observational studies (including cohort and case–control studies) to assess the perioperative and oncological outcomes of minimally invasive pancreatoduodenectomy compared with open excision.

23. Context.
Give summary details of the setting and other relevant characteristics which help define the inclusion or exclusion criteria.
24. *Main outcome(s)*.

Give the pre-specified main (most important) outcomes of the review, including details of how the outcome is defined and measured and when these measurement are made, if these are part of the review inclusion criteria.

Operative time, intraoperative bleeding loss, time of oral intake, hospital stay, postoperative complications, mortality of postoperative within 30-days, 2-year survival, local recurrence, and distant metastasis.

* Measures of effect

Please specify the effect measure(s) for you main outcome(s) e.g. relative risks, odds ratios, risk difference, and/or 'number needed to treat.

Perioperative time and following period.

25. *Additional outcome(s)*.

List the pre-specified additional outcomes of the review, with a similar level of detail to that required for main outcomes. Where there are no additional outcomes please state 'None' or 'Not applicable' as appropriate to the review

None

* Measures of effect

Please specify the effect measure(s) for you additional outcome(s) e.g. relative risks, odds ratios, risk difference, and/or 'number needed to treat.

Not applicable

26. *Data extraction (selection and coding)*.

Describe how studies will be selected for inclusion. State what data will be extracted or obtained. State how this will be done and recorded.

Two investigators (Rui Sun and Mengqing Sun) independently assessed selected studies according to NOS and extracted the following information: first author, year of publication, study type, mean age, number of population, and main outcomes of interest (operative time, intraoperative bleeding loss, time of oral intake, hospital stay, postoperative complications, mortality of postoperative within 30-days, 2-year survival, local recurrence, and distant metastasis, etc.). We use Excel to record the results. We use the Review manager 5.3 to conduct the study.

27. *Risk of bias (quality) assessment*

Describe the method of assessing risk of bias or quality assessment. State which characteristics of the studies will be assessed and any formal risk of bias tools that will be used.

We will use NOS to assess the quality and bias of the involved studies.

28. *Strategy for data synthesis*.

Provide details of the planned synthesis including a rationale for the methods selected. This must not be generic text but should be specific to your review and describe how the proposed analysis will be applied to your data.
We will provide a narrative synthesis of the findings from the included studies, structured around the type of intervention, target population characteristics, type of outcome and intervention content. Statistical analysis of dichotomous variables was performed using the relative risk (RR) as the summary statistic, while continuous variables were analyzed using the weighted mean difference (MD). For both variables, 95% confidence intervals (CI) were reported. Heterogeneity was assessed using the $I^2$ statistic.

29. * Analysis of subgroups or subsets.
State any planned investigation of ‘subgroups’. Be clear and specific about which type of study or participant will be included in each group or covariate investigated. State the planned analytic approach. This is a qualitative synthesis and while subgroup analyses may be undertaken it is not possible to specify the groups in advance.

30. * Type and method of review.
Select the type of review and the review method from the lists below. Select the health area(s) of interest for your review.

Type of review
Cost effectiveness
No
Diagnostic
No
Epidemiologic
No
Individual patient data (IPD) meta-analysis
No
Intervention
No
Meta-analysis
Yes
Methodology
No
Narrative synthesis
No
Network meta-analysis
No
Pre-clinical
No
Prevention
No
Prognostic
No
Prospective meta-analysis (PMA)
No
Review of reviews
No
Service delivery
No
Synthesis of qualitative studies
| Health area of the review | Yes/No |
|---------------------------|--------|
| Alcohol/substance misuse/abuse | No     |
| Blood and immune system    | No     |
| Cancer                     | Yes    |
| Cardiovascular             | No     |
| Care of the elderly        | No     |
| Child health               | No     |
| Complementary therapies    | No     |
| Crime and justice          | No     |
| Dental                     | No     |
| Digestive system           | No     |
| Ear, nose and throat       | No     |
| Education                  | No     |
| Endocrine and metabolic disorders | No |
| Eye disorders              | No     |
| General interest           | No     |
| Genetics                   | No     |
| Health inequalities/health equity | No |
| Infections and infestations | No   |
| International development  | No     |
| Mental health and behavioural conditions | No |
| Musculoskeletal            | No     |
| Neurological               | Yes    |
31. Language.
Select each language individually to add it to the list below, use the bin icon to remove any added in error.

- English
There is an English language summary.

32. * Country.
Select the country in which the review is being carried out from the drop down list. For multi-national collaborations select all the countries involved.

- China
33. Other registration details.

Give the name of any organisation where the systematic review title or protocol is registered (such as with The Campbell Collaboration, or The Joanna Briggs Institute) together with any unique identification number assigned. (N.B. Registration details for Cochrane protocols will be automatically entered). If extracted data will be stored and made available through a repository such as the Systematic Review Data Repository (SRDR), details and a link should be included here. If none, leave blank.

34. Reference and/or URL for published protocol.

Give the citation and link for the published protocol, if there is one

Give the link to the published protocol.

Alternatively, upload your published protocol to CRD in pdf format. Please note that by doing so you are consenting to the file being made publicly accessible.

No I do not make this file publicly available until the review is complete

Please note that the information required in the PROSPERO registration form must be completed in full even if access to a protocol is given.

35. Dissemination plans.

Give brief details of plans for communicating essential messages from the review to the appropriate audiences.

We will submit to a leading journal in this field

Do you intend to publish the review on completion?

Yes

36. Keywords.

Give words or phrases that best describe the review. Separate keywords with a semicolon or new line. Keywords will help users find the review in the Register (the words do not appear in the public record but are included in searches). Be as specific and precise as possible. Avoid acronyms and abbreviations unless these are in wide use.

Laparoscopic pancreaticoduodenectomy, Whipple procedure, robotic pancreaticoduodenectomy, perioperative outcome, Oncologic outcome, open

37. Details of any existing review of the same topic by the same authors.

Give details of earlier versions of the systematic review if an update of an existing review is being registered, including full bibliographic reference if possible.

38. * Current review status.

Review status should be updated when the review is completed and when it is published. For new registrations the review must be Ongoing.

Please provide anticipated publication date

Review_Ongoing

39. Any additional information.

Provide any other information the review team feel is relevant to the registration of the review.
40. Details of final report/publication(s).

This field should be left empty until details of the completed review are available.

Give the link to the published review.