Appendix 1 PubMed search strategy

1# "spectroscopy, near infrared"[MeSH Terms] OR "near-infrared spectroscopy"[Title/Abstract] OR "near infrared spectroscopy"[Title/Abstract] OR "near-infrared spectroscopies"[Title/Abstract] OR "Near-Infrared Spectroscopy"[Title/Abstract] OR "nir spectroscopy"[Title/Abstract] OR "nir spectroscopies"[Title/Abstract] OR ("near infrared"[All Fields] AND "Spectrometries"[Title/Abstract]) OR "near-infrared spectrometry"[Title/Abstract]

2# "cerebral venous oxyhemoglobin saturation"[Title/Abstract] OR "cerebral oxygenation"[Title/Abstract] OR "cerebral saturations"[Title/Abstract] OR "cerebral saturation"[Title/Abstract] OR "tissue oxygenation index"[Title/Abstract] OR "cerebral oximetry"[Title/Abstract] OR "cerebral oximeter"[Title/Abstract] OR "cerebral regional oxygen saturation"[Title/Abstract] OR "regional cerebral oxygenation"[Title/Abstract] OR "venous oxygen saturation"[Title/Abstract]

3# (#1) AND (#2)

4# (#1) AND (#2) Filters: Child: birth-18 years

Appendix 2 The Cochrane Library search strategy

#1→MeSH descriptor: [Spectroscopy, Near-Infrared] explode all trees

#2→((near-infrared spectroscop*) or (NIR spectroscop*) or (near-infrared spectromet*) or (near infrared spectroscop*)): ti,ab,kw

#3→((cerebral venous oxyhemoglobin saturation) or (cerebral oxygenation) or (cerebral saturations) or (cerebral saturation) or (tissue oxygenation index) or (cerebral oximetry) or (cerebral oximeter) or (cerebral regional oxygen saturation) or (regional cerebral oxygenation) or (venous oxygen saturation)): ti,ab,kw

#4→#1 or #2

#5→#3 and #4 with 'Neonatal', 'Child Health' in Cochrane Groups

Appendix 3 Embase search strategy

#1 'near infrared spectroscopy'/exp

#2 'near-infrared spectroscop*' OR 'near infrared spectroscop*' OR 'nir spectroscop*' OR 'near-infrared spectromet*': ab,ti

#3 #1 OR #2

#4 'cerebral venous oxyhemoglobin saturation' OR 'cerebral oxygenation': ab,ti OR 'cerebral saturations' OR 'cerebral saturation' OR 'tissue oxygenation index' OR'cerebral oximetry' OR 'cerebral oximeter' OR 'cerebral regional oxygen saturation' OR 'regional cerebral oxygenation' OR 'venous oxygen saturation':ab,ti

#5 #3 AND #4

#6 #3 AND #4 AND ([newborn]/lim OR [infant]/lim OR [child]/lim OR [adolescent]/lim)

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-----------------------------------------------------------------------
 Study omitted    |  Estimate     [95%  Conf.  Interval]
------------------+----------------------------------------------------
 Nagdyman  (2004) |  .07593819    -.02669942    .17857581
 Tortoriello (2005)| .03061461    -.07051696    .13174619
 Bhutta  (2007)   |  .0312417     -.07052172    .13300511
 Kirshbom (2007)  |  .04419363    -.05695939    .14534664
 McQuillen (2007) |  .05217678    -.05256429    .15691786
 Knirsch  (2008)  |  .04118957    -.06284186    .14522099
 Nagdyman (2008)  |  .06189227    -.03987115    .16365568
 Ranucci  (2008)  |  .05100425    -.0497757     .1517842
 Ricci (2010)     |  .04545117    -.06169142    .15259375
 Ginther (2011)   |  .04563222    -.05470719    .14597164
 Marimón (2012)   |  .04829279    -.05286023    .14944582
 Hansen (2013)    |  .03699954    -.06497241    .13897149
 Moreno (2013)    |  .01956561    -.08170312    .12083434
 Iodice (2014)    |  .03747183    -.06300995    .13795361
 Rescoe (2017)    | -.01790722    -.12249233    .08667788
 Gagnon (2020)    | -.02154422    -.12418184    .0810934
 Terada (2022)    |  .10962417    -.00467884    .22392718
------------------+----------------------------------------------------
 Combined         |  .03998831    -.05984477    .13982138
-----------------------------------------------------------------------
```

Figure S1 Sensitivity analysis of Cohen's d between $rScO_2$ and $ScvO_2$. $rScO_2$, cerebral regional oxygen saturation; $ScvO_2$, central venous oxygen saturation.

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-----------------------------------------------------------------------
 Study omitted    |  Estimate     [95%  Conf.  Interval]
------------------+----------------------------------------------------
 Yoxall (1995)    |  .03919733    -.08966073    .16805539
 Daubeney (1996)  |  .04449827    -.08793661    .17693315
 Nagdyman (2005)  |  .07896332    -.05681033    .21473698
 Shimizu (2005)   |  .03982654    -.08764096    .16729404
 Knirsch  (2008)  |  .0500006     -.08577307    .18577425
 Nagdyman (2008)  |  .06519345    -.06573382    .19612074
 Kussman (2017)   | -.07570761    -.20981026    .05839504
 Naguib (2017)    |  .01759147    -.11389553    .14907847
 Terada (2022)    |  .06486888    -.09653542    .22627318
------------------+----------------------------------------------------
 Combined         |  .03507014    -.09174492    .1618852
-----------------------------------------------------------------------
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Figure S2 Sensitivity analysis of Cohen's d between $rScO_2$ and $SjvO_2$. $rScO_2$, cerebral regional oxygen saturation; $SjvO_2$, jugular venous oxygen saturation.

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--------------------------------------------------------------------------
Study omitted     |  Estimate      [95%  Conf.  Interval]
------------------+-------------------------------------------------------
Nagdyman (2004)   |  .67662913     .60228348     .75097477
Tortoriello (2005)|  .66786659     .59472138     .7410118
Bhutta (2007)     |  .66735268     .5937447      .74096072
Kirshbom (2007)   |  .6698966      .59675139     .74304175
McQuillen (2007)  |  .64745301     .57161975     .72328627
Knirsch  (2008)   |  .64951825     .57424629     .72479022
Nagdyman (2008)   |  .6605196      .58685964     .73417956
Ranucci  (2008)   |  .66885465     .59596282     .74174649
Ricci (2010)      |  .71415955     .63656384     .79175526
Ginther (2011)    |  .66877973     .5962382      .74132121
Marimón (2012)    |  .67065084     .59750569     .74379605
Hansen (2013)     |  .66390949     .59014529     .7376737
Moreno (2013)     |  .67531627     .60201776     .74861479
Iodice (2014)     |  .66706121     .59442008     .73970228
Rescoe (2017)     |  .66550446     .58950031     .7415086
Gagnon (2020)     |  .68304491     .60848433     .75760543
Terada (2022)     |  .7026099      .61918831     .78603148
------------------+-------------------------------------------------------
Combined          |  .67117119     .59887683     .74346555
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Figure S3 Sensitivity analysis of Fisher's Z between $rScO_2$ and $ScvO_2$. $rScO_2$, cerebral regional oxygen saturation; $ScvO_2$, central venous oxygen saturation.

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--------------------------------------------------------------------------
Study omitted     |  Estimate      [95%  Conf.  Interval]
------------------+-------------------------------------------------------
Yoxall (1995)     |  .70140219     .60880256     .79400176
Daubeney (1996)   |  .68834889     .59305215     .78364557
Nagdyman (2005)   |  .67198551     .57435274     .76961827
Shimizu (2005)    |  .70093799     .60935485     .79252106
Knirsch  (2008)   |  .68569124     .58805847     .783324
Nagdyman (2008)   |  .70544904     .61125916     .79963893
Kussman (2017)    |  .68417186     .58690047     .78144324
Naguib (2017)     |  .70288646     .60825849     .79751438
Terada (2022)     |  .80152673     .68376392     .91928959
------------------+-------------------------------------------------------
Combined          |  .70118681     .60980302     .79257061
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Figure S4 Sensitivity analysis of Fisher's Z between $rScO_2$ and $SjvO_2$. $rScO_2$, cerebral regional oxygen saturation; $SjvO_2$, jugular venous oxygen saturation.