

Systematic Reviews

Leon S. McGoogan Health Sciences Library

Presenters



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Outline

1. Literature Review Types (Danielle)
2. Systematic Review – Definition (Cindy)
3. Systematic Review – Process (Kim)
4. Working with the McGoogan Library (Kiara)
 - Library Policy
 - Requests
 - Delivery
5. Q&A



Objectives

By the end of this session, you will be able to:

- Identify three types of literature reviews
- Define what a systematic review is and list the steps in the systematic review process
- Locate resources that can assist you with a systematic review



1. Literature Reviews



Evidence Synthesis

A general term that captures a widening universe of methodologies; aims to reduce biases in the process of selecting studies that will be included in a review

*Uses **transparent and reproducible methods to exhaustively search** for information on a topic and select studies on a **well-defined predetermined topic***

Types of Literature Reviews

Types of Reviews	Definition	Time Commitment
Critical Review	Critically evaluated the quality; comprehensive/exhaustive search	~ 8+ months
Rapid Review	Assessment of what is known; comprehensive search, critically appraise	~ 2+ months
Mixed Methods	A combination of methods; sometimes includes a systematic review	~ 6+ months
Scoping Review	Aims to identify the nature and extent of research evidence	~ 6+ months
Systematized Review	Includes elements of a systematic review; good for post graduate assignments	~ 3+ months
Narrative	Useful for obtaining a broad perspective on a topic	~ 2+ months

<https://unmc.libguides.com/literaturereviews>

Systematic vs Scoping Reviews

Systematic Reviews	Scoping Reviews
Questions are focused; feasibility, effectiveness of a treatment or practice	Questions can be broader in scope; identify characteristics/concepts
Uncover international evidence	Identify the scope of available evidence in a given field
Confirm current practice/address variation/locate new practices	Examine how research is conducted
Identify and investigate conflicting decision	A precursor to a systematic review
Produce statements to guide decision making	To identify and analyze knowledge gaps

Both systematic and scoping reviews include exhaustive searching, aim to be transparent and reproducible, and the data is extracted and presented in a structured way.

What Review is Right for You?



Previously known as "What Review is Right for You?"

This tool is designed to provide guidance and supporting material to reviewers on methods for the conduct and reporting of knowledge synthesis.

Select the type of review:

Quantitative

Qualitative

[Click here to read our article about the development and evaluation of this tool in the Journal of Clinical Epidemiology.](#)

TREAD

Time	How much time do you have?
Resources	What resources/constraints do you have?
Expertise	What expertise do you have?
Audience	What does your audience want out of this review?
Data	How rich and available is the data?

2. Systematic Reviews (Definition)



A Systematic Review:

1. is based on a well-documented, reproducible, systematic search that seeks to identify all the available evidence on a specific topic.
2. critically appraises studies meeting inclusion criteria
3. synthesizes the findings of high quality studies to produce overall findings or recommendations.
4. adheres, ideally, to guidelines for systematic review conduct and reporting.

Defining a Systematic Review



Team



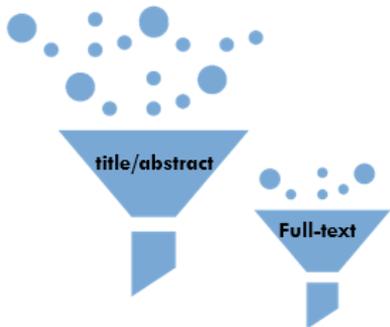
Focused research question(s)



Eligibility criteria



Comprehensive searches in 3+ sources



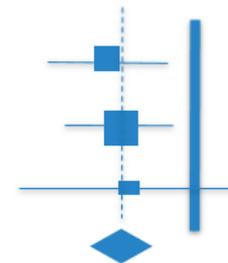
2 phases of screening, resolve conflicts after each phase



Data extraction



Quality/ Risk of Bias Assessment



Forest Plots (meta-analysis only)

Reporting Guidelines vs Manuals

Handbooks and manuals provide practical methodological guidance for undertaking a systematic review.

Reporting guidelines aid in the transparent and accurate reporting, in your manuscript for publication, the steps you performed when conducting your review.

Reporting Guidelines + Standards

A reporting guideline is a simple, structured tool for health researchers to use while writing manuscripts.

What is the purpose of a reporting standard?

- Accurately document all the steps and decisions made during the SR process
- Provide enough detail that a knowledgeable reader or researcher could reproduce the SR

PRISMA is used for systematic reviews:

<http://www.prisma-statement.org/>

PRISMA



PRISMA

TRANSPARENT REPORTING OF SYSTEMATIC REVIEWS AND META-ANALYSES

HOME

PRISMA STATEMENT

EXTENSIONS

TRANSLATIONS

PROTOCOLS

ENDORSEMENT

Welcome to the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) website!

PRISMA is an evidence-based minimum set of items for reporting in systematic reviews and meta-analyses. PRISMA focuses on the reporting of reviews evaluating randomized trials, but can also be used as a basis for reporting systematic reviews of other types of research, particularly evaluations of interventions.

Who should use PRISMA?

- Authors: PRISMA aims to help authors improve the reporting of systematic reviews and meta-analyses.
- Journal Peer reviewers and editors: PRISMA may also be useful for critical appraisal of published systematic reviews, although it is not a quality assessment instrument to gauge the quality of a systematic review.

Key Documents

- [PRISMA Checklist](#)
- [PRISMA flow diagram](#)
- [PRISMA Statement](#)
- [PRISMA E&E](#)

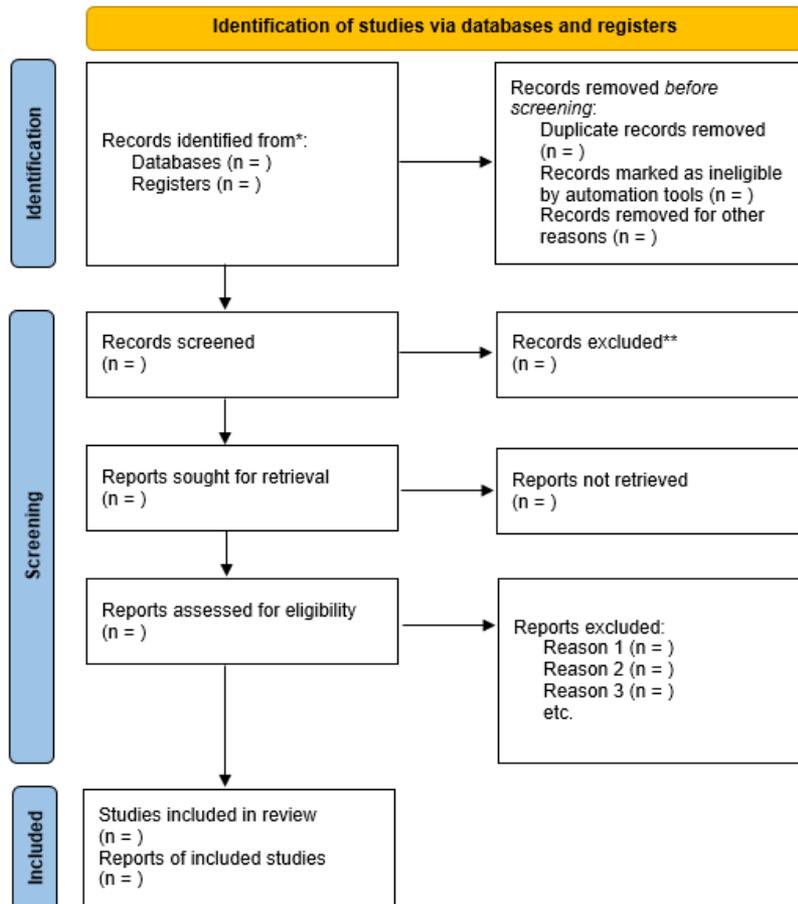


PRISMA

Section and Topic	Item #	Checklist item	Location where item is reported
TITLE			
Title	1	Identify the report as a systematic review.	
ABSTRACT			
Abstract	2	See the PRISMA 2020 for Abstracts checklist.	
INTRODUCTION			
Rationale	3	Describe the rationale for the review in the context of existing knowledge.	
Objectives	4	Provide an explicit statement of the objective(s) or question(s) the review addresses.	
METHODS			
Eligibility criteria	5	Specify the inclusion and exclusion criteria for the review and how studies were grouped for the syntheses.	
Information sources	6	Specify all databases, registers, websites, organisations, reference lists and other sources searched or consulted to identify studies. Specify the date when each source was last searched or consulted.	
Search strategy	7	Present the full search strategies for all databases, registers and websites, including any filters and limits used.	
Selection process	8	Specify the methods used to decide whether a study met the inclusion criteria of the review, including how many reviewers screened each record and each report retrieved, whether they worked independently, and if applicable, details of automation tools used in the process.	
Data collection process	9	Specify the methods used to collect data from reports, including how many reviewers collected data from each report, whether they worked independently, any processes for obtaining or confirming data from study investigators, and if applicable, details of automation tools used in the process.	
Data items	10a	List and define all outcomes for which data were sought. Specify whether all results that were compatible with each outcome domain in each study were sought (e.g. for all measures, time points, analyses), and if not, the methods used to decide which results to collect.	
	10b	List and define all other variables for which data were sought (e.g. participant and intervention characteristics, funding sources). Describe any assumptions made about any missing or unclear information.	
Study risk of bias assessment	11	Specify the methods used to assess risk of bias in the included studies, including details of the tool(s) used, how many reviewers assessed each study and whether they worked independently, and if applicable, details of automation tools used in the process.	
Effect measures	12	Specify for each outcome the effect measure(s) (e.g. risk ratio, mean difference) used in the synthesis or presentation of results.	
Synthesis methods	13a	Describe the processes used to decide which studies were eligible for each synthesis (e.g. tabulating the study intervention characteristics and comparing against the planned groups for each synthesis (item #5)).	
	13b	Describe any methods required to prepare the data for presentation or synthesis, such as handling of missing summary statistics, or data conversions.	

PRISMA

PRISMA 2020 flow diagram for new systematic reviews which included searches of databases and registers only



Other Reporting Standards + Guidelines

See the [Equator Network](#)

Other reporting standards include:

- [MOOSE](#) for Meta-analysis Of Observational Studies in Epidemiology
- Various [PRISMA Extensions](#) – including scoping reviews
- [AGREE reporting checklist](#) for clinical practice guidelines
- Methodological Expectations of Campbell Collaboration Intervention Reviews ([MECCIR](#))
- Campbell conduct and reporting standards checklists for [evidence and gap maps](#)

3. Systematic Review (Process)



Assemble Your Team

- Systematic review teams consist of at least **3 people** (2 screeners, 1 librarian) but can be larger. Systematic reviews should not be done by 1 person alone.
- Possible team members
 - Team lead
 - Screeners
 - Search specialist (librarian/information professional)
 - Statistician (recommended if you are conducting a meta-analysis with your SR)

Create your Research Question

- A well developed and answerable question is important for any systematic review.
- Use a framework to help create your question.
 - PICO(TTS)
 - SPIDER
 - SPICE

<https://unmc.libguides.com/literaturereviews/researchquestion>

Frameworks

Framework	Description	Question	Examples
<p>PICO</p> <p>P: patient/population I: Intervention C: Comparison O: Outcome</p>	<p>Most used in health professions to find information concerning prognoses, diagnoses, and therapies. Used to compare on intervention with another.</p>	<p>In adult patients undergoing third molar extractions, do antibiotics prevent complications such as postoperative infections?</p>	<p>P: adult patients undergoing third-molar extractions I: antibiotics C: no antibiotics O: postoperative complications</p>
<p>PURPOSE</p> <p>P: Population U: User R: Responsible Team P: Problem O: Outcome S: Setting E: Effort</p>	<p>Used in clinical settings for Evidence-based practice interventions intended for implementation and incorporation into clinical workflow</p>	<p>Increase PICC line duration without upper extremity DVT for hospitalized adult patients by the end of the calendar year with a nurse-led vascular access team triage using guided ultrasound.</p>	<p>P: hospitalized adults U: nurses R: vascular access team P: difficult IV access O: improve IV access rates S: general medicine units E: One year</p>
<p>SPICE</p> <p>S: Setting P: Perspective/Population I: Intervention C: Comparison E: Evaluation</p>	<p>Can be used to find literature evaluating the outcomes of a service, project, or intervention.</p>	<p>For teenagers in South Carolina, what is the effect of provision of Quit Kits to assist with giving up smoking compared to no support?</p>	<p>Settings: South Carolina Perspectives: Teenagers Intervention: Quit Kits Comparison: Cold turkey/no support Evaluation: giving up smoking with Quit Kits vs Cold Turkey/No support</p>
<p>SPIDER</p> <p>S: Sample P/I: Phenomenon of Interest D: Design E: Evaluation R: Research Type</p>	<p>Designed to structure qualitative research questions; focuses on interventions and more on study design, and samples vs populations.</p>	<p>What are the experiences of young parents who attend antenatal education classes?</p>	<p>Sample: Young Parents Phenomenon: attendance of antenatal education classes Design: Interviews Evaluation: Experiences Research Type: Qual. studies</p>

For more examples, visit the Literature Reviews Guide:

<https://unmc.libguides.com/literaturereviews/researchquestion>

Writing + Registering Your Protocol

Systematic reviews and scoping reviews should have a protocol which helps to plan and outline the study methodology.

Many journals are requiring that authors have a protocol registered for their systematic review. Check your journal choice(s) guidelines before getting started.

Writing + Registering Your Protocol

The protocol should include:

- the rationale for the review
- key questions broken into PICO components
- inclusion/exclusion criteria
- literature searches for published/unpublished literature
- data abstraction/data management
- assessment of methodological quality/risk of bias of individual studies (not required for scoping reviews)
- data synthesis
- grading the evidence for each key question

Writing + Registering Your Protocol

Where – registry sites and repositories

- [PROSPERO](#) - A registry for systematic review protocols
 - [How to register with PROSPERO](#)
- [OSF \(Open Science Framework\)](#)
- [How to create an OSF Preregistration](#)
- [Example OSF Preregistration protocol](#)

Where – publish your protocol in a journal

- [BioMed Central Protocols](#)
- [BMJ Open](#)
- [JBI Evidence Synthesis](#)
- [Systematic Reviews, a BioMed Central journal](#)

Writing + Registering Your Protocol

Templates

- [PRISMA-P protocol extension](#)
- [PROSPERO template](#)
- [OSF template](#)
- [JBI Scoping Review template](#)

Other tools

- SR Accelerator's Methods Wizard

Searching: Working with a Librarian

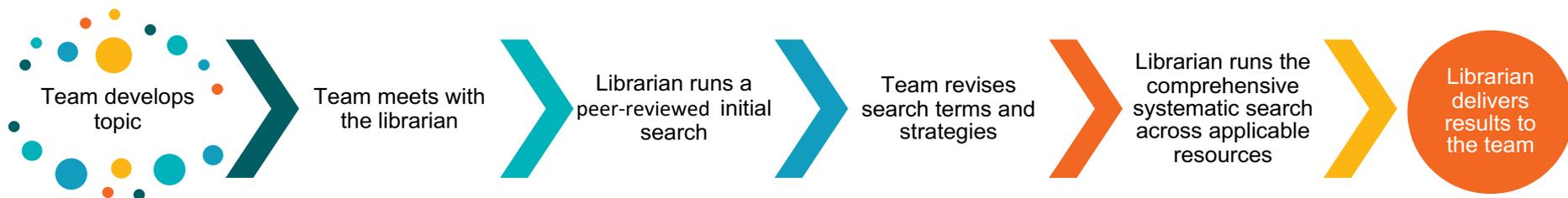
What to bring

- A solid research question
- Inclusion, exclusion & eligibility criteria
- Exemplar articles
- List of target journals for publication

What you'll get

- Expertly designed and peer reviewed search strategies
- Compiled, deduplicated search results
- Written methods section
- Assistance with utilizing software
- Assistance in getting published

Searching: Working With a Librarian



Expert Search Strategy Example:

PICO statement: What are the urinary biomarkers that can be utilized for accurate prediction of **dietary patterns** in adults?

PubMed dietary patterns hedge:

("diet"[MeSH Terms] OR "diet"[All Fields] OR "dietary"[All Fields] OR "dieteries"[All Fields]) AND ("behavior"[MeSH Terms] OR "behavior"[All Fields] OR "behavioral"[All Fields] OR "behavioural"[All Fields] OR "behavior s"[All Fields] OR "behaviorally"[All Fields] OR "behaviour"[All Fields] OR "behaviourally"[All Fields] OR "behaviours"[All Fields] OR "behaviors"[All Fields] OR "pattern"[All Fields] OR "pattern s"[All Fields] OR "patternability"[All Fields] OR "patternable"[All Fields] OR "patterned"[All Fields] OR "patterning"[All Fields] OR "patterning s"[All Fields] OR "patterns"[All Fields]) OR "Feeding Behavior"[MeSH Terms] OR "diet, western"[MeSH Terms] OR "Diet Fads"[MeSH Terms] OR "diet, atherogenic"[MeSH Terms] OR "diet, carbohydrate loading"[MeSH Terms] OR "diet, carbohydrate restricted"[MeSH Terms] OR "diet, high protein low carbohydrate"[MeSH Terms] OR "diet, ketogenic"[MeSH Terms] OR "diet, cariogenic"[MeSH Terms] OR "diet, fat restricted"[MeSH Terms] OR "diet, gluten free"[MeSH Terms] OR "diet, healthy"[MeSH Terms] OR "diet, high fat"[MeSH Terms] OR "diet, high protein"[MeSH Terms] OR "diet, mediterranean"[MeSH Terms] OR "diet, paleolithic"[MeSH Terms] OR "diet, protein restricted"[MeSH Terms] OR "diet, sodium restricted"[MeSH Terms] OR "diet, vegetarian"[MeSH Terms] OR "diet, macrobiotic"[MeSH Terms] OR "diet, vegan"[MeSH Terms] OR "Dietary Approaches To Stop Hypertension"[MeSH Terms] OR "Energy Intake"[MeSH Terms] OR "Portion Size"[MeSH Terms] OR "Serving Size"[MeSH Terms] OR "Recommended Dietary Allowances"[MeSH Terms] OR "Nutritive Value"[MeSH Terms] OR "diet, food, and nutrition"[MeSH Terms] OR "Nutritional Requirements"[MeSH Terms] OR food* OR diet* OR "food intake" OR "individual food" OR "food group" OR "food component" OR "dietary component" OR ((dietary OR nutritional OR diet OR nutrition) AND (habit* OR pattern* OR intake OR profil* OR assessment* OR consume OR consumption OR exposure)) OR nutritypes OR "nutritional supplement" OR "dietary supplement" OR "dietary supplementation" OR metabolomics OR "western diet" OR "mediterranean diet" OR "healthy eating index" OR "alternative healthy eating index" OR "prudent diet pattern" OR "dietary inflammatory index" OR "ketogenic diet" OR "low carbohydrate diet" OR keto OR "modified atkins diet" OR MAD OR "traditional diet" OR "high fat diet" OR "low fat diet" OR "low-fat diet" OR FODMAP OR fermentable oligosaccharides, disaccharides, monosaccharides and polyols OR ("short chain carbohydrate" AND (diet OR nutrition)) OR "hypoglycemia diet" OR DASH OR "dietary approaches to stop hypertentsion" OR "fad diet" OR "popular diet" OR "south beach diet" OR "paleo diet" OR "zone diet" OR "dukan diet" OR vegan* OR vegetarian* OR omnivor* OR "weight watchers" OR "macrobiotic diet" OR "volumetrics" OR "raw food diet" OR "intermittent fasting" OR "high carbohydrate diet" OR "mayo clinic diet" OR "NOVA food classification system" OR "dietary guidelines" OR "diet quality assessment" OR ((food OR diet OR nutrient* OR nutrition AND (quantit* OR volum* OR proportion* OR frequen*)) OR "metabolome"[MeSH Terms] OR "metabolome"[All Fields] OR "metabolomes"[All Fields] OR "metabolomics"[MeSH Terms] OR "metabolomics"[All Fields] OR "metabolomic"[All Fields] OR "nutrition s"[All Fields] OR "nutritional status"[MeSH Terms] OR ("nutritional"[All Fields] AND "status"[All Fields]) OR "nutritional status"[All Fields] OR "nutrition"[All Fields] OR "nutritional sciences"[MeSH Terms] OR ("nutritional"[All Fields] AND "sciences"[All Fields]) OR "nutritional sciences"[All Fields] OR "nutritional"[All Fields] OR "nutritional s"[All Fields] OR "nutritives"[All Fields] OR "nutritive"[All Fields]

Screening

- All articles included in your systematic review must undergo two rounds of screening:
 - title/abstract and full-text.
 - In the title/abstract phase, it is better to be overly permissive rather than overly conservative. Often, exclusion criteria are made more stringent during the full-text screening phase.

Resources for Screening

- Covidence
 - approved by UNMC IT
 - Not available from the library/UNMC
 - \$\$\$
- Rayyan
 - Approved by UNMC IT
 - Not available from the library/UNMC
 - \$\$
- EndNote
- Zotero

Quality and Bias

- Conducting risk of bias assessment, sometimes called quality assessment, is a defining feature of the systematic review process that elevates the methodological rigor and transparency of reported results.
- Tools to assess quality and bias
 - <https://guides.mclibrary.duke.edu/sysreview/assess>

Reporting

- Use the reporting tools and guides
 - PRISMA: <http://prisma-statement.org/Extensions/>
 - MOOSE: <https://pubmed.ncbi.nlm.nih.gov/10789670/>
 - AGREE: <https://www.equator-network.org/reporting-guidelines/the-agree-reporting-checklist-a-tool-to-improve-reporting-of-clinical-practice-guidelines/>
 - MECCIR: <https://onlinelibrary.wiley.com/page/journal/18911803/homepage/author-guidelines>



Systematic Review Toolbox

- Web-based catalog of tools that support various tasks within the systematic review and wider evidence synthesis process
- Aims to help researchers and reviewers find:
 - Software tools
 - Quality assessment/critical appraisal checklists
 - Reporting standards
 - Guidelines

Marshall, C., Sutton, A., O'Keefe, H., Johnson, E. (Eds.). (2021). The Systematic Review Toolbox. Available from: <http://www.systematicreviewtools.com/>

4. Expert Searching Services at the McGoogan Library



Systematic Review Services @ McGoogan

- Collaborate with a librarian to work on a systematic review, meta-analysis, and scoping review
- A librarian will help with:
 - Discuss your topic and review options
 - Review registries; preliminary searching
 - Create search strategies & updated results
 - Methods assistance
 - Identify potential journals
 - Author rights, digital commons, etc.

Systematic Review Services @ McGoogan

- Librarians will not:
 - Perform manual searches of journal table of contents or article bibliographies
 - Call outside investigators who are completing studies on your topic
 - Pay inter-library loan costs, or request articles via interlibrary loan
 - Pay for fees for searching databases not available from the library
 - Pay for software not licensed by the library or UNMC

Systematic Review Services @ McGoogan

Statement on Authorship

Librarians design and implement substantial search strategies; these contribute to the design of the study. The citation data we acquire and organize is substantial for the creation of the work. Authorship decisions will be made prior to conducting preliminary searches.

- As a member of the project team, librarian authors will perform searches, write methods sections, and contribute to the draft version of the article.
- Review of the article prior to submission is required. If we agree to be an author on a systematic review, we will stand behind the accuracy and integrity of our role in the project.

Delivery of Search Results

- RIS file with all the results, duplicates removed
 - This file can be uploaded to Zotero, EndNote, or other citation screening tools
- Excel file of the list of results (by request)

Things to Remember

- Develop your research topic
- Develop your team
- Meet with a librarian
- Register your protocol
- Check your guidelines and biases

Resources

- UNMC Systematic Review Research Guide:
<https://unmc.libguides.com/systematicreview>
- JBI YouTube channel:
<https://www.youtube.com/channel/UCEWhJYFQityaRhV-BGCKlCQ>
- Cochrane Review – Systematic Review Handbook and Training:
<https://training.cochrane.org/handbook>
- PRISMA: <http://www.prisma-statement.org/?AspxAutoDetectCookieSupport=1>

Contact Us

Request a Systematic Review & Scoping
Review Meeting

[https://unmc.libguides.com/systematicreview/
meetingrequest](https://unmc.libguides.com/systematicreview/meetingrequest)

McGoogan Library – AskUs

askus@unmc.edu

402-559-6221

unmc.edu/library

Librarians

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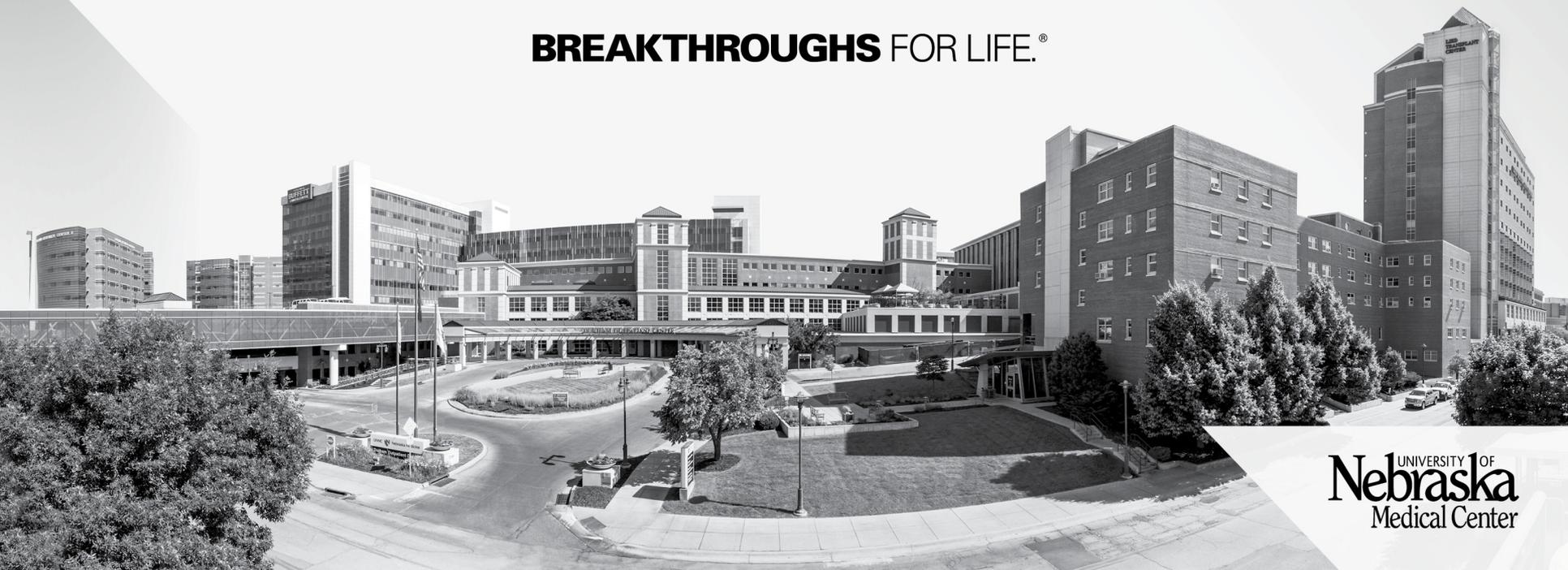
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