

Supplementary Document

The Newcastle-Ottawa Scale (NOS) for Assessing the Quality of Nonrandomized Studies in Meta-Analysis

	<b>Selection</b>	<b>Ascertainment</b>		<b>Causality</b>			<b>Reporting</b>	
		Does the patient(s) represent(s) the whole experience of the investigator (centre)? (or is the selection method unclear to the extent that other patients with similar presentation may not have been reported?)	Was the exposure adequately ascertained?	Was the outcome adequately ascertained?	Were other alternative causes that may explain the observation ruled out?	Was there a challenge/rechallenge phenomenon?		Was there a dose–response effect?
Sun Z et al., 2019	Y	Y	Y	Y	N	N	Y	Y
Wang B et al., 2017	Y	Y	Y	N	N	N	Y	Y
Johansson BB et al., 1978	Y	Y	Y	Y	N	N	Y	Y
Chi OZ et al., 1992	Y	Y	Y	Y	N	N	Y	Y
Nemoto EM et al., 1978	Y	N	Y	Y	N	N	Y	Y
Cao Y et al., 2018	Y	N	Y	N	N	N	Y	Y
Chi OZ et al., 1992	Y	Y	Y	Y	N	N	Y	Y
Acharya et al. (2015)	Y	Y	Y	N	N	N	Y	Y
Cao et al. (2015)	Y	Y	Y	Y	N	N	Y	Y
Zhu et al. (2018)	Y	Y	Y	N	N	N	Y	Y
Hu et al. (2016)	Y	N	Y	N	N	N	Y	Y
Zheng et al. (2017)	Y	Y	Y	N	N	N	Y	Y
Saija et al. (1989)	Y	Y	Y	N	N	N	Y	Y
He et al. (2012)	Y	Y	Y	N	N	N	Y	Y

Y = Yes (1 Point)

N = No (0 Points)

Murad MH, Sultan S, Haffar S, et al. BMJ Evidence-Based Medicine 2018;23:60–63.

## MedlineALL

Ovid MEDLINE(R) ALL 1946 to June 24, 2021

#	Searches	Results
1	Blood-Brain Barrier/	29146
2	blood brain barrier?.mp.	52416
3	bloodbrain barrier?.mp.	92
4	brain blood barrier?.mp.	296
5	brainblood barrier?.mp.	0
6	hemato encephalic barrier?.mp.	422
7	hematoencephalic barrier?.mp.	146
8	haemato encephalic barrier?.mp.	5
9	haematoencephalic barrier?.mp.	11
10	or/1-9 [ Blood-Brain Barrier ]	52706
11	exp "Anesthesia and Analgesia"/	238931
12	exp Anesthetics/	249328
13	anaesthe*.mp.	109919
14	anesthe*.mp.	411893
15	Postoperative Complications/	378345
16	postoperat*.mp.	895809
17	post-operat*.mp.	81509
18	postsurg*.mp.	21031
19	post-surg*.mp.	19619
20	post-procedur*.mp.	7735
21	postprocedur*.mp.	7823

22	postan?esth*.mp.	4722
23	post-an?esth*.mp.	2443
24	or/11-23 [ Anesthesia or Postoperative ]	1519276
<b>25</b>	<b>10 and 24 [ BBB + Anesthesia/Postoperative ]</b>	<b>2258</b>
26	exp Permeability/	58012
27	permeabilit*.mp.	171209
28	permeable.mp.	28587
29	permeat*.mp.	37112
30	disrupt*.mp.	317183
31	disturb*.mp.	254801
32	interrupt*.mp.	76398
33	intrusi*.mp.	14779
34	or/26-33 [ Permeability or Disruption ]	871139
<b>35</b>	<b>25 and 34 [ BBB + Anesthesia/Postoperative + Permeability/Disruption ]</b>	<b>864</b>
<b>36</b>	<b>limit 35 to english language</b>	<b>802</b>
	Targets from protocol bibliography caught:	
37	("28848542" or "25960348" or "25524410" or "23078219" or "24440777" or "30268095" or "28990533").ui. [targets]	7
38	36 and 37	7















## EMBASE Search Strategy

















### Search History

(15searches found)

Search history sorted by search number ascending

#### # ▲ Searches

	Results	Type	Actions	Annotations
1 obstetric anesthesia/ or geriatric anesthesia/ or anesthesia mechanism/ or epidural anesthesia/ or balanced anesthesia/ or anesthesia complication/ or anesthesia/ or regional anesthesia/ or caudal anesthesia/ or endotracheal anesthesia/ or rectal anesthesia/ or retrobulbar anesthesia/ or intravenous anesthesia/ or thorax epidural anesthesia/ or pediatric anesthesia/ or topical anesthesia/ or spinal anesthesia/ or general anesthesia/ or peribulbar anesthesia/ or brachial plexus anesthesia/ or inhalation anesthesia/ or anesthesia.mp. or local anesthesia/ or dental anesthesia/ or cardiac anesthesia/	385216	Advanced	<a href="#">Display Results</a> <a href="#">More</a>	 
2 anesthetic agent.mp. or anesthetic agent/	81652	Advanced	<a href="#">Display Results</a> <a href="#">More</a>	 
3 blood brain barrier/ or blood brain barrier permeability.mp.	68649	Advanced	<a href="#">Display Results</a> <a href="#">More</a>	 
4 blood brain barrier.mp.	82112	Advanced	<a href="#">Display Results</a> <a href="#">More</a>	 
5 post operative complications.mp. or postoperative complication/	351700	Advanced	<a href="#">Display Results</a> <a href="#">More</a>	 
6 cognitive defect/ or cognitive decline.mp.	197605	Advanced	<a href="#">Display Results</a> <a href="#">More</a>	 
7 sedative agent.mp. or sedative agent/	27670	Advanced	<a href="#">Display Results</a> <a href="#">More</a>	 

8	hypnotic.mp. or hypnotic agent/	29916 Advanced	<a href="#">Display Results</a>  
			<a href="#">More</a>
9	opioids.mp. or opiate/	122542 Advanced	<a href="#">Display Results</a>  
			<a href="#">More</a>
10	benzodiazepines.mp. or benzodiazepine derivative/	57963 Advanced	<a href="#">Display Results</a>  
			<a href="#">More</a>
11	artery permeability/ or cell membrane permeability/ or permeability.mp. or capillary permeability/ or permeability/ or permeability barrier/ or blood vessel permeability/ or apparent permeability/ or vein permeability/ or gas permeability/ or membrane permeability/	216936 Advanced	<a href="#">Display Results</a>  
			<a href="#">More</a>
12	1 or 2 or 7 or 8 or 9 or 10	600759 Advanced	<a href="#">Display Results</a>  
			<a href="#">More</a>
13	3 or 4 or 11	283866 Advanced	<a href="#">Display Results</a>  
			<a href="#">More</a>
14	5 or 6	547697 Advanced	<a href="#">Display Results</a>  
			<a href="#">More</a>
15	12 and 13 and 14	185 Advanced	<a href="#">Display Results</a>  
			<a href="#">More</a>

## Cochrane Search Strategy

View fewer lines [Print](#)





<b>+</b>					
<b>-</b>	<b>+</b>	#1	MeSH descriptor: [Blood-Brain Barrier] explode all trees	MeSH ▾	126
<b>-</b>	<b>+</b>	#2	MeSH descriptor: [Anesthesia] explode all trees	MeSH ▾	20439
<b>-</b>	<b>+</b>	#3	MeSH descriptor: [Postoperative Complications] explode all trees	MeSH ▾	43041
<b>-</b>	<b>+</b>	#4	MeSH descriptor: [Hypnotics and Sedatives] explode all trees	MeSH ▾	3888
<b>-</b>	<b>+</b>	#5	MeSH descriptor: [Analgesics, Opioid] explode all trees	MeSH ▾	8265
<b>-</b>	<b>+</b>	#6	MeSH descriptor: [Benzodiazepines] explode all trees	MeSH ▾	9917
<b>-</b>	<b>+</b>	#7	MeSH descriptor: [Cell Membrane Permeability] explode all trees	MeSH ▾	82
<b>-</b>	<b>+</b>	#8	anesthetic agent OR sedative agent OR hypnotic agent OR opioids OR benzodiazepines	Limits	18347
<b>-</b>	<b>+</b>	#9	blood brain barrier OR blood brain barrier permeability OR permeability	Limits	4904
<b>-</b>	<b>+</b>	#10	post operative complications OR cognitive decline	Limits	14019
<b>-</b>	<b>+</b>	#11	#2 OR #4 OR #5 OR #6 OR #8	Limits	49390
<b>-</b>	<b>+</b>	#12	#1 OR #7 OR #9	Limits	4904
<b>-</b>	<b>+</b>	#13	#3 OR #10	Limits	55105
<b>-</b>	<b>+</b>	#14	#11 AND #12 AND #13	Limits	27
<b>-</b>	<b>+</b>	#15	Type a search term or use the S or MeSH buttons to compose	S ▾ MeSH ▾	Limits N/A



























116 total articles before duplicates  
 102 total new articles after duplicates removed

PUBMED Updated Search; 2019 to 2022  
 44 New Articles

#12	Search: (("Cognitive Dysfunction"[MeSH Terms] OR "Postoperative Complications"[MeSH Terms] OR ("cognitive dysfunction*" [Title/Abstract] OR "cognitive impairment*" [Title/Abstract] OR "delirium*" [Title/Abstract])) AND ("Blood-Brain Barrier"[MeSH Terms] OR ("blood brain barrier*" [Title/Abstract] OR "permeability*" [Title/Abstract])) AND ("Anesthetics"[MeSH Terms] OR "Anesthesia"[MeSH Terms] OR "Central Nervous System Depressants"[MeSH Terms] OR ("anesthes*" [Title/Abstract] OR "sedative*" [Title/Abstract] OR "anaesthe*" [Title/Abstract] OR "anesthes*" [Title/Abstract] OR "hypnotic*" [Title/Abstract] OR "opioi*" [Title/Abstract] OR "benzodiazepine*" [Title/Abstract]))) AND ((english[Filter]) AND (2019:2022[pdat]))	44
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EMBASE Updated Search; 2019 to 2022  
 72 New Articles

#	▲ Searches	Results	Type
1	obstetric anesthesia/ or geriatric anesthesia/ or anesthesia mechanism/ or epidural anesthesia/ or balanced anesthesia/ or anesthesia complication/ or anesthesia/ or regional anesthesia/ or caudal anesthesia/ or endotracheal anesthesia/ or rectal anesthesia/ or retrobulbar anesthesia/ or intravenous anesthesia/ or thorax epidural anesthesia/ or pediatric anesthesia/ or topical anesthesia/ or spinal anesthesia/ or general anesthesia/ or peribulbar anesthesia/ or brachial plexus anesthesia/ or inhalation anesthesia/ or anesthesia.mp. or local anesthesia/ or dental anesthesia/ or cardiac anesthesia/	414562	 
2	anesthetic agent.mp. or anesthetic agent/	86616	 

3	blood brain barrier/ or blood brain barrier permeability.mp.	76741	 
4	blood brain barrier.mp.	91619	 
5	post operative complications.mp. or postoperative complication/	386000	 
6	cognitive defect/ or cognitive decline.mp.	219290	 
7	sedative agent.mp. or sedative agent/	29449	 
8	hypnotic.mp. or hypnotic agent/	31391	 
9	opioids.mp. or opiate/	134757	 
10	benzodiazepines.mp. or benzodiazepine derivative/	61087	 
11	artery permeability/ or cell membrane permeability/ or permeability.mp. or capillary permeability/ or permeability/ or permeability barrier/ or blood vessel permeability/ or apparent permeability/ or vein permeability/ or gas permeability/ or membrane permeability/	230786	 
12	1 or 2 or 7 or 8 or 9 or 10	646577	 
13	3 or 4 or 11	305662	 
14	5 or 6	603454	 
15	12 and 13 and 14	217	 
16	limit 15 to yr="2019 -Current"	72	