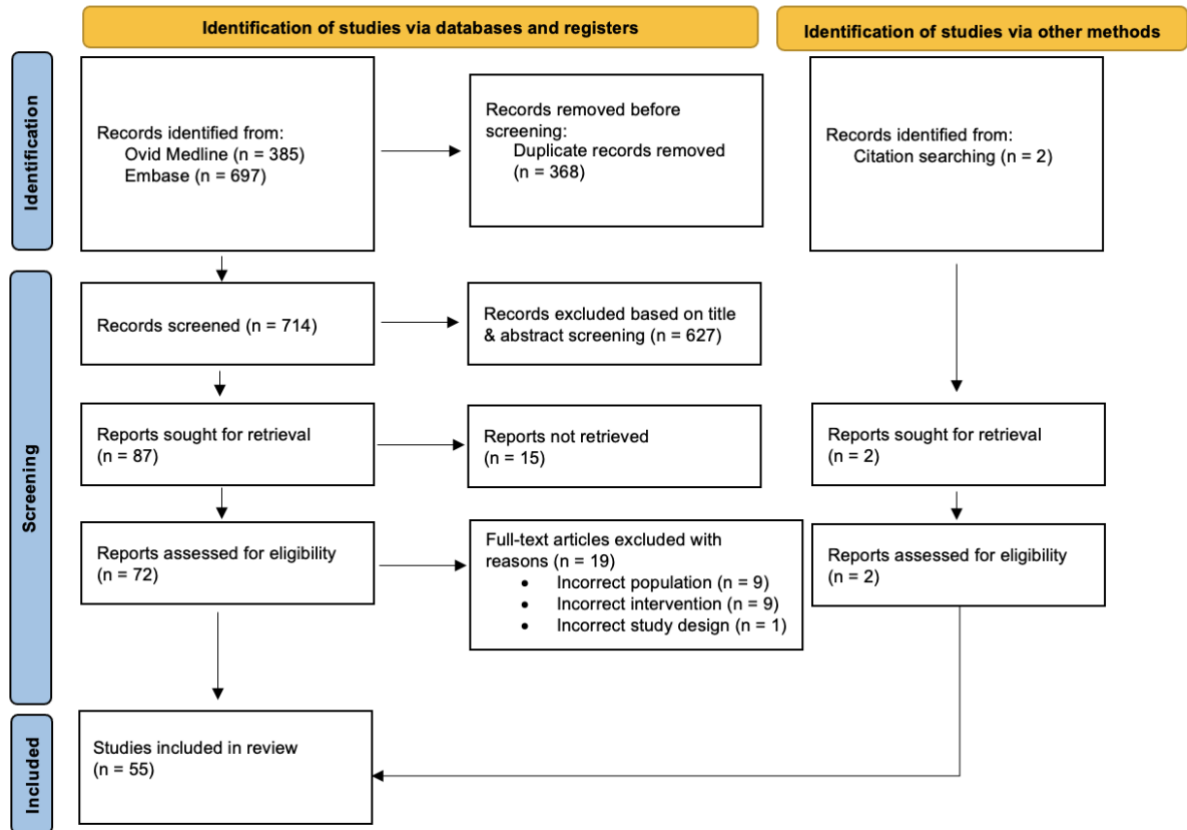


Supplemental 1. Search strategy and search terms.

#	Query
1	(perinatal or neonat* or newborn or infant or f?et* or prematur*).tw.
2	exp Animals/ or exp Rats/ or exp Mice/ or exp Sheep/ or exp Swine/ or exp Rabbits/ or exp Disease Models, Animal/
3	1 and 2
4	(brain or cerebral or encephalopath* or neuro*).tw.
5	(injury or damage or insult or trauma or hypox* or anox* or oxygen deprivation or isch?em* or h?emorrhag* or stroke or thrombosis or hypoperfusion or underperfusion or asphyxia or growth restriction or periventricular leukomalacia or inflamm* or chorioamnionitis or infection or sepsis or toxin or hypoglyc?em* or placental insufficiency or placental abnormality or placental lesion or placental abruption or uterine rupture or maternal obesity or metabolic or stress or distress or vascular dysfunction or low birth weight or cord prolapse or eclampsia or preeclampsia).tw.
6	4 and 5
7	(umbilical cord and cell).tw.
8	umbilical cord blood.tw.
9	(cell and cord blood).tw.
10	(h?ematopoietic and cord blood).tw.
11	(mesenchymal and cord blood).tw.
12	(stromal and cord blood).tw.
13	(endothelial progenitor and cord blood).tw.
14	(mononuclear and cord blood).tw.
15	(regulatory T and cord blood).tw.

16	7 or 8 or 9 or 10 or 11 or 12 or 13 or 14 or 15
17	3 and 6 and 16

Supplemental 2. Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) diagram detailing study selection process.

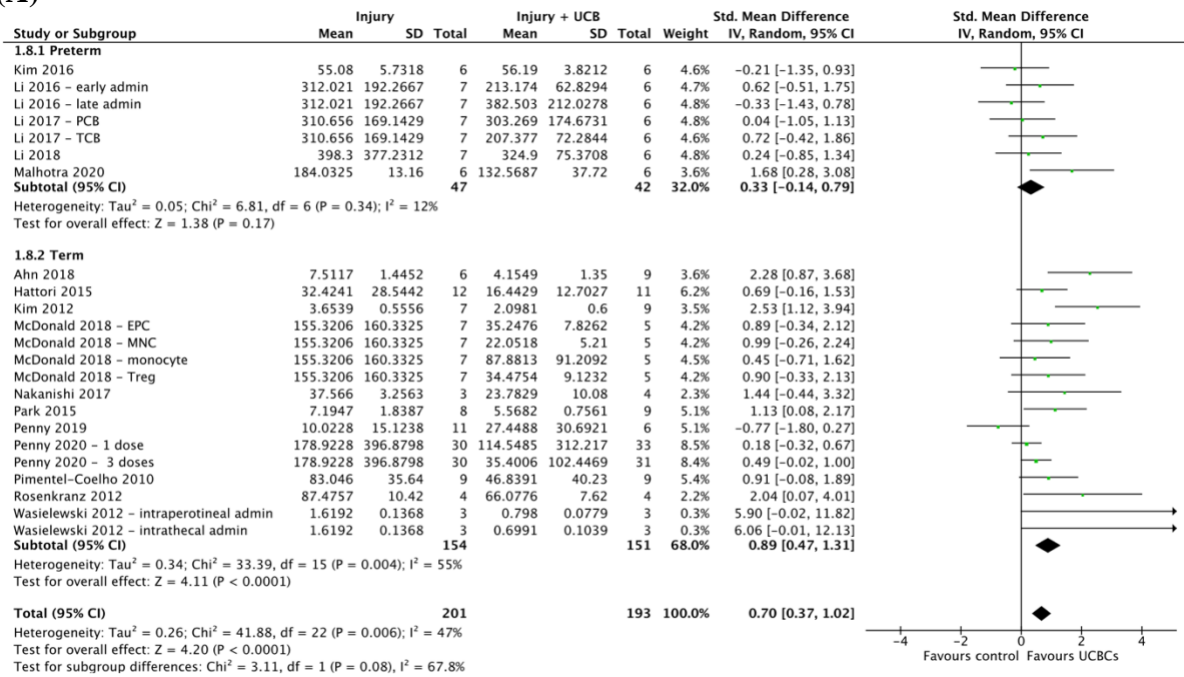


Supplemental 3. Summary of subgroup analyses. Abbreviations: * = $0.01 \leq P < 0.1$; ** = $0.001 \leq P < 0.01$; *** $P < 0.001$; -, subgroup analysis not performed due to insufficient number of studies; GM, grey matter; HI, hypoxia ischaemia; IVH, intraventricular haemorrhage; M/kg, million cells per kilogram; NSD, no significant difference; vs, versus; WM, white matter.

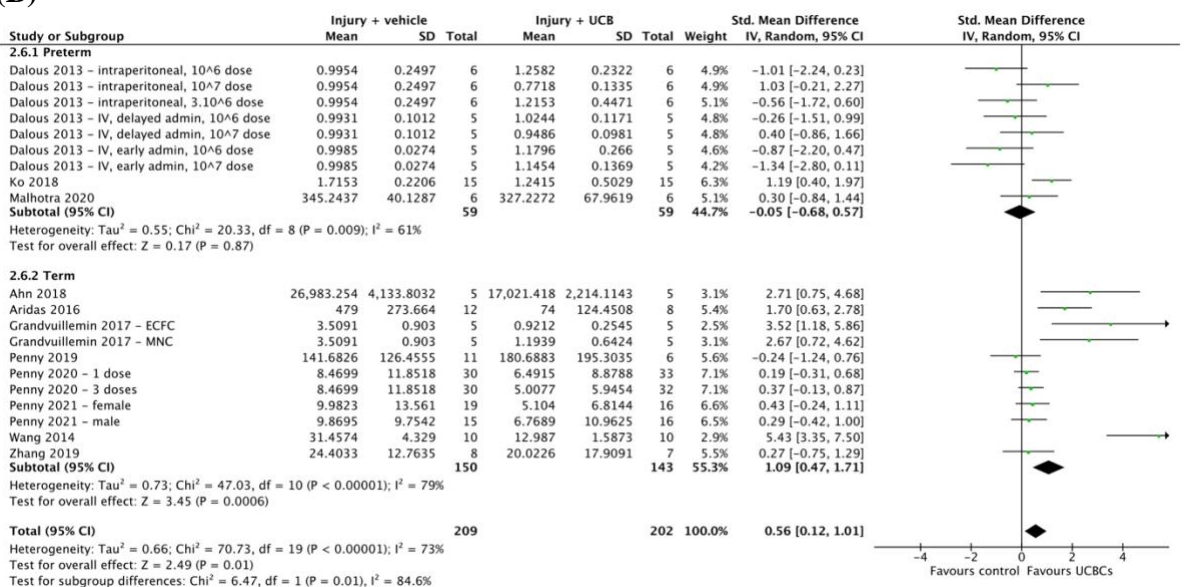
Outcome	Model type (preterm vs term)	Brain injury type (HI vs IVH)	UCB cell type (MNC vs MSC)	Timing of cell administration (<24hrs vs 24-72hrs)	Route of cell administration (intraperitoneal vs intraventricular/ intrathecal vs systemic)	Cell dosage (<25M/kg vs 25-100M/kg vs >100M/kg)	Number of cell doses (single vs multiple)
Apoptosis (GM)	NSD	-	*	NSD	NSD	NSD	-
Apoptosis (WM)	-	*	NSD	*	NSD	*	-
Astrogliosis (GM)	*	-	-	NSD	NSD	NSD	-
Astrogliosis (WM)	NSD	-	**	*	**	NSD	-
Infarct size	*	-	-	NSD	NSD	NSD	-
Microglial activation (GM)	*	-	NSD	NSD	*	NSD	-
Microglial activation (WM)	-	-	-	-	-	-	-
Neuron number	-	-	-	-	-	NSD	-
Oligodendrocyte number (GM)	-	-	-	-	-	-	-
Oligodendrocyte number (WM)	***	-	*	-	-	NSD	-
Neuroinflammation (TNF- α)	NSD	*	*	*	NSD	-	-
Neuroinflammation (IL-6)	-	-	NSD	-	-	-	-
Neuroinflammation (IL-1 β)	NSD	-	NSD	*	-	NSD	-
Neuroinflammation (IL-10)	-	-	-	-	-	-	-
Motor function – cylinder test	-	-	-	-	*	NSD	-
Motor function – rotarod test	-	-	-	-	-	-	-

Supplemental 4. Forest plots demonstrating the effect of preterm and term models on brain outcomes of (A) Microglial activation – grey matter; (B) Astrogliosis- grey matter; (C) Infarct size; (D) Oligodendrocyte number – white matter; (E) Apoptosis – grey matter; (F) Astrogliosis – white matter; (G) Neuroinflammation - TNF- α ; (H) Neuroinflammation - IL-1 β . Abbreviations: admin, administration; ECFC, endothelial colony-forming cell; EPC, endothelial progenitor cell; ICV, intracerebroventricular; IV, intraventricular; MNC, mononuclear cell; PCB, preterm cord blood; TCB, term cord blood; Treg, T regulatory cell.

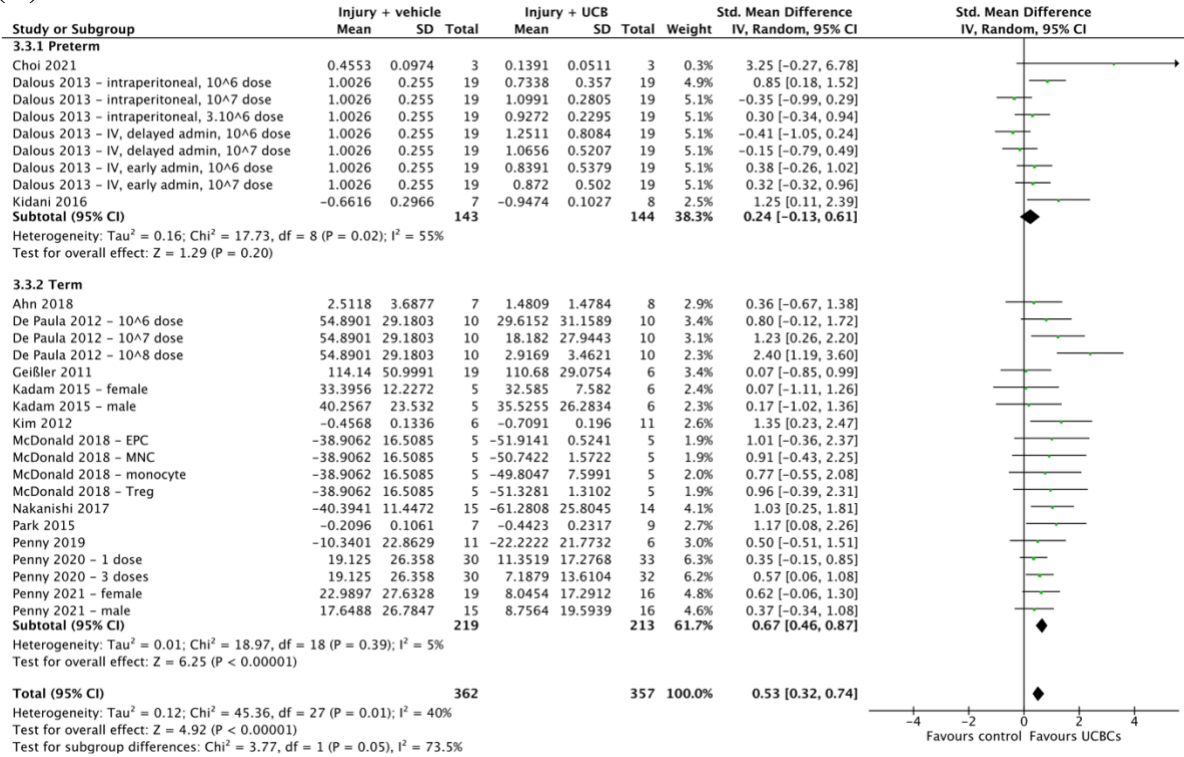
(A)



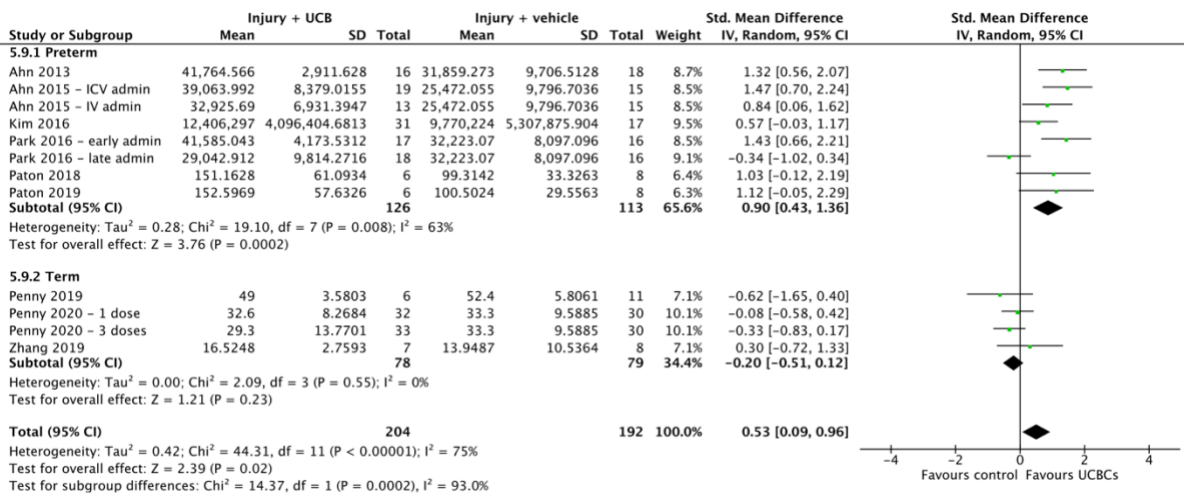
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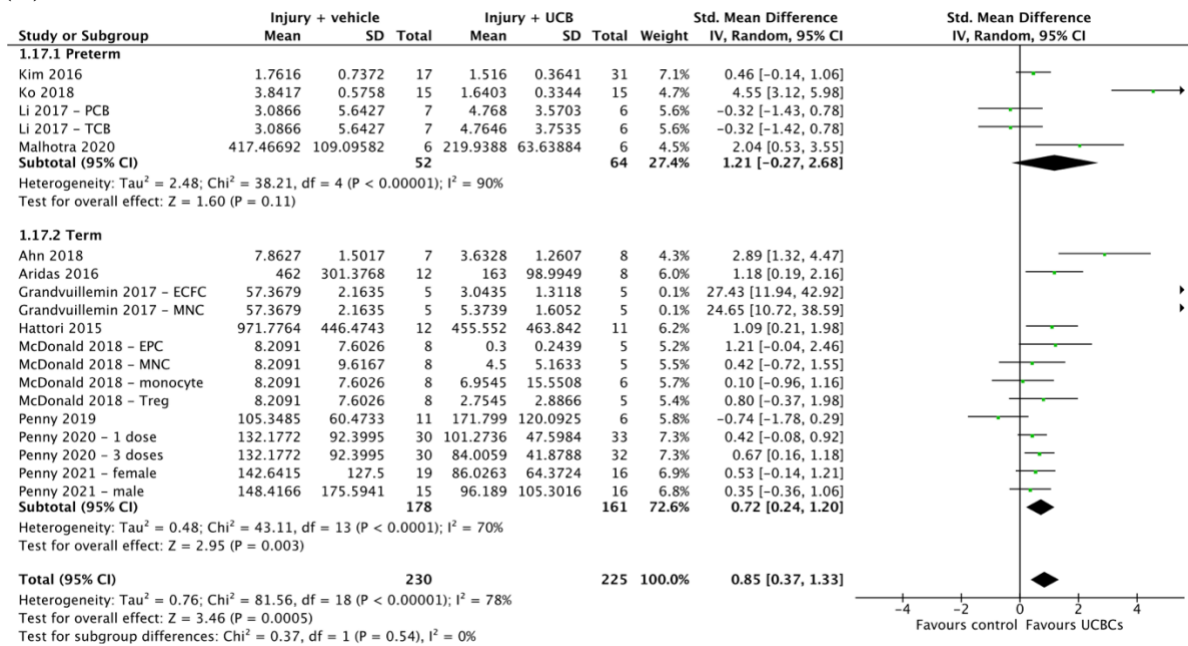
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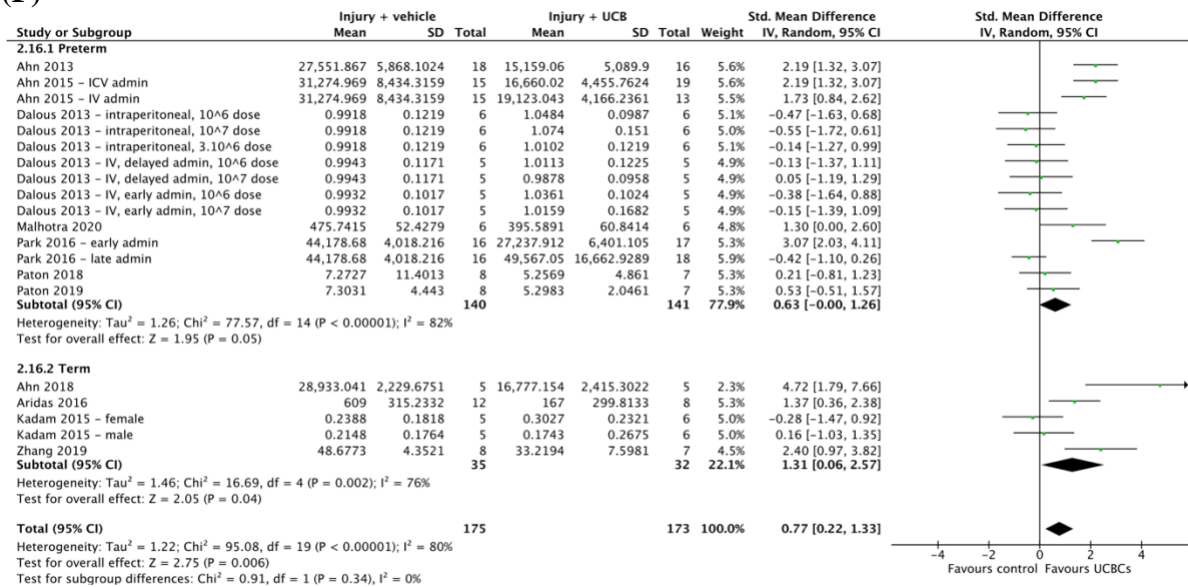
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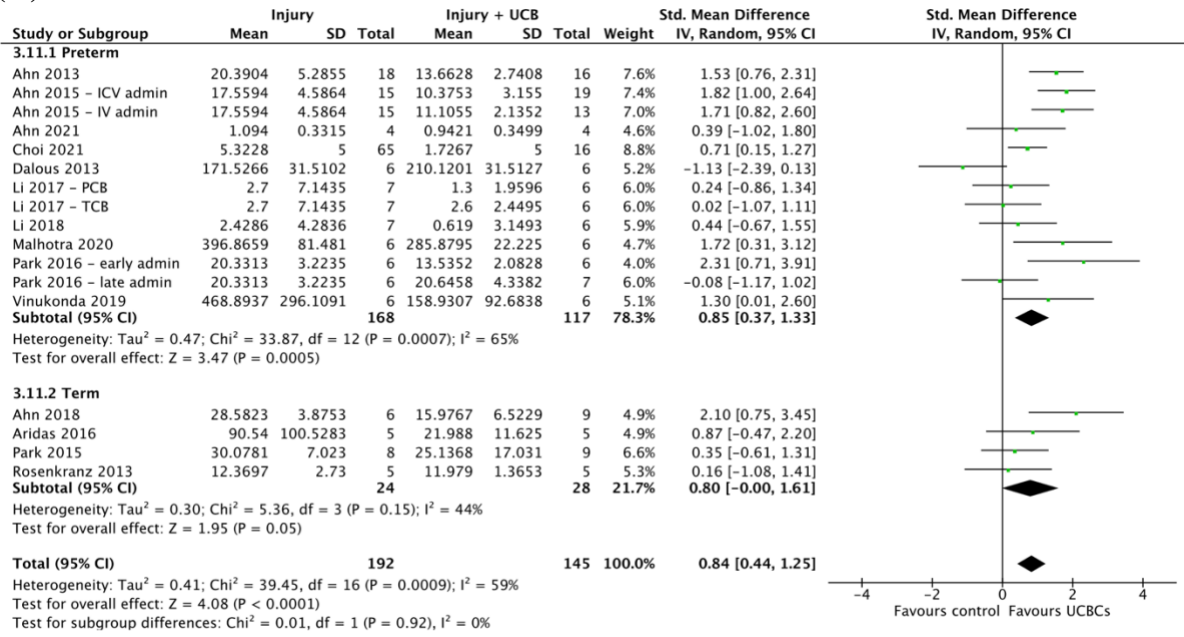
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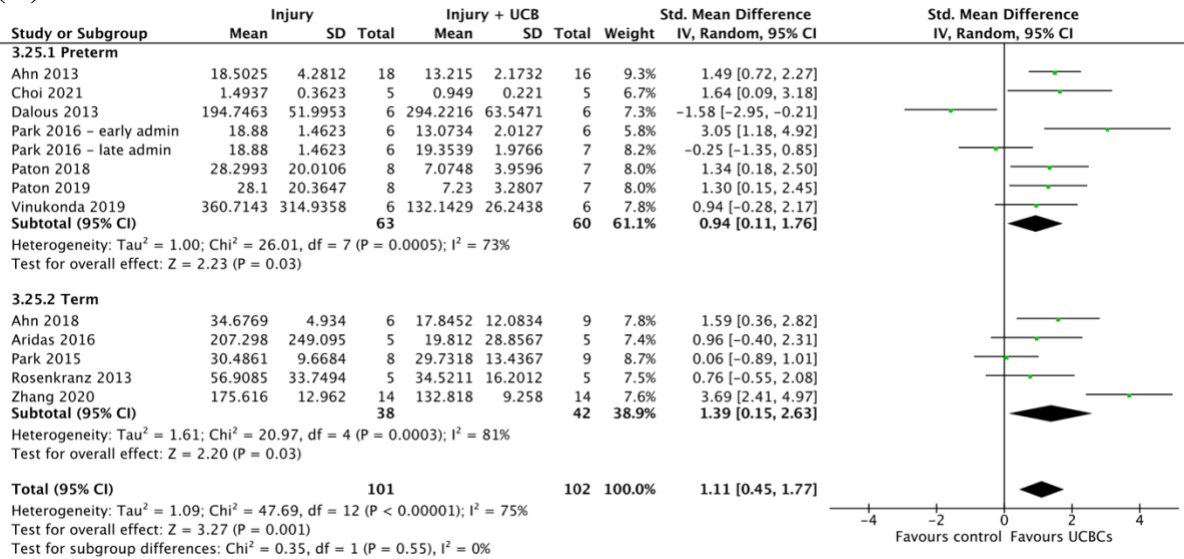
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(G)

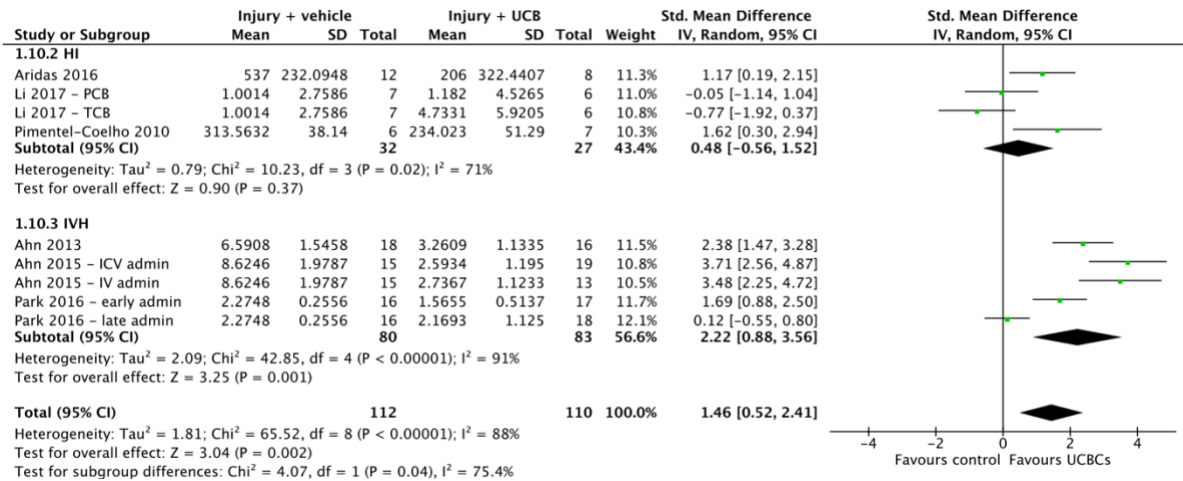


(H)

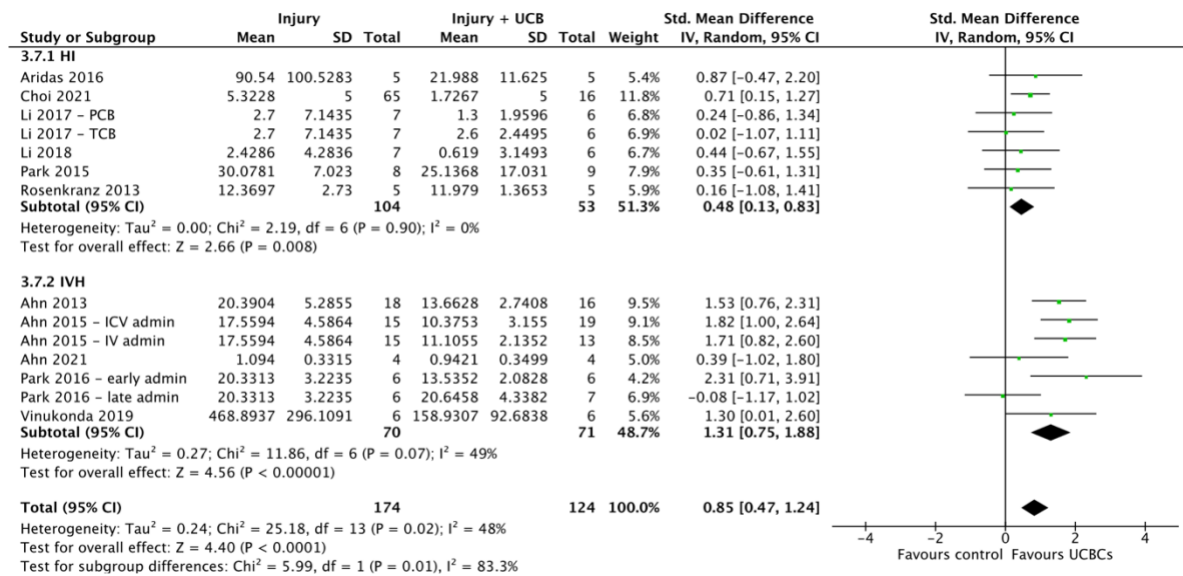


Supplemental 5. Forest plots demonstrating the effect of brain injury model on brain outcomes of (A) Apoptosis – white matter; (B) Neuroinflammation - TNF- α . Abbreviations: admin, administration; HI, hypoxia ischemia; ICV, intracerebroventricular; IV, intraventricular; IVH, intraventricular haemorrhage; PCB, preterm cord blood; TCB, term cord blood.

(A)

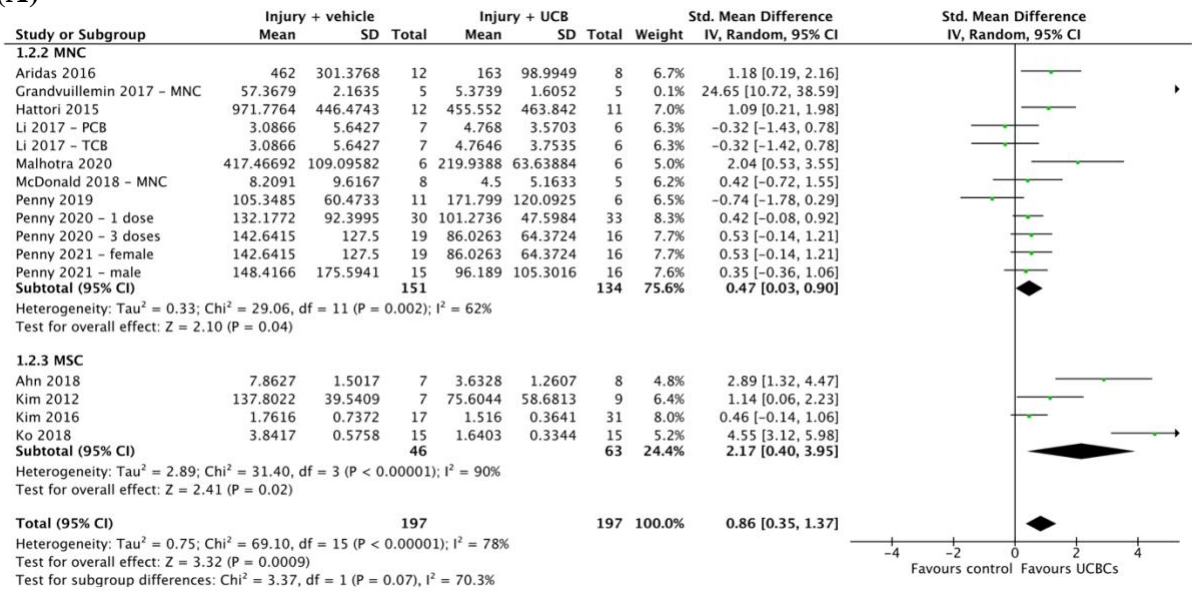


(B)

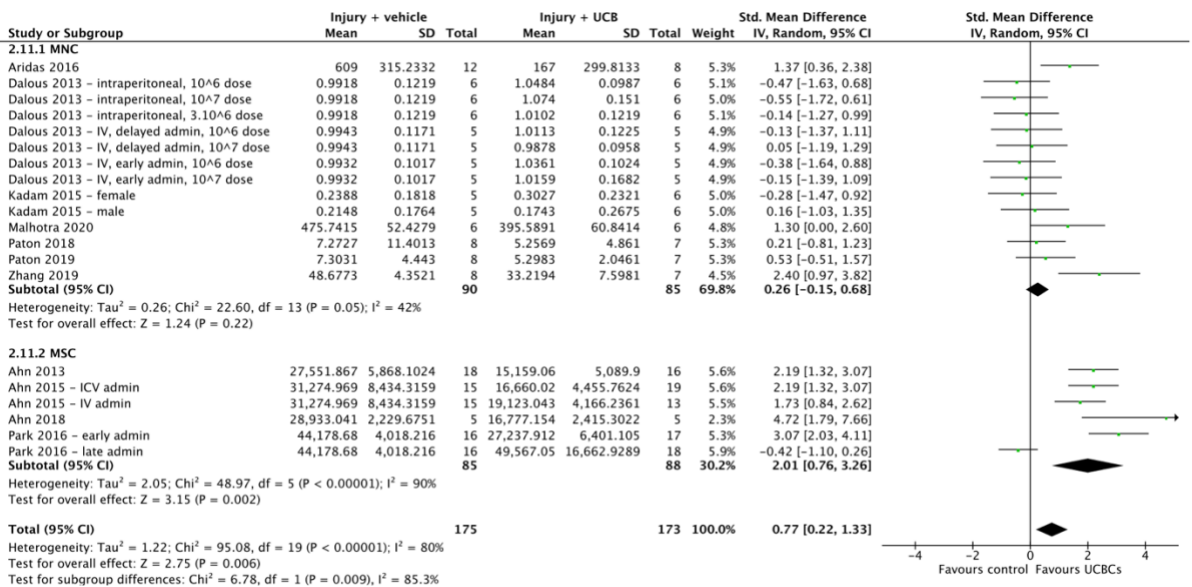


Supplemental 6. Forest plots demonstrating the effect of cell type on brain outcomes of **(A)** Apoptosis - grey matter; **(B)** Astrogliosis - white matter; **(C)** Apoptosis - white matter; **(D)** Microglial activation - grey matter; **(E)** Oligodendrocyte number - white matter; **(F)** Neuroinflammation - TNF- α ; **(G)** Neuroinflammation - IL-6. **(H)** Neuroinflammation - IL-1 β . Abbreviations: admin, administration; ICV, intracerebroventricular; IV, intraventricular; MNC, mononuclear cell; MSC, mesenchymal stromal cell; PCB, preterm cord blood; TCB, term cord blood.

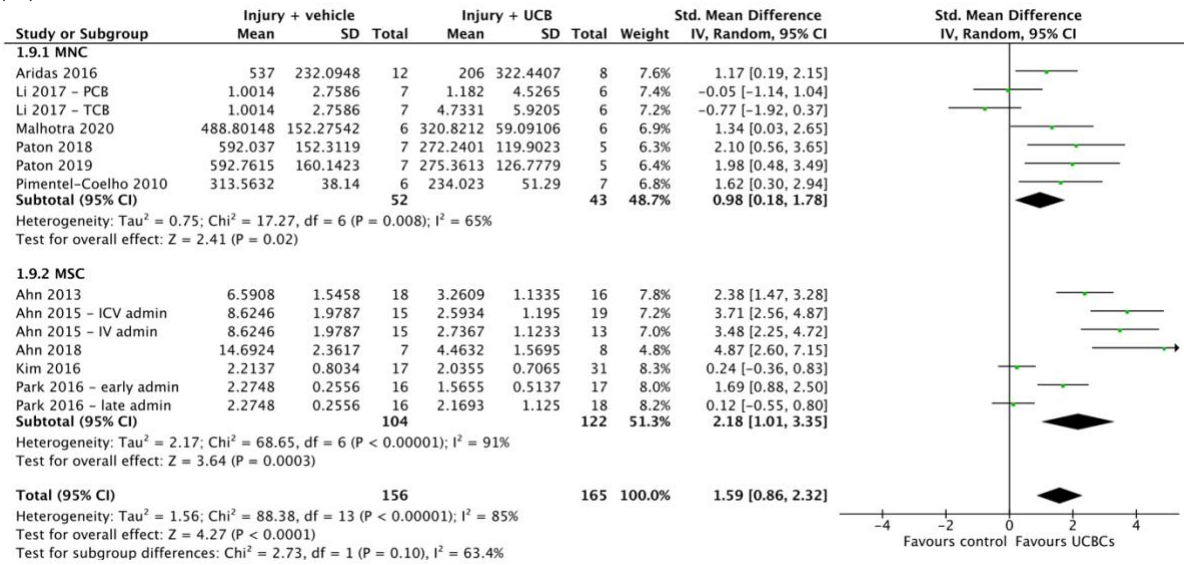
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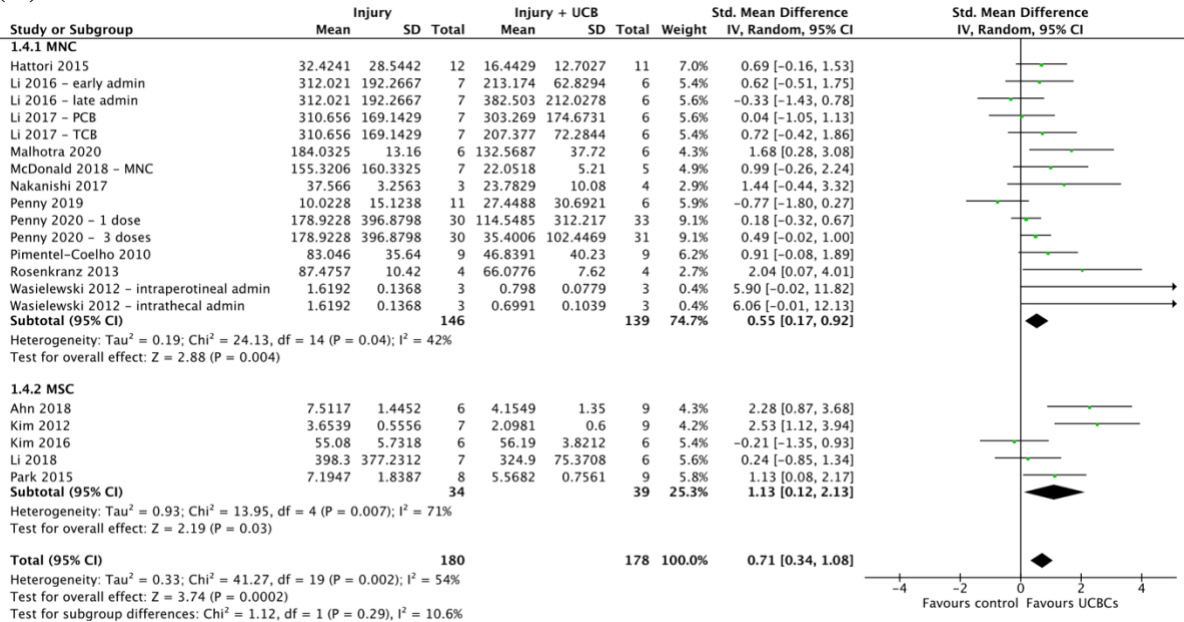
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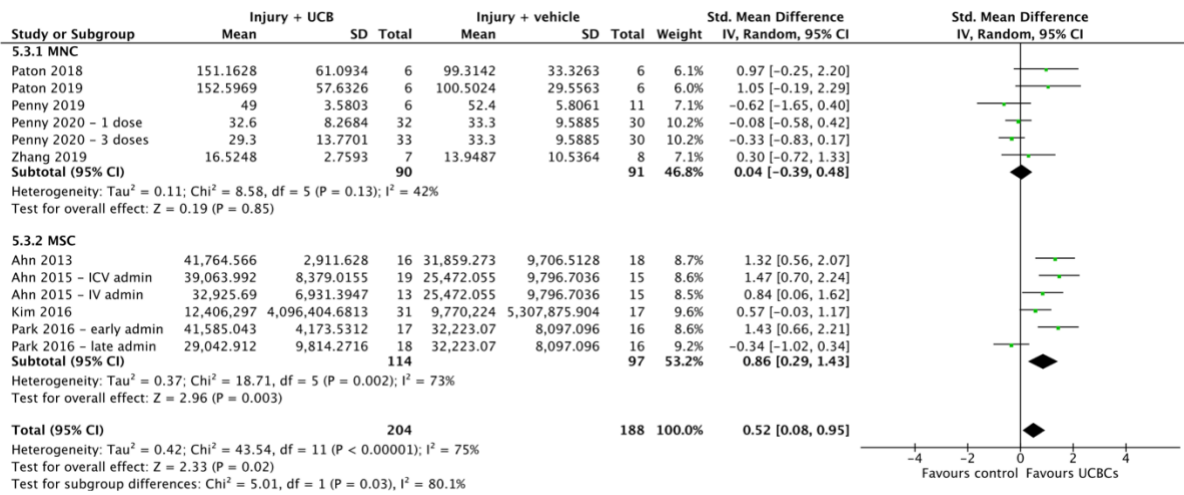
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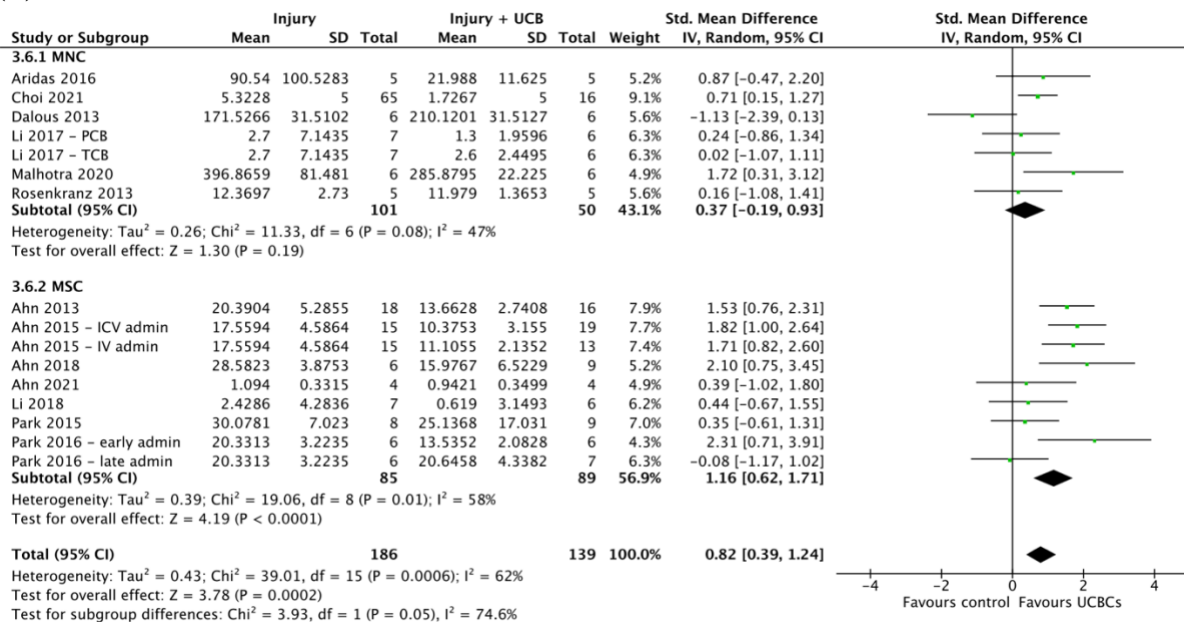
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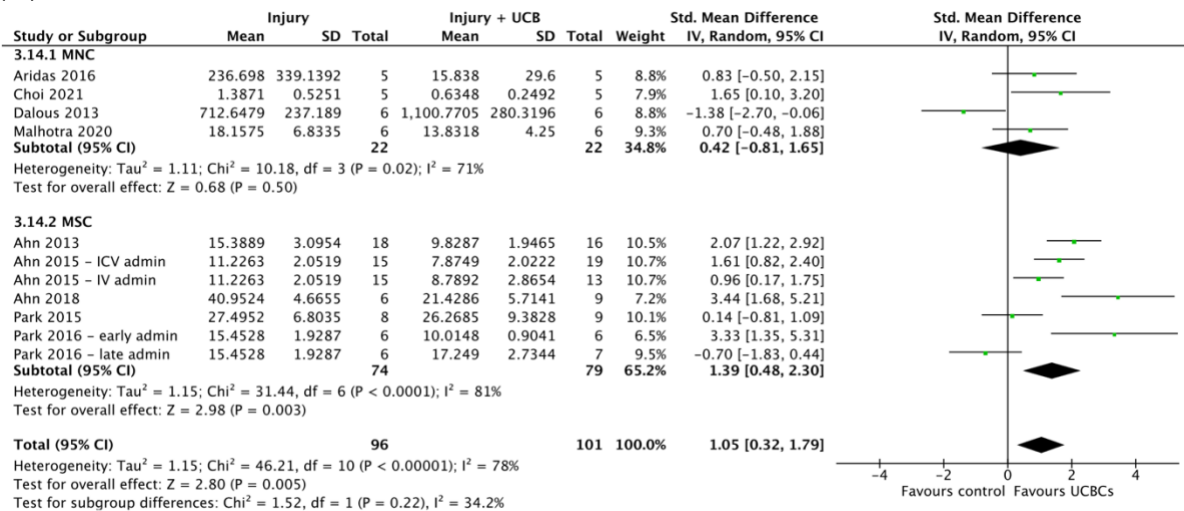
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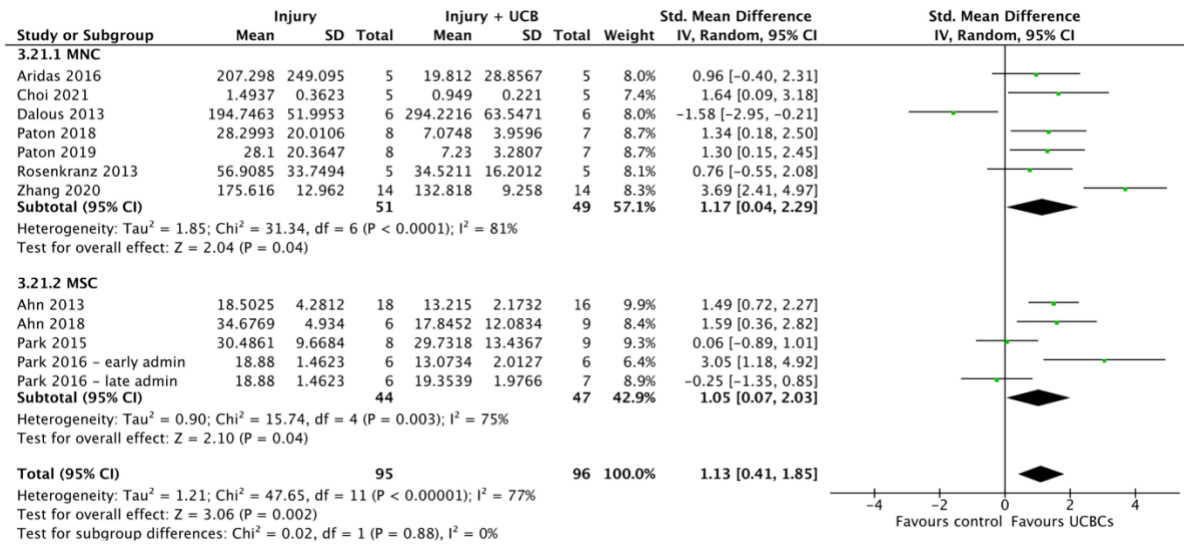
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(G)

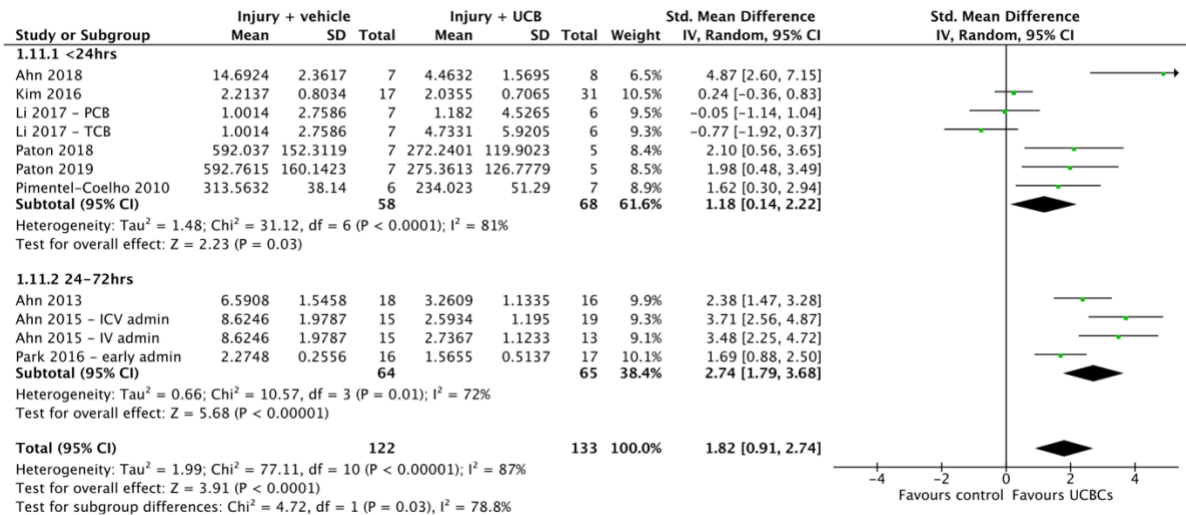


(H)

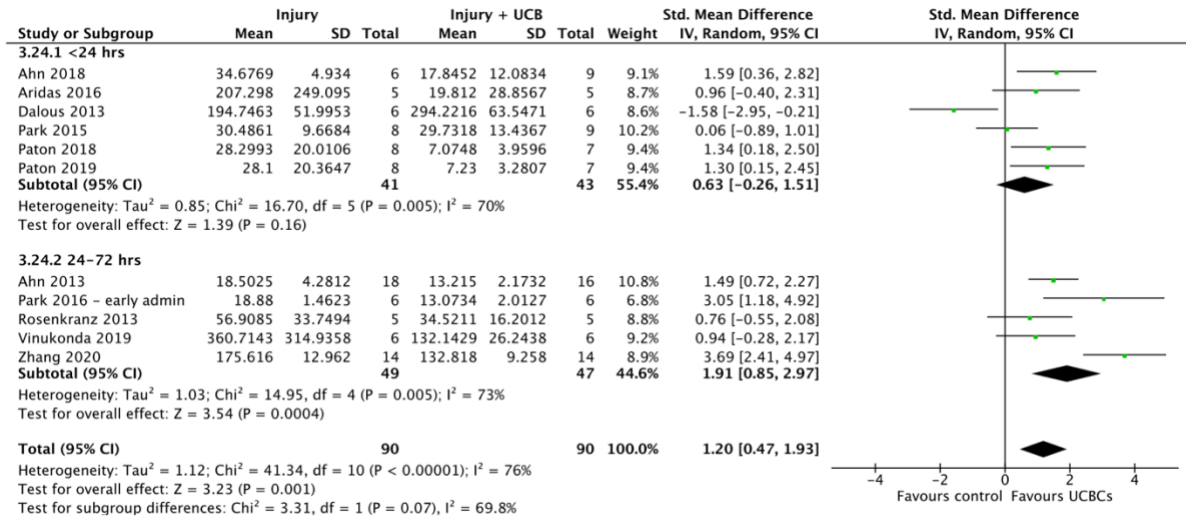


Supplemental 7. Forest plots demonstrating the effect of timing of UCB-derived cell therapy post injury induction on brain outcomes of (A) Apoptosis - white matter; (B) Neuroinflammation - IL-1 β ; (C) Apoptosis - grey matter; (D) Astrogliosis - grey matter; (E) Astrogliosis - white matter; (F) Infarct size; (G) Microglial activation - grey matter; (H) Neuroinflammation - TNF- α . Abbreviations: admin, administration; ECFC, endothelial colony-forming cell; EPC, endothelial progenitor cell; ICV, intracerebroventricular; IV, intraventricular; MNC, mononuclear cell; PCB, preterm cord blood; TCB, term cord blood; Treg, T regulatory cell.

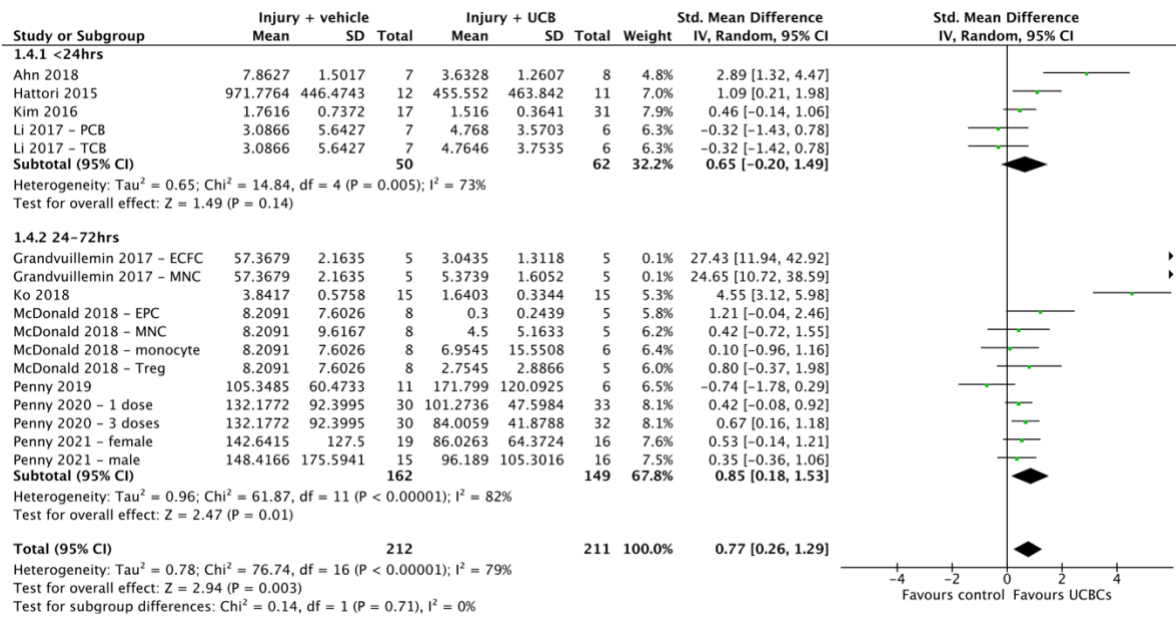
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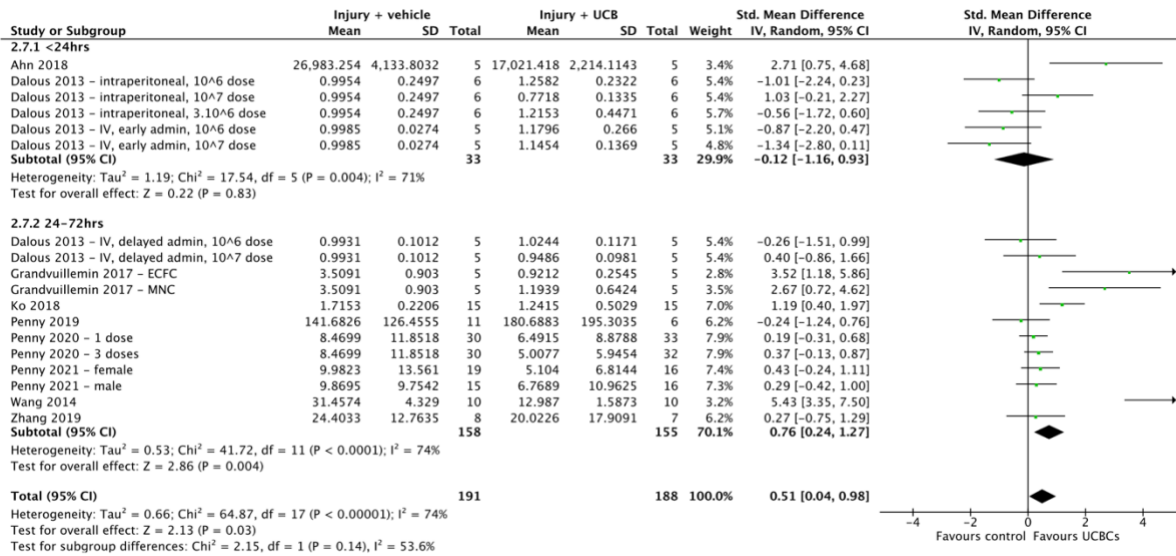
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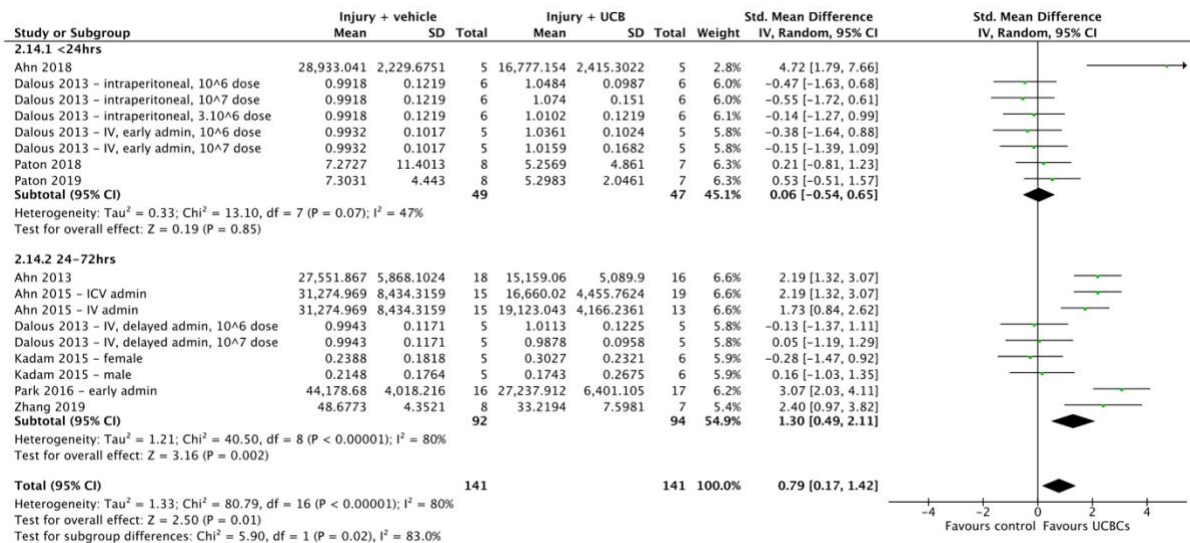
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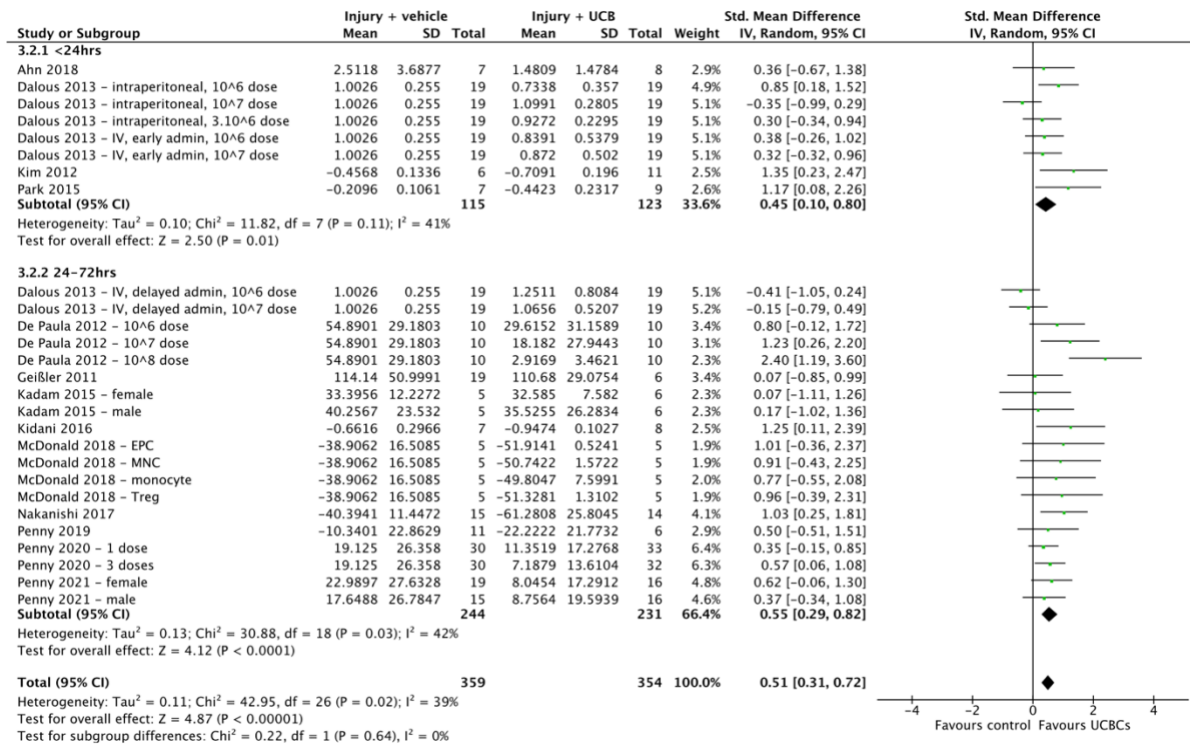
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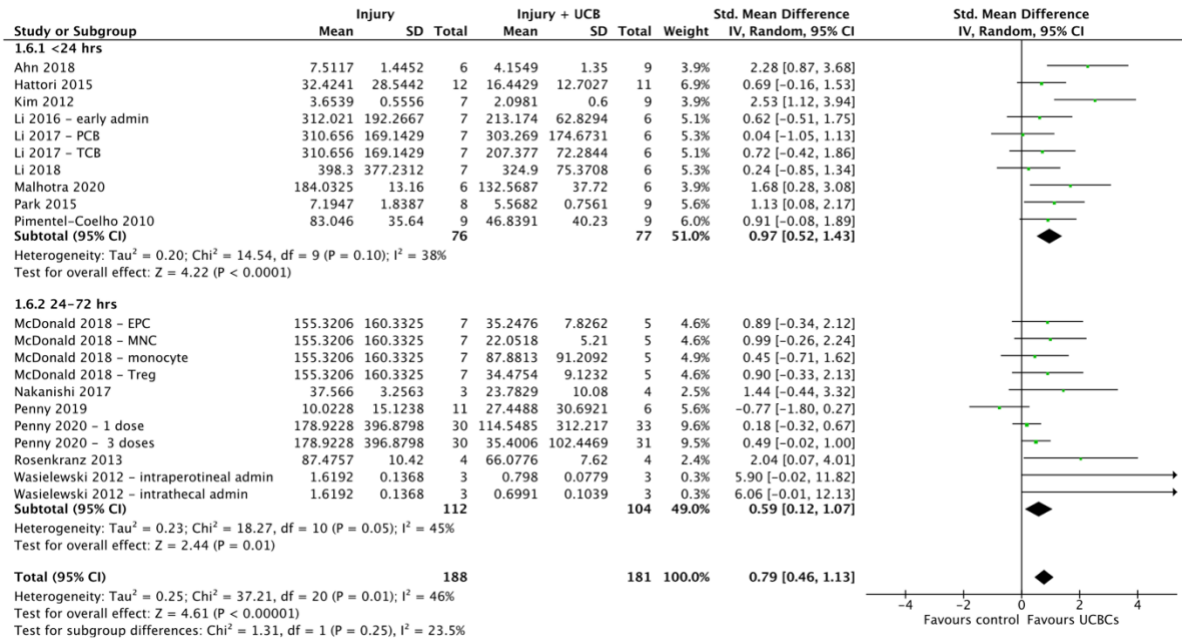
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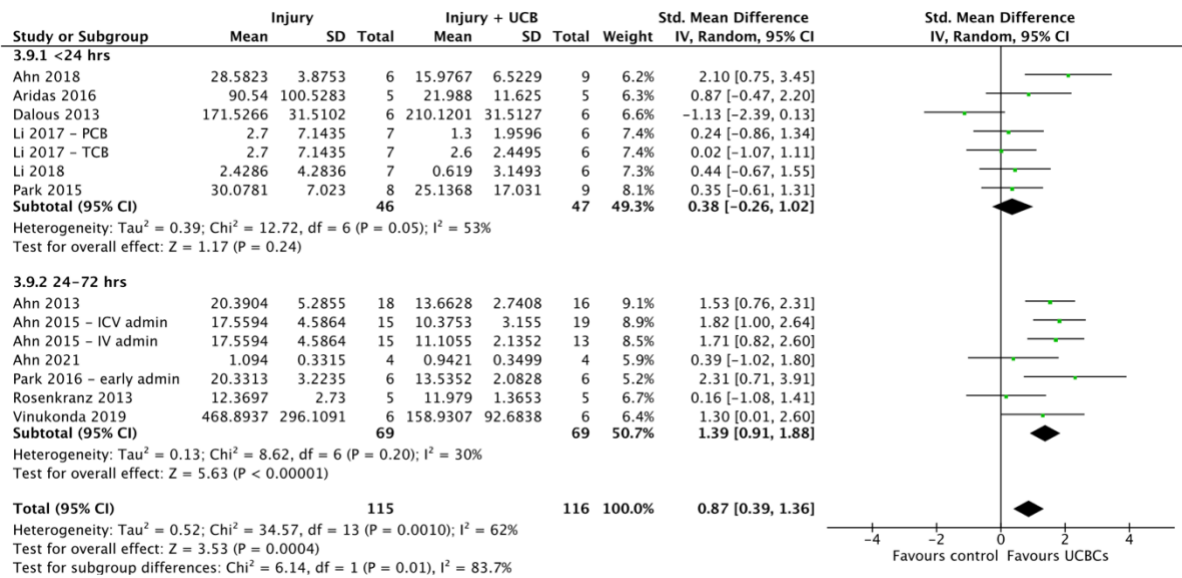
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(G)

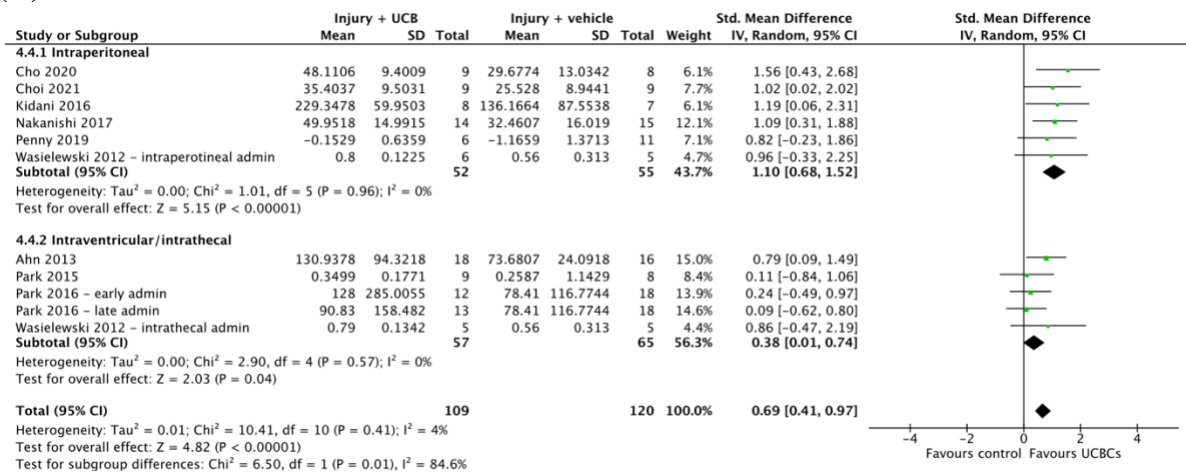


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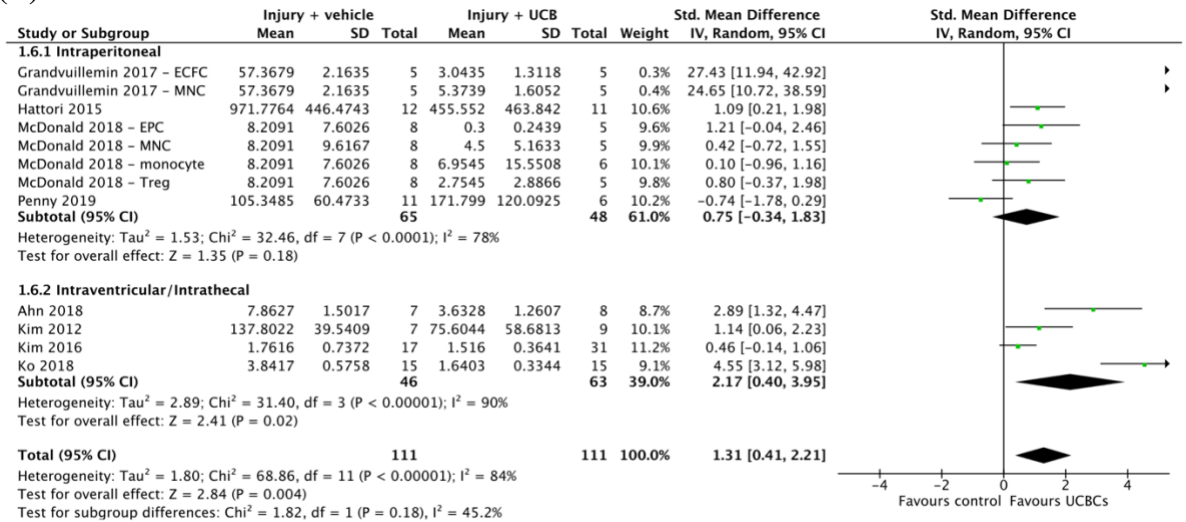


Supplemental 8. Forest plots demonstrating the effect of the route of cell administration on brain outcomes of **(A)** Motor function – cylinder test; **(B)** Apoptosis - grey matter; **(C)** Apoptosis - white matter; **(D)** Astrogliosis - grey matter; **(E)** Astrogliosis - white matter; **(F)** Infarct size; **(G)** Microglial activation - grey matter; **(H)** Neuroinflammation - TNF- α . Abbreviations: admin, administration; ECFC, endothelial colony-forming cell; EPC, endothelial progenitor cell; ICV, intracerebroventricular; IV, intraventricular; MNC, mononuclear cell; PCB, preterm cord blood; TCB, term cord blood; Treg, T regulatory cell.

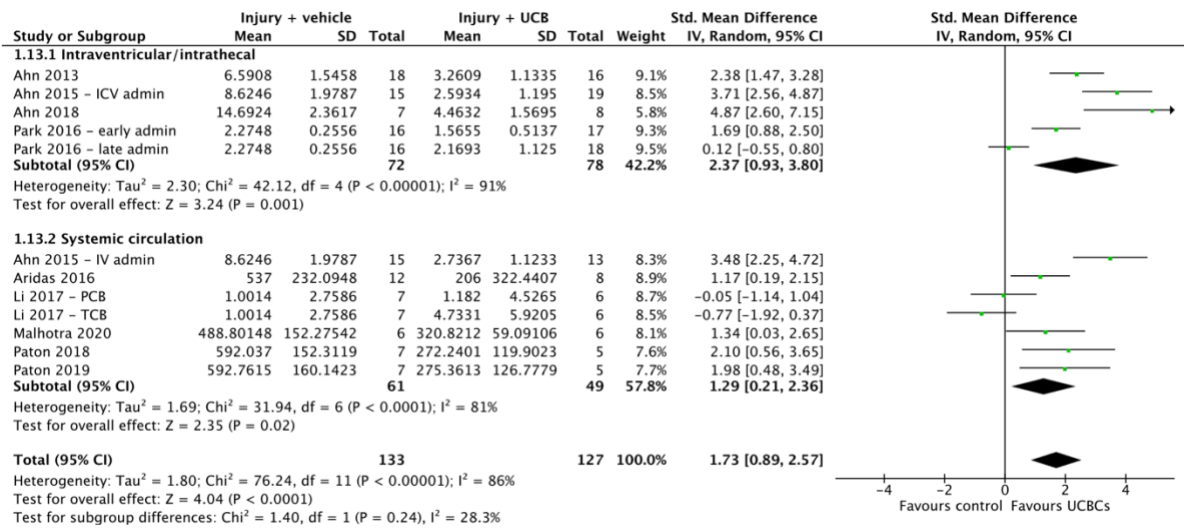
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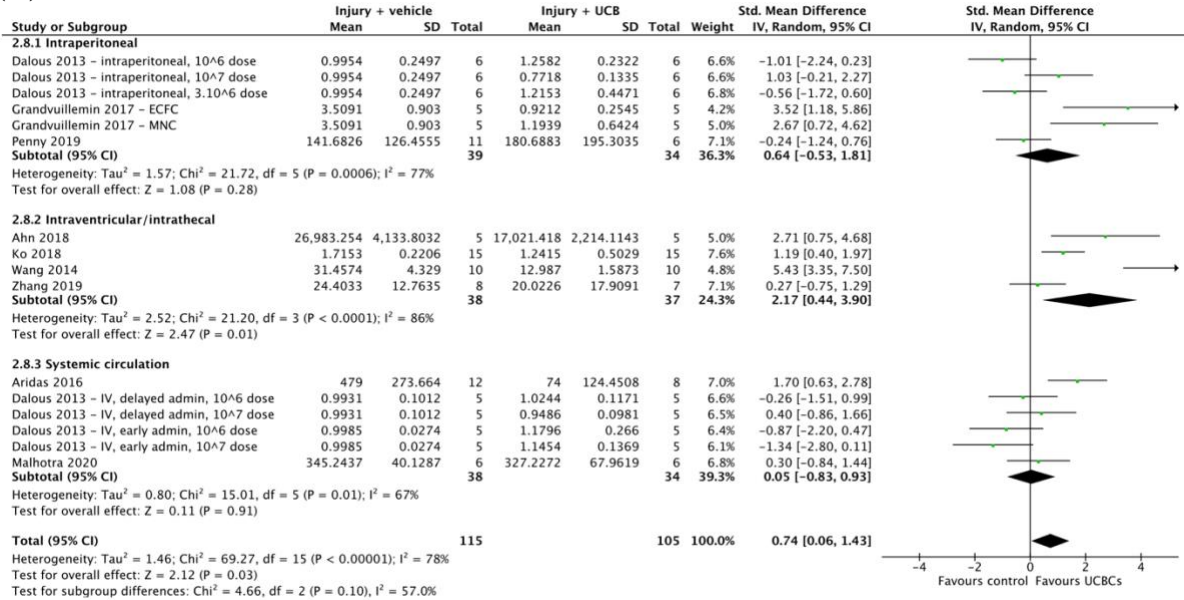
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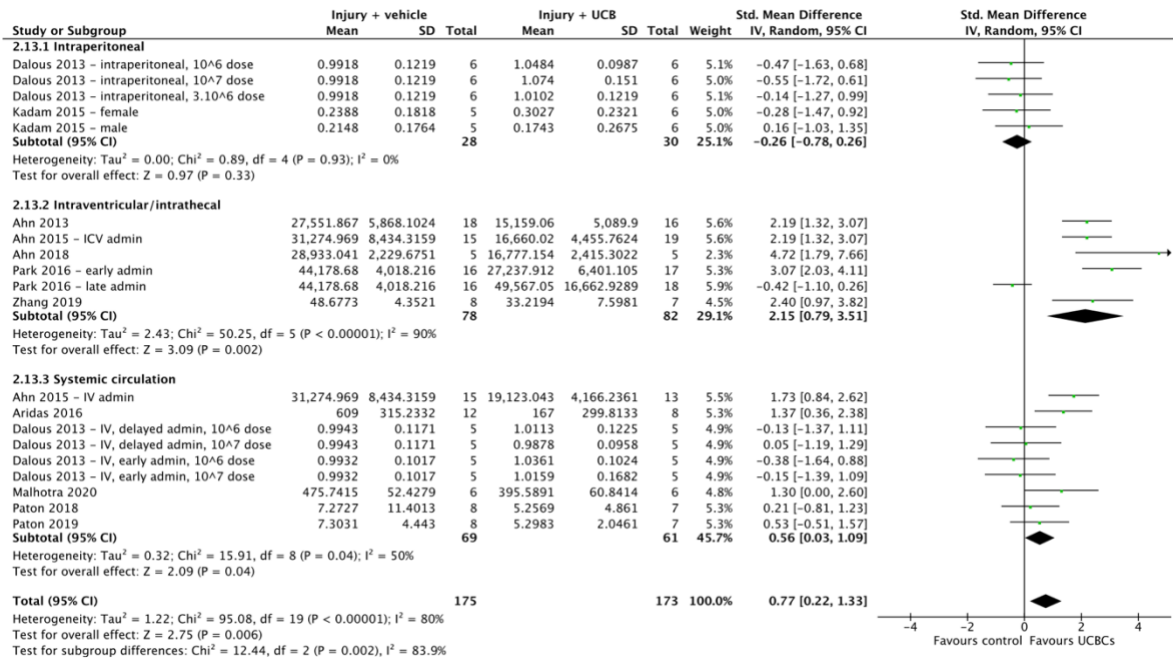
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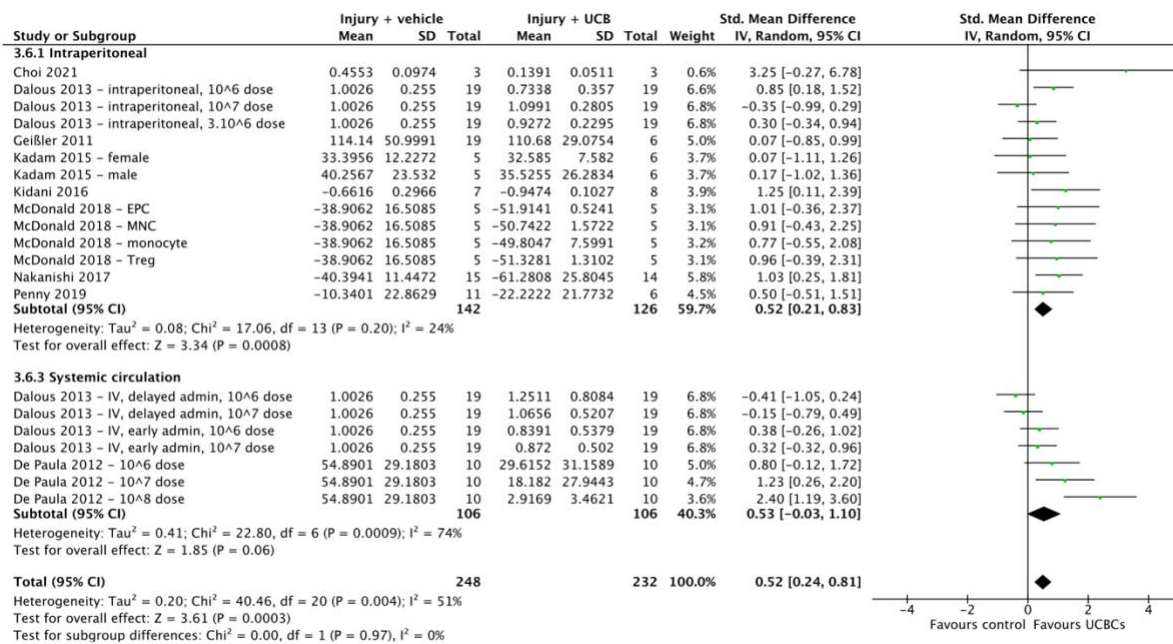
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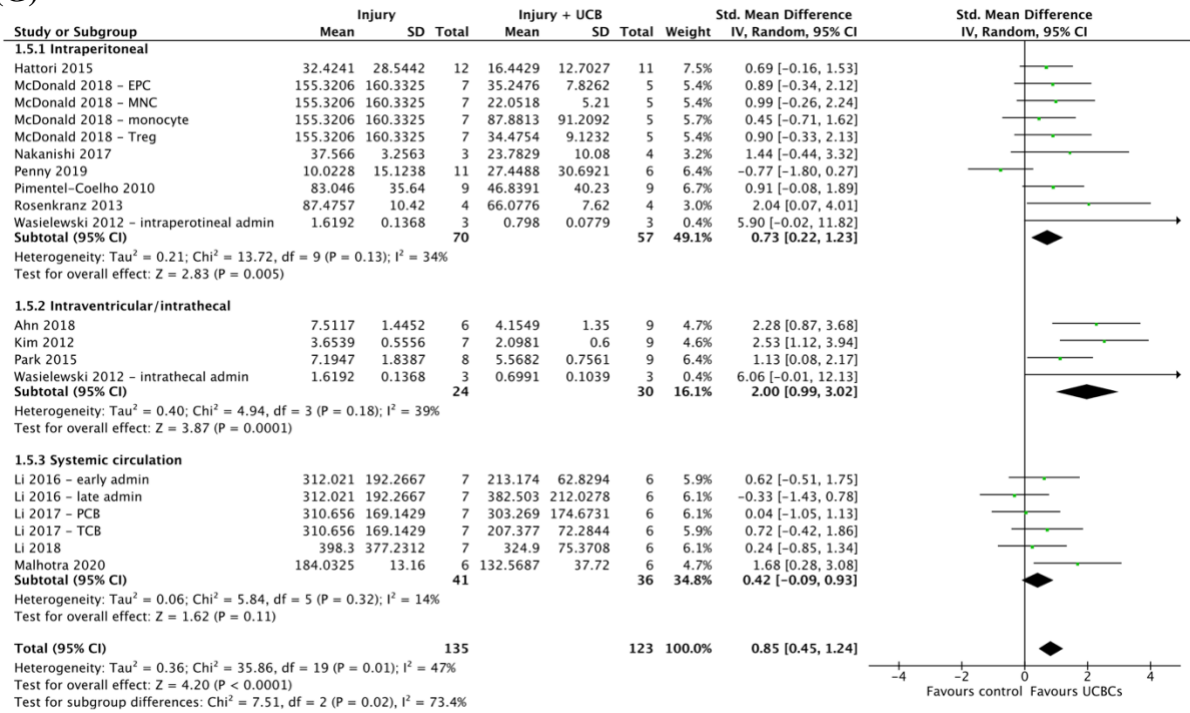
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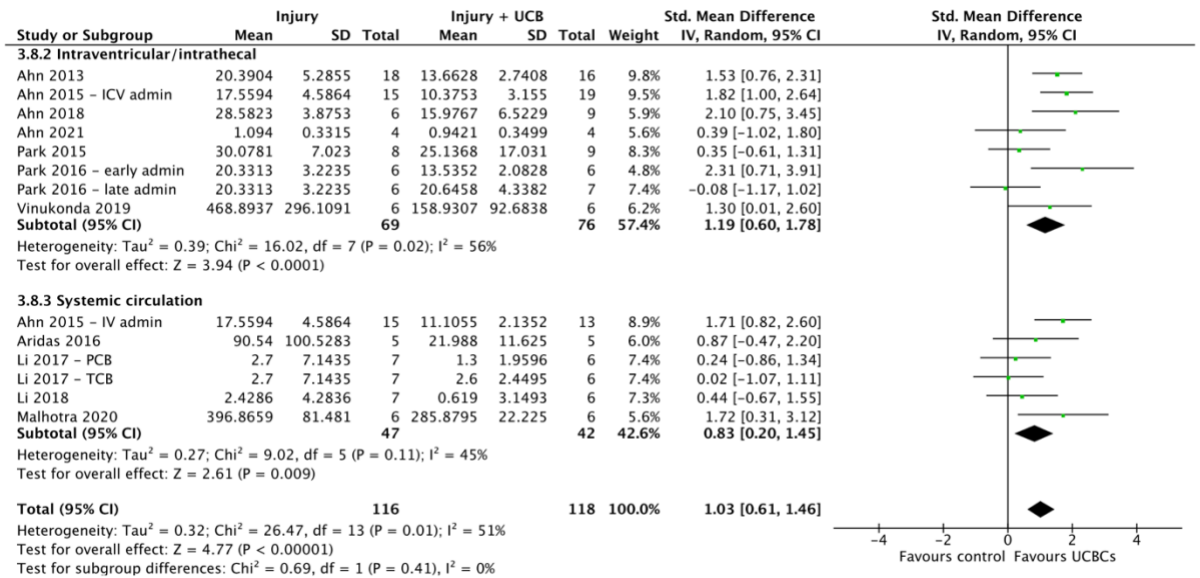
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(G)

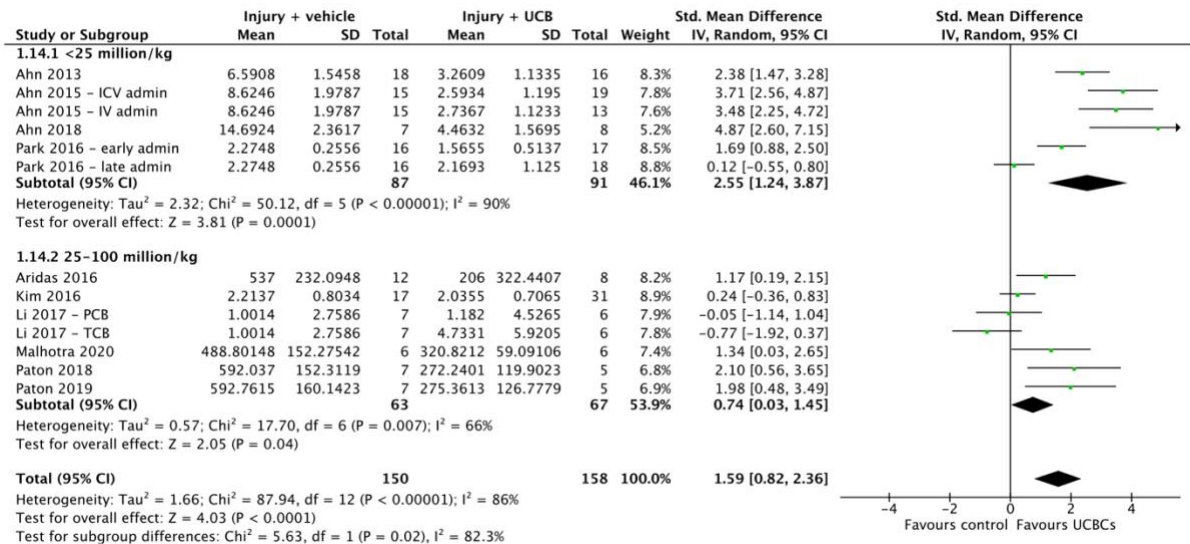


(H)

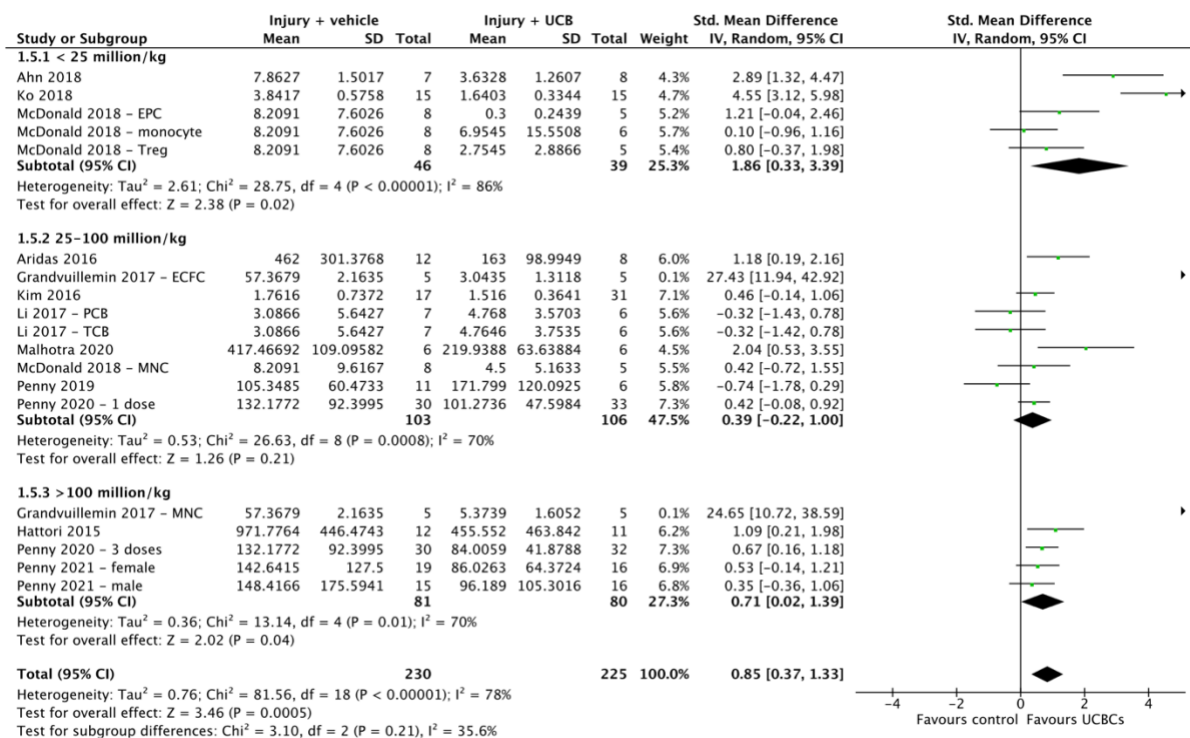


Supplemental 9. Forest plots demonstrating the effect of cell dosage on brain outcomes of **(A)** Apoptosis - white matter; **(B)** Apoptosis - grey matter; **(C)** Astrogliosis - grey matter; **(D)** Astrogliosis - white matter; **(E)** Infarct size; **(F)** Microglial activation - grey matter; **(G)** Neuron number; **(H)** Oligodendrocyte number – white matter; **(I)** Neuroinflammation - TNF- α ; **(J)** Neuroinflammation - IL-1 β ; **(K)** Motor function – cylinder test. Abbreviations: admin, administration; ECFC, endothelial colony-forming cell; EPC, endothelial progenitor cell; ICV, intracerebroventricular; IV, intraventricular; MNC, mononuclear cell; million/kg, million cells per kilogram; PCB, preterm cord blood; TCB, term cord blood; Treg, T regulatory cell.

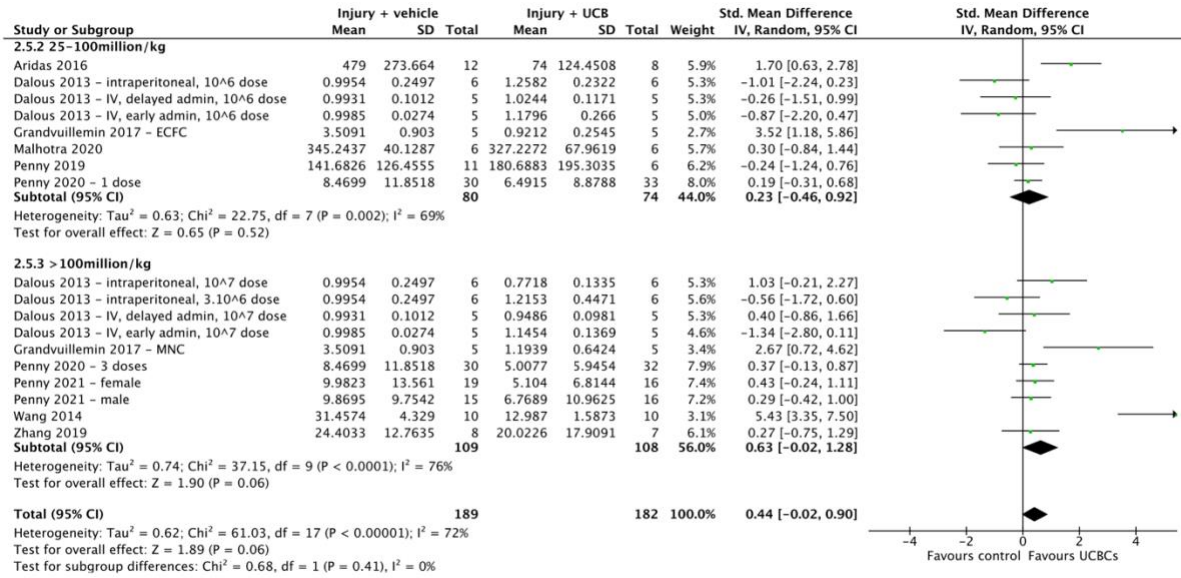
(A)



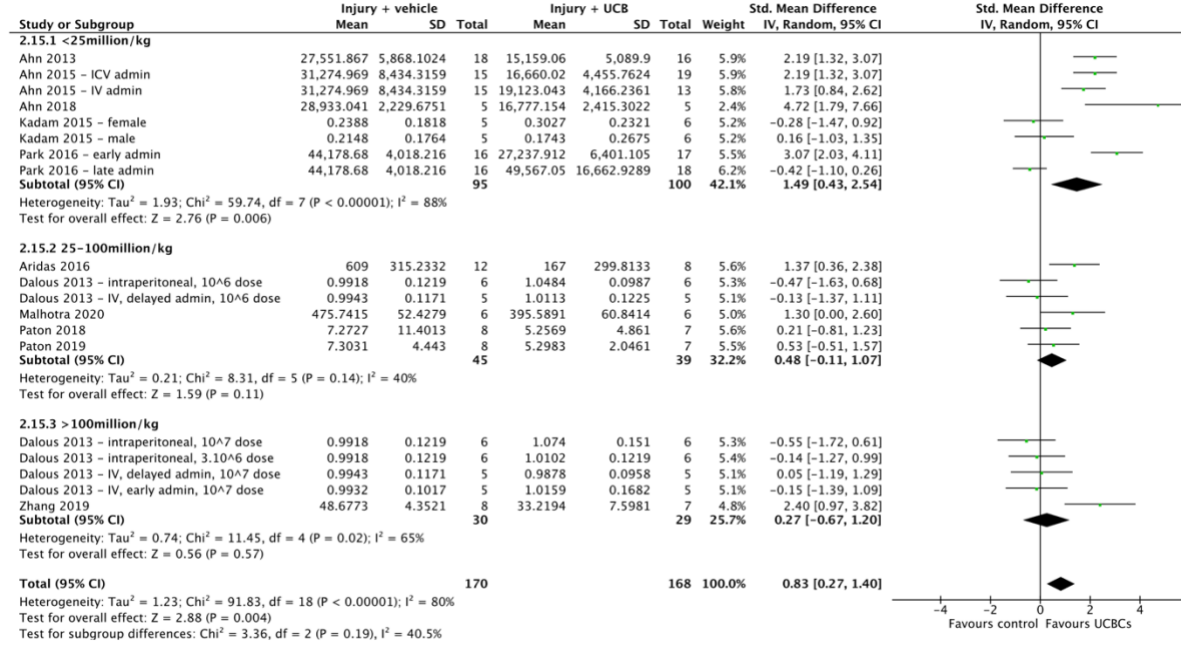
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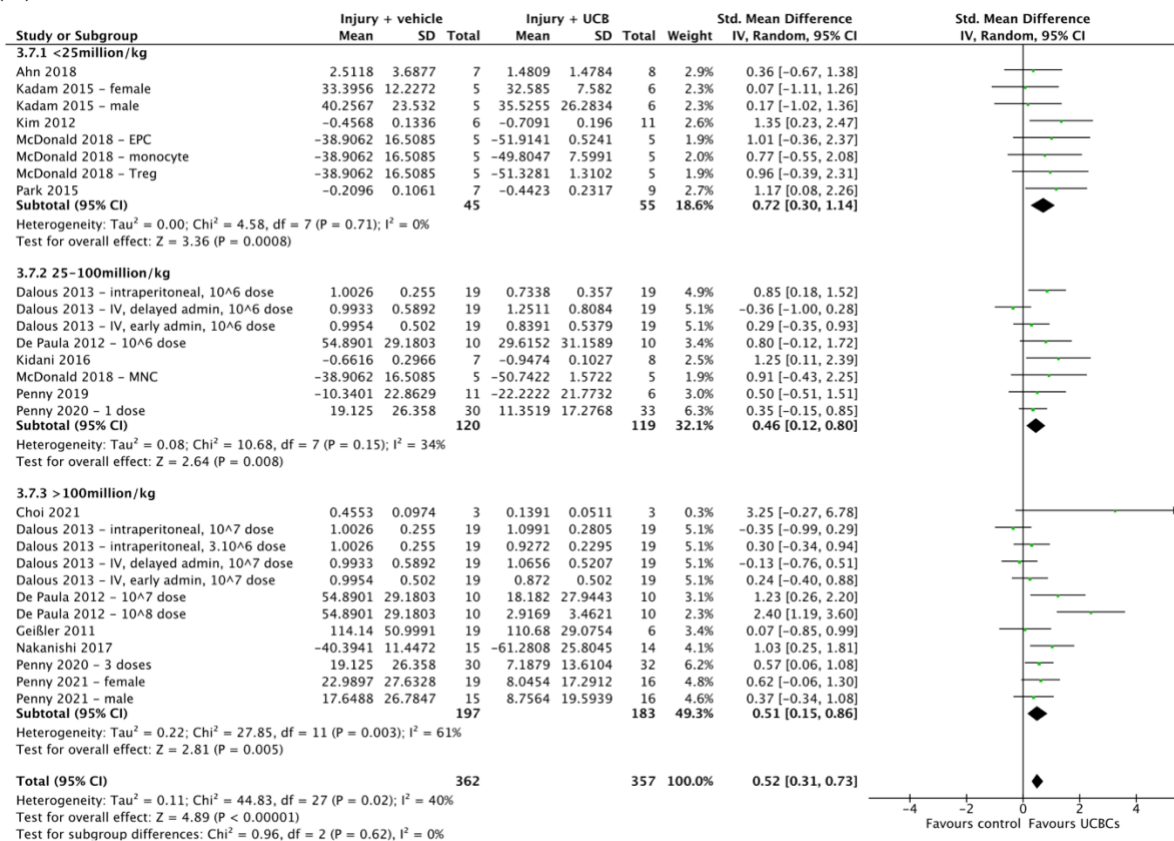
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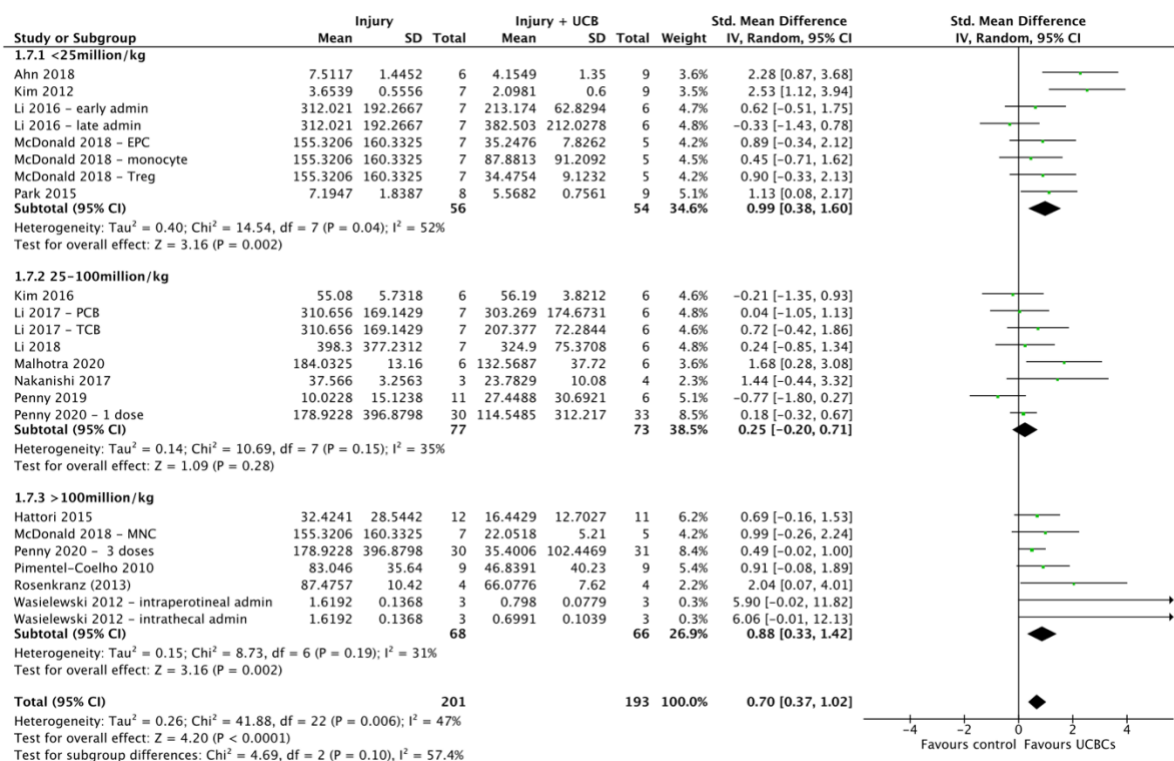
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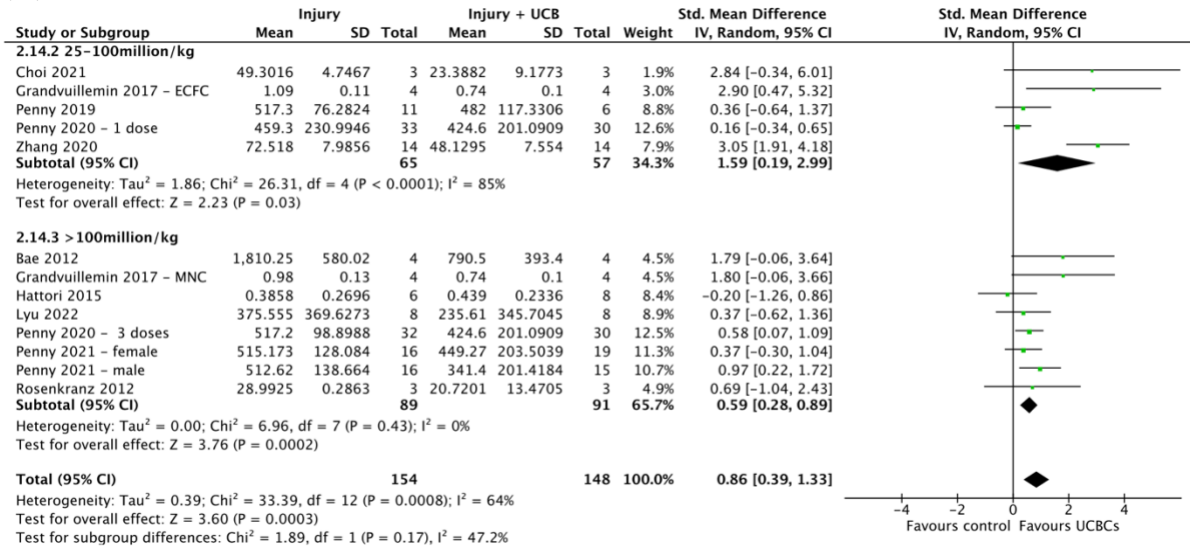
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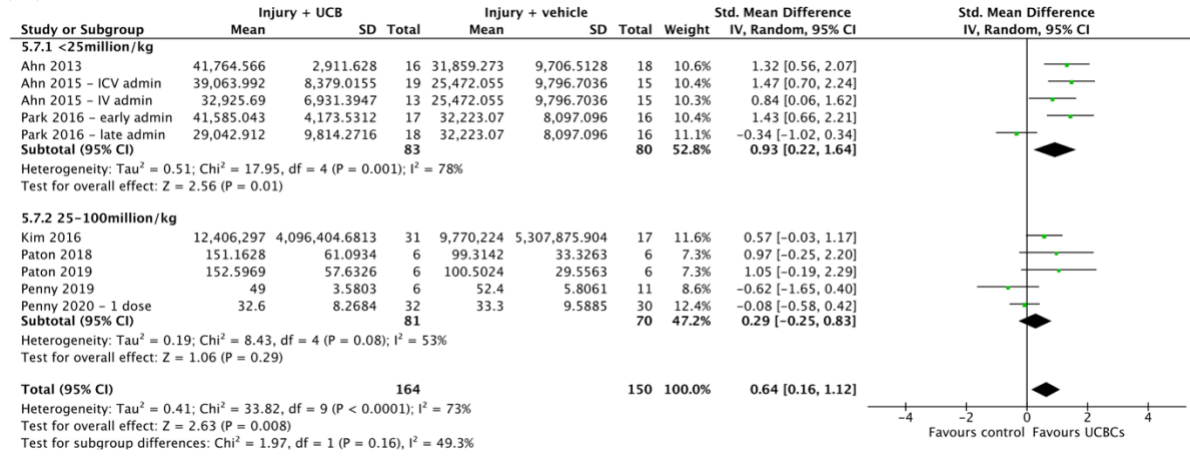
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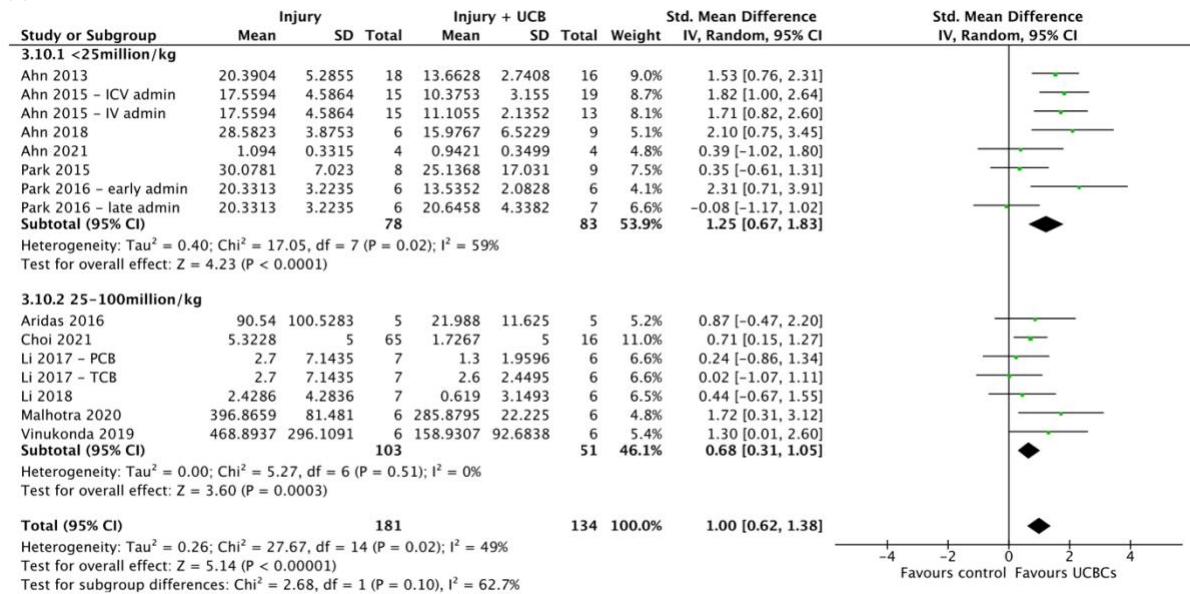
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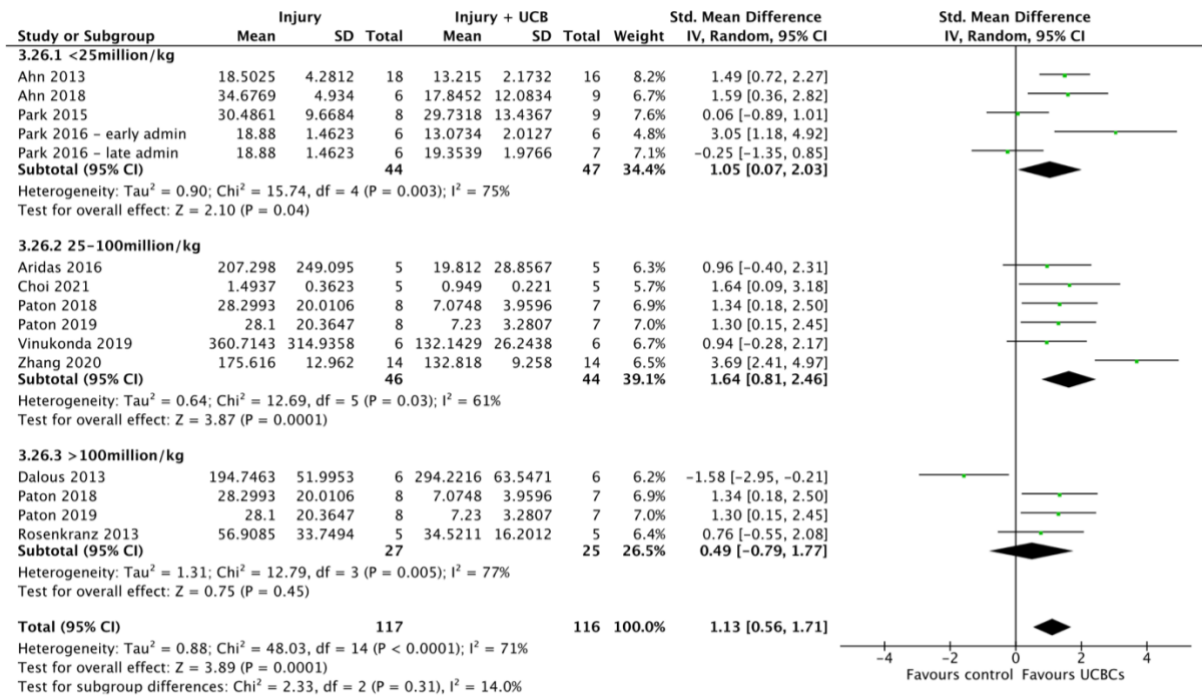
(H)



(I)



(J)



(K)

