

## eAppendix. Full Search Strategy per Database

### Research question:

*The use of ultrasound diagnostic imaging is increasing. Despite the importance of ultrasound, studies indicate that a significant proportion of ultrasound investigations may not significantly impact patient care, meaning the imaging is unlikely to modify patient management or outcomes. The research question is: **What are the indications for ultrasound that demonstrate high clinical value and contribute to patient outcomes, and conversely, what are the indications that lack clinical utility and do not significantly benefit patient care?***

### Overview databases & results

Date last searched: **June 17<sup>th</sup>, 2024.**

	Before deduplication	After deduplication
Medline ALL (Ovid)	1947	
Embase (Ovid)	2056	
Cochrane Library	98	
CINAHL (EBSCOhost)	1382	
Google Scholar	200	
Total	<b>5683</b>	<b>3933</b>

1750 duplicate records removed using Deduklick[1]

[1] Borisso, N.; Haas, Q.; Minder, B.; Kopp-Heim, D.; von Gernler, M.; Janka, H.; Teodoro, D.; Amini, P. Reducing systematic review burden using Deduklick: A novel, automated, reliable, and explainable deduplication algorithm to foster medical research. *Syst. Rev.* 2022, 11, 172.

**Medline ALL (via Ovid)**

Ovid MEDLINE(R) ALL &lt;1946 to June 14, 2024&gt;

Search History Link:

<https://ovidsp.ovid.com/ovidweb.cgi?T=JS&NEWS=N&PAGE=main&SHAREDSEARCHID=5BDjKRCl2AU2HmKgWtkAZogarREBT7GBNi92iJI0C47FVpDp4goziOGcMyraN7ZrN>

#	Query	Results from 17 Jun 2024
1	ultrasonography/ or echocardiography/ or ultrasonography, doppler/	320,001
2	(ultrasound* or ultra-sound* or ultrason* or ultra-son* or sonogra* or ultrasonogra* or ultra-sonogra* or doppler or echogra* or echocardiogra* or echo-cardiogra* or PoCUS or imaging or (overus* adj3 "diagnostic test*") or "primary care screening*").ti.	590,837
3	1 or 2	764,144
4	practice guideline/ or Practice Guidelines as Topic/	159,374
5	(guideline* or consensus* or recommendat*).ti.	177,187
6	(practice parameter* or position statement* or position paper* or policy statement* or best practice*).ti.	16,301
7	(care adj2 (path or paths or pathway or pathways or map or maps or plan or plans or standard?)).ti.	10,733
8	((critical or clinical or practice) adj2 (path or paths or pathway or pathways or protocol?)).ti.	5,039
9	(guideline* or standard? or consensus* or recommendat*).ca.	2,076
10	or/4-9	304,024
11	Systematic Review/ or Systematic Reviews as Topic/ or Meta-Analysis/ or Meta-Analysis as Topic/ or ((systematic adj2 review) or meta-analy* or metanaly* or metaanaly*).ti.	452,165
12	("choosing wisely" or "clinical utility" or (utility and diagnos*) or "clinical value*" or indication*).ti.	71,079
13	10 or 11 or 12	813,840
14	((Primary Health Care/ or Physicians, Family/ or Physicians, Primary Care/ or Practice Patterns, Physicians'/ or General Practitioners/ or Family Practice/ or General Practice/ or Private Practice/) and (st or mt or td).fs.) or *Unnecessary Procedures/ or (indication* or (clinical* adj3 (practice or validit* or recommendation* or useful*)) or (clinic* adj3 relevan*) or practitioner* or (general adj2 physician*) or GP or GPs or family practice or (family adj2 physician*) or (primary adj2 care) or "choosing wisely" or utility or ((high or low	866,388

	or clinical* or ultrasound* or ultrason* or predictive) adj5 value*) or overus* or overdiagnos* or avoidable or unnecessary or appropriate* or wasteful* or inappropriate or unjustified or "ultrasound first" or (depend* adj3 skills) or benefit* or harm*).ti,kf. or (indication* or (clinical* adj3 (practice or validit* or recommendation* or useful*)) or (clinic* adj3 relevan*) or practitioner* or (general adj2 physician*) or GP or GPs or family practice or (family adj2 physician*) or (primary adj2 care) or "choosing wisely" or utility or ((high or low or clinical* or ultrasound* or ultrason* or predictive) adj5 value*) or overus* or overdiagnos* or avoidable or unnecessary or appropriate* or wasteful* or inappropriate or unjustified or "ultrasound first" or skill* or benefit* or harm*).tw. /freq=3	
15	3 and 13 and 14	5,575
16	15 not (letter or news or comment or editorial or congress).pt. not ((exp animals/ or exp animal experimentation/ or exp models, animal/ or exp plants/ or exp fungi/) not humans/)	5,240
17	16 not (Intens* or Critical* or Obstet* or Gyne* or Gynae* or Anaes* or Anest* or Neuro* or Neonat*).jw.	4,802
18	17 not (obste* or endometrio* or pregn* or contrast* or CEUS* or elasto* or fetal* or foetal* or endosc* or intervent* or neonat* or neuro*).ti.	4,013
19	limit 18 to yr="2014 -Current"	2,018
20	limit 19 to (english or german)	1,947

### Embase (via Ovid)

Embase <1974 to 2024 June 14>

Search History Link

<https://ovidsp.ovid.com/ovidweb.cgi?T=JS&NEWS=N&PAGE=main&SHAREDSEARCHID=2KcLnkZgGhW6Vmm2dng3De6ftPplnekbhq4JHtlaESQJW0VHpsZ3halNtyL36KijM>

#	Query	Results from 17 Jun 2024
1	*echography/ or *ultrasound/ or *point of care ultrasound/ or *doppler ultrasonography/ or *echocardiography/	215,951
2	(ultrasound* or ultra-sound* or ultrason* or ultra-son* or sonogra* or ultrasonogra* or ultra-sonogra* or doppler or echogra* or echocardiogra* or	767,307

	echo-cardiogra* or PoCUS or imaging or (overus* adj3 "diagnostic test*") or "primary care screening*" or EFSUMB or WFUMB).ti.	
3	1 or 2	806,772
4	practice guideline/ or consensus development/	608,163
5	(guideline* or consensus* or recommendat*).ti.	229,688
6	(practice parameter* or position statement* or position paper* or policy statement* or best practice*).ti.	19,628
7	(care adj2 (path or paths or pathway or pathways or map or maps or plan or plans or standard?)).ti.	15,581
8	((critical or clinical or practice) adj2 (path or paths or pathway or pathways or protocol?)).ti.	6,815
9	or/4-8	752,258
10	"systematic review"/ or "systematic review (topic)"/ or exp meta analysis/ or "meta analysis (topic)"/ or ((systematic adj2 review) or meta-analy* or metanaly* or metaanaly*).ti.	726,378
11	("choosing wisely" or "clinical utility" or "clinical value*").ti.	17,615
12	9 or 10 or 11	1,441,622
13	exp primary health care/ or general practitioner/ or clinical practice/ or private practice/ or unnecessary procedure/ or (indication* or (clinical* adj3 (practice or validit* or recommendation* or useful*)) or (clinic* adj3 relevan*) or practitioner* or (general adj2 physician*) or GP or GPs or family practice or (family adj2 physician*) or (primary adj2 care) or "choosing wisely" or utility or ((high or low or clinical* or ultrasound* or ultrason* or predictive) adj5 value*) or overus* or overdiagnos* or avoidable or unnecessary or appropriate* or wasteful* or inappropriate or unjustified or "ultrasound first" or (depend* adj3 skills) or benefit* or harm\$4).ti,kf. or (indication* or (clinical* adj3 (practice or validit* or recommendation* or useful*)) or (clinic* adj3 relevan*) or practitioner* or (general adj2 physician*) or GP or GPs or family practice or (family adj2 physician*) or (primary adj2 care) or "choosing wisely" or utility or ((high or low or clinical* or ultrasound* or ultrason* or predictive) adj5 value*) or overus* or overdiagnos* or avoidable or unnecessary or appropriate* or wasteful* or inappropriate or unjustified or "ultrasound first" or skill* or benefit* or harm\$4).tw. /freq=3	1,567,026
14	3 and 12 and 13	6,045
15	14 not (letter or note or editorial or conference).pt. not ((exp animal/ or nonhuman/) not exp human/)	4,255

16	15 not (Intens* or Critical* or Obstet* or Gyne* or Gynae* or Anaes* or Anest* or Neuro* or Neonat*).jx.	3,881
17	16 not (obste* or endometrio* or pregn* or contrast* or CEUS* or elasto* or fetal* or foetal* or endosc* or intervent* or neonat* or neuro*).ti.	3,217
18	limit 17 to ((english or german) and yr="2014 -Current")	2,056

### Cochrane Library (years 2014-2024)

97 Trials: Cochrane Central Register of Controlled Trials, Issue 5 of 12, May 2024

1 Review: Cochrane Database of Systematic Reviews, Issue 6 of 12, June 2024

#### ID Search Hits

#1 (ultrasound\* or ultra-sound\* or ultrason\* or ultra-son\* or sonogra\* or ultrasonogra\* or ultra-sonogra\* or doppler or echogra\* or echocardiogra\* or echo-cardiogra\* or PoCUS or imaging or ((overus\* or unnecessary or inappropriate) NEAR/3 diagnostic-test\*) or primary-care-screening\*):ti 30682

#2 (guideline\* or consensus\* or recommendat\*):ti 5023

#3 (practice-parameter\* or position-statement\* or position-paper\* or policy-statement\* or best-practice\*):ti 300

#4 (care NEAR/2 (path or paths or pathway or pathways or map or maps or plan or plans or standard OR standards)):ti 3723

#5 ((critical or clinical or practice) NEAR/2 (path or paths or pathway or pathways or protocol or protocols)):ti 992

#6 ("choosing wisely" or "clinical utility" or (utility and diagnos\*) or (clinical NEXT value\*) or indication\*):ti 2049

#7 ((systematic NEAR/2 review) or meta-analy\* or metanaly\* or metaanaly\*):ti 6185

#8 #2 OR #3 OR #4 OR #5 OR #6 OR #7 18120

#9 (indication\* or (clinical\* NEAR/3 (practice or validit\* or recommendation\* or useful\*)) or (clinic\* NEAR/3 relevan\*) or practitioner\* or (general NEAR/2 physician\*) or GP or GPs or family-practice or (family NEAR/2 physician\*) or (primary NEAR/2 care) or "choosing wisely" or utility or ((high or low or clinical\* or ultrasound\* or ultrason\* or predictive) NEAR/5 value\*) or overus\* or overdiagnos\* or overutili\* or avoidable or unnecessary or appropriate\* or wasteful\* or inappropriate or unjustified or "ultrasound first" or (depend\* NEAR/3 skills) or benefit\* or harm or harms or harmless or harmful):ab,ti,kw 374546

#10 #1 AND #8 AND #9 152

**CINAHL with Full Text**

Cumulative Index to Nursing and Allied Health Literature CINAHL with Full Text (via EBSCOhost)  
 Search Screen - Advanced Search

Limiters - Publication Date: 20140101-20241231; Peer Reviewed; Language: English, German

Expanders - Apply equivalent subjects

Search modes - Find all my search terms

S17	S15 NOT S16	1,382
S16	SO (Intens* or Critical* or Obstet* or Gyne* or Gynae* or Anaest* or Anest* or Neuro* or Neonat*)	269,962
S15	S13 NOT S14	1,502
S14	TI (obste* or endometrio* or pregn* or contrast* or CEUS* or elasto* or fetal* or foetal* or endosc* or intervent* or neonat* or neuro*)	269,740
S13	S3 AND S7 AND S10 [Limiters - Peer Reviewed; Language: English, German]	1,861
S12	S3 AND S7 AND S10 [Limiters - Publication Date: 20140101-20241231]	1,943
S11	S3 AND S7 AND S10	2,598
S10	S8 OR S9	1,176,901
S9	TI (indication* or (clinical* N3 (practice or validit* or recommendation* or useful*)) or (clinic* N3 relevan*) or practitioner* or (general N2 physician*) or GP or GPs or family practice or (family N2 physician*) or (primary N2 care) or "choosing wisely" or utility or ((high or low or clinical* or ultrasound* or ultrason* or predictive) N5 value*) or overus* or overdiagnos* or overutili* or avoidable or unnecessary or appropriate* or wasteful* or inappropriate or unjustified or "ultrasound first" or skill* or benefit* or harm or harms or harmless or harmful) OR AB (indication* or (clinical* N3 (practice or validit* or recommendation* or useful*)) or (clinic* N3 relevan*) or practitioner* or (general N2 physician*) or GP or GPs or family practice or (family N2 physician*) or (primary N2 care) or "choosing wisely" or utility or ((high or low or clinical* or ultrasound* or ultrason* or predictive) N5 value*) or overus* or overdiagnos* or overutili* or avoidable or unnecessary or appropriate* or wasteful* or inappropriate or unjustified or "ultrasound first" or skill* or benefit* or harm or harms or harmless or harmful)	1,118,405
S8	MH "Primary Health Care" or MH "Physicians, Family" or MH "Practice Patterns" or MH "Family Practice" or MH "Private Practice" or MH "Unnecessary Procedures" or MH "Utilization Review"	137,876

S7	S4 OR S5 OR S6	403,921
S6	TI ("choosing wisely" or "clinical utility" or (utility and diagnos*) or "clinical value*" or indication*)	12,504
S5	PT (systematic review OR meta analysis) OR TI ((systematic N2 review) or meta-analy* or metanaly* or metaanaly*)	240,719
S4	PT (practice guidelines or protocol or critical path or care plan) or TI (guideline* or standards or consensus* or recommendat*) or AU (guideline* or standards or consensus* or recommendat*) or CA (guideline* or standards or consensus* or recommendat*) or TI ("practice parameter*" or "position statement*" or "policy statement*" or "best practice*") or TI (care N2 path or care N2 paths or care N2 pathway or care N2 pathways or care N2 map or care N2 maps or care N2 plan or care N2 plans or care N2 standard*) or TI (critical N2 path or critical N2 paths or critical N2 pathway or critical N2 pathways or critical N2 protocol* or clinical N2 path or clinical N2 paths or clinical N2 pathway or clinical N2 pathways or clinical N2 protocol* or practice N2 path or practice N2 paths or practice N2 pathway or practice N2 pathways or practice N2 protocol*)	159,797
S3	S1 OR S2	157,886
S2	TI ((ultrasound* or ultra-sound* or ultrason* or ultra-son* or sonogra* or ultrasonogra* or ultra-sonogra* or doppler or echogra* or echocardiogra* or echo-cardiogra* or PoCUS or imaging or (overus* N3 "diagnostic test*") or "primary care screening*"))	148,869
S1	MM "Ultrasonography" OR MM "Echocardiography" OR MM "Ultrasonography, Doppler" OR MM "Ultrasonography, Carotid Arteries"	34,373

**Google Scholar** (first 200 results according to relevance ranking, 2014-2024)

ultrasound|ultrasonography|echography|PoCUS  
 "primary care|health"|practitioner|physician|clinician|"family medicine"  
 indication|application|utility|"clinical practice"|evidence|value  
 "systematic review"|"meta-analysis"|guideline|"practice guideline"

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