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Restrictive versus liberal red blood cell transfusion strategies for people with haematological malignancies treated with intensive chemotherapy or radiotherapy, or both, with or without haematopoietic stem cell support

Information

DOI:

https://doi.org/10.1002/14651858.CD011305.pub3 Copy DOI Check for updates

Database:

Cochrane Database of Systematic Reviews

Version published:

23 May 2024 see what's new

Type:

Intervention

Stage:

Review

Cochrane Editorial Group:

Cochrane Haematology Group

Article metrics

Altmetric:

Cited by:

Cited 0 times via Crossref Cited-by Linking

Authors

Michael Radford

Correspondence to: McMaster Centre for Transfusion Research, McMaster University, Hamilton, Canada

mike.radford@medportal.ca

Department of Oncology, Hamilton Health Sciences Centre, Hamilton, Canada

More by this author on the Cochrane Library

Lise J Estcourt

Haematology/Transfusion Medicine, NHS Blood and Transplant, Oxford, UK

Nuffield Department of Clinical Laboratory Sciences, University of Oxford, Oxford, UK

More by this author on the Cochrane Library

Emily Sirotich

Medicine, Yale School of Medicine, New Haven, USA

More by this author on the Cochrane Library

Tyler Pitre

Medicine, University of Toronto, Toronto, Canada

More by this author on the Cochrane Library

Joanne Britto

Oncology, Hamilton Health Sciences Centre, Hamilton, Canada

More by this author on the Cochrane Library

Megan Watson

Medicine, University of Toronto, Toronto, Canada

More by this author on the Cochrane Library

Susan J Brunskill

Nuffield Department of Clinical Laboratory Sciences, University of Oxford, Oxford, UK
Systematic Review Initiative, NHS Blood and Transplant, Oxford, UK
More by this author on the Cochrane Library

Dean A Fergusson

Clinical Epidemiology Program, Ottawa Hospital Research Institute, Ottawa, Canada
More by this author on the Cochrane Library

Carolyn Dorée

Nuffield Department of Clinical Laboratory Sciences, University of Oxford, Oxford, UK
Systematic Review Initiative, NHS Blood and Transplant, Oxford, UK
More by this author on the Cochrane Library

Donald M Arnold

Division of Hematology and Thromboembolism, Department of Medicine, McMaster University, Ontario, Canada
McMaster University, Hamilton, Canada
More by this author on the Cochrane Library

Contributions of authors

Mike Radford is a content advisor for this review and has contributed to the protocol development, selection of studies, eligibility and certainty assessment, data extraction and analysis.

Lise Estcourt is a content and methodological advisor for this review and has contributed to the protocol development, selection of studies and eligibility and data analysis.

Susan Brunskill is a content and methodological advisor for this review and has contributed to the protocol development and writing of the review manuscript.

Megan Watson is a content advisor for this review and has contributed to the study selection, eligibility and data extraction.

Tyler Pitre is a content advisor for this review and has contributed to the certainty assessment.

Donald Arnold is a content advisor for this review and has contributed to the protocol development and data analysis.

Joanne Britto is a content advisor for the review and has contributed to the study selection, data extraction, eligibility and certainty assessment.

Emilie Sirotich is a content advisor for this review and has contributed to the protocol development, and certainty assessment.

Carolyn Doree is an information specialist and has written and run all the search strategies for this review, and did an early screening of the search results.

Dean Fergusson is a content advisor for this review and has contributed to the review in this capacity.

Sources of support

Internal sources

- NHS Blood and Transplant, UK

  Research and Development

External sources

- No Sources of Support Supplied, Other

  No Sources of Support Supplied

Declarations of interest

Michael Radford: None to declare.

Lise Estcourt - Coordinating editor of Cochrane Haematology (author was not involved in the editorial process of this review).

Susan Brunskill - None to declare.

Megan Watson - None to declare.

Donald Arnold - None to declare.

Joanne Britto - None to declare.

Emilie Sirotich - Board membership: COVID-19 Global Rheumatology Alliance, Canadian Arthritis Patient Alliance. Funding: CIHR, American College of Rheumatology, PDSA

Carolyn Doree - None to declare.

Dean Ferguson - Primary investigator of Tay 2020.

Tyler Pitre - None to declare.

Acknowledgements

Editorial and peer-reviewer contributions

The following people conducted the editorial process for this article:

• Sign-off Editor (final editorial decision): Nicole Skoetz, University of Cologne and University Hospital Cologne, Germany

• Managing Editor (selected peer reviewers, provided editorial guidance to authors, edited the article): Sam Hinsley, Leticia Rodrigues, Cochrane Central Editorial Service

• Editorial Assistant (conducted editorial policy checks, collated peer-reviewer comments and supported editorial team): Leticia Rodrigues, Cochrane Central Editorial Service

• Copy Editor (copy editing and production): Anne Lethaby, Cochrane Production Service

• Peer-reviewers (provided comments and recommended an editorial decision): Nuala Livingstone, Cochrane Evidence Production and Methods Directorate (methods), Irma Klerings, Cochrane Austria, Cochrane Public Health, Department for Evidence-based Medicine and Evaluation, University for Continuing Education Krems, Austria (search), Dr. Markus M. Mueller, M.D.; Institute for Transfusion Medicine and Immunohaematology, German Red Cross Blood Transfusion Service Baden-Wuerttemberg-Hessen (NFPO); Sandhofstrasse 1; 60528 Frankfurt/Main; Germany (clinical), and Neil Blumberg MD University of Rochester (clinical).

We thank the review authors involved in the initial primary review: Reem Malouf, Marialena Trivella, Sally Hopewell, and Michael Murphy. We also thank all authors involved in the initial protocol development.

Version history

Published	Title	Stage	Authors	Version
2024 May 23 Show revisions	Restrictive versus liberal red blood cell transfusion strategies for people with haematological malignancies treated with intensive chemotherapy or radiotherapy, or both, with or without haematopoietic stem cell support	Review	Michael Radford, Lise J Estcourt, Emily Sirotich, Tyler Pitre, Joanne Britto, Megan Watson, Susan J Brunskill, Dean A Fergusson, Carolyn Dorée, Donald M Arnold	**https://doi.org/10.1002/14651858.CD011305.pub3**

Published	Title	Stage	Authors	Version
2017 Jan 27 Show revisions	Restrictive versus liberal red blood cell transfusion strategies for people with haematological malignancies treated with intensive chemotherapy or radiotherapy, or both, with or without haematopoietic stem cell support	Review	Lise J Estcourt, Reem Malouf, Marialena Trivella, Dean A Fergusson, Sally Hopewell, Michael F Murphy	**https://doi.org/10.1002/14651858.CD011305.pub2**
2014 Sep 30 Show revisions	Restrictive versus liberal red blood cell transfusion strategies for patients with haematological malignancies treated with intensive chemotherapy or radiotherapy, or both, with or without haematopoietic stem cell support	Protocol	Caroline Butler, Jason Tay, Carolyn Doree, Susan J Brunskill, Marialena Trivella, Dean A Fergusson, Alan Tinmouth, Michael F Murphy	**https://doi.org/10.1002/14651858.CD011305**

Differences between protocol and review

Changes from previous versions of this review: There were a few differences between the protocol (Butler 2014), the 2017 version (Estcourt 2017) and this version of the review, often due to lack of data. Due to changes in standards for Cochrane systematic reviews, risk of bias in this review used ROB 2.0 and ROBINS-I tools for outcome-based assessments in RCTs and NRSs respectively, which differed from previous reviews. Separate ROB figures are no longer recommended and are not included in this update. Peto ORs are used for outcomes of < 1% compared to the previous cut-off of < 5%. Random-effects models were used for all analyses.

Publication bias: Similar to the previous review, we did not perform a formal assessment of potential publication bias (small-trial bias) because we included fewer than 10 trials within this review (Sterne 2016).

Review outcome and reporting results: The outcome veno-occlusive (VOD) disease was not a pre-planned outcome in the protocol. Due to the frequency of VOD events in the liberal transfusion arm in Robitaille 2013, resulting in early termination of the paediatric trial, the review group considered that it was an important outcome to include. Mortality (undefined time) was not reported/analysed, as timing of all participant deaths were provided for all included trials. A time point of 0 to 3 months, aside from mortality (where time points were already prespecified), was added. This did not change the results of any outcomes as the included study follow-up time points were all within these time points already for the purpose of adding context and clarity to the outcomes.

Subgroup analyses: Similar to the previous review, we could not perform any of the subgroup analyses that we initially planned due to absence of data.

Metaregression: Similar to the previous review, this was not possible as this technique is advised only for subgroups that contain more than 10 studies (Deeks 2021).

Sensitivity analyses: Sensitivity analyses for single-centre versus multicentre settings were completed for a few select analyses that contained a sufficient number of included trials. For most of the analyses, sensitivity analysis was not possible as we were only able to combine relevant data extracted from seven included studies in very few meta-

analyses, including three or fewer studies as well as trials which were monocentric.

Summary of findings: We listed the seven most important patient-relevant outcomes for the comparison of the two transfusion strategies. With the early termination of Robitaille 2013, limited evidence was provided that negatively impacted GRADE due to indirectness. As a result, we decided to remove Robitaille 2013 from the summary of findings table.

Keywords

MeSH

Medical Subject Headings (MeSH) Keywords

Acute Disease;

Anemia [blood, etiology, *therapy];

Erythrocyte Transfusion [adverse effects, *methods];

Hematologic Neoplasms [blood, *drug therapy, *radiotherapy];

Hematopoietic Stem Cell Transplantation;

Hemoglobin A [analysis];

Leukemia [blood, drug therapy, radiotherapy];

Prospective Studies;

Quality of Life;

Randomized Controlled Trials as Topic;

Medical Subject Headings Check Words

Adult;

Child;

Humans;

PICOs

Population (16)	Intervention (1)	Comparison (1)	Outcome (1)
Child, Preschool 2-5 years	Red Blood Cell Transfusion	Red Blood Cell Transfusion	Death
Aged 80 and over 80+ years			
Child 6-12 years			
Infant 1 to 23 mo			

Myelodysplasia			
Radiotherapy			
Aged 65-79 years			
Adolescent 13-18 years			
Adult 19-44 years			
Chemotherapy			
Middle Aged 45-64 years			
Blood Transfusion			
Acute Leukemia			
Young Adult 19-24 years			
Myelosuppression			
Hematological Malignancy			

The PICO model is widely used and taught in evidence-based health care as a strategy for formulating questions and search strategies and for characterizing clinical studies or meta-analyses. PICO stands for four different potential components of a clinical question: Patient, Population or Problem; Intervention; Comparison; Outcome.

See more on using PICO in the **Cochrane Handbook**.