Living systematic reviews: what, why, when and how?

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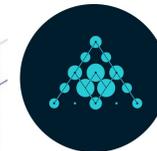April 2025

Overview

- Background

- What is a living systematic review (LSR)

- When to conduct an LSR

- How to conduct an LSR
  - Planning
  - Core / LSR specific methods

- Practical tips

- Resources
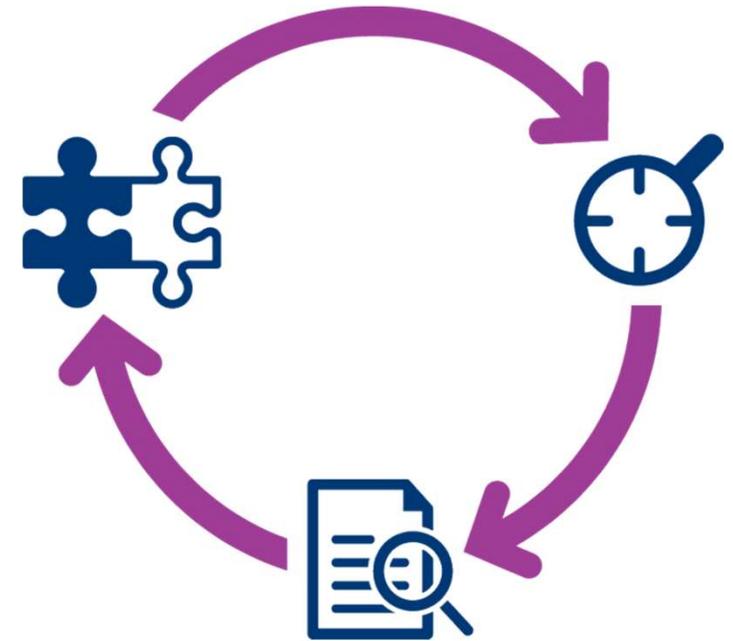
Background

- Systematic reviews highest level of evidence to inform evidence-based decision making

- Aim to adopt high quality methods and incorporate most recent evidence

- Systematic reviews take years to produce and publish, infrequently updated

- Can be out of date on publication

- **Challenge: how to retain high methodological quality and currency of systematic reviews?**

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What is a living systematic review?

"A systematic review that is continually updated, incorporating relevant new evidence as it becomes available."

"In practice, this means continual surveillance for new research evidence through ongoing or frequent searches and the inclusion of relevant new information into the review in a timely manner so that the findings of the systematic review remain current"

Elliott JH, et al. Living Systematic Review Network. Living systematic review: 1. Introduction-the why, what, when, and how. J Clin Epidemiol. 2017 Nov;91:23-30
https://www.vectorstock.com

Features of a living systematic review

✓ Can be applied to any review type (e.g. RCTs, qualitative)

✓ New reviews or existing reviews

✓ Retains all core systematic review methods

✓ Addition of LSR-specific methods, pre-specified at protocol stage

✓ Continual evidence surveillance / synthesis frequency is explicit, stated *a priori*

✓ LSR commences with a protocol and / or standard 'baseline' review

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LSR verses standard SRs?

	Living systematic review	Standard systematic review
Explicit, pre-defined methods describing search frequency	✓	x
Explicit, pre-defined methods describing when new evidence is incorporated into the review	✓	x
Continual evidence surveillance	✓	x
New evidence is immediately flagged for reader or incorporated into the review	✓	x
Core SR methods (e.g. screening, data extraction, risk of bias, GRADE)	✓	✓

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https://community.cochrane.org/sites/default/files/uploads/inline-files/Transform/201912_LSR_Revised_Guidance.pdf

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When should you conduct an LSR?

Key criteria to consider whether an LSR appropriate

1. Is the review question a priority for decision making?
2. Is the certainty in the existing evidence low or very low?
3. Is there is likely to be new research evidence?
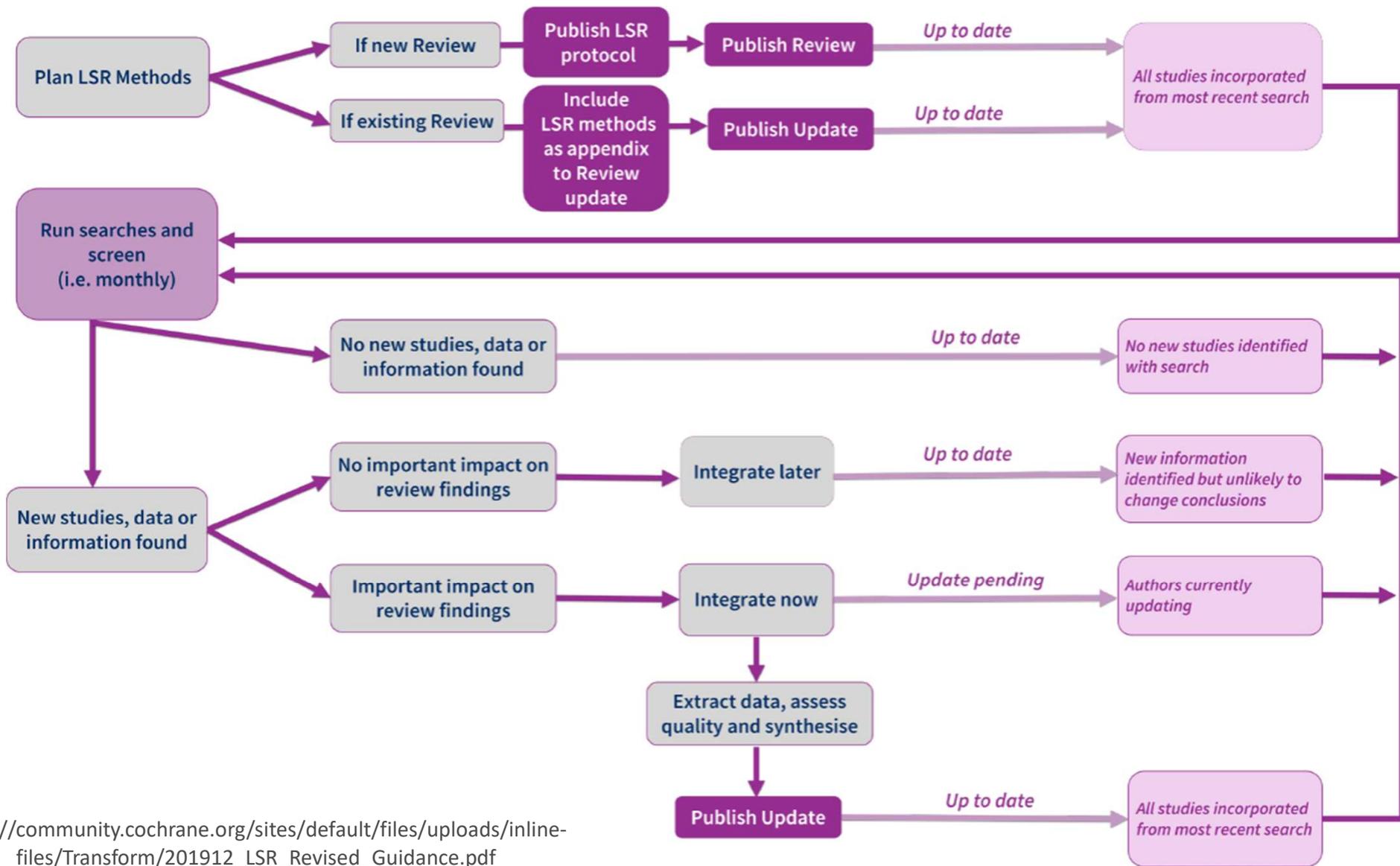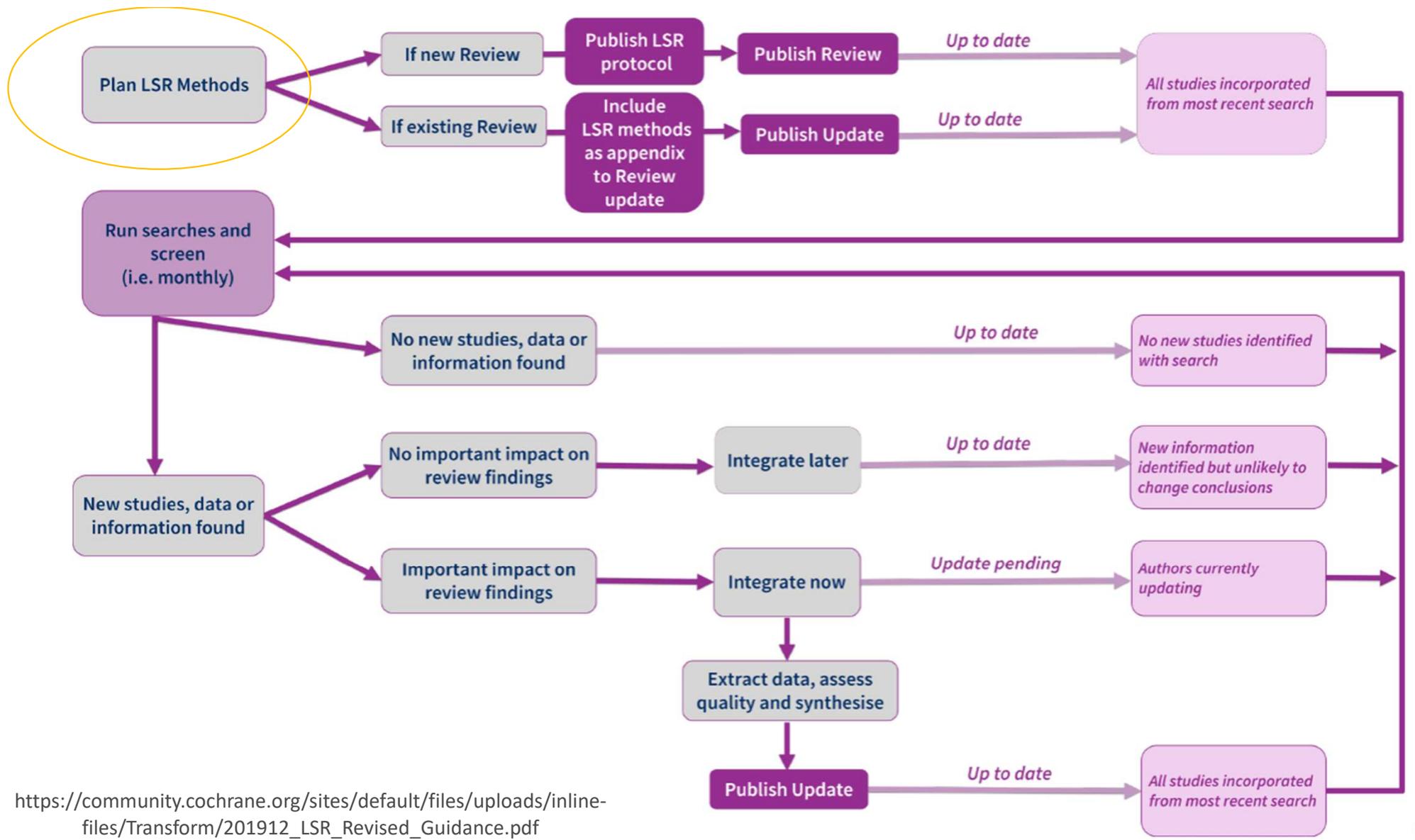4. **Feasible? Author (and editorial) capacity for an LSR?**

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How to conduct an LSR

Plan LSR Methods → If new Review → Publish LSR protocol → Publish Review → *Up to date* → *All studies incorporated from most recent search*

Plan LSR Methods → If existing Review → Include LSR methods as appendix to Review update → Publish Update → *Up to date* → *All studies incorporated from most recent search*

Run searches and screen (i.e. monthly)

No new studies, data or information found → *Up to date* → *No new studies identified with search*

New studies, data or information found → No important impact on review findings → Integrate later → *Up to date* → *New information identified but unlikely to change conclusions*

New studies, data or information found → Important impact on review findings → Integrate now → *Update pending* → *Authors currently updating*

Integrate now → Extract data, assess quality and synthesise → Publish Update → *Up to date* → *All studies incorporated from most recent search*

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Planning an LSR

Develop an LSR protocol

- Living document in public domain
- Core method considerations
  - Searching/screening for new evidence – frequency?
  - Incorporating new evidence – frequency?
- LSR-specific methods
  - Review status between updates – communicated how?
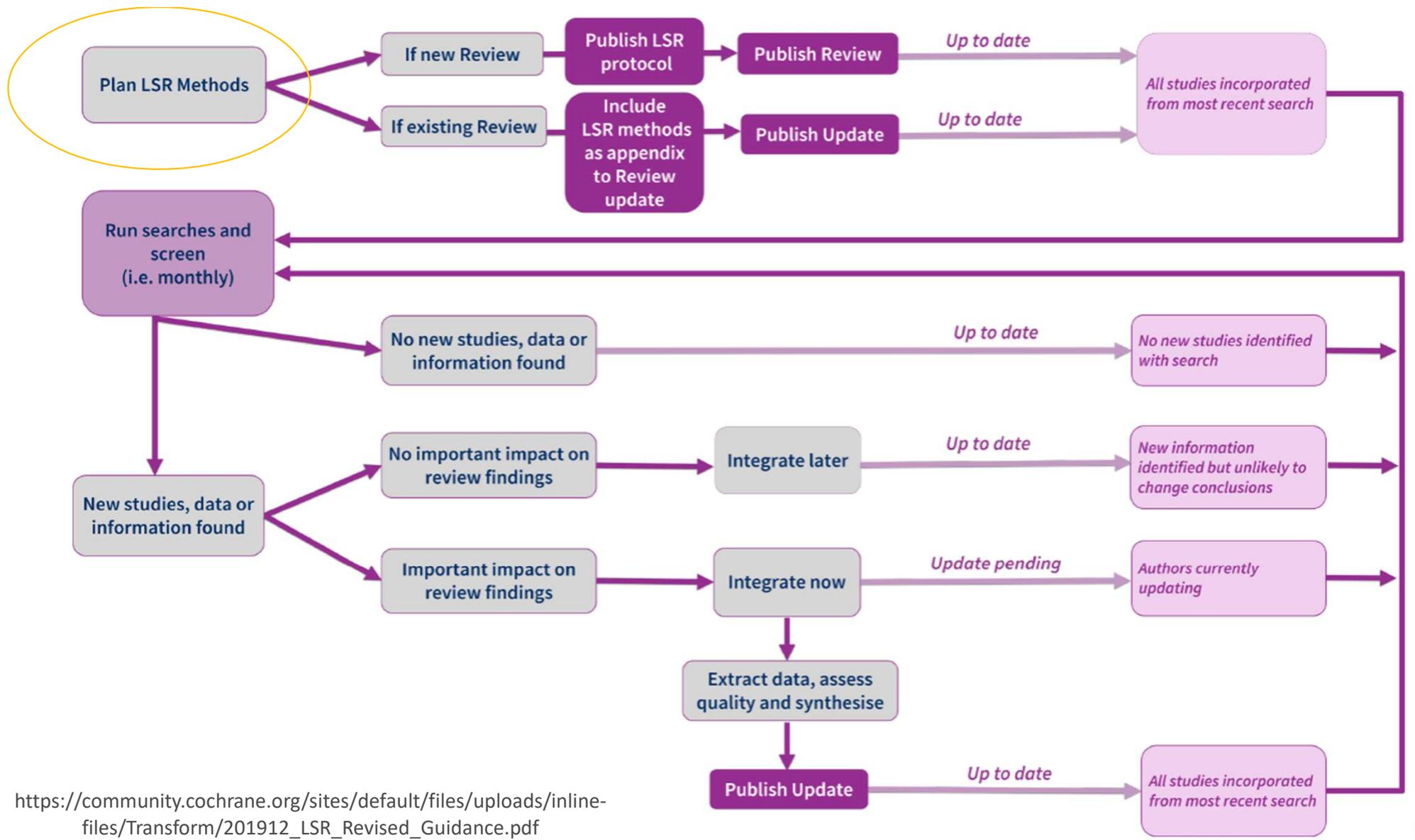 - Review of LSR and other methods – when?

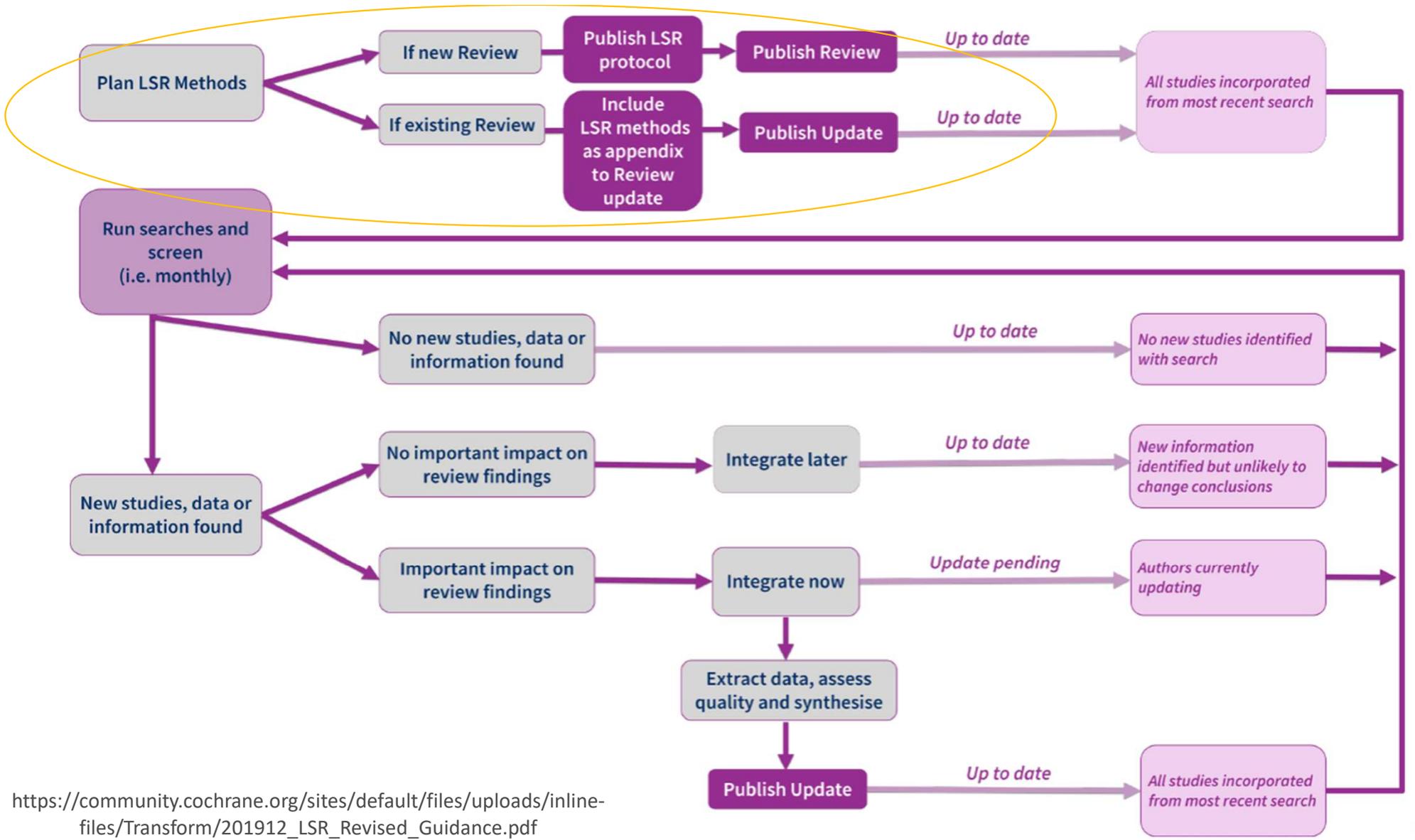Editorial team endorsement for LSR approach
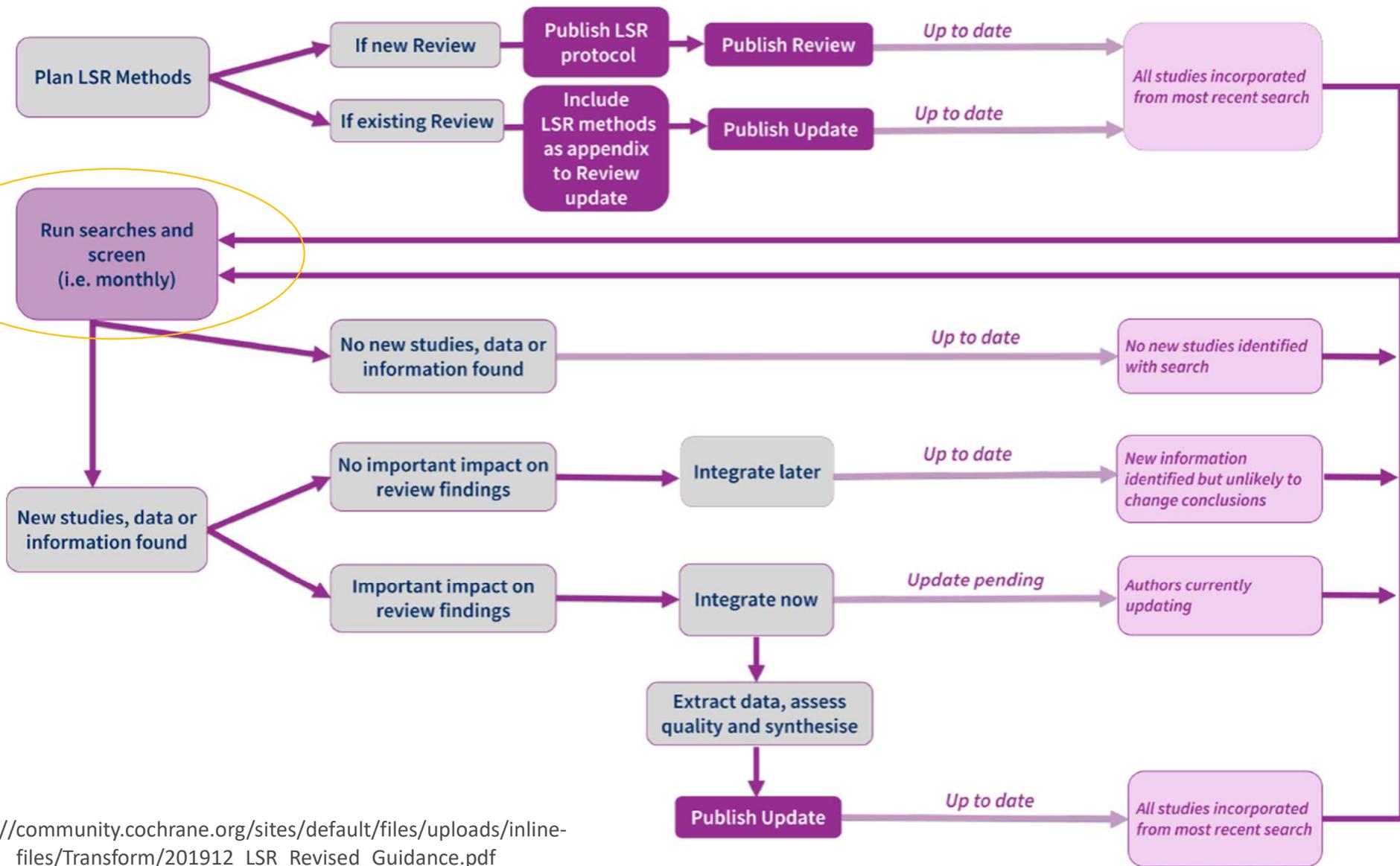
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Extract data, assess quality and synthesise

Publish Update → *Up to date* → *All studies incorporated from most recent search*

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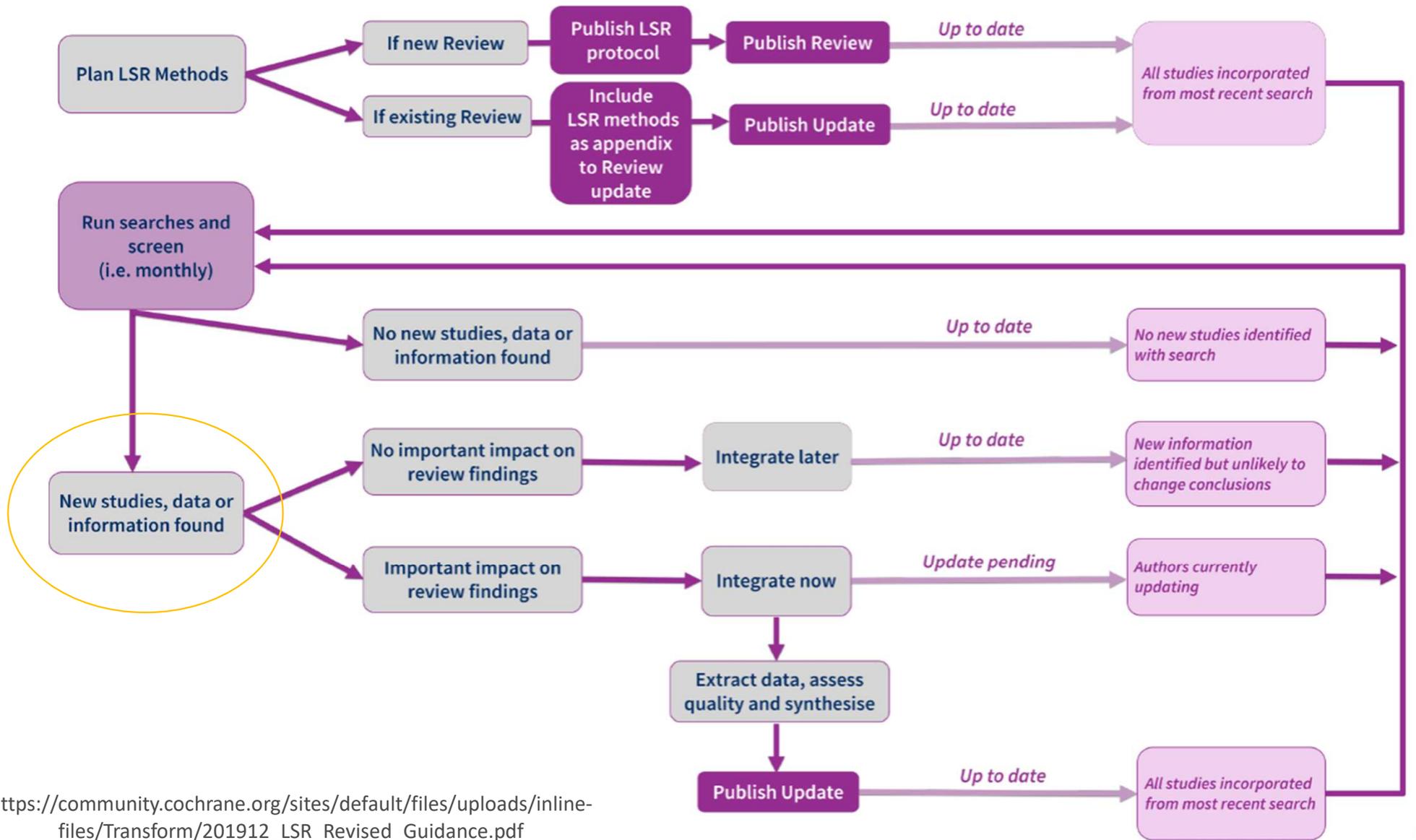
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Searching and evidence surveillance

- Decide on search frequency
  - Fixed / pre-specified interval or response to predefined triggers
  - Matched to pace of new research - minimum every 3 months
  - Can change over life of LSR
  - Database frequency can be different to other sources
- Revision of search methods
  - To identify contribution of individual databases/sources
  - Optimal frequency of searching each source
  - Annual review of search strategy terms
- Management of ongoing searches
  - All reference libraries for duplicates, linking
  - Auto alerts

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Selecting studies

- Follow same core methods as standard reviews…except….
    - Pre-determined frequency, usually aligned to search frequency
- LSR-specific considerations
    - Linking new reports of included studies
        - Trial registries, protocols → full report of results
    - Adoption of automation software and tools
        - Classifiers e.g. 'RCT classifier'
        - Citizen science e.g. Cochrane Crowd
        - Workflows e.g. Screen4Me
        - Review-specific supervised machine learning classifiers

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      │
      └──► Extract data, assess quality and synthesise
            │
            └──► Publish Update ──Up to date──► All studies incorporated from most recent search

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Incorporating new evidence

Follow same core methods as standard reviews...except...

- When to incorporate evidence?
  - Pre-specified interval schedule
  - When new evidence identified substantively impacts conclusions
- What is a *'substantive impact on conclusions'* ?
  - Apply formal statistics e.g. re-run data analysis
  - Pre-specification of type/degree of change
    - e.g. magnitude of change in effect size or precision
  - Other considerations
    - change in direction of effect, certainty of effect (GRADE)
    - new unreported interventions, populations, service adverse events or other clinically meaningful findings

Plan LSR Methods
- If new Review → **Publish LSR protocol** → **Publish Review** → *Up to date* → *All studies incorporated from most recent search*
- If existing Review → **Include LSR methods as appendix to Review update** → **Publish Update** → *Up to date* →

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LSR reporting requirements

- Must describe core methods (PRISMA) plus LSR specific methods

RESEARCH METHODS AND REPORTING

OPEN ACCESS

Check for updates

Extension of the PRISMA 2020 statement for living systematic reviews (PRISMA-LSR): checklist and explanation

Elie A Akl,[1,2] Joanne Khabsa,[3] Claire Iannizzi,[4] Vanessa Piechotta,[5] Lara A Kahale,[6] James M Barker,[7] Joanne E McKenzie,[8] Matthew J Page,[8] Nicole Skoetz[4]; on behalf of the PRISMA-LSR Group

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LSR publishing & status between updates

Publishing

- LSRs can challenge journal workflows

- Cochrane developed adapted editorial and publication workflow

Status between updates

- Essential LSR information shared between updates
  - Status and new studies that have been identified
  - Cochrane 'What's new' platform

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Periodic review of LSR methods

Following 12 months in living mode...

- Does the review still meet LSR criteria?
    - Are all review question **still** a priority for decision making?
    - Is the certainty in the existing evidence **still** low or very low?
    - Is there **still** likely to be new research evidence?
    - Is there sufficient resource and capacity to continue in living mode?
        - ➢ If no, living mode should cease
- Appropriateness of methods
    - Core methods
    - LSR-specific methods

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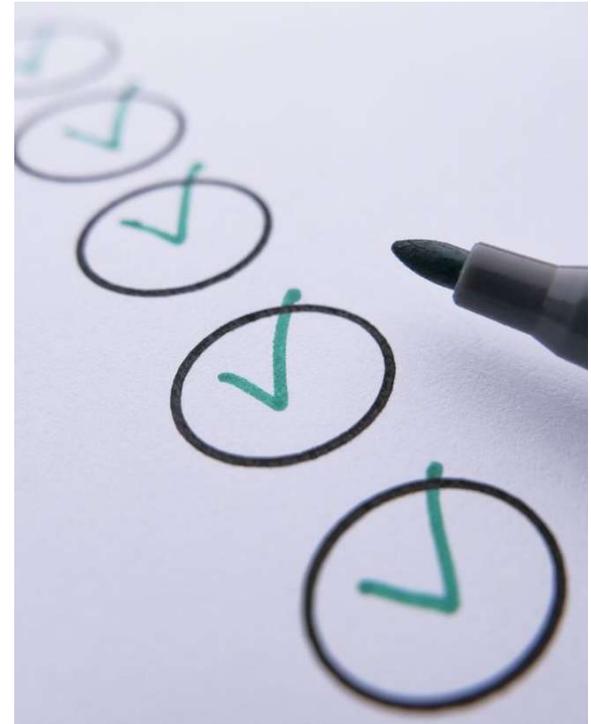
Transitioning out of living mode

Triggers for transitioning LSRs out of living mode

- No longer a priority for decision makers
- Level of certainty not likely to be impacted by new research
- No new research emerging
- Ongoing funding for LSR no longer available

Next steps?

- Authors and editorial team consultation
- Ideally one final update – new evidence, remove LSR methods

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Practical tips

- LSR planning
  - Author team with commitment, capacity and expertise
  - Partner with information specialists and other experts
  - Adopt tested SR tech enablers and automation tools
  - Access LSR support and resources
- LSR management and sustainability
  - Tight management / leadership of tasks to timelines
  - Systematic record management processes over time
  - Ongoing funding support
  - Maintaining author team

Systema

RESEARCH

Feasibility and acceptability of living systematic reviews: results from a mixed-methods evaluation

Tanya Millard, Anneliese Synnot, Julian Elliott, Sally Green, Steve McDonald and Tari Turner

Cochrane Library

Cochrane Database of Systematic Reviews

Interventions for increasing fruit and vegetable consumption in children aged five years and under (Review)

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LSR tools and resources

- Cochrane LSR guidelines

- LSR series in Journal of Clinical epidemiology
  1. Introduction: why, what, when and how
  2. Combining human and machine effort
  3. Statistical methods for updating meta-analyses
  4. Living guideline recommendations

- Cochrane Community LSR website
  - Report of Cochrane's evaluation of pilot LSRs
  - Cochrane Learning Live Webinars on LSRs
  - Webinars (e.g. tech enablers for living evidence)

➢ *(WATCH THIS SPACE) Cochrane Handbook LSR Chapter*

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Guidance for the production and publication of Cochrane living systematic reviews: Cochrane Reviews in living mode

Version December 2019

ELSEVIER   CrossMark   Journal of Clinical Epidemiology

Journal of Clinical Epidemiology 91 (2017) 23—30

SERIES: LIVING SYSTEMATIC REVIEWS

Living systematic review: 1. Introduction—the why, what, when, and how

Julian H. Elliott[a,b,*], Anneliese Synnot[a,c], Tari Turner[a], Mark Simmonds[d], Elie A. Akl[e,f,g], Steve McDonald[a], Georgia Salanti[h], Joerg Meerpohl[i], Harriet MacLehose[j], John Hilton[j], David Tovey[j], Ian Shemilt[k], James Thomas[k], on behalf of the Living Systematic Review Network

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Living systematic reviews
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- Living systematic reviews

News

Participate in living evidence study

The revised *Guidance for the production and publication of Cochrane living systematic* has been released

Tech enablers for systematic reviews

References and other resources

Living evidence series

- Elliott JH et al. Living systematic review: 1. Introduction-the why, what, when, and how. JClin Epidemiol. 2017 Nov;91:23-30. https://pubmed.ncbi.nlm.nih.gov/28912002/
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- Project Transform: https://community.cochrane.org/help/tools-and-software/project-transform

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Questions?

**Living systematic reviews:
What, why, when and how**

Dr Rebecca K Hodder
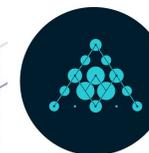Professor Tari Turner

Rebecca.Hodder@health.nsw.gov.au