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**Original Paper** 

# Induced Pluripotent Stem Cell **Transplantation Improves Locomotor Recovery in Rat Models of Spinal Cord Injury: a Systematic Review and Meta-Analysis of Randomized Controlled Trials**

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#### **Key Words**

Spinal cord injury • Locomotor recovery • BBB score • Induced pluripotent stem cells • Rats • Meta-analysis

#### Abstract

Background/Aims: Spinal cord injury (SCI) has long been a subject of great interest in a wide range of scientific fields. Several attempts have been made to demonstrate motor function improvement in rats with SCI after transplantation of induced pluripotent stem cells (iPSC). This systematic review and meta-analysis was designed to summarize the effects of iPSC on locomotor recovery in rat models of SCI. Methods: We searched the publications in the PubMed, Medline, Science Citation Index, Cochrane Library, CNKI, and Wan-fang databases and the China Biology Medicine disc. Results were analyzed by Review Manager 5.3.0. The quality of evidence was assessed using the Grading of Recommendations Assessment, Development and Evaluation (GRADE) methodology. Results: Six randomized controlled preclinical trials covering eight comparisons and including 212 rats were selected. The subgroup analyses were based on the following items: different SCI models, cell counts, iPSC sources, iPSC differentiations and transplantation methods. The pooled results indicated that iPSC transplantation significantly improved locomotor recovery of rats after SCI by sustaining beneficial effects, especially in the subgroups of contusion, moderate cell counts (5×10<sup>5</sup>), source of human fetal lung fibroblasts, iPSC-neural precursors and intraspinal injection. **Conclusion:** Our meta-analysis of the effects of iPSC transplantation on locomotor function in SCI models is, to our knowledge, the first meta-analysis in this field. We conclude that iPSC transplantation improves locomotor recovery in rats with SCI, implicating this strategy as an effective therapy. However, more studies are required to validate our conclusions.

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#### Introduction

Spinal cord injury (SCI) is a devastating event, resulting in permanent neurological impairment and attendant social and economic losses [1, 2]. Due to the loss of sensory and motor capabilities, patients are usually rendered paraplegic or tetraplegic. Beyond that, bladder dysfunction, intestinal flora disturbance and cardiac problems represent the most lethal threat [3, 4]. Thus, improved strategies targeting these issues are urgently required.

To date, surgical interventions to decompress the spinal cord [5] and related rehabilitation [6] are the standard of care for acute SCI. However, no neuroprotective and regenerative therapies capable of producing directly beneficial effects are currently available [7]. It has been demonstrated that high-dose methylprednisolone may have good effects on SCI, but there remains no consensus on the efficacy of this approach [8].

Recent progress in stem cell research may be at the point of breaking this impasse [9]. A variety of stem cell types have shown their potential for transplantation, such as neural stem cells [10], mesenchymal stem cells [11], Schwann cells [12], embryonic stem cells [13] and more recently, induced pluripotent stem cells(iPSC) [14, 15]. Among these, iPSC has played a pivotal role in repairing the damaged spinal cord. Within the past 5 years, laboratories around the world have reported functional improvements following iPSC transplantation in animal models of SCI [16, 17]. This effect may be associated with significantly enhanced secretion of regenerative molecules and growth factors [7]. However, several studies have demonstrated poor survival of the cells and no significant functional recovery after the transplantation [18, 19].

Meta-analyses of controlled studies increase the power and precision of the estimated intervention effect and thus, represents a more powerful test of the null hypothesis than any of the individual studies alone [20]. To date, no quantitative data are available regarding locomotor recovery in rats following iPSC transplantation after SCI. As a result, we summarized and analyzed the history of basic research into iPSC transplantation in rats with SCI and evaluated the potential rat models as a platform for the development of iPSC therapy for SCI in the clinic.

#### **Materials and Methods**

#### Search strategy

Following the methodological recommendations of the Cochrane Collaboration and the PRISMA statement, the PubMed, Medline, Science Citation Index, Cochrane Library, CNKI, and Wan-fang electronic databases and the China Biology Medicine disc were searched to retrieve related studies. Notably, we searched the Medical Subject Heading (MeSH) terms "induced pluripotent stem cells", "transplantation", "spinal cord injury" and all related free words. The language, publication date, or publication status were not restricted.

#### Inclusion criteria

The inclusion criteria together with the PICO (Patient/ Participants, Intervention, Comparison and Outcome) approaches were established as follows:

1) Types of participants: laboratory rats of any breed, sex, body weight and age suffering contusion and compression of SCI were included.

2) Types of Intervention: we included the basic information of iPSC transplantation irrespective of cell sources, cell differentiation, transplantation method, cell count and time of transplantation. Labeling or transfection with markers for cellular tracing and imaging (such as green fluorescent protein) were included.

3) Types of comparison: the included publications contained at least two groups; iPSC transplantation and control groups. The control interventions comprised placebo (e.g. saline, culture medium or similar vehicle control). All rats underwent laminectomy followed by SCI before iPSC or control interventions.

4) Types of outcome evaluated: locomotor function was evaluated according to the open-field



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(Basso, Beattie and Bresnahan, BBB) test. The 21-point BBB score was used to assess hind limb locomotion. The highest scores obtained using the BBB rating method represent normal function (coordinated gait, consistent toe clearance, predominant paw position is parallel throughout stance, consistent trunk stability, and tail is consistently up) [21]. It is a sensitive indicator of basic overground locomotion and can be used to evaluate limb movements and walking characteristics in an open-field environment [22].

5) Types of study design: randomized controlled animal trials were regarded as eligible for evaluation of iPSC transplantation in laboratory rats with SCI.

#### Exclusion criteria

Publications were excluded if they met one of the following criteria: no access to the full text; review; the mean and standard deviation (SD) of BBB scores were unavailable; BBB score is not in use; ischemic model; mouse model; chronic spinal cord injury model; use animal trials of low quality; concomitant injection with other cell types or use of adjuvant products (e.g. injectable hydrogel).

#### Definitions

We defined a "publication" as a discrete piece of work (including abstracts). Each publication may report data from more than one experiment. Each experiment may describe outcomes in several different experimental cohorts. The contrast between outcomes in a single intervention cohort with that in a control cohort we defined as a "comparison" [23].

#### Selection of studies

Based on the same selection criteria, two investigators (QC and GY) independently screened citations and publications identified by the initial search. Then, we selected potentially relevant titles, reviewed their abstracts and determined if the publications met the inclusion criteria. We also searched the reference lists in the selected publications identify any comparisons that were not identified in the original search. All disagreements were resolved by discussion until a consensus was reached between the two investigators. A third author was consulted if necessary.

#### Data extraction

The data were extracted independently by two reviewers (QC and GY) and were rechecked after the extraction by reading the titles, abstracts and the full text if necessary, according to the inclusion and exclusion criteria. We recorded the following information: first author's name, publication year, the type of SCI, injury level of spinal cord, cells count, time of iPSC transplantation, cell sources and differentiation, iPSC transplantation method as well as rat breed, sex, body weight, age and number of rats per group. For each comparison, data were recorded for mean BBB score, SD and number of rats in each group. In publications with multiple comparisons, we considered only the data from the iPSC transplantation and control groups in each publication. We used GetData Graph Digitizer 2.25 to calculate the mean and SD of the BBB score for conditions for which data were only shown in graphs. Moreover, we planned to contact first or senior authors by email if necessary.

#### Study quality assessment

The quality of the included studies was assessed according to Cochrane Handbook for Systematic Reviews of Interventions version 5.3.0. Here, six items were widely used in previous studies [21, 24]: 1) random sequence generation; 2) allocation concealment; 3) blinding of outcome assessment; 4) incomplete outcome data; 5) selective reporting; 7) other bias. Every publication was assessed by two independent reviewers and each item was judged as "low risk", "unclear" or "high risk". Any discrepancy over bias assessment was resolved by group discussion.

#### Evidence quality assessment

Two authors (QC and GY) independently assessed the quality of evidence for the main outcomes and generated summary tables using the GRADE methodology (GRADEpro GDT, GRADEpro Guideline Development Tool, https://gradepro.org) [25]. The quality of evidence was judged as "high," "moderate," "low," or "very low" for each outcome with six items: risk of bias, inconsistency, indirectness, imprecision, and publication bias. Any disagreement regarding evidence quality assessment was discussed and resolved.



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#### Details of subgrouping

The subgroup analyses were based on the following items:

1) Different SCI models: compression (balloon-induced compression or clip compression) or contusion (set up by NYU Impactor or Infinite Horizon Impactor).

2) Different cell counts: different doses of cells for transplantation (cell counts  $1 \times 10^5$ ,  $5 \times 10^5$  and  $1 \times 10^6$ ).

3) Different iPSC sources: established from female (IMR90) human fetal lung fibroblasts or mouse embryonic fibroblasts.

4) Different iPSC differentiation: according to published protocols with slight modifications, iPSC were differentiated into neural precursors, oligodendrocyte progenitors or astrocytes under clonal conditions

5) Different transplantation methods: based on the different cell transplantation methods, subgroups of intrathecal (injected intrathecally between L3 and L4 or L4 and L5 through a 25 G needle for 30 s) or intraspinal (injected in the midline of the spinal cord at a depth of 1 mm below the dorsal surface) injections were established.

#### Statistical analysis

We used the Review Manager Software package (version 5.3.0; the Cochrane collaboration) to conduct the meta-analysis. For continuous outcomes, we reported pooled estimates as weighted mean differences (WMDs) with 95% CIs. WMDs were identified as statistically significant when P < 0.05. Statistical heterogeneity among studies and subgroups was evaluated with  $\Box^2$  and  $I^2$  tests. Both fixed-effects and random-effects models were used to obtain summary WMDs. The fixed-effects model was employed in the absence of heterogeneity, otherwise the random-effects model was used. The subgroup analyses were adopted to analyze the source of heterogeneity. We analyzed the BBB scores according to the time observed (1–7 weeks) after SCI.

#### Results

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#### Selection of publications

A total of 79 publications were initially identified after computer and manual literature searches. After selecting potentially relevant titles, and reviewing abstracts and full texts if necessary, a total of six publications covering eight comparisons published from 2011 to 2017

were included in the meta-analysis. The detailed flow diagram of the publication selection process is shown in Fig. 1.

#### Description of comparisons

Characteristics of the included comparisons are detailed in Table 1 and Table 2. Overall, 212 experimental rats were included. In terms of ways to induce SCI, the contusion models were adopted for four comparisons and the compression model was used for the other four comparisons. For the cell counts, rats in iPSC groups received injections of  $5 \times 10^5$  iPSC in five comparisons,  $1 \times 10^5$  iPSC in two comparisons and 1×106 iPSC in one comparison. For cells sources, most of the comparisons used iPSC established from female human fetal lung fibroblasts, except three comparisons, in which mouse embryonic fibroblasts were used



**Fig. 1.** Flow chart illustrating the literature search strategy and the different phases of publication eligibility assessment. Including publications: Jiri Ruzicka et al. 2017 [26]; Nataliya Romanyuk et al. 2015 [27]; Takashi Amemori et al. 2015 [28]; Angelo H. All et al. 2015 [29]; Jin Young Hong et al. 2014 [30]; Koichi hayashi et al. 2011[31].

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<b>Table 1.</b> Description of included publications. SCI: spinal cord injury; FHFLF: female (IMR90) human fetal
lung fibroblasts; MEF: mouse embryonic fibroblasts

Author and Year	Settings	SCI model	Injury level	Cell count	Transplantation time	Cell sources	Cell differentiation	Transplantation methods
Jiri Ruzicka 2017 [26]	Czech Republic	Compression	тв	$5  imes 10^5$	7d	FHFLF	Neural precursors	Intraspinal injection
Nataliya Romanyuk 2015 [27]	Czech Republic	Compression	Т8-Т9	$5\! imes\!10^5$	7d	FHFLF	Neural precursors	Intraspinal injection
Takashi Amemori 2015 [28]	Czech Republic	Compression	Т8	$5\! imes\!10^5$	7d	FHFLF	Neural precursors	Intrathecal intraspinal injection
Angelo H. All 2015 [29]	America	Contusion	Т8	$5  imes 10^5$	24h	FHFLF	Oligodendrocyte progenitors	Intraspinal injection
Jin Young Hong 2014 [30]	Korea	Contusion	Т9	$1 \times 10^{6}$	9d	MEF	Neural precursors	Intraspinal injection
Koichi hayashi 2011 [31]	Japan	Contusion	T9- T10	$1\! imes\!10^5$	3d 7d	MEF	Astrocytes	Intraspinal injection

Table 2. Characteristics of included experimental rats. iPSC: Induced pluripotent stem cells

Author and Year	Breed and gender	Body weight	Age	Rats of iPSC group	Rats of control group
Jiri Ruzicka 2017 [26]	Male Wistar rats	285-315g	10-week-old	24	16
Nataliya Romanyuk 2015 [27]	Male Wistar rats	270-300g	10-week-old	21	22
Takashi Amemori 2015 [28]	Male Wistar rats	270-300g	10-week-old	18	20
Angelo H. All 2015 [29]	Female Lewis rats	200-220g	10-week-old	12	12
Jin Young Hong 2014 [30]	Female Sprague-Dawley rats	230–250 g	12-week-old	12	9
Koichi Hayashi 2011 [31]	Female Sprague-Dawley rats	not mentioned	8-week-old	29	17

as iPSC sources. For cell differentiation, with slight modifications, iPSC were differentiated into neural precursors in five comparisons, oligodendrocyte progenitors in one comparison and astrocytes in two comparisons under clonal conditions. For iPSC transplantation methods, most comparisons transplanted iPSC by intraspinal injection, while intrathecal injection was used for only 1 comparison (Table 1).

As shown in Table 2, we next characterized the basic information of the experimental rats included in the following terms: breed, sex, body weight, and age.

## Methodological study quality assessment

A summary of the methodological domain assessment for each comparison is shown in Fig. 2. Only three comparisons did not clearly mention the blinding of outcome assessment and other bias remained unclear in six comparisons. Overall, the risk of bias was considered to be low.

To facilitate understanding, we made Table 3-7 to present the data (WMDs and heterogeneity) of all the subgroups (iPSC vs control group) straightforward.

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**Fig. 2.** Risk of bias summary: review of authors' judgments about each risk of bias item for each included comparison. Including publications: Jiri Ruzicka et al. 2017 [26]; Nataliya Romanyuk et al. 2015 [27]; Takashi Amemori et al. 2015 [28]; Angelo H. All et al. 2015 [29]; Jin Young Hong et al. 2014 [30]; Koichi hayashi et al. 2011[31].

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#### BBB scores in subgroups of different types of SCI models

*BBB scores at 1–7 weeks after transplantation.* As shown in Figures 3A–3G, no significant difference was found between the iPSC and control groups in terms of BBB score of the contusion subgroups at 1-7 weeks after iPSC transplantation. The BBB scores of the compression subgroups were significantly higher in the iPSC groups than those in the control groups at 1-7 weeks after iPSC transplantation (WMD = 3.77; 95% CI: 3.17–4.36; P < 0.001; WMD = 4.33; 95% CI: 4.02–4.64; P < 0.001; WMD = 4.05; 95% CI: 3.28–4.82; P < 0.001; WMD = 3.86; 95% CI: 3.09–4.63; P < 0.001; WMD = 4.14; 95% CI: 3.34–4.93; P < 0.001; WMD = 4.12; 95% CI: 3.38–4.86; P < 0.001; WMD = 4.58; 95% CI: 3.69–5.48; P < 0.001). The

**Table 3.** Results of weighted mean differences (WMDs) and heterogeneity in subgroups of different types of SCI models (iPSC vs control group) \* means P>0.05; Subgroup means the heterogeneity between subgroups

Observing time	V	VMDs			Heterogeneity(I <sup>2</sup> )				
Observing unie	Compression	Contusion	Total	Compression	Contusion	Total	Subgroup		
1week	3.77	-0.36*	1.77	84%	98%	98%	88.9%		
2weeks	4.33	1.01*	2.75	61%	92%	97%	95.5%		
3weeks	4.05	0.70*	2.41	96%	90%	98%	95.1%		
4weeks	3.86	0.99*	2.48	95%	96%	98%	91.1%		
5weeks	4.14	1.11*	2.65	96%	96%	98%	90.0%		
6weeks	4.12	0.88*	2.49	95%	89%	98%	95.8%		
7weeks	4.58	1.07*	2.88	97%	97%	98%	87.6%		

**Table 4.** Results of weighted mean differences (WMDs) and heterogeneity in subgroups of different doses of cells (iPSC vs control group) \* means P>0.05; NA means not applicable; Subgroup means the heterogeneity between subgroups

Observing time		WM	Ds			Heterogeneity(I <sup>2</sup> )				
Observing unie	5×10 <sup>5</sup>	$1 \times 10^{5}$	$1 \times 10^{6}$	Total	5×105	$1 \times 10^{5}$	$1 \times 10^{6}$	Total	Subgroup	
1week	2.57	-0.62*	2.25	1.77	99%	96%	NA	98%	0%	
2weeks	3.99	-0.04*	1.68	2.75	92%	0%	NA	97%	97.5%	
3weeks	3.47	-0.30*	2.35	2.41	97%	50%	NA	98%	92.4%	
4weeks	3.60	-0.43*	2.01	2.48	98%	57%	NA	98%	92.2%	
5weeks	3.98	-0.30*	1.90	2.65	95%	0%	NA	98%	97.5%	
6weeks	3.68	-0.41*	1.90	2.49	96%	81%	NA	98%	89.5%	
7weeks	4.39	-0.62*	2.30	2.88	96%	0%	NA	98%	97.9%	

**Table 5.** Results of weighted mean differences (WMDs) and heterogeneity in subgroups of different iPSC sources (iPSC vs control group) \* means P>0.05; Subgroup means the heterogeneity between subgroups; FHFLF means female (IMR90) human fetal lung fibroblasts; MEF means mouse embryonic fibroblasts

Ob a sumine a time s		WMDs			Heterogeneity(12)					
Observing time	FHFLF	MEF	Total	FHFLF	MEF	Total	Subgroup			
1week	2.57	0.43*	1.77	99%	94%	98%	47.7%			
2weeks	3.99	0.48*	2.75	92%	85%	97%	95.4%			
3weeks	3.47	0.52*	2.41	97%	93%	98%	86.7%			
4weeks	3.60	0.36*	2.48	98%	93%	98%	90.4%			
5weeks	3.98	0.33*	2.65	95%	94%	98%	92.9%			
6weeks	3.68	0.45*	2.49	96%	92%	98%	92.3%			
7weeks	4.39	0.21*	2.88	96%	94%	98%	91.8%			

**Table 6.** Results of weighted mean differences (WMDs) and heterogeneity in subgroups of different iPSC differentiation (iPSC vs control group) \* means P>0.05; NA means not applicable; Subgroup means the heterogeneity between subgroups

Observing		WMDs			Heterogeneity(I <sup>2</sup> )						
time	Neural precursors	Oligodendrocyte progenitors	Astrocytes	Total	Neural precursors	Oligodendrocyte progenitors	Astrocytes	Total	Subgroup		
1week	3.51	-2.47	-0.62*	1.77	86%	NA	96%	98%	98.9%		
2weeks	3.86	2.50	-0.04*	2.75	93%	NA	0%	97%	97.2%		
3weeks	3.73	1.04	-0.30*	2.41	96%	NA	50%	98%	95.3%		
4weeks	3.49	2.68	-0.43*	2.48	97%	NA	57%	98%	92.3%		
5weeks	3.67	3.36	-0.30*	2.65	98%	NA	0%	98%	97.7%		
6weeks	3.66	1.86	-0.41*	2.49	97%	NA	81%	98%	88.0%		
7weeks	4.15	3.59	-0.62	2.88	97%	NA	0%	98%	98.4%		

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**Table 7.** Results of weighted mean differences (WMDs) and heterogeneity in subgroups of different transplantation methods (iPSC vs control group) \* means P>0.05; NA means not applicable; Subgroup means the heterogeneity between subgroups

Observing times		WMDs		Heterogeneity(I <sup>2</sup> )				
Observing time	Intraspinal	Intrathecal	Total	Intraspinal	Intrathecal	Total	Subgroup	
1week	1.36*	4.67	1.77	99%	NA	98%	91.4%	
2weeks	2.56	4.03	2.75	98%	NA	97%	78.5%	
3weeks	2.43	2.26	2.41	98%	NA	98%	0%	
4weeks	2.52	2.17	2.48	98%	NA	98%	0%	
5weeks	2.69	2.37	2.65	98%	NA	98%	0%	
6weeks	2.48	2.50	2.49	98%	NA	98%	0%	
7weeks	2.91	2.71	2.88	99%	NA	98%	0%	

corresponding heterogeneities were moderate ( $I^2 = 61\%$ ) at 2 weeks after transplantation but were high at 1, and 3–7 weeks after transplantation ( $I^2 = 84\%$ , 96%, 95%, 96%, 95% and 97%, respectively).

Notably, the overall BBB scores were significantly higher in the iPSC groups than those in the control groups at 1-7 weeks (WMD = 1.77; 95% CI: 0.20–3.35; P = 0.03;WMD = 2.75; 95% CI, 1.78–3.72; P < 0.001; WMD = 2.41; 95% CI, 1.35–3.47; P < 0.001; WMD = 2.48; 95% CI, 1.55–3.41; P < 0.001; WMD = 2.65; 95% CI, 1.55–3.75; P < 0.001; WMD = 2.49; 95% CI, 1.39–3.59; P < 0.001 and WMD = 2.88; 95% CI, 1.64–4.12; P < 0.001, respectively) after iPSC transplantation. The total heterogeneities were high at 1-7 weeks ( $I^2 = 98\%$ , 97%, 98%, 98%, 98%, 98% and 98%, respectively) after transplantation. The heterogeneities between subgroups were also high ( $I^2 = 88.9\%$ , 95.5%, 95.1%, 91.1%, 90.0%, 95.8% and 87.6%, respectively). All the results favored the iPSC group, which suggested a protective effect.

#### BBB scores in subgroups of different doses of cells

BBB score at 1-6 weeks after transplantation. Comparisons were divided into three subgroups, which received iPSC by injection at cell counts of 5×10<sup>5</sup>, 1×10<sup>5</sup> and 1×10<sup>6</sup>, respectively. As indicated in Fig. 4A-4F, the iPSC and control groups exhibited similar changes in BBB scores at 1–6 weeks after iPSC transplantation. Specifically, the BBB scores in the  $5 \times 10^5$  subgroup were significantly higher in the iPSC groups than those in the control groups (WMD = 2.57; 95% CI: 0.50-4.63; P = 0.01; WMD = 3.99; 95% CI: 3.37-4.61; P < 0.001; WMD = 3.47; 95% CI: 2.53-4.41; P < 0.001; WMD = 3.60; 95% CI: 2.70-4.50; P < 0.001; WMD = 3.98; 95% CI: 3.25-4.71; *P* < 0.001 and WMD = 3.68; 95% CI: 2.80-4.55; *P* < 0.001, respectively). The corresponding heterogeneities were high ( $I^2 = 99\%$ , 92%, 97%, 98%, 95% and 96%, respectively). The BBB scores in the 1×10<sup>6</sup> subgroup were significantly higher in the iPSC groups than those in the control groups (WMD = 2.25; 95% CI, 1.45-3.05; *P* < 0.001; WMD = 1.68; 95% CI, 0.98-2.38; *P* < 0.001; WMD = 2.35; 95% CI, 1.65–3.05; *P* < 0.001; WMD = 2.01; 95% CI, 1.41–2.61; P < 0.001; WMD = 1.90; 95% CI, 1.42–2.38; P < 0.001 and WMD = 1.90; 95% CI, 1.39–2.41; *P* < 0.001, respectively). However, there were no significant differences in the BBB scores between the iPSC and control groups in the  $1 \times 10^5$ subgroups. Notably, because we analyzed the same included comparisons as those in the different SCI model subgroups, we achieved the same results in terms of the overall BBB score and total heterogeneities, favoring the iPSC groups. The heterogeneity between subgroups was also high at 2–6 weeks ( $I^2 = 97.5\%$ , 92.4%, 92.2%, 97.5% and 89.5%, respectively) after transplantation, except at 1 week after transplantation ( $I^2 = 0\%$ ).

*BBB score at 7 weeks after transplantation.* As indicated in Fig. 4G, the BBB scores in the  $5 \times 10^5$  subgroup were significantly higher in the iPSC group than those in the control groups at 7 weeks after transplantation (WMD = 4.39; 95% CI: 3.55–5.23; *P* < 0.001). The corresponding heterogeneity was high ( $I^2 = 96\%$ ). Conversely, the BBB scores in the  $1 \times 10^5$  subgroup were significantly lower in the iPSC groups than those in the control groups at 7 weeks (WMD = -0.62; 95% CI: -1.23 – -0.02; P = 0.04) after transplantation. The relevant heterogeneity was zero ( $I^2 = 96\%$ ). Notably, the overall BBB scores were significantly higher in the iPSC groups than those in the control groups (WMD = 2.88; 95% CI: 1.64–4.12; *P* < 0.001). The total heterogeneity and the heterogeneity between subgroups was high ( $I^2 = 98\%$  and 97.9%, respectively).



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	IPSCs Control		Mean Difference	Mean D	fference		IPSCs	Control		nar-	Mean Difference
Study or Subgroup 1.1.1 compression	Mean SD Total Mean SD				om, 95% Cl	Study or Subgroup	IPSCs Mean SD Total	Control Mean SD Tota		lean Difference 1, Random, 95% Cl	Mean Difference IV, Random, 95% Cl
in Teckiological additi Jim Rucziola 2015 Takashi Amemori 2015 (Intraspinal) Takashi Amemori 2015 (Intraspinal) Subtotal (95% CD) Heterogeneity: Tau <sup>2</sup> = 0.30; Chi <sup>2</sup> = 18.84, Test for overall effect Z= 12.40 (P < 0.00	63 df = 3 (P = 0.0003); P = 84%	16 12.9% 22 12.7% 11 12.8% 9 12.5% 58 50.8%	3.32 [3.06, 3.58] 3.17 [2.60, 3.74] 4.16 [3.71, 4.59] 4.67 [3.84, 5.50] 3.77 [3.17, 4.36]		÷ + •	1.2.1 compression Jiri Ruacka 2017 Natakija Fromanyuk 2015 Takashi Amemoni 2015 (intraspinal) Takashi Amemori 2015 (intrashecal) Subtotal (95% Ct) Heterogeneik; Tau? = 0.05; Chi? = 7.76, Testfor overali effect Z = 27.46 (% < 0.0	10.12 0.71 9 63 , df = 3 (P = 0.05); P = 61	4.27 0.43 2 4.03 0.83 1 6.09 1 5	2 13.4% 1 12.7% 9 12.4%	4.40 [4.17, 4.63] 4.09 [3.85, 4.33] 4.96 [4.29, 5.63] 4.03 [3.23, 4.83] 4.33 [4.02, 4.64]	÷ + •
1.1.2 contrusion Angele H, All 2015 Jim Young Hong 2014 Kolich haysehi 2011 (3d) Kolich haysehi 2011 (7d) Subtotal (95% CI) Heterogeneik, Tau?= 6.95, Chi?= 123.6 Test for overall effect Z = 0.26 (P = 0.79)	2.49 0.99 9 5.35 1.97 53 7, df= 3 (P < 0.00001); P= 98%	9 12.5% 10 12.6% 7 11.4%	-2.47 [-3.06, -1.88] 2.25 [1.45, 3.05] 1.51 [0.77, 2.25] -2.86 [-4.46, -1.26] -0.36 [-2.99, 2.27]	+	+++++++++++++++++++++++++++++++++++++++	1.2.2 contusion Angleio H. AJI 2015 Jin Young Hong 2014 Kolchi hayashi 2011 (3d) Kolchi hayashi 2011 (7d) Subtotal (95% CL) Heterogenetik, Tau <sup>2</sup> = 1.85, Chi <sup>2</sup> = 38.5 Testfor overall effect Z = 1.48 (P = 0.14	7.52 0.47 20 5.98 1.02 9 53 4, df = 3 (P < 0.00001); F	6.74 0.82 7.44 1.06 1 6.66 2 3	9 12.6% 0 12.7% 7 9.8%	2.50 (2.00, 3.00) 1.68 (0.98, 2.38) 0.08 (-0.61, 0.77) -0.68 (-2.30, 0.94) 1.01 (-0.33, 2.35)	
Total (95% Cl) Heterogeneity: Tau <sup>2</sup> = 5.00; Chi <sup>2</sup> = 438.5 Test for overall effect: Z = 2.21 (P = 0.03) Test for suborouo differences: Chi <sup>2</sup> = 8.9		96 100.0%	1.77 [0.20, 3.35]	-4 -2 Favours (control)	0 2 4 A	Total (95% CI) Heterogeneity: Tau <sup>e</sup> = 1.81; Chi <sup>a</sup> = 246.0 Test for overall effect: Z = 5.55 (P < 0.00 Test for suboroup differences: Chi <sup>a</sup> = 2:	0001)	I <sup>a</sup> = 97%	6 100.0%	2.75 [1.78, 3.72]	-4 -2 0 2 4 Favours (control) Favours (IPSCs) B
Study or Subgroup	IPSCs Control Mean SD Total Mean SD		Mean Difference IV, Random, 95% Cl		ifference vm. 95% Cl	Study or Subgroup	IPSCs Mean SD Tota	Control al Mean SD T	otal Weight	Mean Difference IV, Random, 95% Cl	Mean Difference IV, Random, 95% Cl
1.3.1 compression Jiri Ruzicka 2017 Nataliya Romanyuk 2015 Takashi Amemori 2015 (intraspinal) Takashi Amemori 2015 (intrathecal) Subtotal (95% CI) Heterogeneity, Tau"= 0.56; Chi"= 67.13, Test for overall effect Z = 10.35 (P < 0.00	10.49 0.52 9 8.23 0.85 63 df=3 (P < 0.00001); P=96%	16 13.2% 22 13.2% 11 12.8% 9 12.7% 58 51.9%	4.50 [4.26, 4.74] 3.90 [3.72, 4.08] 5.44 [4.87, 6.01] 2.26 [1.61, 2.91] 4.05 [3.28, 4.82]			1.4.1 compression Jin Ruzicka 2017 Natalija Romanyuk 2015 Takashi Amemori 2015 (intrashieal) Takashi Amemori 2015 (intrashiecal) Subtotal (95% CI) Heterogeneity, Tau <sup>2</sup> = 0.57; Chi <sup>2</sup> = 66: Test for overall effect Z = 9.78 (P < 0.0	9.41 0.39 2 11.01 0.53 9 10.62 0.56 9 21, df= 3 (P < 0.00001)	1 5.55 0.29 9 6.48 0.88 9 8.45 0.88 3	16 13.3% 22 13.3% 11 12.7% 9 12.5% 58 51.9%	4.70 [4.48, 4.92] 3.86 [3.65, 4.07] 4.53 [3.91, 5.15] 2.17 [1.49, 2.85] 3.86 [3.09, 4.63]	
1.3.2 contustion           Argelo H. All 2015           Jim Young Hong 2014           Kolich hayashi 2011 (30)           Kolich hayashi 2011 (7d)           Studdodl (95% CI)           Helstrogeneity: Tarl=1.38; Chi#= 29.47;           Testfor overall effect: Z = 1.11 (P = 0.27)	8.34 1.18 12 7.3 0.31 9.76 0.82 12 7.41 0.81 8.28 0.55 20 8.19 0.91 7.85 1.01 9 8.79 1.95 53 df= 3 (P < 0.00001); P= 90%	12 12.6% 9 12.6% 10 12.7% 7 10.2% 38 48.1%	1.04 [0.35, 1.73] 2.35 [1.65, 3.05] 0.09 [-0.52, 0.70] -1.14 [-2.73, 0.45] 0.70 [-0.54, 1.94]	<del>_</del>	+ + •	1.4.2 confusion Angelo H. All 2015 Jin Young Hong 2014 Kolichi hayashi 2011 (7d) Kolichi hayashi 2011 (7d) Sablotad (1956 C) Heterogenetic Taal* 2.09; Chi <sup>p</sup> = 61 Test for overall effect Z = 1.31 (P = 0.1	53 11, df = 3 (P < 0.00001)	2 8.19 0.72 0 8.95 0.98 9 9.14 2.04 3	12 13.3% 9 12.7% 10 12.6% 7 9.5% 38 48.1%	2.68 [2.47, 2.89] 2.01 [1.41, 2.61] 0.04 [-0.60, 0.68] -1.34 [-2.99, 0.31] 0.99 [-0.49, 2.48]	
Total (95% Cl) Heterogeneity: Tau <sup>a</sup> = 2.20; Chi <sup>a</sup> = 341.0- Test for overall effect: Z = 4.46 (P < 0.000 Test for suborous differences: Chi <sup>a</sup> = 20.	01)	96 100.0%	2.41 [1.35, 3.47]	-4 -2 Favours [control]	Pavours [IPSCs]	Total (95% CI) Heterogeneily: Tau <sup>#</sup> = 1.68; Chi <sup>#</sup> = 387 Test for overall effect: Z = 5.21 (P < 0.0 Test for suborouo differences: Chi <sup>#</sup> = 1	10001)	1); P= 98%	96 100.0%	2.48 [1.55, 3.41]	-4 -2 0 2 4 Favours [control] Favours [IPSCs]
Study or Subgroup	IPSCs Control Mean SD Total Mean SD 1		Nean Difference /, Random, 95% Cl	Mean Diff IV. Random		Study or Subgroup	IPSCs Mean SD Tot	Control tal Mean SD	Total Weigh	Mean Difference It IV, Random, 95% Cl	Mean Difference IV. Random, 95% Cl
1.51 Compression Jiri Ruzicka 2017 Natalias Romanyuk 2015 Takashi Amemori 2015 ( Intraspinal) Takashi Amemori 2015 ( Intraspinal) Sabitotal (95% CI) Heterogeneity: Tau"= 0.60; Chi"= 68.65; Test for overall effect: Z= 10.23 (P < 0.00)	10.83 0.64 9 8.46 0.87 63 df = 3 (P < 0.00001); P = 96%	16 13.1% 22 13.1% 11 12.7% 9 12.5% 58 51.4%	5.05 (4.83, 5.27) 4.19 (3.98, 4.40) 4.72 (4.10, 5.34) 2.37 (1.66, 3.08) 4.14 [3.34, 4.93]		+ ◆	1.6.1 compression Jiri Ruzicka 2017 Nataliya Romanyuk 2015 Takashi Amemori 2015 ( Initraspina) Subtotal (95% CI) Helerogenelly, Tau <sup>a</sup> e 0.51; Chi <sup>a</sup> = 55 Test for overall effect Z = 10.98 (P < C	) 11.07 0.5 (03, df= 3 (P < 0.0000)	21 5.82 0.37 9 6.66 0.92 9 8.57 0.84 63	16 13.19 22 13.19 11 12.79 9 12.79 58 51.69	% 4.20 [3.98, 4.42] % 4.73 [4.12, 5.34] % 2.50 [1.86, 3.14]	
1.5.2 contusion Angelo H. All 2015 Jin Young Hong 2014 Kolichi hayashi 2011 (74) Kolichi hayashi 2011 (74) Subtotal (95% Cl) Heterogenetiy: Tarti-2.73; Chil= 7.4 26, Test fur overall effect: Z = 1.28 (P=0.20)	10.95 0.66 12 9.05 0.47 9.15 0.51 20 9.33 1 8.47 0.99 9 9.49 1.95 53		3.36 [2.78, 3.94] 1.90 [1.42, 2.38] -0.18 [-0.84, 0.48] -1.02 [-2.60, 0.56] 1.11 [-0.59, 2.80]		+ + •	1.6.2 confusion     Angelo H. All 2015     Jin Young Hong 2014     Kolchi hayashi 2011 (3d)     Kolchi hayashi 2011 (7d)     Subtoctal (95% CI)     Hetenogenety Tau <sup>+</sup> = 1.02; Ch <sup>#</sup> = 26     Testfor overall effect Z = 1.59 (P = 0.	8.17 1.05 1.84. df = 3 (P < 0.0000	12 9.33 0.49 20 8.95 0.98 9 9.75 2.01 53	12 12.6' 9 12.9' 10 12.7' 7 10.2' 38 48.4'	% 1.90 [1.39, 2.41] % 0.46 [-0.16, 1.08] % -1.58 [-3.22, 0.06]	
Total (95% Cl) Heterogeneily: Tau <sup>#</sup> = 2.39; Chi <sup>#</sup> = 388.23 Test for overall effect. Z = 4.72 (P < 0.000) Test for suborouo differences: Chi <sup>#</sup> = 10.1	31)	96 100.0%	2.65 [1.55, 3.75]	-4 -2 0 Favours (control)		Total (95% CI) Helerogeneity: Tau <sup>a</sup> = 2.38; Chi <sup>a</sup> = 35 Test for overall effect: Z = 4.43 (P < 0. Test for subproup differences: Chi <sup>a</sup> =	i6.55, df = 7 (P < 0.000) .00001)		96 100.0	% 2.49 [1.39, 3.59]	-4 -2 0 2 4 Favours [control] Favours [IPSCs]
Study or Subgroup	IPSCs Control Mean SD Total Mean SD 1		lean Difference , Random, 95% Cl	Mean Differ IV, Random,							
1.7.1 compression Jim Ruzicka 2017 Nataliya Romanyuk 2015 Takashi Amemori 2015 (intraspinal) Takashi Amemori 2015 (intrastecal) Subtotal (95% Cl) Heterogenetik; Tau <sup>+</sup> = 0.78; Chi <sup>+</sup> = 87.76; Test for overall effect Z = 10.00 (P < 0.00	10.74 0.41 24 5.2 0.28 10.8 0.38 21 6.13 0.35 11.99 0.62 9 6.67 0.91 11.36 0.35 9 8.65 0.87 63 df = 3 (P < 0.00001); f= 97%	16 13.0% 22 13.0% 11 12.6% 9 12.7% 58 51.4%	5.54 (5.33, 5.75) 4.67 (4.45, 4.89) 5.32 (4.65, 5.89) 2.71 (2.10, 3.32) 4.58 (3.69, 5.48)		 *** *◆						
1.7.2 contrusion Angelo H. All 2015 Jin Young Hong 2014 Kolchi hayash 2011 (2d) Kolchi hayashi 2011 (7d) Subtota (IS% CI) Heterogeneity, Tau <sup>2</sup> 5.08; ChF= 101.8 Test for overall affect Z = 0.92 (P = 0.36)	11.87 0.73 12 9.57 1.01 9.21 0.29 20 9.71 1.03 8.49 1 9 9.85 1.96 53 5, df= 3 (P < 0.00001); P= 97%	7 10.8%	3.59 (3.01, 4.17) 2.30 (1.52, 3.08) 0.50 [-1.15, 0.15] 1.36 [-2.45, 0.23] 1.07 [-1.20, 3.33]		+ +						
Total (95% CI) Heterogeneity: Tau <sup>2</sup> = 3.04; Chi <sup>2</sup> = 450.0 Test for overall effect Z = 4.56 (P < 0.000 Test for suborouo differences: Chi <sup>2</sup> = 8.0	<b>116</b> 7, ctf = 7 (P < 0.00001); I <sup>a</sup> = 98% I01)	96 100.0%	2.88 [1.64, 4.12]	-4 -2 0 Favours (control) Fa							

Fig. 3. Forest plot of the differences in the BBB scores of the iPSC and control groups in different injury model subgroups at different time-points after transplantation. (A-G) At 1-7 weeks, respectively, after iPSC transplantation. Including publications: Jiri Ruzicka et al. 2017 [26]; Nataliya Romanyuk et al. 2015 [27]; Takashi Amemori et al. 2015 [28]; Angelo H. All et al. 2015 [29]; Jin Young Hong et al. 2014 [30]; Koichi hayashi et al. 2011[31].

#### BBB score in subgroups of different iPSC sources

BBB scores at 1-7 weeks after transplantation. Based on the different iPSC sources, we divided the comparisons into two subgroups of iPSC established from female (IMR90) human fetal lung fibroblasts or from mouse embryonic fibroblasts. As shown in Figures 5A–5G, the BBB scores of the female (IMR90) human fetal lung fibroblast subgroup were significantly higher in the iPSC groups than those in the control groups and the corresponding heterogeneities were high (data not shown because the included comparisons are the same those in the contusion subgroups). However, there was no significant difference in the BBB scores of the mouse embryonic fibroblast subgroups between the iPSC and control groups.



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Study or Subgroup	IPSCs Control Mean SD Total Mean SD	Mean Differen Total Weight IV, Random, 9	ce Mean Difference 5% Cl IV. Randem, 95% Cl	Study or Subgroup	IPSCs Control Mean SD Total Mean SD	Mean Difference Total Weight IV, Random, 95% Cl	Mean Difference IV, Random, 95% CI
Subtotal (95% CI) Heterogeneity: Tau <sup>a</sup> = 5.48; Chi <sup>a</sup> = 375.28 Test for overall effect: Z = 2.43 (P = 0.01)	2.51 0.85 12 4.86 0.61 5.73 0.45 24 2.41 0.37 5.8 0.91 21 2.63 1.01 6.98 0.37 9 2.83 0.63 7.78 0.94 9 3.11 0.85 75 0.94 94 0.00001); P= 99%	12         12.7%         -247 [-3.06, -           16         12.9%         3.32 [3.06, -           22         12.7%         3.17 [2.60, -           11         12.8%         4.15 [3.71, -           9         12.5%         4.67 [3.84, -           70         63.5%         2.57 [0.50, -	3.56) 3.74) 4.59) 5.50) 	4.2.15+0 <sup>6</sup> Angelo H. Al 2015 Jirl Ruzicka 2017 Takashi Annemot 2015 (Intespinal) Takashi Annemot 2015 (Intespinal) Takashi Annemot 2015 (Intespinal) Subtotal (95% CI) Hietorogenetik, Tay <sup>2</sup> = 0.43, Chi <sup>2</sup> = 51.71, Test for overall effect Z = 12.57 (P < 0.00		12         13.0%         2.50 [2.00, 3.00]           16         13.4%         4.0 [4.17, 4.63]           22         13.4%         4.09 [3.85, 4.33]           11         12.7%         4.56 [4.29, 5.43]           9         12.4%         4.56 [4.29, 5.43]           70         64.9%         3.99 [3.37, 4.61]	÷
4.12.1×10 <sup>5</sup> Koishi hayashi 2011 (3d) Koishi hayashi 2011 (7d) Subtotal (95% CI) Heterogeneih: Tau <sup>p</sup> = 9.15; Chi <sup>p</sup> = 23.71, Test for overall effect. Z = 0.28 (P = 0.78)	5.85 0.77 20 4.34 1.06 2.49 0.99 9 5.35 1.97 29 df=1 (P < 0.00001); P=98%	10 12.6% 1.51 (0.77, 7 11.4% -2.85 [-4.46, - 17 24.0% -0.62 [-4.96, :	2.29] 1.26] 3.67]	4.2.2 1+10° Kolichi hayashi 2011 (3d) Kolichi hayashi 2011 (7d) Subtotal (95% CI) Heistorgeneiity: Tau* = 0.00; Chi* = 0.71, Test for overall effect: Z = 0.11 (P = 0.91)	7.52 0.47 20 7.44 1.06 5.98 1.02 9 6.66 2 29 #= 1 (P = 0.40); P = 0%	10 12.7% 0.08 [-0.61, 0.77] 7 8.8% -0.68 [-2.30, 0.94] 17 22.5% -0.04 [-0.67, 0.60]	
4.1.3 1×10 <sup>6</sup> Jin Young Hong 2014 Subtotal (95% CI) Hetarogeneity: Not applicable Test for overall effect Z = 5.52 (P < 0.0000	7.35 0.78 12 5.1 1.02 12	9 12.5% 2.25 (1.45, 9 12.5% 2.25 (1.45,		4.2.3 1+10 <sup>6</sup> Jin Young Hong 2014 Subted (95% CI) Heterogeneity: Not applicable Test for overall effect: Z = 4.72 (P < 0.000	8.42 0.79 12 6.74 0.82 12 001)	9 12.6% 1.68 [0.98, 2.38] 9 12.6% 1.68 [0.98, 2.38]	•
Total (95% CI) Heterogeneity: Tau <sup>a</sup> = 5.00; Chi <sup>a</sup> = 438.54 Test for overall effect $Z = 2.21$ (P = 0.03) Test for subarous differences: Chi <sup>a</sup> = 1.80	116 , df= 7 (P < 0.00001); P= 98% 0. df= 2 (P = 0.41). P = 0%	96 100.0% 1.77 [0.20,	3.35]	Total (95% CI) Heterogeneily, Tata <sup>2</sup> = 1.81; Chi <sup>2</sup> = 248.8; Test for overall effect: Z = 5.55 (P < 0.000 Test for subarous differences: Chi <sup>2</sup> = 79.	116 3, df = 7 (P < 0.00001); P = 97% 101) 50. df = 2 (P < 0.00001). P = 97.5%	96 100.0% 2.75 [1.78, 3.72]	-4 -2 0 2 4 Favours [control] Favours [PSCs] B
Study or Subgroup	IPSCs Control Mean SD Total Mean SD	Mean Differenc		Study or Subgroup	IPSCs Control	Mean Difference Total Weight IV, Random, 95% Cl	Mean Difference IV, Random, 95% Cl
Autor value value 4.23, 55-10 <sup>5</sup> Angolo H, All 2015 Jin Rucika 2015 Nataliya Romanyuk 2015 Takasta Amemon 2015 (intraspinal) Takasta Amemon 2015 (intraspinal) Satatata (95% CI) Heletopenek, Tat/F = 1.05; Ch <sup>ar</sup> = 1.40, 19; Test for overall effect Z = 7.22 (P < 0.0000	8.34 1.18 12 7.3 0.31 8.97 0.4 24 4.47 0.37 9.03 0.33 21 5.13 0.27 10.81 0.6 9 5.37 0.7 10.48 0.52 9 8.23 0.85 75 off=4 (P < 0.00001); P=97%	1044         Vegati         Iv, remain(1,25)           12         12.6%         1.04 [0.35, 1]           16         13.2%         4.50 [4.26, 4]           12         13.2%         3.09 [31, 2]           11         12.8%         5.44 [4.87, 6]           9         12.7%         2.26 [1.61, 2]           70         64.5%         3.47 [2.53, 4]	73] 74] 08] 91]	story of slowy of slowy and 4.4.15+16 <sup>0</sup> Angloi 1.42.015 Air Ruccia 2017 Natalaya Romanyuk 2015 Takashi Amemori 2015 (intraspinal) Takashi Amemori 2015 (intraspinal) Satetad (95% cl) <sup>4</sup> = 1.01 (Ch <sup>2</sup> = 205.11 Testor orecali effect 2 = 7.81 (P < 0.000	11.39 0.28 12 8.71 0.23 9.42 0.37 24 4.72 0.32 9.41 0.39 21 5.55 0.29 11.01 0.53 9 6.48 0.88 10.62 0.55 9 8.45 0.88 75 6. cf = 4 (P < 0.0001); P = 98%	101.4         Versal         (2, ramon, 255.1)           12         13.3%         2.68 [2.47, 2.89]           15         13.3%         4.70 [4.48, 4.52]           22         13.3%         3.68 [3.65, 4.07]           11         12.7%         4.53 [3.91, 5.19]           9         12.5%         3.60 [2.70, 4.50]           70         65.2%         3.60 [2.70, 4.50]	N, Ramon I, 573 (J
4.3.2 1×10 <sup>5</sup> Koichi hayashi 2011 (3d) Koichi hayashi 2011 (7d) Subtetal (95% Cl) Heterogeneity: Tau <sup>2</sup> = 0.38; Chi <sup>2</sup> = 2.01, dl Test for overall effect: Z = 0.52 (P = 0.80)	8.28 0.55 20 8.19 0.91 7.65 1.01 9 8.79 1.95 29 = 1 (P = 0.16); P = 50%	10 12.7% 0.09[-0.52,0 7 10.2% -1.14[-2.73,0 17 23.0% -0.30[-1.42,0	70] 45] 82]	4.4.2 1×10 <sup>5</sup> Kolichi hayashi 2011 (3d) Kolichi hayashi 2011 (7d) Subtotal (95% CI) Heterogeneity. Tau <sup>2</sup> = 0.55; Chi <sup>2</sup> = 2.34, c Test for overall effect Z = 0.66 (P = 0.51)	7.8 1.01 9 9.14 2.04 29 #=1 (P=0.13); P=57%	10 12.6% 0.04 [-0.60, 0.68] 7 9.5% -1.34 [-2.99, 0.31] 17 22.1% -0.43 [-1.71, 0.85]	
4.3.3 1×10 <sup>8</sup> Jin Young Hang 2014 Subtotal (95% CI) Heterogeneity: Not applicable Test for overall effect. Z = 5.54 (P < 0.0000	9.76 0.82 12 7.41 0.81 12	9 12.6% 2.35 (1.65, 3 9 12.6% 2.35 (1.65, 3	05] <b>•</b>	4.4.3 1×10 <sup>6</sup> Jin Young Hong 2014 Subtotal (95% CI) Heterogeneith; Not applicable Test for overall effect Z = 6.60 (P < 0.000	10.2 0.65 12 8.19 0.72 12	9 12.7% 2.01 [1.41, 2.61] 9 12.7% 2.01 [1.41, 2.61]	•
Total (95% Cl) Heterogenetity: Tau <sup>2</sup> = 2.20; Chi <sup>2</sup> = 341.04, Test for overall effect: Z = 4.46 (P < 0.0000 Test for suboroud differences: Chi <sup>2</sup> = 26.1	116 , df= 7 (P < 0.00001); (P = 98% 11) 9. df= 2 (P < 0.00001). (P = 92.4%)	96 100.0% 2.41 [1.35, 3	47]	Total (95% CI) Heterogeneith: Tau <sup>2</sup> = 1.68; Chi <sup>2</sup> = 387.9; Test for overall effect: Z = 5.21 (P < 0.000 Test for subarous differences: Chi <sup>2</sup> = 25.	116 3, df = 7 (P ≤ 0.00001); P = 98% 101) 63. df = 2 (P ≤ 0.00001). P = 92.2%	96 100.0% 2.48 [1.55, 3.41]	-4 -2 0 2 Favours [control] Favours [IPSCs]
Study or Subgroup	IPSCs Control Mean SD Total Mean SD	Mean Difference Total Weight IV, Random, 95		Study or Subgroup	IPSCs Control Mean SD Total Mean SD	Mean Difference Total Weight IV, Random, 95% Cl	Mean Difference IV, Random, 95% Cl
ASIS 5+10 <sup>6</sup> Angalo H, All 2015 Jul Ruzika 2017 Natalya Romanyuk 2015 Taikashi Armemod 2015 (intraspinal) Taikashi Armemod 2015 (intraspical) Sakutoda (2015 (intraspical) Hatoropaneby Turf = 0.63; Chif = 62.77, Test for overall effect Z = 10.70 (P < 0.000	# = 4 (P < 0.00001); P = 95%	12 12.7% 3.38 [2.78, 3 16 13.1% 5.05 [4.83, 5 22 13.1% 4.19 [3.84, 4 11 12.7% 4.72 [4.1] 70 64.2% 3.98 [3.25, 4	27) 40] 34	4.6.1 5 - 10 <sup>6</sup> Angelo H. All 2015 Juli Ruzcka 2017 Nataliya Romanyuk 2015 Talaszh Amemord 2015 (Intraspinal) Talaszh Amemord 2015 (Intraspinal) Sabetal (195% CI) Hohoropenk; Tau" = 0.93; Ch" = 108. Test for overall effect Z = 8.25 (P < 0.00	11.07 0.5 9 8.57 0.84 75 29, df = 4 (P < 0.00001); P = 96%	16 13.1% 4.89 [4.66, 5.12] 22 13.1% 4.20 [3.98, 4.42] 11 12.7% 4.73 [4.12, 5.34]	
	9.15 0.51 20 9.33 1 8.47 0.99 9 9.49 1.95 29 != 1 (P = 0.34); P = 0%	10 12.8% -0.18 -0.84,0 7 10.4% -1.02 -2.80,0 17 23.0% -0.30[-0.91,0	48] 58] 30]	4.6.2 1×10 <sup>5</sup> Kaichi hayashi 2011 (2d) Kaichi hayashi 2011 (7d) <b>Subtotal (95% Cl)</b> Hiotengeneity: Taa <sup>st</sup> = 1.88; Chi <sup>p</sup> = 5.20 Text for overall effect. Z = 0.41 (P = 0.86	9.41 0.32 20 8.95 0.98 8.17 1.05 9 9.75 2.01 29 , df=1 (P=0.02); P=81% 3)	10 12.7% 0.46 [-0.16, 1.08] 7 10.2% -1.58 [-3.22, 0.06] 17 22.9% -0.41 [-2.39, 1.57]	
4.5.3 1×10 <sup>6</sup> Jin Young Hong 2014 Subtobal (95% CI) Heterogeneity: Not applicable Test for overall effect: Z = 7.70 (P < 0.0000	10.95 0.66 12 9.05 0.47 12	9 12.9% 1.90 (1.42, 2 9 12.9% 1.90 (1.42, 2	33] 38]	4.6.3 1 × 10 <sup>6</sup> Jin Young Hong 2014 Subtotal (95% CI) Helenogeneity: Not applicable Test for overall effect. Z = 7.31 (P < 0.00	11.23 0.7 12 9.33 0.49 12 3001)	9 12.9% 1.90 [1.39, 2.41] 9 12.9% 1.90 [1.39, 2.41]	•
Total (95% CI) Heterogeneity: Tau <sup>a</sup> = 2.38; Chi <sup>a</sup> = 388.23, Test for overall effect; $Z = 4.72$ ( $P < 0.0000$ Test for suboroud differences: Ch <sup>a</sup> = 79.9	116 , df = 7 (P < 0.00001); P = 98% (1) 2. df = 2 (P < 0.00001), P = 97.5%	96 100.0% 2.65 [1.55, 3	75]	Total (95% CI) Heterogeneity: Tau <sup>e</sup> = 2.38; Chi <sup>e</sup> = 356. Test for overall effect Z = 4.43 (P < 0.00 Test for suborous differences: Chi <sup>e</sup> = 1	<b>116</b> 55, df = 7 (P < 0.00001); P = 98% 3001) 8.99. df = 2 (P < 0.0001). P = 89.5%	96 100.0% 2.49 [1.39, 3.59]	Favours [control] Favours [PSCs]
Study or Subgroup	IPSCs Control Mean SD Total Mean SD	Mean Differenc Total Weight IV, Random, 95	e Mean Difference 5 Cl IV. Random, 95% Cl				
4.7.1 5×10 <sup>5</sup>	15.57 0.13 12 11.98 1.01 10.74 0.41 24 5.2 0.28 10.8 0.38 21 6.13 0.35 11.99 0.52 9 6.67 0.91 11.36 0.35 9 8.65 0.87 76	12         12.7%         3.5%         3.5%         3.5%           16         13.0%         5.54         [5.33,5]         22.13.0%         4.67         4.45,4           11         12.6%         5.32         [4.65,5]         9.12.7%         2.71         [21.03]           70         64.1%         4.39         [3.55,5]         [3.55,5]	17]				
$\begin{array}{l} 4.7.2 \pm 10^6 \\ \text{Koich hayashi 2011 (3d)} \\ \text{Koich hayashi 2011 (7d)} \\ \text{Subtotal (95% C0)} \\ \text{Heterogeneity: Tau# = 0.00; Chi# = 0.96, dt} \\ \text{Test for overall effect: } Z = 2.03 (P = 0.04) \end{array}$	9.21 0.29 20 9.71 1.03 8.49 1 9 9.85 1.96 29 1 (P=0.33); P=0%	10 12.6% -0.50[-1.15, 0 7 10.8% -1.36[-2.95, 0 17 23.4% -0.62[-1.23, -0	15] 23] Ø2]				
Subtotal (95% Cl) Heterogeneity: Not applicable Test for overall effect: Z = 5.79 (P < 0.000)		9 12.5% 2.30 (1.52, 3 9 12.5% 2.30 (1.52, 3	.08]				
Total (95% Cl) Heterogeneity: Tau <sup>a</sup> = 3.04; Ch <sup>a</sup> = 450.07, Test for overall effect: Z = 4.56 (P < 0.0000 Test for suboroup differences: Ch <sup>a</sup> = 97.3	116 , df = 7 (P < 0.00001); P = 98% (1) (3. df = 2 (P < 0.00001), P = 97.9%	96 100.0% 2.88 [1.64, 4	12) -4 -2 0 2 4 Favours (PSCs) Favours (control) G				

Fig. 4. Forest plot of the differences in the BBB scores of the iPSC and control groups in different cell counts subgroups at different time-points after transplantation. (A–G) At 1–7 weeks, respectively, after iPSC transplantation. Including publications: Jiri Ruzicka et al. 2017 [26]; Nataliya Romanyuk et al. 2015 [27]; Takashi Amemori et al. 2015 [28]; Angelo H. All et al. 2015 [29]; Jin Young Hong et al. 2014 [30]; Koichi hayashi et al. 2011[31].

Notably, because we analyzed the same included comparisons as those in the different SCI model subgroups, we obtained the same results in terms of the overall BBB score and total heterogeneities, favoring the iPSC groups, which suggested a protective effect. There were significant differences in the heterogeneities between the subgroups ( $I^2 = 47.7\%$ , 95.4%, 86.7%, 90.4% and 89.5%, respectively).

#### BBB score in subgroups of different iPSC differentiation

BBB scores at 1–7 weeks after transplantation. According to published protocols with slight modifications, iPSC were differentiated into neural precursors, oligodendrocyte progenitors or astrocytes under clonal conditions, representing three subgroups. As KARGER

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IPS			lean Difference	Mean Difference		IPSCs Control		Mean Difference	Mean Difference
2.1.1 female (IMR90) human fetal lung fibroblasts	SD Total Mean SD Tot			IV, Random, 95% Cl	Study or Subgroup 2.2.1 female (IMR90) human fetal lung	Mean SD Total Mean SD fibroblasts			IV, Random, 95% Cl
Angelo H. All 2015 2.51 0. Jiri Ruzicka 2017 5.73 0.	85 12 4.98 0.61		-2.47 [-3.06, -1.88] 3.32 [3.06, 3.58]		Angelo H. All 2015 Jiri Ruzicka 2017	8.21 0.75 12 5.71 0.48 8.32 0.37 24 3.92 0.35	12 13.0% 16 13.4%	2.50 (2.00, 3.00) 4.40 (4.17, 4.63)	
Nataliya Romanyuk 2015 5.8 0 Takashi Amemori 2015 (intraspinal) 6.98 0	91 21 2.63 1.01	22 12.7%	3.17 [2.60, 3.74] 4.15 [3.71, 4.59]	+_	Nataliya Romanyuk 2015 Takashi Amemori 2015 (intraspinal)	8 36 0 38 21 4 27 0 43	22 13.4%	4.09 [3.85, 4.33] 4.96 [4.29, 5.63]	· •_
Takashi Amemori 2015 (intrathecal) 7.78 0.	94 9 3.11 0.85	9 12.5%	4.67 [3.84, 5.50]		Takashi Amemori 2015 (intrathecal)	10.12 0.71 9 6.09 1	11 12.7% 9 12.4%	4.03 [3.23, 4.83]	
Subtotal (95% CI) Heterogeneity: Tau <sup>2</sup> = 5.48; Chi <sup>2</sup> = 375.28, df = 4 (P	/5	70 63.5%	2.57 [0.50, 4.63]	-	Subtotal (95% CI) Heterogeneity: Tau <sup>2</sup> = 0.43; Chi <sup>2</sup> = 51.71		70 64.9%	3.99 [3.37, 4.61]	•
Test for overall effect Z = 2.43 (P = 0.01)					Test for overall effect Z = 12.57 (P < 0.0	0001)			
2.1.2 mouse embryonic fibroblasts					2.2.2 mouse embryonic fibroblasts				
Knichi havashi 2011 (3d) 5.85, 0	77 20 4.34 1.06	9 12.5% 10 12.6%	2.25 [1.45, 3.05] 1.51 [0.77, 2.25]		Jin Young Hong 2014 Koichi hayashi 2011 (3d)	8.42 0.79 12 6.74 0.82 7.52 0.47 20 7.44 1.06	9 12.6% 10 12.7%	1.68 (0.98, 2.38) 0.08 (-0.61, 0.77)	+-
Koichi hayashi 2011 (7d) 2.49 0. Subtotal (95% Cl)	99 9 5.35 1.97	7 11.4% -	-2.86 [-4.46, -1.26] 0.43 [-1.77, 2.64]		Koichi hayashi 2011 (7d) Subtotal (95% Cl)	5.98 1.02 9 6.66 2 41	7 9.8% 26 35.1%	-0.68 [-2.30, 0.94] 0.48 [-0.87, 1.82]	
Heterogeneity: Tau# = 3.49; Chi# = 31.77, df = 2 (P < Test for overall effect: Z = 0.39 (P = 0.70)	0.00001); I <sup>a</sup> = 94%				Heterogeneity: Tau# = 1.14; Chl# = 13.44 Test for overall effect: Z = 0.70 (P = 0.49	l, df = 2 (P = 0.001); P = 85%			-
Total (95% CI) Heterogeneity: Tau <sup>2</sup> = 5.00; Chi <sup>2</sup> = 438.54, df = 7 (P		96 100.0%	1.77 [0.20, 3.35]		Total (95% Cl) Heterogeneity: Tau# = 1.81; Ch# = 246.8	116 33, df = 7 (P × 0.00001); I# = 97%	96 100.0%	2.75 [1.78, 3.72]	
Test for overall effect: $Z = 2.21$ (P = 0.03) Test for subgroup differences: $Ch^{\mu} = 1.91$ . df = 1 (P	= 0 17) P = 47 7%			Favours (control) Favours (IPSCs) A	Test for overall effect: Z = 5.55 (P < 0.00 Test for subgroup differences: Chi <sup>a</sup> = 21	001) 1.55. df = 1.72 < 0.00001) (P = 95.4%)			-4 -2 0 2 4 B Favours (control) Favours (IPSCs)
restor substate and enters. on a rest are the									
IPSi Study or Subgroup Mean	Cs Control S <u>D Total Mean SD To</u> t		lean Difference	Mean Difference IV, Random, 95% Cl	Study or Subgroup	IPSCs Control Mean SD Total Mean SD		Mean Difference	Mean Difference IV. Random, 95% Cl
2.3.1 female (IMR90) human fetal lung fibroblasts				N, National, 2011 Cl	2.4.1 female (IMR90) human fetal lung	fibroblasts			IV, Nalidulli, 35% CI
Jiri Ruzicka 2017 8.97	0.4 24 4.47 0.37	12 12.6% 16 13.2%	1.04 [0.35, 1.73] 4.50 [4.26, 4.74]	· ·	Angelo H. All 2015 Jiri Ruzicka 2017	11.39 0.28 12 8.71 0.23 9.42 0.37 24 4.72 0.32	12 13.3% 16 13.3%	2.68 [2.47, 2.89] 4.70 [4.48, 4.92]	· · ·
Nataliya Romanyuk 2015 9.03 0. Takashi Amemori 2015 (Intraspinal) 10.81	33 21 5.13 0.27 3 0.6 9 5.37 0.7	22 13.2% 11 12.8%	3.90 [3.72, 4.08] 5.44 [4.87, 6.01]	· -	Nataliya Romanyuk 2015	9.41 0.39 21 5.55 0.29	22 13.3%	3.86 [3.65, 4.07]	· ·
Takashi Amemori 2015 (intrathecal) 10.49 0	52 9 8.23 0.85	9 12.7%	2.26 [1.61, 2.91]		Takashi Amemori 2015 (intraspinal) Takashi Amemori 2015 (intrathecal)	10.62 0.56 9 8.45 0.88	11 12.7% 9 12.5%	4.53 (3.91, 5.15) 2.17 (1.49, 2.85)	-
Subtotal (95% Cl) Heterogeneity: Tau <sup>2</sup> = 1.09; Chi <sup>2</sup> = 140.19, df = 4 (P	75 < 0.00001); P= 97%	70 64.5%	3.47 [2.53, 4.41]	-	Subtotal (95% CI) Heterogeneity: Tau <sup>a</sup> = 1.01; Chi <sup>a</sup> = 206.1	75	70 65.2%	3.60 [2.70, 4.50]	•
Test for overall effect Z = 7.22 (P < 0.00001)					Test for overall effect Z = 7.81 (P < 0.00	001)			
2.3.2 mouse embryonic fibroblasts	82 12 7.41 0.81	9 12.6%	2 35 (1 85 3 05)	-	2.4.2 mouse embryonic fibroblasts				
Koichi havashi 2011 (3d) 8 28 .0	55 20 819 091	10 12.7%	0.09 [-0.52, 0.70]	+	Jin Young Hong 2014 Koichi havashi 2011 (3d)		10 12.6%	2.01 [1.41, 2.61] 0.04 F0.60, 0.68	+ -
Koichi hayashi 2011 (7d) 7.65 1. Subtotal (95% Cl)	01 9 8.79 1.95 41		-1.14 [-2.73, 0.45] 0.52 [-1.36, 2.41]		Koichi hayashi 2011 (7d) Subtotal (95% CI)	7.8 1.01 9 9.14 2.04 41	7 9.5% 26 34.8%	-1.34 [-2.99, 0.31] 0.36 [-1.38, 2.10]	
Heterogeneity: Tau <sup>2</sup> = 2.50; Chi <sup>2</sup> = 29.34, df = 2 (P < Test for overall effect. Z = 0.55 (P = 0.59)	0.00001); P= 93%				Heteropeneity: Tau# = 2.10; Chi# = 27.37	7. df = 2 (P < 0.00001); P = 93%	20 34.67	0.30 [-1.30, 2.10]	
					Test for overall effect Z = 0.41 (P = 0.68	)			
Total (95% CI) Heterogeneity: Tau <sup>2</sup> = 2.20; Chi <sup>2</sup> = 341.04, df = 7 (P	116 ! < 0.00001); P= 98%	96 100.0%	2.41 [1.35, 3.47]		Total (95% CI) Heterogeneity: Tau <sup>2</sup> = 1.68; Chi <sup>2</sup> = 387.9	116	96 100.0%	2.48 [1.55, 3.41]	•
Test for overall effect Z = 4.46 (P < 0.00001) Test for subaroup differences: ChiP = 7.50. df = 1 (P				Favours (control) Favours (IPSCs)	Test for overall effect Z = 5.21 (P < 0.00	001)			-4 -2 0 2 4 D
reactor based and cancer reast of a = 1.20. ar = 1.1	- 0.0007.1 - 00.1 %			-	Test for subaroup differences: Chi <sup>2</sup> = 10	0.46. df= 1 (P = 0.001). P = 90.4%			
IPS			Mean Difference						
				Mean Difference IV. Random, 95% CI	Study or Subgroup	IPSCs Control Mean SD Total Mean SD	Total Weight	Mean Difference IV, Random, 95% CI	Mean Difference IV, Random, 95% CI
Study or Subgroup Mean 2.5.1 female (IMR90) human fetal lung fibroblasts	SD Total Mean SD To	otal Weight N	IV, Random, 95% Cl	Mean Difference IV. Random, 95% Cl	Study or Subgroup 2.6.1 female (IMR90) human fetal lung	Mean SD Total Mean SD fibroblasts	Total Weight	IV, Random, 95% CI	Mean Difference IV. Random, 95% Cl
Study or Subgroup         Mean           2.5.1 female (IMR90) human fetal lung fibroblasts         Angelo H. All 2015         13.33         0           Jiri Ruzicka 2017         9.82         0         3.32         0	SD Total Mean SD To 174 12 9.97 0.72 135 24 4.77 0.34	12 12.7% 16 13.1%	V. Random, 95% Cl 3.36 [2.78, 3.94] 5.05 [4.83, 5.27]	Mean Difference IV. Random, 95% Cl	2.6.1 female (IMR90) human fetal lung Angelo H. All 2015 Jiri Ruzicka 2017	Mean         SD         Total         Mean         SD           fibroblasts         14.94         0.24         12         13.08         1.15           9.98         0.4         24         5.09         0.35	Total Weight 12 12.6% 16 13.1%	N, Random, 95% Cl 1.86 [1.20, 2.52] 4.89 [4.66, 5.12]	Mean Difference N. Random, 95% Cl
Study or Subgroup         Mean           2.5.1 female (IMR90) human fetal lung fibroblasts         Angelo H. All 2015         13.33           Jiri Ruzicka 2017         9.82         0           Vataliya Romanyuk 2015         9.86         0	SD Total Mean SD To 174 12 9.97 0.72 135 24 4.77 0.34 132 21 5.67 0.37	otal Weight N	N, Random, 95% Cl 3.36 [2.78, 3.94]	Mean Difference N. Random, 95% Cl	2.6.1 female (IMR90) human fetal lung Angelo H. All 2015 Jiri Ruzicka 2017 Nataliya Romanyuk 2015	Mean         SD         Total         Mean         SD           fibroblasts         14.94         0.24         12         13.08         1.15           9.98         0.4         24         5.09         0.35           10.02         0.36         21         5.82         0.37	Total Weight 12 12.6% 16 13.1% 22 13.1%	IV, Random, 95% Cl 1.86 [1.20, 2.52]	Mean Difference N. Random, 95% CI
Study or Subgroup         Mean           2.5.1 female (MR90) human fetal kung fitroblasts         Angelo H. All 2015         13.33 cl           Juli Ruccius 2017         9.82 cl         Nataliya Romanyuk 2015         9.86 cl           Takashi Amemori 2015 (intrapinal)         11.31 cl         Takashi Amemori 2015 (intrapinal)         10.83 cl	SD         Total         Mean         SD         Total           1.74         12         9.97         0.72           1.35         24         4.77         0.34           1.32         21         5.67         0.37           1.42         9         6.59         0.94           1.64         9         8.46         0.87	tal Weight N 12 12.7% 16 13.1% 22 13.1% 11 12.7% 9 12.5%	N. Random, 95% Cl 3.36 [2.78, 3.94] 5.05 [4.83, 5.27] 4.19 [3.98, 4.40] 4.72 [4.10, 5.34] 2.37 [1.68, 3.08]	Mean Difference N. Random, 55% Cl	2.6.1 female (IMR90) human fetal lung Angelo H. All 2015 Jiri Ruzicka 2017 Nataliya Romanyuk 2015 Takashi Amemori 2015 (intraspinal) Takashi Amemori 2015 (intrathecal)	Mean         SD         Total         Mean         SD           fibroblasts         14.94         0.24         12         13.08         1.15           9.98         0.4         24         5.09         0.35           10.02         0.36         21         5.82         0.37           11.39         0.43         9         6.66         0.92           11.07         0.5         9         8.57         0.84	Total         Weight           12         12.6%           16         13.1%           22         13.1%           11         12.7%           9         12.7%	N, Random, 95% Cl 1.86 [1.20, 2.52] 4.89 [4.66, 5.12] 4.20 [3.98, 4.42] 4.73 [4.12, 5.34] 2.50 [1.86, 3.14]	Mean Difference <u>N.Random, 95% Cl</u>
Study or Subaryop         Mean           2.5.1 fremsie (MPK00) lumman (fact alung för oblasts Angelo H. All 2015         1.3.3.1           3.4.1 All 2015         1.3.3.2           Juri Rutzkola 2017         9.8.2           Vatablayk Romanyak 2015         9.88           Takasta Amemon 2015 (intraspiral)         11.31           Masshark Roman 2015 (intraspiral)         11.38           Studytal (2055 CD)         5.8.10×10.25 (intraspiral)	SD         Total         Mean         SD         Te           1.74         12         9.97         0.72         1.35         2.4         4.77         0.34           1.32         21         5.67         0.37         1.42         9         6.59         0.94           1.64         9         8.46         0.87         75         75	tal Weight N 12 12.7% 16 13.1% 22 13.1% 11 12.7%	N, Random, 95% Cl 3.36 (2.78, 3.94) 5.05 (4.83, 5.27) 4.19 (3.98, 4.40) 4.72 (4.10, 5.34)	Mean Difference N. Random, 55% Cl	2.6.1 female (MMS90) human fetal lung Angelo H. All 2015 Juri Ruzicka 2017 Nataliya Romanyuk 2015 Takashi Amemori 2015 (intraspinal) Takashi Amemori 2015 (intrashecal) Subtotal (95% CJ) Heletogeneity, Tau <sup>2</sup> = 0.93, Chi <sup>2</sup> = 109.	Mean         SD         Total         Mean         SD           fibrobasts         14.94         0.24         1.2         13.08         1.15           9.98         0.4         2.4         5.09         0.35           10.02         0.36         2.1         5.82         0.37           11.39         0.43         9         6.66         0.92           11.07         0.5         9         8.57         0.84           29, df=4 (P < 0.00001); P=96%	Total Weight 12 12.6% 16 13.1% 22 13.1% 11 12.7%	N, Random, 95% Cl 1.86 [1.20, 2.52] 4.89 [4.66, 5.12] 4.20 [3.98, 4.42] 4.73 [4.12, 5.34]	Mean Difference <u>N.Random, 95% Cl</u>
Study of Subgroup         Mean           2.5.1 female (MR90) human fetal king fibroklasts         Angelo H.AI (2015)         13.30 (2015)           Juri Rudoka 2017         9.82 (2015)         13.84 (2015)         13.86 (2015)           Juri Rudoka 2017         9.82 (2015)         13.86 (2015)         13.86 (2015)           Takashi Amemori 2015 (intraspinal)         11.31 (2015)         11.31 (2015)         11.31 (2015)           Subtotal (95% CD)         Subtotal (95% CD)         10.83 (2015)         10.83 (2015)         10.83 (2015)	SD         Total         Mean         SD         Te           1.74         12         9.97         0.72         1.35         2.4         4.77         0.34           1.32         21         5.67         0.37         1.42         9         6.59         0.94           1.64         9         8.46         0.87         75         75	tal Weight N 12 12.7% 16 13.1% 22 13.1% 11 12.7% 9 12.5%	N. Random, 95% Cl 3.36 [2.78, 3.94] 5.05 [4.83, 5.27] 4.19 [3.98, 4.40] 4.72 [4.10, 5.34] 2.37 [1.68, 3.08]	Mean Difference M. Random, 555: CI	2.6.1 female (IMR90) human fetal kung Angelo H. All 2015 Jiri Ruzicka 2017 Nataliya Aromanyuk 2015 Takashi Anemoni 2015 (intraspinal) Takashi Anemoni 2015 (intrathecal) Subtotal (95% CI)	Mean         SD         Total         Mean         SD           fibrobasts         14.94         0.24         1.2         13.08         1.15           9.98         0.4         2.4         5.09         0.35           10.02         0.36         2.1         5.82         0.37           11.39         0.43         9         6.66         0.92           11.07         0.5         9         8.57         0.84           29, df=4 (P < 0.00001); P=96%	Total         Weight           12         12.6%           16         13.1%           22         13.1%           11         12.7%           9         12.7%	N, Random, 95% Cl 1.86 [1.20, 2.52] 4.89 [4.66, 5.12] 4.20 [3.98, 4.42] 4.73 [4.12, 5.34] 2.50 [1.86, 3.14]	Mean Otter ence M. Random, 55% ()
Study or Subaryap         Hean           2.5.1 fermale (MRS) human feld all burgh for bolatest Angelo 4.41 2015         13.33 ( 19.17 Rucks) 2017         18.32 ( 19.18 Rucks) 2017         18.32 ( 19.18 Rucks) 2015 ( 19.18	SD         Total         Mean         SD         T/s           1.74         1.2         9.97         0.72           1.35         2.4         4.77         0.34           1.32         2.1         5.67         0.37           1.32         2.1         5.69         0.94           1.42         9         6.59         0.94           1.64         9         8.46         0.87           75         0.000001); P= 95%         0.000001; P= 95%	tal Weight N 12 12.7% 16 13.1% 22 13.1% 11 12.7% 9 12.5% 70 64.2%	N. Random, 95% Cl 3.36 [2.78, 3.94] 5.05 [4.83, 5.27] 4.19 [3.98, 4.40] 4.72 [4.10, 5.34] 2.37 [1.68, 3.08] 3.98 [3.25, 4.74]	Mean Difference N. Ramom, 555 CI	2.6.1 fremade (MKR90) humann fetal kung Angelo H. Al 2015 Jiri Ruucika 2017 Nabaliya Romanyuk 2015 Takash Amemon 2015 (intraspinal) Takash Amemon 2015 (intraspinal) Sautokal (357) Heletoppenety: Tai# 0.83, Ch# = 109, Test for oreal effect. Z = 8.25 (p < 0.00 2.6.2 mouse embryonic fibroblasts	Mean         SD         Total         Mean         SD           'fibroblasts         14         0.24         1.2         1.00         1.15           9.89         0.4         2.4         5.09         0.35         1.15           9.80         0.4         2.4         5.09         0.35         1.15         0.37           10.02         0.36         1.52         1.52         0.37         1.139         0.43         9         6.66         0.92         1.107         0.5         9         8.57         0.84         29, df = 4 (P < 0.00001); P = 96%, 0001)	Total         Weight           12         12.6%           16         13.1%           22         13.1%           11         12.7%           9         12.7%           70         64.2%	M. Random, 95% Cl 1.86 [1.20, 2.52] 4.89 [4.66, 5.12] 4.20 [3.98, 4.42] 4.73 [4.12, 5.34] 2.50 [1.86, 3.14] 3.68 [2.80, 4.55]	Mean Offer ence
Study or Subgroup         Heam           2.5.1 fermals (MH90) hansan feld lung/flocalasts         13300           Angolo A.1.2015         13300           Markania A.2015         13300           Malakia Komanek 2011         68302           Malakia Komanek 2011         68302           Malakia Komanek 2015         10303           Statefact 2015         10302           Statefact 2015         10303           Statefact 2015         104030           Statefact 2017         10400           Statefact 2017         10400           Statefact 2017         1040           Statefact 2017         10400           Statefact 2017         10400           Statefact 2017         10400	SD         Total         Mean         SD         Ts           1.74         12         9.97         0.72         1.35         24         4.77         0.34           1.32         21         5.67         0.37         1.34         9         6.69         0.94           1.82         9         8.46         0.87         75         75         0.000001); ₽ = 95%           1.66         12         9.05         0.47         1.51         20         9.33         1	stal Weight N 12 12.7% 16 13.1% 22 13.1% 11 12.7% 9 12.5% 70 64.2% 9 12.9% 10 12.6%	N. Random, 95% Cl 3.36 [2.78, 3.94] 5.05 [4.83, 5.27] 4.19 [3.96, 4.40] 4.72 [4.10, 5.34] 2.37 [1.86, 3.08] 3.96 [3.25, 4.71] 1.90 [1.42, 2.36] -0.18 [-0.84, 0.46]	Neadoff 1950	2.6.1 Greade (MRR90) human fetal lung Angelo H. All 2004 Jul Riddis 2015 Takasti Areance 2015 (Intraspinal) Takasti Areance 2015 (Intraspinal) Takasti Areance 2015 (Intraspical) Subtedial (955). July 2016 (Intraspical) Heteropageneity, Tair <sup>2</sup> 0.83, Ch <sup>±</sup> 100; Test for oreal effect 2 = 0.55 p <sup>2</sup> ≤ 0.00 2.6.2 mouse embyyeric (Bireblasts July Yung Hong 2014 Kolich havaeli (2011 Ch)	Mean         SD         Total         Mean         SD           "fibroblasts         1434         0.24         12         13.06         1.15           9.89         0.4         24         5.09         0.35         1.12           10.02         0.36         0.42         1.52         0.37         1.139         0.43         9         6.66         0.22           11.07         0.5         9         8.57         0.84         75         0.84         0.001)         P         96%         0001)           11.23         0.7         12         9.33         0.49         8.66         0.82         0.001)	Total         Weight           12         12.6%           13         13.1%           11         12.7%           9         12.7%           70         64.2%           9         12.9%           10         12.7%	M. Random, 95% Cl 1.86 (1.20, 2.52) 4.99 (4.66, 5.12) 4.20 (3.80, 4.42) 4.73 (4.12, 5.34) 2.50 (1.86, 3.14) 3.68 [2.80, 4.55] 1.90 (1.39, 2.41] 0.46 [-0.16, 1.08]	Maniference
Study or Subgroup         Heam           2.5.1 fermale (MH90) human fefal log(Enclasts).         Argo(b A1, 2015)         1.3.3.0.0           Angulo A1, 2015         1.3.3.0.1         9.8.2           Markadox J2017, 2015         1.3.3.0.1         9.8.2           Markadox J2017, 2015         1.3.3.0.1         1.3.3.0.1           Markadox J2017, 2015         1.0.3.0.1         1.3.3.0.1           Stability Americand 2015 (instancial)         1.3.3.0.1         1.3.3.0.1           Stability Americand 2015 (instancial)         1.9.3.0.1         1.3.3.0.1           Stability Americand 2015 (instancial)         1.3.3.0.1         1.3.3.0.1           Stability Americand 2015 (instancial)         1.3.3.0.1         1.3.3.0.1           Stability Americand 2015 (instancial)         1.0.3.0.1         1.3.3.0.1           Stability Americand 2015 (instancial)         1.3.3.0.1         1.3.3.0.1           Stability Americand Berling 2-1.0.10,0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0	SD         Total         Mean         SD         Ts           1.74         1.2         9.97         0.72         1.35         2.4         4.77         0.34           1.35         2.4         4.77         0.34         0.37         0.34           1.32         2.1         5.67         0.37         1.42         9         6.59         0.94           1.64         9         8.46         0.87         75         0.00001); P = 95%           1.66         1.2         9.05         0.47         1.51         20         9.37           9         9         9.49         1.95         1.95         1.95	stal Weight N 12 12.7% 16 13.1% 22 13.1% 21 13.1% 9 12.5% 70 64.2% 9 12.9% 10 12.6% 7 10.4%	M. Random, 95% Cl 3.36 [2.78, 3.94] 5.05 [4.83, 5.27] 4.19 [3.98, 4.40] 4.72 [4.10, 5.34] 2.37 [1.60, 3.06] 3.98 [3.25, 4.71] 1.90 [1.42, 2.38]	Ne hand there exce	26.1 female (MR30) human field lung Angelo H all 2015           Jin Rudzia 2017           Nathaja Romanyuk 2015           Takashi Amemon 2015 (intersprink) Takashi Amemod 2015 (intersprink)           Takashi Amemod 2015 (intersprink)           Heterspreine(Tau <sup>2</sup> = 0.3); Ch <sup>2</sup> = 100.           Testfor romeral effect Z = 0.5 (p <sup>2</sup> < 0.00	Mean         SD         Total         Mean         SD           1649.40         24         12         12.08         1.15           9.96         0.4         24         5.09         0.35           10.02         0.36         21         5.92         0.37           11.00         0.5         21         5.92         0.37           11.07         0.5         9         8.77         0.4           29, of = 4 (P < 0.00001); P = 9%	Total         Weight           12         12.6%           13         13.1%           11         12.7%           9         12.7%           70         64.2%           9         12.9%           10         12.7%	M. Random, 95% Cl 1.86 [1.20, 2.53] 4.89 [4.66, 5.12] 4.20 [3.98, 4.42] 4.73 [4.12, 534] 2.50 [1.68, 3.14] 3.68 [2.80, 4.55] 1.90 [1.39, 2.41]	Man Utterrec
Study or Subgraup         Heam           25.1 fermals (MRWb) humans feld Jump for bolasts:         Angeo N. 41.2015         1.33.0 (21.2016)           10.7 Ruciola 2017         9.89.6 (20.2016)         1.33.0 (21.2016)         1.33.0 (21.2016)           10.8 Just Armenic 2015 (Instraptical)         1.38.0 (21.2016)         1.33.0 (21.2016)         1.33.0 (21.2016)           10.8 Just Armenic 2015 (Instraptical)         1.38.0 (21.2016)         1.33.0 (21.2016)         1.33.0 (21.2016)           10.8 Just Armenic 2015 (Instraptical)         1.38.0 (21.2016)         1.33.0 (21.2016)         1.33.0 (21.2016)           10.8 Just Armenic 2015 (Instraptical)         1.38.0 (21.2016)         1.33.0 (21.2016)         1.33.0 (21.2016)           10.8 Just Armenic 2015 (Instraptical)         1.30.0 (21.2016)         1.33.0 (21.2016)         1.33.0 (21.2016)           10.8 Just Armenic 2017 (20.2017)         1.30.0 (21.2017)         1.30.0 (21.2017)         1.30.0 (21.2017)           10.8 Just Armenic 2017 (20.2017)         1.30.0 (21.2017)         1.30.0 (21.2017)         1.30.0 (21.2017)           10.8 Just Armenic 2017 (20.2017)         1.30.0 (21.2017)         1.30.0 (21.2017)         1.30.0 (21.2017)           10.8 Just Armenic 2017 (20.2017)         1.30.0 (21.2017)         1.30.0 (21.2017)         1.30.0 (21.2017)           10.8 Just Armenic 2017 (20.2017)         1.30.0 (21.2017)	SD         Total         Mean         SD         Ts           (74         12         9.97         0.72         1.35         24         4.77         0.34           (33         22         1.567         0.37         1.34         9         6.59         0.94           (44         9         8.65         0.37         75         0.00001); P = 95%         9           166         12         9.05         0.47         1.51         20         9.33         1           1.99         9         9.49         1.95         41         1         1.55	stal Weight N 12 12.7% 16 13.1% 22 13.1% 21 13.1% 9 12.5% 70 64.2% 9 12.9% 10 12.6% 7 10.4%	M. Random, 95% Cl 3.36 (2.78, 3.94) 5.05 (4.83, 5.27) 4.19 (3.88, 4.40) 4.27 (4.10, 5.88, 4.40) 4.27 (4.10, 5.84, 5.08) 3.98 (3.25, 4.71) 1.90 (1.42, 2.38) -0.18 (-0.84, 0.48) -0.18 (-0.84)	Mean Uterence N. Readon 55:0	2.6.1 Greate (MRSI) human field lung Angelo H all 2015 an Rucciae 2017 Taskari, Amenina 2015 (Encarica) Taskari, Amenina 2015 (Encarica) Taskari, Amenina 2015 (Encarica) Taskari, Amenina 2015 (Encarica) Subtetal (395 - 0.0) Heterspeeches, Tas <sup>2</sup> = 0.30, Ch <sup>2</sup> = 100. Test for oreal effect. 2 = 0.25 e < 0.00 2.6.2 moreas employees (Taré-Balant Jun Yoang Hong 2014 (Machinaes) 2017 (70) Subtetal (395) CD Subtetal (395) CD	Hear         SD         Tetrik Mean         SD           14.54         0.24         12         1.06         1.6           14.54         0.24         12         1.00         1.6           19.80         0.4         2.4         5.00         0.5           10.02         0.35         2.5         5.00         0.5           11.02         0.43         0.66         0.22         1.10         0.43         0.00           20.df = 4.07         0.00001), P = 96%.         0.00010), P = 96%.         0.00010)         0.01         0.	Total         Weight           12         12.8%           16         13.1%           22         13.1%           11         12.7%           70         64.2%           9         12.9%           10         12.7%           7         10.2%	M. Random, 95% C1 1.86 [1.20, 2.52] 4.89 [4.66, 5.12] 4.20 [3.90, 4.42] 4.73 [4.12, 5442] 2.50 [1.80, 3.14] 3.68 [2.80, 4.55] 1.90 [1.39, 2.41] 0.46 [-0.16, 1.00] -1.58 [-3.22, 0.06]	Maniferrere M. Navien SSC
Study or Subgroup         Heam           2.5.1 fermals (MH90) human feld lung) (fitoslasts         Aragio (h. 41.2015)         1.3.3.0           Anguio (h. 41.2015)         1.3.3.0         0.8.2.1           In Facilica (J217)         0.8.2.1         0.8.2.1           Mark Mark Mark Mark Mark Mark Mark Mark	SD         Tetal         Mean         SD         Tc           174         12         9.97         0.23         3.03         3.02         2.05         0.037         3.02         2.05         0.037         3.02         2.05         0.037         4.2         9         5.64         0.84         0.00001         2.000001	stal         Weight         N           12         12.7%         16         13.1%           16         13.1%         22         13.1%           12         12.1%         11         12.2%           9         12.5%         70         64.2%           9         12.9%         10         12.6%           7         10.4%         26         35.8%	M. Random, 95% Cl 3.36 (2.78, 3.94) 5.65 (4.83, 5.27) 4.19 (3.98, 4.40) 4.19 (3.98, 4.40) 4.22 (4.10, 5.34) 2.371 (1.66, 3.08) 3.398 (3.25, 4.71) 1.90 (1.42, 2.38) -0.18 (1.064, 0.48) -1.02 (2.60, 0.56) 0.33 [-1.43, 2.09]	Ne notifier occe	2.8.1 formes (MR39) human field large Applie (H, 2012) Applie (H, 2012) and Russia 2017 Taisain's Remained 2015 (Intranspiral) Taisain's Remained 2015 (Intranspiral) Subliding (STN: 1) (Intranspiral) Heimpopenty Taisain 2012 (Intranspiral) Subliding (STN: 1) (Interpreted 2012) Applie (STN: 1) (Interpreted 2012) Applie (STN: 1) (Interpreted 2012) Applie (STN: 1) (Interpreted 2012) Applie (STN: 1) (Interpreted 2012) (Interpreted 2012) (Interpreted 2012) (Interpreted 2012) (Interpreted 2012) (Interpreted 2012) (Interpreted 2012) (Interpreted 2012)	Heam         SD         Total Meam         SD           1454 0.24         12         12         1.00         15           1454 0.24         12         12         1.00         1.00           980         0.4         2.0         1.02         0.00         1.02           11.02         0.35         2.1         5.20         6.66         0.22         1.10         0.43         0.40         0.00         1.01         1.02         2.0         d.64         0.00         0.00         1.01         0.43         0.40         0.00         0.00         1.01         0.00         0.00         1.01         0.00         0.00         0.00         0.00         1.01         0.00         0.00         0.00         0.00         0.00         0.00         0.00         1.01         0.00	Total         Weight           12         12.5%           16         13.1%           22         13.1%           21         12.7%           9         12.7%           70         64.2%           9         12.9%           10         12.7%           7         10.2%           26         35.8%	<u>N. Random. 95% C1</u> 1.86 (1.20, 2.52) 4.89 (4.66, 5.12) 4.20 (3.89, 4.66, 5.12) 4.20 (3.89, 4.12, 5.34) 2.50 (1.68, 3.25) 1.90 (1.39, 2.41) 0.46 (-0.16, 1.08) -1.58 (-3.22, 0.08) 0.45 (-1.07, 1.97)	Mariotetree
Study or Subgroup         Heam           2.5.1 fermals (MHOB) human fetal Jung forsblasts         Aragio H. Al. 2015         1.33.0           Anguio H. Al. 2015         1.33.0         1.93.2           Maskal Konsamo, 2015         1.93.2         1.93.2           Maskal Konsamo, 2015         1.93.2         1.93.2           Maskal Konsamo, 2015         1.93.2         1.93.2           Stabet Areano, 2015         1.93.4         1.93.5           An Young Hong 2014         1.90.5         1.93.5           Mashat Manno, 2010         9.15.5         1.93.4         2.97.4           Mashat Jenne, 2.2.17, Cht = 3.19.3, dt = 2.07.4         1.94.5         1.93.5         1.93.5           Mashat Jenne, 2.2.2.2.2.2.2.2.2.2.2.2.97.4         2.97.7         1.93.5         1.93.5         1.93.5           Mashat Jenne, 2.2.2.2.2.2.2.2.2.2.0.7.4         2.97.6         2.97.7         1.93.5         1.93.5         1.93.5         1.93.5         1.93.5         1.93.5         1.93.5         1.93.5         1.93.5	SD         Tetal         Mean         SD         Tc           74         12         9.07         0.34         35         24         47.0         0.34           32         24         7.0         0.34         32         21         56         0.37         4.42         6.56         0.37         4.42         6.56         0.87         75         0.00001); P= 85%         9.66         0.87         33         1         9.55         1.55         1.03         3.1         1.95         9.49         1.95         41         0.00001); P= 84%         0.00001); P= 84%         146         9.49         1.95         41         1.05 </td <td>stal         Weight         N           12         12.7%         16         13.1%           16         13.1%         22         13.1%           12         12.1%         11         12.2%           9         12.5%         70         64.2%           9         12.9%         10         12.6%           7         10.4%         26         35.8%</td> <td>M. Random, 95% Cl 3.36 (2.78, 3.94) 5.05 (4.83, 5.27) 4.19 (3.88, 4.40) 4.27 (4.10, 5.88, 4.40) 4.27 (4.10, 5.84, 5.08) 3.98 (3.25, 4.71) 1.90 (1.42, 2.38) -0.18 (-0.84, 0.48) -0.18 (-0.84)</td> <td></td> <td>2.6.1 Green (MR39) human field large Applies (H. 2012) and Riccias 2017 Taisata's Remons 2015 (Intransport) Taisata's Amening 2016 (Intransport) Taisata's Amening 2016 (Intransport) Heingequest Tai<sup>2</sup> = 0.82; 0 + 2 × 0.02 Heingequest Tai<sup>2</sup> = 0.82; 0 + 2 × 0.02 Action taisata's 2011 (Ca) Science 2016 (Ca) Heingequest Tai<sup>2</sup> = 3.65; Ch<sup>2</sup> = 2.03 Heingequest Tai<sup>2</sup> = 3.65; Ch<sup>2</sup> = 2.03 Factor Ca) Heingequest Tai<sup>2</sup> = 3.65; Ch<sup>2</sup> = 2.03 Factor Ca)</td> <td>Heam         SD         Total Meam         SD           1434         0.24         12         13.06         15           1434         0.24         12         13.06         15           198         0.4         24.06         13.06         15           110.0         0.35         21         25.07         15           20,07         12.00001), P = 96%         57         8.4         16         16           111.20         0.7         12         8.37         8.4         16         17         15         16</td> <td>Total         Weight           12         12.8%           16         13.1%           22         13.1%           11         12.7%           70         64.2%           9         12.9%           10         12.7%           7         10.2%</td> <td>M. Random, 95% C1 1.86 [1.20, 2.52] 4.89 [4.66, 5.12] 4.20 [3.90, 4.42] 4.73 [4.12, 5442] 2.50 [1.80, 3.14] 3.68 [2.80, 4.55] 1.90 [1.39, 2.41] 0.46 [-0.16, 1.00] -1.58 [-3.22, 0.06]</td> <td>M.Ranten 253.0</td>	stal         Weight         N           12         12.7%         16         13.1%           16         13.1%         22         13.1%           12         12.1%         11         12.2%           9         12.5%         70         64.2%           9         12.9%         10         12.6%           7         10.4%         26         35.8%	M. Random, 95% Cl 3.36 (2.78, 3.94) 5.05 (4.83, 5.27) 4.19 (3.88, 4.40) 4.27 (4.10, 5.88, 4.40) 4.27 (4.10, 5.84, 5.08) 3.98 (3.25, 4.71) 1.90 (1.42, 2.38) -0.18 (-0.84, 0.48) -0.18 (-0.84)		2.6.1 Green (MR39) human field large Applies (H. 2012) and Riccias 2017 Taisata's Remons 2015 (Intransport) Taisata's Amening 2016 (Intransport) Taisata's Amening 2016 (Intransport) Heingequest Tai <sup>2</sup> = 0.82; 0 + 2 × 0.02 Heingequest Tai <sup>2</sup> = 0.82; 0 + 2 × 0.02 Action taisata's 2011 (Ca) Science 2016 (Ca) Heingequest Tai <sup>2</sup> = 3.65; Ch <sup>2</sup> = 2.03 Heingequest Tai <sup>2</sup> = 3.65; Ch <sup>2</sup> = 2.03 Factor Ca) Heingequest Tai <sup>2</sup> = 3.65; Ch <sup>2</sup> = 2.03 Factor Ca)	Heam         SD         Total Meam         SD           1434         0.24         12         13.06         15           1434         0.24         12         13.06         15           198         0.4         24.06         13.06         15           110.0         0.35         21         25.07         15           20,07         12.00001), P = 96%         57         8.4         16         16           111.20         0.7         12         8.37         8.4         16         17         15         16	Total         Weight           12         12.8%           16         13.1%           22         13.1%           11         12.7%           70         64.2%           9         12.9%           10         12.7%           7         10.2%	M. Random, 95% C1 1.86 [1.20, 2.52] 4.89 [4.66, 5.12] 4.20 [3.90, 4.42] 4.73 [4.12, 5442] 2.50 [1.80, 3.14] 3.68 [2.80, 4.55] 1.90 [1.39, 2.41] 0.46 [-0.16, 1.00] -1.58 [-3.22, 0.06]	M.Ranten 253.0
Study or Subgraup         Heam           2.5.1 female (MHS0) human fetal (mit broklasts Angelo N. Al. 2015         133.02           1 retundo (a) 2017         138.02           Natable Romanyk 2015         138.02           Natable Romanyk 2015         138.02           Natable Romanyk 2015         138.02           Takash Anemot 2015         138.02           Natable Romanyk 2015         138.02           Lastash Anemot 2015         138.02           Valation Status (Memot 2015         138.02           Valation Status (Memot 2015         138.02           Valation Status (Memot 2015         139.02           Valation Status (Memot 2015         149.02           Valation Status (Memot 2017         4.02           Alexing Memot 2011         109.02           Calch hussin 2011         109.02           Valation (Memot 2017)         149.02           Alexing Memot 22.02         107.01           Alexing Memot 22.02         107.01           Heldengenetic Tarl= 21.02         107.01           Heldengenetic Tarl= 21.02         107.02           Heldengenetic Tarl= 21.02         107.02           Heldengenetic Tarl= 21.02         107.02	SD         Tetal         Mean         SD         Te           74         12         9.7         0.24         9.7         0.34           32         24         7.7         0.34         32         0.37         0.34           32         24         5.6         0.37         4.4         0.50         0.37         1.42         0.55         0.01         1.42         0.55         0.01         0.14         0.01         0.17         75         0.00001); F = 85%         0.010011; F = 85%         0.010011; F = 84%         0.000011; F = 84%         0.000011; F = 84%         0.000011; F = 84%         0.000011; F = 80%         0.010011; F = 80%         <	stal         Weight         N           12         12.7%         16         13.1%           16         13.1%         22         13.1%           12         12.1%         11         12.2%           9         12.5%         70         64.2%           9         12.9%         10         12.6%           7         10.4%         26         35.8%	M. Random, 95% Cl 3.36 (2.78, 3.94) 5.65 (4.83, 5.27) 4.19 (3.98, 4.40) 4.19 (3.98, 4.40) 4.22 (4.10, 5.34) 2.371 (1.66, 3.08) 3.398 (3.25, 4.71) 1.90 (1.42, 2.38) -0.18 (1.064, 0.48) -1.02 (2.60, 0.56) 0.33 [-1.43, 2.09]	Menaliterence N. Pandimo 55:0	2.8.1 Granes (MR39) human field large Apple (H. 2012) 41 (Bucks 2017) Taskinky Romanaka 2015 Taskinky Romanaka 2015 Taskinky Romanaka 2015 Taskinky Romanaka 2015 Taskinky Romanaka 2015 Hollongenety: Tasking 2015 (Initiative Hollongenety: Tasking 2012) 2.8.2 mouse entryperic Brotelasts Justic Hollong 2015 (Bucks 2015) 2.8.2 mouse entryperic Brotelasts Justic Hollong 2015 (Bucks 2015) 2.9.2 mouse entryperic Brotelasts Justic Hollong 201	Heam         SD         Tetral Meam         SD           1434         0.24         12         1.00         1.6           1434         0.24         12         1.00         1.6         500         0.5           10.02         0.36         2         5.20         0.8         5.70         0.4         0.6         0.2           11.03         0.42         0.2         5.20         0.8         0.6         0.2         1.10         0.4         0.6         0.2         1.10         0.4         0.6         0.2         1.10         0.4         0.6         0.2         1.10         0.4         0.6         0.2         1.10         0.4         0.2         0.6         0.2         0.10         <	Total         Weight           12         12.5%           16         13.1%           22         13.1%           21         12.7%           9         12.7%           70         64.2%           9         12.9%           10         12.7%           7         10.2%           26         35.8%	M. Random. 95% C1 1.86 (1.20, 2.52) 4.89 (4.66, 5.12) 4.20 (3.89, 4.66, 5.12) 4.20 (3.89, 4.12, 5.34) 2.50 (10.63, 2.53) 3.68 (2.80, 4.55) 1.90 (1.39, 2.41) 0.46 (-0.16, 1.08) -1.58 (-3.22, 0.08) 0.45 (-1.07, 1.97)	Mail difference McDannel DSCL
Study or Subgroup         Heam           2.5.1 fermals (MHR9) human fefal lugit fites/lasts         1333 (5)           3.5.1 fermals (MHR9) human fefal lugit fites/lasts         333 (5)           3.6.1 fites/last (MHR9) human fefal lugit fites/lasts         333 (5)           3.6.1 fites/last (MHR9) human fefal lugit fites/lasts         333 (5)           3.6.1 fites/lasts         3.6.1 fites/lasts           3.6.1 fites/lasts         3.6.1 fites/lasts           3.6.1 fites/lasts         4.6.1 fites/lasts           3.6.1 fites/lasts         4.7.1 fites/lasts           4.6.1 fites/lasts         4.7.1 fites/lasts	SD         Tetal         Mean         SD         Tc           7.74         12         9.97         0.72         0.34         0.77         0.34           3.2         24         4.77         0.34         0.55         0.94         0.84         0.87         0.94         0.97         0.94         0.97         0.94         0.97         0.94         0.97         0.94         0.97         0.94         0.97         0.94         0.97         0.94         0.97         0.94         0.97         0.94         0.97         0.94         0.97         0.94         0.97         0.94         0.95         0.94         0.95         0.47         1.51         20         0.33         1.9         9         9         4.9         9         0.49         0.95         0.47         1.95         0.47         1.95         0.47         1.95         0.47         1.95         0.47         1.95         0.47         1.95         0.47         1.95         0.44         1.95         0.44         1.95         0.44         1.95         0.44         1.95         0.44         1.95         0.44         1.95         0.44         1.95         0.44         1.95         0.44         1.95         0.44 </td <td>stal         Weight         N           12         12.7%         16         13.1%           16         13.1%         22         13.1%           22         13.1%         22         13.1%           9         12.5%         70         64.2%           9         12.5%         7         10.4%           26         35.8%         95         100.0%</td> <td>M. Randern, 95% CI 3.36 (2.78, 3.94) 5.65 (4.83, 5.27) 4.19 (3.98, 4.40) 4.72 (4.16, 5.34) 2.77 (1.64, 3.08) 3.98 (3.25, 4.71) 1.90 (1.42, 2.38) -0.18 (0.84, 0.48) -1.02 (2.20, 5.56) 0.33 (1.43, 2.09) 2.65 (1.55, 3.75)</td> <td>M. Bandom, 555 Cl</td> <td>2.6.1 Green (MR39) human field large Applies (H. 2012) and Riccias 2017 Taisata's Remons 2015 (Intransport) Taisata's Amening 2016 (Intransport) Taisata's Amening 2016 (Intransport) Heingequest Tai<sup>2</sup> = 0.82; 0 + 2 × 0.02 Heingequest Tai<sup>2</sup> = 0.82; 0 + 2 × 0.02 Action taisata's 2011 (Ca) Science 2016 (Ca) Heingequest Tai<sup>2</sup> = 3.65; Ch<sup>2</sup> = 2.03 Heingequest Tai<sup>2</sup> = 3.65; Ch<sup>2</sup> = 2.03 Factor Ca) Heingequest Tai<sup>2</sup> = 3.65; Ch<sup>2</sup> = 2.03 Factor Ca)</td> <td>Heam         SD         Tetral Meam         SD           1434         0.24         12         1.00         1.6           1434         0.24         12         1.00         1.6         500         0.5           10.02         0.36         2         5.20         0.8         5.70         0.4         0.6         0.2           11.03         0.42         0.2         5.20         0.8         0.6         0.2         1.10         0.4         0.6         0.2         1.10         0.4         0.6         0.2         1.10         0.4         0.6         0.2         1.10         0.4         0.6         0.2         1.10         0.4         0.2         0.6         0.2         0.10         &lt;</td> <td>Total         Weight           12         12.5%           16         13.1%           22         13.1%           21         12.7%           9         12.7%           70         64.2%           9         12.9%           10         12.7%           7         10.2%           26         35.8%</td> <td>M. Random. 95% C1 1.86 (1.20, 2.52) 4.89 (4.66, 5.12) 4.20 (3.89, 4.66, 5.12) 4.20 (3.89, 4.12, 5.34) 2.50 (10.63, 2.53) 3.68 (2.80, 4.55) 1.90 (1.39, 2.41) 0.46 (-0.16, 1.08) -1.58 (-3.22, 0.08) 0.45 (-1.07, 1.97)</td> <td>M.Ranten 253.0</td>	stal         Weight         N           12         12.7%         16         13.1%           16         13.1%         22         13.1%           22         13.1%         22         13.1%           9         12.5%         70         64.2%           9         12.5%         7         10.4%           26         35.8%         95         100.0%	M. Randern, 95% CI 3.36 (2.78, 3.94) 5.65 (4.83, 5.27) 4.19 (3.98, 4.40) 4.72 (4.16, 5.34) 2.77 (1.64, 3.08) 3.98 (3.25, 4.71) 1.90 (1.42, 2.38) -0.18 (0.84, 0.48) -1.02 (2.20, 5.56) 0.33 (1.43, 2.09) 2.65 (1.55, 3.75)	M. Bandom, 555 Cl	2.6.1 Green (MR39) human field large Applies (H. 2012) and Riccias 2017 Taisata's Remons 2015 (Intransport) Taisata's Amening 2016 (Intransport) Taisata's Amening 2016 (Intransport) Heingequest Tai <sup>2</sup> = 0.82; 0 + 2 × 0.02 Heingequest Tai <sup>2</sup> = 0.82; 0 + 2 × 0.02 Action taisata's 2011 (Ca) Science 2016 (Ca) Heingequest Tai <sup>2</sup> = 3.65; Ch <sup>2</sup> = 2.03 Heingequest Tai <sup>2</sup> = 3.65; Ch <sup>2</sup> = 2.03 Factor Ca) Heingequest Tai <sup>2</sup> = 3.65; Ch <sup>2</sup> = 2.03 Factor Ca)	Heam         SD         Tetral Meam         SD           1434         0.24         12         1.00         1.6           1434         0.24         12         1.00         1.6         500         0.5           10.02         0.36         2         5.20         0.8         5.70         0.4         0.6         0.2           11.03         0.42         0.2         5.20         0.8         0.6         0.2         1.10         0.4         0.6         0.2         1.10         0.4         0.6         0.2         1.10         0.4         0.6         0.2         1.10         0.4         0.6         0.2         1.10         0.4         0.2         0.6         0.2         0.10         <	Total         Weight           12         12.5%           16         13.1%           22         13.1%           21         12.7%           9         12.7%           70         64.2%           9         12.9%           10         12.7%           7         10.2%           26         35.8%	M. Random. 95% C1 1.86 (1.20, 2.52) 4.89 (4.66, 5.12) 4.20 (3.89, 4.66, 5.12) 4.20 (3.89, 4.12, 5.34) 2.50 (10.63, 2.53) 3.68 (2.80, 4.55) 1.90 (1.39, 2.41) 0.46 (-0.16, 1.08) -1.58 (-3.22, 0.08) 0.45 (-1.07, 1.97)	M.Ranten 253.0
State of Software         Hem           Schward (SRR) Aurolian (Han (SRR) Software) Angolo A. 40 (25)         13.21 (2)           Angolo A. 2015         13.21 (2)           Angolo A. 40 (25)         13.21 (2)           Tablash America 2015 (1)         13.21 (2)           Tablash America 2016 (1)         13.21 (2)           Tablash America 2016 (1)         13.21 (2)           Angolo A. 10.22 (2)         20.27 (2)         4.21 (2)           Angolo A. 10.22 (2)         20.27 (2)         4.21 (2)           Angolo A. 10.23 (2)         2.21 (2)         4.21 (2)           Angolo A. 10.20 (2)         13.21 (2)         4.21 (2)           Angolo A. 10.21 (2)         12.11 (2)         4.21 (2)           Angolo A. 10.21 (2)         12.11 (2)         4.2 (2)           Angolo A. 10.21 (2)         12.11 (2)         4.21 (2)           Tablash angolo A. 10.11 (2)         12.11 (2)         4.21 (2)           Tablash angolo A. 10.11 (2)         12.11 (2)         12.11 (2)           Tablash angolo A. 10.11 (2)         12.11 (2)         12.11 (2)           Tabla C. 10.21 (2) <td>SD         Tetal         Mean         SD         Tc           7.74         12         9.97         0.72         0.34         0.55         0.97         0.34         0.55         0.94         0.97         0.34         0.37         0.34         0.55         0.94         0.97         0.94         0.97         0.94         0.97         0.94         0.97         0.94         0.97         0.94         0.97         0.94         0.97         0.94         0.97         0.94         0.97         0.94         0.97         0.94         0.97         0.94         0.95         0.94         0.95         0.94         1.95         0.00001), P = 95%         9         9.44         1.95         44         0.00001), P = 94%         1.96         0.00001), P = 94%         1.96         0.00001), P = 95%         P         0.00001), P = 952.9%         CS         Control Mean         SD         To         SD         T</td> <td>tal Weight R 12 12.7% 16 13.1% 22 13.1% 22 13.1% 11 12.7% 9 12.5% 70 64.2% 9 12.9% 10 12.6% 70 64.2% 9 54.2% 9 100.0%</td> <td>M. Random, 95% Cl 3.36 (2.78, 3.94) 5.05 (4.33, 5.27) 4.19 (3.98, 4.40) 4.72 (4.16, 4.53) 2.72 (1.16, 3.38) 1.80 [1.42, 2.38] -0.18 (0.84, 0.46) -1.02 (2.80, 0.56) 0.33 [1.43, 2.69] 2.65 [1.55, 3.75] Mean Difference</td> <td>M. Random, 555 C</td> <td>2.8.1 Granes (MR39) human field large Apple (H. 2012) 41 (Bucks 2017) Taskinky Romanaka 2015 Taskinky Romanaka 2015 Taskinky Romanaka 2015 Taskinky Romanaka 2015 Taskinky Romanaka 2015 Hollongenety: Tasking 2015 (Initiative Hollongenety: Tasking 2012) 2.8.2 mouse entryperic Brotelasts Justic Hollong 2015 (Bucks 2015) 2.8.2 mouse entryperic Brotelasts Justic Hollong 2015 (Bucks 2015) 2.9.2 mouse entryperic Brotelasts Justic Hollong 201</td> <td>Heam         SD         Tetral Meam         SD           1434         0.24         12         1.00         1.6           1434         0.24         12         1.00         1.6         500         0.5           10.02         0.36         2         5.20         0.8         5.70         0.4         0.6         0.2           11.03         0.42         0.2         5.20         0.8         0.6         0.2         1.10         0.4         0.6         0.2         1.10         0.4         0.6         0.2         1.10         0.4         0.6         0.2         1.10         0.4         0.6         0.2         1.10         0.4         0.2         0.6         0.2         0.10         &lt;</td> <td>Total         Weight           12         12.5%           16         13.1%           22         13.1%           21         12.7%           9         12.7%           70         64.2%           9         12.9%           10         12.7%           7         10.2%           26         35.8%</td> <td>M. Random. 95% C1 1.86 (1.20, 2.52) 4.89 (4.66, 5.12) 4.20 (3.89, 4.66, 5.12) 4.20 (3.89, 4.12, 5.34) 2.50 (10.63, 2.53) 3.68 (2.80, 4.55) 1.90 (1.39, 2.41) 0.46 (-0.16, 1.08) -1.58 (-3.22, 0.08) 0.45 (-1.07, 1.97)</td> <td>M.Ranten 253.0</td>	SD         Tetal         Mean         SD         Tc           7.74         12         9.97         0.72         0.34         0.55         0.97         0.34         0.55         0.94         0.97         0.34         0.37         0.34         0.55         0.94         0.97         0.94         0.97         0.94         0.97         0.94         0.97         0.94         0.97         0.94         0.97         0.94         0.97         0.94         0.97         0.94         0.97         0.94         0.97         0.94         0.97         0.94         0.95         0.94         0.95         0.94         1.95         0.00001), P = 95%         9         9.44         1.95         44         0.00001), P = 94%         1.96         0.00001), P = 94%         1.96         0.00001), P = 95%         P         0.00001), P = 952.9%         CS         Control Mean         SD         To         SD         T	tal Weight R 12 12.7% 16 13.1% 22 13.1% 22 13.1% 11 12.7% 9 12.5% 70 64.2% 9 12.9% 10 12.6% 70 64.2% 9 54.2% 9 100.0%	M. Random, 95% Cl 3.36 (2.78, 3.94) 5.05 (4.33, 5.27) 4.19 (3.98, 4.40) 4.72 (4.16, 4.53) 2.72 (1.16, 3.38) 1.80 [1.42, 2.38] -0.18 (0.84, 0.46) -1.02 (2.80, 0.56) 0.33 [1.43, 2.69] 2.65 [1.55, 3.75] Mean Difference	M. Random, 555 C	2.8.1 Granes (MR39) human field large Apple (H. 2012) 41 (Bucks 2017) Taskinky Romanaka 2015 Taskinky Romanaka 2015 Taskinky Romanaka 2015 Taskinky Romanaka 2015 Taskinky Romanaka 2015 Hollongenety: Tasking 2015 (Initiative Hollongenety: Tasking 2012) 2.8.2 mouse entryperic Brotelasts Justic Hollong 2015 (Bucks 2015) 2.8.2 mouse entryperic Brotelasts Justic Hollong 2015 (Bucks 2015) 2.9.2 mouse entryperic Brotelasts Justic Hollong 201	Heam         SD         Tetral Meam         SD           1434         0.24         12         1.00         1.6           1434         0.24         12         1.00         1.6         500         0.5           10.02         0.36         2         5.20         0.8         5.70         0.4         0.6         0.2           11.03         0.42         0.2         5.20         0.8         0.6         0.2         1.10         0.4         0.6         0.2         1.10         0.4         0.6         0.2         1.10         0.4         0.6         0.2         1.10         0.4         0.6         0.2         1.10         0.4         0.2         0.6         0.2         0.10         <	Total         Weight           12         12.5%           16         13.1%           22         13.1%           21         12.7%           9         12.7%           70         64.2%           9         12.9%           10         12.7%           7         10.2%           26         35.8%	M. Random. 95% C1 1.86 (1.20, 2.52) 4.89 (4.66, 5.12) 4.20 (3.89, 4.66, 5.12) 4.20 (3.89, 4.12, 5.34) 2.50 (10.63, 2.53) 3.68 (2.80, 4.55) 1.90 (1.39, 2.41) 0.46 (-0.16, 1.08) -1.58 (-3.22, 0.08) 0.45 (-1.07, 1.97)	M.Ranten 253.0
State & Software         Hen           State & Software         Hen           Actimute, 1869 Manne field auffendbacks         Apple A. 14, 2015           Apple A. 14, 2015         13.21           Anglacks, 2017         18.21           Malay, Remain 2018         18.91           Malay, Remain 2018 (chargen)         18.91           Malay, Remain 2017 (chargen)         18.91           Malay, Remain 2018 (chargen)         19.91           Malay, Remain 2018 (chargen)	SD Tetal Mean SD Tr 74 + 12 + 97 - 72 + 32 + 37 - 72 + 34 + 37 - 34 + 37 + 34 + 37 + 34 + 37 + 34 + 34 +	stal         Weight         R           12         12.7%         16         13.1%           16         13.1%         22         13.1%           11         12.7%         9         12.9%           11         12.7%         9         12.9%           10         12.8%         7         64.2%           9         12.9%         10         12.8%           9         10.0%         9         10.0%           9         10.0%         10         12.8%           9         12.12.7%         12         12.7%	M. Random, 959 CI 3.56 (27), 3.94 6.56 (43), 5.27 4.19 (3.84, 4.40 4.19 (3.84, 4.40 4.27 (1.84, 3.08) 3.96 (3.24, 2.38) 1.90 (1.42, 2.38) 4.19 (1.42, 2.38) 4.10 (2.44, 2.48) 4.10 (2.44, 2.48)	M. Bandom 595:0	2.8.1 Granes (MR39) human field large Apple (H. 2012) 41 (Bucks 2017) Taskinky Romanaka 2015 Taskinky Romanaka 2015 Taskinky Romanaka 2015 Taskinky Romanaka 2015 Taskinky Romanaka 2015 Hollongenety: Tasking 2015 (Initiative Hollongenety: Tasking 2012) 2.8.2 mouse entryperic Brotelasts Justic Hollong 2015 (Bucks 2015) 2.8.2 mouse entryperic Brotelasts Justic Hollong 2015 (Bucks 2015) 2.9.2 mouse entryperic Brotelasts Justic Hollong 201	Heam         SD         Tetral Meam         SD           1434         0.24         12         1.00         1.6           1434         0.24         12         1.00         1.6         500         0.5           10.02         0.36         2         5.20         0.8         5.70         0.4         0.6         0.2           11.03         0.42         0.2         5.20         0.8         0.6         0.2         1.10         0.4         0.6         0.2         1.10         0.4         0.6         0.2         1.10         0.4         0.6         0.2         1.10         0.4         0.6         0.2         1.10         0.4         0.2         0.6         0.2         0.10         <	Total         Weight           12         12.5%           16         13.1%           22         13.1%           21         12.7%           9         12.7%           70         64.2%           9         12.9%           10         12.7%           7         10.2%           26         35.8%	M. Random. 95% C1 1.86 (1.20, 2.52) 4.89 (4.66, 5.12) 4.20 (3.89, 4.66, 5.12) 4.20 (3.89, 4.12, 5.34) 2.50 (10.63, 2.53) 3.68 (2.80, 4.55) 1.90 (1.39, 2.41) 0.46 (-0.16, 1.08) -1.58 (-3.22, 0.08) 0.45 (-1.07, 1.97)	M.Ranten 253.0
State & States & More         Hen           Schemes (1869) humori falue (1876-1886)         Apple AL 2015         13.20 (2017)           Apple AL 2015         13.20 (2017)         8.20 (2017)         8.20 (2017)           Apple AL 2015         13.20 (2017)         8.20 (2017)         8.20 (2017)         8.20 (2017)           Apple AL 2015         13.20 (2017)         8.20 (2017)         8.20 (2017)         8.20 (2017)         13.2	SD:         Tetal         Mean         SD:         Tetal           7.4         12         9.70         0.34         9.77         0.34           3.2         24         4.77         0.34         0.35         0.34         0.35         0.34         0.35         0.34         0.35         0.34         0.35         0.34         0.35         0.34         0.35         0.34         0.35         0.34         0.35         0.34         0.35         0.34         0.35         0.34         0.35         0.34         0.35         0.34         0.35         0.34         0.35         0.34         1.35         0.34         1.35         0.34         1.35         0.34         1.35         0.34         1.35         0.34         1.35         0.34         1.35         0.34         1.35         0.34         1.35         0.34         1.35         0.34         1.35         0.34         1.35         0.34         1.35         1.36         0.34         1.35         1.36         0.34         1.35         0.34         1.35         1.36         0.34         1.35         0.34         1.35         0.35         1.36         0.35         1.35         0.36         1.36         0.35         1.36	stal         Weisht         R           12         12.7%         16         15.1%           16         15.1%         22         13.1%           11         12.7%         9         70         64.2%           9         12.2%         10         12.6%         7           10         12.6%         7         10.4%         26           96         100.0%         1         1         1           12         12.7%         16         12.0%         1           16         13.0%         1         1         1	M. Random, 955 C1 3.36 (273, 3.94) 5.65 (4.81, 5.27) 4.19 (3.84, 4.01) 2.77 (1.81, 5.04) 1.59 (1.42, 2.38) 1.59 (1.42, 2.38) 1.59 (1.42, 2.38) 0.33 (1.43, 2.38) 2.65 (1.55, 3.75) 2.66 (1.55, 3.75) 2.95 (1.55, 3.75) 3.95 (1.55, 3.	M. Bandom 595:0	2.8.1 Granes (MR39) human field large Apple (H. 2012) 41 (Bucks 2017) Taskinky Romanaka 2015 Taskinky Romanaka 2015 Taskinky Romanaka 2015 Taskinky Romanaka 2015 Taskinky Romanaka 2015 Hollongenety: Tasking 2015 (Initiative Hollongenety: Tasking 2012) 2.8.2 mouse entryperic Brotelasts Justic Hollong 2015 (Bucks 2015) 2.8.2 mouse entryperic Brotelasts Justic Hollong 2015 (Bucks 2015) 2.9.2 mouse entryperic Brotelasts Justic Hollong 201	Heam         SD         Tetral Meam         SD           1434         0.24         12         1.00         1.6           1434         0.24         12         1.00         1.6         500         0.5           10.02         0.36         2         5.20         0.8         5.70         0.4         0.6         0.2           11.03         0.42         0.2         5.20         0.8         0.6         0.2         1.10         0.4         0.6         0.2         1.10         0.4         0.6         0.2         1.10         0.4         0.6         0.2         1.10         0.4         0.6         0.2         1.10         0.4         0.2         0.6         0.2         0.10         <	Total         Weight           12         12.5%           16         13.1%           22         13.1%           21         12.7%           9         12.7%           70         64.2%           9         12.9%           10         12.7%           7         10.2%           26         35.8%	M. Random. 95% C1 1.86 (1.20, 2.52) 4.89 (4.66, 5.12) 4.20 (3.89, 4.66, 5.12) 4.20 (3.89, 4.12, 5.34) 2.50 (10.63, 2.53) 3.68 (2.80, 4.55) 1.90 (1.39, 2.41) 0.46 (-0.16, 1.08) -1.58 (-3.22, 0.08) 0.45 (-1.07, 1.97)	M.Ranten 253.0
State of Software         Hem           Schware (BRO) human feld au (Brobabbar) Angole A (2015)         13.21 (2016)           Angole A (2015)         13.21 (2016)           Angole A (2015)         13.21 (2016)           Tabasia Homemon 2015 (cmissprand)         13.21 (2016)           Angole A (2017) (2016)         20.21 (2016)           Tabasia Homemon 2015 (cmissprand)         13.21 (2016)           Angole A (2017) (20	SD         Tetal         Mean         SD         Tetal         SD         Tetal	stal         Weisht         N           12         12.7%         18         15.1%           16         15.1%         22         13.1%           11         12.7%         9         70         64.2%           9         12.2%         70         64.2%           9         12.2%         70         64.2%           9         12.2%         10.0%         11           12         12.7%         16         13.0%           11         12.2%         12.1%         11.2%	M. Random, 1955 C1 3.36 [273, 3.94 5.65 [4.83, 5.27] 4.19 [3.84, 4.40] 4.277 [184, 3.06] 2.277 [184, 3.06] 3.369 [1.24, 2.38] 1.50 [1.42, 2.38] 0.19 [1.64, 3.28] 2.65 [1.55, 3.75] 2.65 [1.55, 3.75] 3.99 [1.44, 2.09] 2.65 [1.55, 3.75] 3.99 [2.44, 4.58] 3.95 [2.14, 4.58] 4.67 [4.44, 4.58] 4.57 [4.58, 4	M. Bandom 595:0	2.8.1 Granes (MR39) human field large Apple (H. 2012) 41 (Bucks 2017) Taskinky Romanaka 2015 Taskinky Romanaka 2015 Taskinky Romanaka 2015 Taskinky Romanaka 2015 Taskinky Romanaka 2015 Helmoppenet: Tasking 2015 (Initiative Bucks 2015) 2.8.2 mease entryweic Biotelasts Junch Initiative 2015 (Initiative Statistic 2015) Salattal (BS) CD Helmoppenet: Tasking 2016) P = 0.5 Helmoppenet: Tasking 2016 P = 0.5Helmoppene	Heam         SD         Tetral Meam         SD           1434         0.24         12         1.00         1.6           1434         0.24         12         1.00         1.6         500         0.5           10.02         0.36         2         5.20         0.8         5.70         0.4         0.6         0.2           11.03         0.42         0.2         5.20         0.8         0.6         0.2         1.10         0.4         0.6         0.2         1.10         0.4         0.6         0.2         1.10         0.4         0.6         0.2         1.10         0.4         0.6         0.2         1.10         0.4         0.2         0.6         0.2         0.10         <	Total         Weight           12         12.5%           16         13.1%           22         13.1%           21         12.7%           9         12.7%           70         64.2%           9         12.9%           10         12.7%           7         10.2%           26         35.8%	M. Random. 95% C1 1.86 (1.20, 2.52) 4.89 (4.66, 5.12) 4.20 (3.89, 4.66, 5.12) 4.20 (3.89, 4.12, 5.34) 2.50 (10.63, 2.53) 3.68 (2.80, 4.55) 1.90 (1.39, 2.41) 0.46 (-0.16, 1.08) -1.58 (-3.22, 0.08) 0.45 (-1.07, 1.97)	M.Ranten 253.0
State & Solverage         Hem           State & Solverage         Hem           Argon & Hall 2015         3.23 (J           Angolo & All 2015         3.23 (J           Hallan & Reacias 2017         8.22 (J           Hallan & Reacias 2017         8.22 (J           Hallan & Reacias 2017         1.03 (J           Hallan & Reacias 2017         1.03 (J           Stateta @95 (G)         Hellan 2017           Hallan & Reacias 2017         1.03 (J           Allan Argon 2016         1.03 (J           Allan Argon 2016         1.03 (J           Allan Argon 2017         1.03 (J	$\begin{array}{cccccccccccccccccccccccccccccccccccc$	tal         Weisht         N           12         12.7%         18         13.1%           18         13.1%         11         12.2%         9           9         12.5%         9         12.2%         9           9         12.2%         9         12.5%         70         64.2%           9         12.2%         35.8%         9         12.2%         9           9         12.2%         35.8%         9         10.0%         10           9         12.2%         35.8%         9         10.0%         1           9         12.2%         10.0%         1         1         1           9         12.2%         10.0%         1 </td <td>M. Random, 959: C1 3.38 [27, 3.34] 6.56 [4.83, 27] 4.19 [284, 4.40] 4.19 [284, 4.40] 4.10 [284, 4</td> <td>M. Bandom 595:0</td> <td>2.8.1 Granes (MR39) human field large Apple (H. 2012) 41 (Bucks 2017) Taskinky Romanaka 2015 Taskinky Romanaka 2015 Taskinky Romanaka 2015 Taskinky Romanaka 2015 Taskinky Romanaka 2015 Helmoppenet: Tasking 2015 (Initiative Bucks 2015) 2.8.2 mease entryweic Biotelasts Junch Initiative 2015 (Initiative Statistic 2015) Salattal (BS) CD Helmoppenet: Tasking 2016) P = 0.5 Helmoppenet: Tasking 2016 P = 0.5Helmoppene</td> <td>Heam         SD         Tetral Meam         SD           1434         0.24         12         1.00         1.6           1434         0.24         12         1.00         1.6         500         0.5           10.02         0.36         2         5.20         0.8         5.70         0.4         0.6         0.2           11.03         0.42         0.2         5.20         0.8         0.6         0.2         1.10         0.4         0.6         0.2         1.10         0.4         0.6         0.2         1.10         0.4         0.6         0.2         1.10         0.4         0.6         0.2         1.10         0.4         0.2         0.6         0.2         0.10         &lt;</td> <td>Total         Weight           12         12.5%           16         13.1%           22         13.1%           21         12.7%           9         12.7%           70         64.2%           9         12.9%           10         12.7%           7         10.2%           26         35.8%</td> <td>M. Random. 95% C1 1.86 (1.20, 2.52) 4.89 (4.66, 5.12) 4.20 (3.89, 4.66, 5.12) 4.20 (3.89, 4.12, 5.34) 2.50 (10.63, 2.53) 3.68 (2.80, 4.55) 1.90 (1.39, 2.41) 0.46 (-0.16, 1.08) -1.58 (-3.22, 0.08) 0.45 (-1.07, 1.97)</td> <td>M.Ranten 253.0</td>	M. Random, 959: C1 3.38 [27, 3.34] 6.56 [4.83, 27] 4.19 [284, 4.40] 4.19 [284, 4.40] 4.10 [284, 4	M. Bandom 595:0	2.8.1 Granes (MR39) human field large Apple (H. 2012) 41 (Bucks 2017) Taskinky Romanaka 2015 Taskinky Romanaka 2015 Taskinky Romanaka 2015 Taskinky Romanaka 2015 Taskinky Romanaka 2015 Helmoppenet: Tasking 2015 (Initiative Bucks 2015) 2.8.2 mease entryweic Biotelasts Junch Initiative 2015 (Initiative Statistic 2015) Salattal (BS) CD Helmoppenet: Tasking 2016) P = 0.5 Helmoppenet: Tasking 2016 P = 0.5Helmoppene	Heam         SD         Tetral Meam         SD           1434         0.24         12         1.00         1.6           1434         0.24         12         1.00         1.6         500         0.5           10.02         0.36         2         5.20         0.8         5.70         0.4         0.6         0.2           11.03         0.42         0.2         5.20         0.8         0.6         0.2         1.10         0.4         0.6         0.2         1.10         0.4         0.6         0.2         1.10         0.4         0.6         0.2         1.10         0.4         0.6         0.2         1.10         0.4         0.2         0.6         0.2         0.10         <	Total         Weight           12         12.5%           16         13.1%           22         13.1%           21         12.7%           9         12.7%           70         64.2%           9         12.9%           10         12.7%           7         10.2%           26         35.8%	M. Random. 95% C1 1.86 (1.20, 2.52) 4.89 (4.66, 5.12) 4.20 (3.89, 4.66, 5.12) 4.20 (3.89, 4.12, 5.34) 2.50 (10.63, 2.53) 3.68 (2.80, 4.55) 1.90 (1.39, 2.41) 0.46 (-0.16, 1.08) -1.58 (-3.22, 0.08) 0.45 (-1.07, 1.97)	M.Ranten 253.0
State & Solverse         Hem           State & Solverse         Hem           Argin A (2015)         13.21 (2014)           Angin A (2015)         13.21 (2014)           Stated # 695 (2015)         13.01 (2014)           Angin A (2015)         13.21 (2014)           Angin A (2015)         13.21 (2014)           Angin A (2014)         13.01 (2014)           Angin A (2015)         13.01 (2014)           Angin (	$\begin{array}{cccccccccccccccccccccccccccccccccccc$	stat         Weisht         R           12         12.7%         16         13.1%           16         13.1%         17.2         17.6%           11         12.7%         9         12.4%           9         12.9%         10         12.6%           70         64.2%         10         12.6%           9         12.9%         10.0%         10.0%           9         12.2%         10.0%         11           12         12.7%         13.0%         22           12         12.7%         11         12.2%           9         12.2%         13.0%         11           12         12.7%         13.0%         12           9         12.7%         12         12.6%	M. Random, 959: C1 3.58 (27), 3.94 5.65 (4.8), 5.27 4.19 (28), 4.40 4.19 (28), 4.40 4.10 (28), 4.40 4.	M. Bandom 595:0	2.8.1 Granes (MR39) human field large Apple (H. 2012) 41 (Bucks 2017) Taskinky Romanaka 2015 Taskinky Romanaka 2015 Taskinky Romanaka 2015 Taskinky Romanaka 2015 Taskinky Romanaka 2015 Helmoppenet: Tasking 2015 (Initiative Bucks 2015) 2.8.2 mease entryweic Biotelasts Junch Initiative 2015 (Initiative Statistic 2015) Salattal (BS) CD Helmoppenet: Tasking 2016) P = 0.5 Helmoppenet: Tasking 2016 P = 0.5Helmoppene	Heam         SD         Tetral Meam         SD           1434         0.24         12         1.00         1.6           1434         0.24         12         1.00         1.6         500         0.5           10.02         0.36         2         5.20         0.8         5.70         0.4         0.6         0.2           11.03         0.42         0.2         5.20         0.8         0.6         0.2         1.10         0.4         0.6         0.2         1.10         0.4         0.6         0.2         1.10         0.4         0.6         0.2         1.10         0.4         0.6         0.2         1.10         0.4         0.2         0.6         0.2         0.10         <	Total         Weight           12         12.5%           16         13.1%           22         13.1%           21         12.7%           9         12.7%           70         64.2%           9         12.9%           10         12.7%           7         10.2%           26         35.8%	M. Random. 95% C1 1.86 (1.20, 2.52) 4.89 (4.66, 5.12) 4.20 (3.89, 4.66, 5.12) 4.20 (3.89, 4.12, 5.34) 2.50 (10.63, 2.53) 3.68 (2.80, 4.55) 1.90 (1.39, 2.41) 0.46 (-0.16, 1.08) -1.58 (-3.22, 0.08) 0.45 (-1.07, 1.97)	M.Ranten 253.0
Staty & Staty and Staty & Staty and A. 25. Intrask (1986) statute if also affectivables (Argolic AI 2015)         Henry B. 23. Intra- B. 2015         Henry B. 23. Intra- tional Statute is a staty of the staty statute is a staty of the staty of the staty statute is a staty of the staty of the staty statute is a staty of the staty of the staty in the staty is a staty of the staty of the staty is a staty of the staty of the staty is a staty of the staty of the staty of the staty is a staty of the staty of the staty of the staty is a staty of the staty of the staty is a staty of the staty of the staty of the staty is a staty of the staty of the staty of the staty is a staty of the staty of the staty of the staty is a staty of the staty of the staty of the staty is a staty of the staty of the staty of the staty is a staty of the staty of the staty of the staty is a staty of the staty of the staty of the staty is a staty of the staty of the staty of the staty is a staty of the staty of the staty of the staty is a staty of the staty of the staty of the staty is a staty of the staty of the staty of the staty is a staty of the staty of the staty of the staty is a statute of the staty of the staty of the staty of the staty is a state of the staty o	$\begin{array}{cccccccccccccccccccccccccccccccccccc$	stat         Weisht         R           12         12.7%         16         13.1%           16         13.1%         17.2         17.6%           11         12.7%         9         12.4%           9         12.9%         10         12.6%           70         64.2%         10         12.6%           9         12.9%         10.0%         10.0%           9         12.2%         10.0%         11           12         12.7%         13.0%         22           12         12.7%         11         12.2%           9         12.2%         13.0%         11           12         12.7%         13.0%         12           9         12.7%         12         12.6%	M. Random, 959: C1 3.58 (27), 3.94 5.65 (4.8), 5.27 4.19 (28), 4.40 4.19 (28), 4.40 4.10 (28), 4.40 4.	M. Bandom 595:0	2.8.1 Granes (MR39) human field large Apple (H. 2012) 41 (Bucks 2017) Taskinky Romanaka 2015 Taskinky Romanaka 2015 Taskinky Romanaka 2015 Taskinky Romanaka 2015 Taskinky Romanaka 2015 Helmoppenet: Tasking 2015 (Initiative Bucks 2015) 2.8.2 mease entryweic Biotelasts Junch Initiative 2015 (Initiative Statistic 2015) Salattal (BS) CD Helmoppenet: Tasking 2016) P = 0.5 Helmoppenet: Tasking 2016 P = 0.5Helmoppene	Heam         SD         Tetral Meam         SD           1434         0.24         12         1.00         1.6           1434         0.24         12         1.00         1.6         500         0.5           10.02         0.36         2         5.20         0.8         5.70         0.4         0.6         0.2           11.03         0.42         0.2         5.20         0.8         0.6         0.2         1.10         0.4         0.6         0.2         1.10         0.4         0.6         0.2         1.10         0.4         0.6         0.2         1.10         0.4         0.6         0.2         1.10         0.4         0.2         0.6         0.2         0.10         <	Total         Weight           12         12.5%           16         13.1%           22         13.1%           21         12.7%           9         12.7%           70         64.2%           9         12.9%           10         12.7%           7         10.2%           26         35.8%	M. Random. 95% C1 1.86 (1.20, 2.52) 4.89 (4.66, 5.12) 4.20 (3.89, 4.66, 5.12) 4.20 (3.89, 4.12, 5.34) 2.50 (10.63, 2.53) 3.68 (2.80, 4.55) 1.90 (1.39, 2.41) 0.46 (-0.16, 1.08) -1.58 (-3.22, 0.08) 0.45 (-1.07, 1.97)	M.Ranten 253.0
State & Solvege         Hen           State & Solvege         Hen           Argo C + Al 2015         3.23 (J           Ango C + Al 2015         3.23 (J           Ango C + Al 2015         3.23 (J           Hallson Process 2017         9.22 (J           Hallson Process 2017         1.93 (J           Hallson Process 2017         1.93 (J           Stated g95 (G)         Heldesgenetic Tark 2018 (JR 2+ 92.77, df = f = f           Tark 2017         1.93 (JR 2+ 92.77, df = f = f           Jack 2016         1.93 (JR 2+ 92.77, df = f = f           Z-2 crosse endowed rifted Z = 1.01 (D = 6 - 40001)         1.95 (JR 2+ 92.77, df = f = f           Jack 2016         1.90 (JR 2+ 10.70, df = 3.18, 3.1, df = JR 7+           Text to read rifted Z = 1.97 (JR 2+ 3.18, 3.1, df = JR 7+         Text to read rifted Z = 1.97 (JR 2+ 3.18, 3.1, df = JR 7+           Text to read rifted Z = 1.97 (JR 2+ 3.18, 3.1, df = JR 7+         Text to read rifted Z = 1.97 (JR 2+ 3.18, 3.1, df = JR 7+           Text to read rifted Z = 2.92 (JR 2+ 3.18, 3.1, df = JR 7+         Text to read rifted Z = 2.92 (JR 2+ 3.18, 3.1, df = JR 7+           Stated g950 (JR 14, 3.18, 3.1, df = 2.17, CR 2+ 3.18, 3.1, df = JR 7+         Text to read rifted Z = 2.17, CR 2+ 3.18, 3.1, df = JR 7+           Stated g50 (JR 2+ 3.18, 3.1, df = 2.17, CR 2+ 3.18, 3.1, df = JR 7+         Text to read rifted Z = 2.17, CR 2+ 3.18, 3.1, df = JR 7+	SD Tetal Mean SD Tr 74 12 937 072 3 24 477 034 5 24 47 034 5 25 034 14 9 846 037 15 20 933 1 199 0 948 195 41 0.00001; $F = 59\%$ The concort; $F = 50\%$	tal         Weischt         R           12         12.7%         16         13.1%           13         13.1%         13.1%         13.1%           14         12.2%         9         12.2%           9         12.2%         70         64.2%           9         12.2%         70         64.2%           9         12.2%         75.8%         9           12         12.7%         16         12.0%           11         12.2%         3         12.7%           12         12.0%         11         12.2%           9         12.7%         64         12.2%           9         12.7%         9         12.7%           9         12.7%         9         12.7%           9         12.7%         9         12.7%           9         12.7%         9         12.7%           9         12.5%         9         12.7%	M. Random, 959: Cl. 3.39 (27, 3.34) 5.09 (43, 5.27) 4.27 (28, 16, 153) 4.27 (28, 163) 4.27 (28, 1	M. Bandom 595:0	2.8.1 Granes (MR39) human field large Apple (H. 2012) 41 (Bucks 2017) Taskinky Romanaka 2015 Taskinky Romanaka 2015 Taskinky Romanaka 2015 Taskinky Romanaka 2015 Taskinky Romanaka 2015 Helmoppenet: Tasking 2015 (Initiative Bucks 2015) 2.8.2 mease entryweic Biotelasts Junch Initiative 2015 (Initiative Statistic 2015) Salattal (BS) CD Helmoppenet: Tasking 2016) P = 0.5 Helmoppenet: Tasking 2016 P = 0.5Helmoppene	Heam         SD         Tetral Meam         SD           1434         0.24         12         1.00         1.6           1434         0.24         12         1.00         1.6         500         0.5           10.02         0.36         2         5.20         0.8         5.70         0.4         0.6         0.2           11.03         0.42         0.2         5.20         0.8         0.6         0.2         1.10         0.4         0.6         0.2         1.10         0.4         0.6         0.2         1.10         0.4         0.6         0.2         1.10         0.4         0.6         0.2         1.10         0.4         0.2         0.6         0.2         0.10         <	Total         Weight           12         12.5%           16         13.1%           22         13.1%           21         12.7%           9         12.7%           70         64.2%           9         12.9%           10         12.7%           7         10.2%           26         35.8%	M. Random. 95% C1 1.86 (1.20, 2.52) 4.89 (4.66, 5.12) 4.20 (3.89, 4.66, 5.12) 4.20 (3.89, 4.12, 5.34) 2.50 (10.63, 2.53) 3.68 (2.80, 4.55) 1.90 (1.39, 2.41) 0.46 (-0.16, 1.08) -1.58 (-3.22, 0.08) 0.45 (-1.07, 1.97)	M.Ranten 253.0
Staty & Scherze         Hom           Staty & Scherze         Hom           Actimus (1869 Manume foldar glifenballes)         13.0 (2010)           Malacia 2015         13.2 (2010)           Malacia 2015         13.2 (2010)           Malacia 2015         13.2 (2010)           Malacia 2015         13.2 (2010)           Status 4000 (2010)         13.0 (2010)           Tatus 1000 (2010)         13.0 (2010)           Status 4000 (2010)         13	SD         Tetal         Mean         SD         Tetal           7/4         12         997         072         034           5/2         4         77         034         035         037           3/2         21         5/5         037         034         035         037           3/2         21         5/5         037         034         055         037         036	tal         Weight R.         R           12         12.7%         6         7           22         13.1%         12.2%         6         7           23         13.1%         9         12.2%         7         6.42%           9         12.9%         7         10.4%         7         7         6.42%           9         12.9%         7         10.4%         7         10.4%         12         12.7%         12.1%	M. Random, 959: C1 3.58 (27), 3.84 (56) (4.8), 5.27) 4.19 (28), 4.10 4.19 (28), 4.10 4.19 (28), 4.10 4.19 (28), 4.10 3.08 (12,5, 4.10) 3.08 (12,5, 4.10) 4.10 (21, 28) 4.10 (21,	M. Bandom 595:0	2.8.1 Granes (MR39) human field large Apple (H. 2012) 41 (Bucks 2017) Taskinky Romanaka 2015 Taskinky Romanaka 2015 Taskinky Romanaka 2015 Taskinky Romanaka 2015 Taskinky Romanaka 2015 Helmoppenet: Tasking 2015 (Initiative Bucks 2015) 2.8.2 mease entryweic Biotelasts Junch Initiative 2015 (Initiative Statistic 2015) Salattal (BS) CD Helmoppenet: Tasking 2016) P = 0.5 Helmoppenet: Tasking 2016 P = 0.5Helmoppene	Heam         SD         Tetral Meam         SD           1434         0.24         12         1.00         1.6           1434         0.24         12         1.00         1.6         500         0.5           10.02         0.36         2         5.20         0.8         5.70         0.4         0.6         0.2           11.03         0.42         0.2         5.20         0.8         0.6         0.2         1.10         0.4         0.6         0.2         1.10         0.4         0.6         0.2         1.10         0.4         0.6         0.2         1.10         0.4         0.6         0.2         1.10         0.4         0.2         0.6         0.2         0.10         <	Total         Weight           12         12.5%           16         13.1%           22         13.1%           21         12.7%           9         12.7%           70         64.2%           9         12.9%           10         12.7%           7         10.2%           26         35.8%	M. Random. 95% C1 1.86 (1.20, 2.52) 4.89 (4.66, 5.12) 4.20 (3.89, 4.66, 5.12) 4.20 (3.89, 4.12, 5.34) 2.50 (10.63, 2.53) 3.68 (2.80, 4.55) 1.90 (1.39, 2.41) 0.46 (-0.16, 1.08) -1.58 (-3.22, 0.08) 0.45 (-1.07, 1.97)	M.Ranten 253.0
Study & Statymum         Hem           Schreder (860) Nummer Hale and Brochstein Angeloc 14.0 (2015)         12.3 (2)           Angeloc 2017         12.3 (2)           Angeloc 14.0 (2)         12.3 (2)           Tabasia Nermon 2015 (1016) (1016) (1016)         12.3 (2)           Tabasia Nermon 2015 (1016) (1016) (1016)         13.0 (2)           Tabasia Nermon 2015 (1016) (1016) (1016) (1016)         13.0 (2)           Tabasia Nermon 2015 (1016) (1016) (1016) (1016)         13.0 (2)           Tabasia Nermon 2015 (1016)	$\begin{array}{cccccccccccccccccccccccccccccccccccc$	tal         Weight R.         R           12         12.7%         5         5           22         13.1%         5         22         13.1%           22         13.1%         9         12.2%         6           9         12.9%         7         10.4%         7           9         12.2%         7         10.4%         7           9         12.2%         9         12.2%         10.4%           9         10.0%         9         10.0%         9           11         12.2%         9         12.2%         10.4%           9         10.0%         9         10.0%         9           11         12.1%         12.1%         12.1%         12.1%           9         12.9%         9         12.7%         4.4%           9         12.7%         0         6.4%         9         12.7%           9         12.2%         9         12.7%         0         6.4%           9         12.2%         10.1%         10.1%         10.1%         10.1%	M. Random, 195: C1 3.39 [27, 3.94 6.56 [4.6], 27, 3.94 6.56 [4.6], 27, 3.94 6.56 [4.6], 27, 3.94 6.56 [4.6], 27, 3.94 7.71 [1.59 [4.41], 4.94 7.71 [1.59 [1.41], 2.95 7.71 [1.59 [1.41], 2.95 7.71 [1.50 [1.41], 2.95 7.71 [1.50 [1.51], 2.95 7.71 [1.50 [1.51], 2.95 7.91 [1.51, 3.75] 2.95 [1.55, 3.75] 3.95	M. Bandom 595:0	2.8.1 Granes (MR39) human field large Apple (H. 2012) 41 (Bucks 2017) Taskinky Romanaka 2015 Taskinky Romanaka 2015 Taskinky Romanaka 2015 Taskinky Romanaka 2015 Taskinky Romanaka 2015 Helmoppenet: Tasking 2015 (Initiative Bucks 2015) 2.8.2 mease entryweic Biotelasts Junch Initiative 2015 (Initiative Statistic 2015) Salattal (BS) CD Helmoppenet: Tasking 2016) P = 0.5 Helmoppenet: Tasking 2016 P = 0.5Helmoppene	Heam         SD         Tetral Meam         SD           1434         0.24         12         1.00         1.6           1434         0.24         12         1.00         1.6         500         0.5           10.02         0.36         2         5.20         0.8         5.70         0.4         0.6         0.2           11.03         0.42         0.2         5.20         0.8         0.6         0.2         1.10         0.4         0.6         0.2         1.10         0.4         0.6         0.2         1.10         0.4         0.6         0.2         1.10         0.4         0.6         0.2         1.10         0.4         0.2         0.6         0.2         0.10         <	Total         Weight           12         12.5%           16         13.1%           22         13.1%           21         12.7%           9         12.7%           70         64.2%           9         12.9%           10         12.7%           7         10.2%           26         35.8%	<u>N. Random. 95% C1</u> 1.86 (1.20, 2.52) 4.89 (4.66, 5.12) 4.20 (3.89, 4.66, 5.12) 4.20 (3.89, 4.12, 5.34) 2.50 (1.68, 3.25) 1.90 (1.39, 2.41) 0.46 (-0.16, 1.08) -1.58 (-3.22, 0.08) 0.45 (-1.07, 1.97)	M.Ranten 253.0
State & Schwarze         Hen           State & Schwarze         Hen           Argen & Hall 2015         3.3.2           Angel & Hall 2015         3.3.2           Hallan Fancasa 2017         8.2.2           Hallan Fancasa 2017         8.2.2           Hallan Fancasa 2017         1.8.2           Hallan Fancasa 2017         1.8.2           Statest 695 vol.         1.8.2           Hallan Fancasa 2017         1.8.2           Statest 695 vol.         1.8.2           Hallan Fancasa 2017         1.0.2           Statest 695 vol.         1.8.2           Hallan Fancasa 2017         1.8.3           Statest 695 vol.         1.8.2           Hallan Fancasa 2017         1.8.3           Statest 695 vol.         1.8.3           Hallan Fancasa 2017         1.8.3           Statest 695 vol.         1.8.2           Hallan Fancasa 2017         1.8.2           Statest 695 vol.         1.8.2           Hallan Fancasa 2017         1.8.2           Statest 695 vol.         1.8.2           Hallan Fancasa 2017         1.8.2           Statest 695 vol.         1.8.2           Hallan Fancasa 2017         1.9.2           Statest 69	$\begin{array}{cccccccccccccccccccccccccccccccccccc$	tat         Weisent         R.           12         12.7%,         12.7%,           12         12.7%,         12.2%,           12         13.1%,         12.2%,           19         12.2%,         12.2%,           10         12.2%,         10.4%,           10         12.2%,         10.4%,           10         12.2%,         10.4%,           11         12.2%,         10.2%,           12         12.1%,         11.2%,           12         12.1%,         11.2%,           11         12.2%,         11.2%,           12         12.1%,         11.2%,           12         12.1%,         11.2%,           12         12.1%,         11.2%,           12         12.1%,         11.2%,           13         12.2%,         11.2%,           14         12.2%,         11.2%,	M. Bandom, 959: 01 3.36 (27, 3.34) 5.06 (43, 5.27) 4.15 (28, 45, 45) 4.15 (28, 45, 45) 4.16 (28, 45) 4.1	M. Bandom 595:0	2.8.1 Granes (MR39) human field large Apple (H. 2012) 41 (Bucks 2017) Taskinky Romanaka 2015 Taskinky Romanaka 2015 Taskinky Romanaka 2015 Taskinky Romanaka 2015 Taskinky Romanaka 2015 Helmoppenet: Tasking 2015 (Initiative Bucks 2015) 2.8.2 mease entryweic Biotelasts Junch Initiative 2015 (Initiative Statistic 2015) Salattal (BS) CD Helmoppenet: Tasking 2016) P = 0.5 Helmoppenet: Tasking 2016 P = 0.5Helmoppene	Heam         SD         Tetral Meam         SD           1434         0.24         12         1.00         1.6           1434         0.24         12         1.00         1.6         500         0.5           10.02         0.36         2         5.20         0.8         5.70         0.4         0.6         0.2           11.03         0.42         0.2         5.20         0.8         0.6         0.2         1.10         0.4         0.6         0.2         1.10         0.4         0.6         0.2         1.10         0.4         0.6         0.2         1.10         0.4         0.6         0.2         1.10         0.4         0.2         0.6         0.2         0.10         <	Total         Weight           12         12.5%           16         13.1%           22         13.1%           21         12.7%           9         12.7%           70         64.2%           9         12.9%           10         12.7%           7         10.2%           26         35.8%	<u>N. Random. 95% C1</u> 1.86 (1.20, 2.52) 4.89 (4.66, 5.12) 4.20 (3.89, 4.66, 5.12) 4.20 (3.89, 4.12, 5.34) 2.50 (1.68, 3.25) 1.90 (1.39, 2.41) 0.46 (-0.16, 1.08) -1.58 (-3.22, 0.08) 0.45 (-1.07, 1.97)	M.Ranten 253.0
State & Schraue         Hen           State & Schraue         Hen           Actimus (BR9) main feld au (Brababas)         Actimus (BR9) main feld au (Brababas)           Ango A 140 205         33.21 (JL)           Mailue Romany St17         Bot 2           Mailue Romany St17	SD         Tetal         Mean         SD         Tetal           174         12         970         72         34           32         24         477         0.34           32         24         570         0.34           32         21         577         0.34           32         24         577         0.34           32         21         577         0.34           32         24         576         0.37           44         9.64         0.64         0.67           52         0.32         1         1.95           41         9.6         0.47         1.55           50         1.41         9.97         9.97           600017), F = 92.9%         P         0.00017         P           90         9.00027, P = 92.9%         0.97         1.03           13         1.119.8         1.01         1.55           14         4.5         0.91         1.37           13         2         1.67         0.91           13         2         9.85         1.91           13         2         9.87         1.03	tat         Weight T. T.           12         12.7%, 61           12         12.7%, 61           13         12.2%, 61           13         12.2%, 70           14         12.2%, 70           10         12.2%, 72           10         12.2%, 72           10         12.2%, 72           10         12.2%, 72           11         12.2%, 72           12         12.1%, 72           12         12.1%, 72           12         12.1%, 72           12         12.7%, 73           12         12.7%, 73           12         12.7%, 73           12         12.7%, 73           12         12.7%, 73           12         12.7%, 73           12         12.7%, 73           12         12.2%, 73           12         12.2%, 73           12         12.2%, 73           12         12.2%, 73           12         12.2%, 73           12         12.2%, 73           12         12.2%, 73           12         12.2%, 73           12         12.2%, 73           12         12.2% <td>M. Bandom, 959: 01 3.36 (27, 3.34) 5.06 (43, 5.27) 4.15 (28, 45, 45) 4.15 (28, 45, 45) 4.16 (28, 45) 4.1</td> <td>M. Bandom 595:0</td> <td>2.8.1 Granes (MR39) human field large Apple (H. 2012) 41 (Bucks 2017) Taskinky Romanaka 2015 Taskinky Romanaka 2015 Taskinky Romanaka 2015 Taskinky Romanaka 2015 Taskinky Romanaka 2015 Helmoppenet: Tasking 2015 (Initiative Bucks 2015) 2.8.2 mease entryweic Biotelasts Junch Initiative 2015 (Initiative Statistic 2015) Salattal (BS) CD Helmoppenet: Tasking 2016) P = 0.5 Helmoppenet: Tasking 2016 P = 0.5Helmoppene</td> <td>Heam         SD         Tetral Meam         SD           1434         0.24         12         1.00         1.6           1434         0.24         12         1.00         1.6         500         0.5           10.02         0.36         2         5.20         0.8         5.70         0.4         0.6         0.2           11.03         0.42         0.2         5.20         0.8         0.6         0.2         1.10         0.4         0.6         0.2         1.10         0.4         0.6         0.2         1.10         0.4         0.6         0.2         1.10         0.4         0.6         0.2         1.10         0.4         0.2         0.6         0.2         0.10         &lt;</td> <td>Total         Weight           12         12.5%           16         13.1%           22         13.1%           21         12.7%           9         12.7%           70         64.2%           9         12.9%           10         12.7%           7         10.2%           26         35.8%</td> <td><u>N. Random. 95% C1</u> 1.86 (1.20, 2.52) 4.89 (4.66, 5.12) 4.20 (3.89, 4.66, 5.12) 4.20 (3.89, 4.12, 5.34) 2.50 (1.68, 3.25) 1.90 (1.39, 2.41) 0.46 (-0.16, 1.08) -1.58 (-3.22, 0.08) 0.45 (-1.07, 1.97)</td> <td>M.Ranten 253.0</td>	M. Bandom, 959: 01 3.36 (27, 3.34) 5.06 (43, 5.27) 4.15 (28, 45, 45) 4.15 (28, 45, 45) 4.16 (28, 45) 4.1	M. Bandom 595:0	2.8.1 Granes (MR39) human field large Apple (H. 2012) 41 (Bucks 2017) Taskinky Romanaka 2015 Taskinky Romanaka 2015 Taskinky Romanaka 2015 Taskinky Romanaka 2015 Taskinky Romanaka 2015 Helmoppenet: Tasking 2015 (Initiative Bucks 2015) 2.8.2 mease entryweic Biotelasts Junch Initiative 2015 (Initiative Statistic 2015) Salattal (BS) CD Helmoppenet: Tasking 2016) P = 0.5 Helmoppenet: Tasking 2016 P = 0.5Helmoppene	Heam         SD         Tetral Meam         SD           1434         0.24         12         1.00         1.6           1434         0.24         12         1.00         1.6         500         0.5           10.02         0.36         2         5.20         0.8         5.70         0.4         0.6         0.2           11.03         0.42         0.2         5.20         0.8         0.6         0.2         1.10         0.4         0.6         0.2         1.10         0.4         0.6         0.2         1.10         0.4         0.6         0.2         1.10         0.4         0.6         0.2         1.10         0.4         0.2         0.6         0.2         0.10         <	Total         Weight           12         12.5%           16         13.1%           22         13.1%           21         12.7%           9         12.7%           70         64.2%           9         12.9%           10         12.7%           7         10.2%           26         35.8%	<u>N. Random. 95% C1</u> 1.86 (1.20, 2.52) 4.89 (4.66, 5.12) 4.20 (3.89, 4.66, 5.12) 4.20 (3.89, 4.12, 5.34) 2.50 (1.68, 3.25) 1.90 (1.39, 2.41) 0.46 (-0.16, 1.08) -1.58 (-3.22, 0.08) 0.45 (-1.07, 1.97)	M.Ranten 253.0
Start & Starture         Hom           Starture (BR9 March 14 and Brachastelland Angolo 14 Al 2015         13.21 G 13.21 G	$\begin{array}{cccccccccccccccccccccccccccccccccccc$	tat         Weight T. T.           12         12.7%, 61           12         12.7%, 61           13         12.2%, 61           13         12.2%, 70           14         12.2%, 70           10         12.2%, 72           10         12.2%, 72           10         12.2%, 72           10         12.2%, 72           11         12.2%, 72           12         12.1%, 72           12         12.1%, 72           12         12.1%, 72           12         12.7%, 73           12         12.7%, 73           12         12.2%, 73           12         12.7%, 73           12         12.7%, 73           12         12.7%, 73           12         12.2%, 73           12         12.2%, 73           12         12.2%, 73           12         12.2%, 73           12         12.2%, 73           12         12.2%, 73           12         12.2%, 73           12         12.2%, 73           12         12.2%, 73           12         12.2%, 73           12         12.2% <td>M. Random, 1953. C1 3.36 [27, 3.94] 5.56 [4, 63, 27] 4.15 [284, 140] 4.15 [284, 140] 4.15 [284, 140] 4.15 [284, 140] 3.36 [125, 140] 4.16 [214, 140] 3.36 [125, 140] 4.10 [214, 140] 4</td> <td>M. Bandom 595:0</td> <td>2.8.1 Granes (MR39) human field large Apple (H. 2012) 41 (Bucks 2017) Taskinky Romanaka 2015 Taskinky Romanaka 2015 Taskinky Romanaka 2015 Taskinky Romanaka 2015 Taskinky Romanaka 2015 Helmoppenet: Tasking 2015 (Initiative Bucks 2015) 2.8.2 mease entryweic Biotelasts Junch Initiative 2015 (Initiative Statistic 2015) Salattal (BS) CD Helmoppenet: Tasking 2016) P = 0.5 Helmoppenet: Tasking 2016 P = 0.5Helmoppene</td> <td>Heam         SD         Tetral Meam         SD           1434         0.24         12         1.00         1.6           1434         0.24         12         1.00         1.6         500         0.5           10.02         0.36         2         5.20         0.8         5.70         0.4         0.6         0.2           11.03         0.42         0.2         5.20         0.8         0.6         0.2         1.10         0.4         0.6         0.2         1.10         0.4         0.6         0.2         1.10         0.4         0.6         0.2         1.10         0.4         0.6         0.2         1.10         0.4         0.2         0.6         0.2         0.10         &lt;</td> <td>Total         Weight           12         12.5%           16         13.1%           22         13.1%           21         12.7%           9         12.7%           70         64.2%           9         12.9%           10         12.7%           7         10.2%           26         35.8%</td> <td><u>N. Random. 95% C1</u> 1.86 (1.20, 2.52) 4.89 (4.66, 5.12) 4.20 (3.89, 4.66, 5.12) 4.20 (3.89, 4.12, 5.34) 2.50 (1.68, 3.25) 1.90 (1.39, 2.41) 0.46 (-0.16, 1.08) -1.58 (-3.22, 0.08) 0.45 (-1.07, 1.97)</td> <td>M.Ranten 253.0</td>	M. Random, 1953. C1 3.36 [27, 3.94] 5.56 [4, 63, 27] 4.15 [284, 140] 4.15 [284, 140] 4.15 [284, 140] 4.15 [284, 140] 3.36 [125, 140] 4.16 [214, 140] 3.36 [125, 140] 4.10 [214, 140] 4	M. Bandom 595:0	2.8.1 Granes (MR39) human field large Apple (H. 2012) 41 (Bucks 2017) Taskinky Romanaka 2015 Taskinky Romanaka 2015 Taskinky Romanaka 2015 Taskinky Romanaka 2015 Taskinky Romanaka 2015 Helmoppenet: Tasking 2015 (Initiative Bucks 2015) 2.8.2 mease entryweic Biotelasts Junch Initiative 2015 (Initiative Statistic 2015) Salattal (BS) CD Helmoppenet: Tasking 2016) P = 0.5 Helmoppenet: Tasking 2016 P = 0.5Helmoppene	Heam         SD         Tetral Meam         SD           1434         0.24         12         1.00         1.6           1434         0.24         12         1.00         1.6         500         0.5           10.02         0.36         2         5.20         0.8         5.70         0.4         0.6         0.2           11.03         0.42         0.2         5.20         0.8         0.6         0.2         1.10         0.4         0.6         0.2         1.10         0.4         0.6         0.2         1.10         0.4         0.6         0.2         1.10         0.4         0.6         0.2         1.10         0.4         0.2         0.6         0.2         0.10         <	Total         Weight           12         12.5%           16         13.1%           22         13.1%           21         12.7%           9         12.7%           70         64.2%           9         12.9%           10         12.7%           7         10.2%           26         35.8%	<u>N. Random. 95% C1</u> 1.86 (1.20, 2.52) 4.89 (4.66, 5.12) 4.20 (3.89, 4.66, 5.12) 4.20 (3.89, 4.12, 5.34) 2.50 (1.68, 3.25) 1.90 (1.39, 2.41) 0.46 (-0.16, 1.08) -1.58 (-3.22, 0.08) 0.45 (-1.07, 1.97)	M.Ranten 253.0

Fig. 5. Forest plot of the differences in the BBB scores of the iPSC and control groups in different iPSC source subgroups at different time-points after transplantation. (A–G) At 1–7 weeks, respectively, after iPSC transplantation. Including publications: Jiri Ruzicka et al. 2017 [26]; Nataliya Romanyuk et al. 2015 [27]; Takashi Amemori et al. 2015 [28]; Angelo H. All et al. 2015 [29]; Jin Young Hong et al. 2014 [30]; Koichi hayashi et al. 2011[31].

shown in Figures 6A–6G, we observed similar changes in the BBB scores between the iPSC and control groups. Specifically, the BBB scores of the neural precursor subgroup were significantly higher in the iPSC groups than those in the control groups (WMD = 3.51; 95% CI: 2.90–4.13; *P* < 0.001; WMD = 3.86; 95% CI: 3.17–4.56; *P* < 0.001; WMD = 3.73; 95% CI: 2.97-4.50; *P* < 0.001; WMD = 3.49; 95% CI: 2.64-4.34; *P* < 0.001; WMD = 3.67; 95% CI: 2.65-4.68; P < 0.001; WMD = 3.66; 95% CI: 2.70–4.62; P < 0.001 and WMD = 4.15; 95% CI: 3.20– 5.10; P < 0.001, respectively). The relevant heterogeneities were high ( $I^2 = 86\%$ , 93%, 96%, 97%, 98%, 97% and 97%, respectively). The BBB scores in the oligodendrocyte progenitor subgroup were lower in the iPSC groups than those in the control groups at 1 week after iPSC transplantation, but were significantly higher at 2–7 weeks. Given that the same comparisons were included in the astrocytes subgroup, we achieved the same results as those obtained in the 1×10<sup>5</sup> subgroup at 1–7 weeks after transplantation. Furthermore, the overall BBB scores

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Qin et al.: Induced Pluripotent Stem Cell Transplantation For Spinal Cord Injury

Study or Subgroup	IPSCs Control Mean SD Total Mean SD Te	Mean Diff tal Weight IV, Rando	ference am, 95% Cl	Mean Difference N. Random, 95% Cl	Study or Subgroup	IPSCs Control Mean SD Total Mean SD To		ilean Difference /, Random, 95% Cl	Mean Difference IV, Random, 95% CI
$\begin{array}{l} \textbf{3.1.1 neural precursors} \\ ain Young Heng 2014 \\ airs Ruscicka 2017 \\ Nataliya Romanyuk 2015 \\ Taksabi Amemord 2015 (intractional) \\ Substati Amemord 2015 (intractional) \\ Substati Amemord 2015 (intractional) \\ Substati Amemord 2015 (intractional) \\ Testfor Oreanity Tauff = 0.39; Chiff = 28.41, \\ Testfor overall effect Z = 11.26 (P < 0.000) \end{array}$	7.35 0.78 12 5.1 1.02 5.73 0.45 24 2.41 0.37 5.8 0.91 21 2.83 1.01 6.08 0.37 9 2.83 0.83 7.78 0.94 9 3.11 0.85 75 # 4 (P < 0.0001); J* 86%	9 12.5% 2.25[ 16 12.9% 3.32] 22 12.7% 3.17[ 11 12.8% 4.15] 9 12.5% 4.67[	(1.45, 3.05) [3.66, 3.56] [2.60, 3.74] [3.71, 4.59] [3.84, 5.50] 2.30, 4.13]	+ + +	3.2.1 hearal precursors jul Young Hong 2014 Jul Rugusha 2017 Natalina Romannyuk 2015 Takashi Armemoti 2015 (Initraspina) Takashi Armemoti 2015 (Initrathecal) Subtotal (95% C) Heterogeneity: Tayi=0.54; Chi <sup>o</sup> = 58.74, e Testfor overall effect Z = 10.94 (P < 0.000		9 12.6% 16 13.4% 22 13.4% 11 12.7% 9 12.4% 67 64.5%	1.68 [0.98, 2.38] 4.40 [4.17, 4.63] 4.09 [3.85, 4.33] 4.98 [4.29, 5.63] 4.03 [3.23, 4.83] 3.86 [3.17, 4.56]	+ 
3.1.2 oligodendrocyte progenitors Angelo H. All 2015 Subtotal (95% C0) Heterogeneity: Not applicable Testfor overall effect Z = 8.18 (P < 0.0000	2.51 0.85 12 4.98 0.81 12	12 12.7% -2.47[-3 12 12.7% -2.47[-3	3.06, -1.88]	•	Heterogeneity: Not applicable Test for overall effect. Z = 9.73 (P < 0.0000	8.21 0.75 12 5.71 0.48 12 1)	12 13.0% 12 13.0%	2.50 [2.00, 3.00] 2.50 [2.00, 3.00]	•
3.1.3 astrocytes Kolchi hayashi 2011 (3d) Kolchi hayashi 2011 (7d) Subtotal (95% Cl) Heterogeneity: Tau <sup>2</sup> = 9.15; Chi <sup>2</sup> = 23.71, Test for overall effect Z = 0.29 (P = 0.78)	5.85 0.77 20 4.34 1.06 2.49 0.99 9 5.35 1.97 29 #=1 (P < 0.00001); P=96%	10 12.6% 1.51   7 11.4% -2.86  -4 17 24.0% -0.62  -4	0.77, 2.25] 8.46, -1.26] 4.90, 3.67]		3.2.3 astrocytes Kolchi hayashi 2011 (7d) Kolchi hayashi 2011 (7d) Subtotal (95% Cl) Heterogeneity: Tau <sup>2</sup> = 0.00; Chi <sup>2</sup> = 0.71, df Test/for overall offect Z = 0.11 (P = 0.91)	7.52 0.47 20 7.44 1.06 5.98 1.02 9 6.66 2 29 = 1 (P = 0.40); P = 0%	10 12.7% 7 9.8% 17 22.5%	0.08 [-0.61, 0.77] -0.68 [-2.30, 0.94] -0.04 [-0.67, 0.60]	
Total (95% Cl) Heterogeneity: Tau <sup>2</sup> = 5.00; Chi <sup>2</sup> = 4.38.54, Test for overall effect. Z = 2.21 (P = 0.03) Test for subarous differences: Chi <sup>2</sup> = 190.	116 df = 7 (P < 0.00001); P = 98% 15. df = 2 (P < 0.00001). P = 98.9%	96 100.0% 1.77 (i	0.20, 3.35] -4 Favou		Total (95% CI) Heterogeneity: Tau*= 1.81; $Chi$ *= 246.63; Test for overall effect Z = 5.55 (P < 0.0000 Test for suboroup differences: $Chi$ *= 70.9	<b>116</b> df = 7 (P < 0.00001); P = 97% 1) 6. df = 2 (P < 0.00001), P = 97.2%	96 100.0%	2.75 [1.78, 3.72]	-4 -2 0 2 4 B Favours (control) Favours (IPSCs) B
Study or Subgroup	IPSCs Control Mean SD Total Mean SD	Mean I Total Weight IV, Ran	Difference idom, 95% Cl	Mean Difference IV. Random, 95% Cl	Study or Subgroup	IPSCs Control Mean SD Total Mean SD 1	fotal Weight	Mean Difference IV. Random, 95% Cl	Mean Difference IV. Random, 95% Cl
1.3.1 neural procursors din Young Hong 2014 din Fucicka 2017 Hatahya Romanyuk 2015 Takashi Amemori 2015 ( infraspinal) Takashi Amemori 2015 ( infraspinal) Sakhotal (ISSN CI) Heterogeneity: Tau <sup>4</sup> = 0.80; Chi <sup>2</sup> = 0.025; Tost for overall effect 2 = 9.80 (P < 0.000)	$\begin{array}{cccccccccccccccccccccccccccccccccccc$	9 12.6% 2.3 16 13.2% 4.5 22 13.2% 3.9 11 12.8% 5.4 9 12.7% 2.2	5 [1 65, 3.05] 0 [4 26, 4.74] 0 [3 72, 4.08] 4 [4 87, 6.01] 6 [1.61, 2.91] 3 [2.97, 4.50]	+	3.4.1 neural precursors jin Young Hong 2014 Jin Ruizkia 2017 Nataliya Romanyuk 2016 Takasahi Amemeri 2015 ( intraspinal) Takasahi Amemeri 2015 ( intrashecai) Subtrata (95% CI) Heterogenetiy: Tauf=0.88; Chir= 114.44 Test for overail effect Z = 8.04 (P < 0.000	75 4, df = 4 (P < 0.00001); P = 97% (01)	9 12.7% 16 13.3% 22 13.3% 11 12.7% 9 12.5% 67 64.6%	2.01 [1.41, 2.61] 4.70 [4.48, 4.92] 3.86 [3.85, 4.07] 4.53 [3.81, 5.15] 2.17 [1.49, 2.85] 3.49 [2.64, 4.34]	
3.3.2 oligodendrocyte progenitors Angelo H, All 2015 Subtotal (95% CI) Heterogeneily: Not applicable Test for overall effect Z = 2.95 (P = 0.003	8.34 1.18 12 7.3 0.31 12	12 12.8% 1.0 12 12.6% 1.04	4 [0.35, 1.73] 4 [0.35, 1.73]	<b>*</b>	3.4.2 oligodendrocyte progenitors Angelo H. All 2015 Subtotal (95% CI) Heterogeneity: Not applicable Testfor overall effect. Z = 25.82 (P × 0.00	11.39 0.28 12 8.71 0.23 12 1001)	12 13.3% 12 13.3%	2.68 [2.47, 2.89] 2.68 [2.47, 2.89]	Ŧ
3.3.3 astrocytes Koichi hayashi 2011 (36) Koichi hayashi 2011 (76) Subtotal (95% CD) Heterogeneiby: Tau"= 0.38; Chi"= 2.01; d Test for overall effect Z = 0.52 (P = 0.50)	8.28 0.55 20 8.19 0.91 7.65 1.01 9 8.79 1.95 29 f= 1 (P = 0.16); P = 50%	7 10.2% -1.14	9 [-0.52, 0.70] 8 [-2.73, 0.45] 9 [-1.42, 0.82]		3.4.3 astrocytes Koichi hayashi 2011 (3d) Koichi hayashi 2011 (7d) Subtotal (95% CI) Heterogeneily: Tau <sup>a</sup> = 0.55; Chi <sup>a</sup> = 2.34, c Testfor overall effect Z = 0.56 (P = 0.51)	f = 1 (P = 0.13); P = 57%	10 12.5% 7 9.5% 17 22.1%	0.04 [-0.60, 0.68] -1.34 [-2.99, 0.31] -0.43 [-1.71, 0.85]	
Total (95% CI) Heterogeneity: Tau <sup>a</sup> = 2.20; Chi <sup>a</sup> = 341.04 Test for overall effect: Z = 4.46 (P < 0.000 Test for subaroub differences: Chi <sup>a</sup> = 42)	116 i, df=7 (P < 0.00001); P=98% 01) 84. df=2 (P < 0.00001). P=95.3%	96 100.0% 2.41	1[1.35, 3.47] -4 Fai	vours (control) Favours (PSCs) C	Total (95% Cl) Heterogeneity: Tau <sup>2</sup> = 1.68; Chi <sup>2</sup> = 387.93 Test for overall effect Z = 5.21 ( $P < 0.000$ Test for subarous differences: Chi <sup>2</sup> = 25.	<b>116</b> 3, df = 7 (P < 0.00001); P = 98% (01) 99. df = 2 (P < 0.00001). P = 92.3%	96 100.0%	2.48 [1.55, 3.41]	+4 -2 0 2 4 D Favours [control] Favours [IPSCs] D
Study or Subgroup	IPSCs Contro Mean SD Total Mean SD	I Mea Total Weight IV, R	an Difference tandom, 95% Cl	Mean Difference IV, Random, 95% Cl	Study or Subgroup	IPSCs Contro Mean SD Total Mean Si	ol D Total Weigh	Mean Difference It IV, Random, 95% Cl	Mean Difference IV, Random, 95% Cl
Study or Stabarous 3.5.1 neural precursors Jin Young Hong 2014 Jin Rucicka 2017 Nataliya Romanyuk 2015 Takasah Arnemori 2015 (Intrashecal) Stabtotal (95% C0) Heterogeneity: Tau <sup>+</sup> = 1.27; Chi <sup>+</sup> = 171.8 Testfor overail effect Z = 7.10 (P < 0.00	10.95 0.66 12 9.05 0.47 9.82 0.35 24 4.77 0.34 9.86 0.32 21 5.67 0.37 11.31 0.42 9 6.59 0.94 10.83 0.64 9 8.46 0.87 75		1.90 [1.42, 2.38] 5.05 [4.83, 5.27] 4.19 [3.98, 4.40] 4.72 [4.10, 5.34] 2.37 [1.66, 3.08] 8.67 [2.65, 4.68]		3.6.1 meteri al precisiones din Young Jong 2014 diri Prasi ka 2015 Takashi Amemori 2015 (Intraspinal Sabiota (2% Ct) Heterogeneity: Tair = 1.14; Chil = 14 Test for overall effect 2 = 7.5 (D = 0.	11.23 0.7 12 9.33 0.4	9 9 12.9	6 1.90 [1.39, 2.41] 6 4.89 [4.66, 5.12] 6 4.20 [3.98, 4.42] 6 4.73 [4.12, 5.34]	
3.5.2 oligodendrocyte progenitors Angelo H. All 2015 Subtotal (95% CI) Heterogeneity: Not applicable Testfor overall effect. Z= 11.27 (P < 0.0	13.33 0.74 12 0.07 0.72 12 0001)	12 12.7% 3 12 12.7% 3	3.36 (2.78, 3.94) 1.36 (2.78, 3.94)	Ŧ	3.6.2 oligodendrocyte progenitors Angelo H. All 2015 Subtotal (95% CI) Heterogeneity. Not applicable Test for overall effect: Z = 5.48 (P < 0.	14.94 0.24 12 13.08 1.1 12 00001)	5 12 12.6 12 12.6	6 1.86 [1.20, 2.52] N <b>1.86 [1.20, 2.52]</b>	÷
3.5.3 astrocytes Kolchi hsyashi 2011 (3d) Kolchi hsyashi 2011 (7d) Subtotal (95% CI) Heterogeneity: Tsu*= 0.00; Chi*= 0.92, Test for overall effect: Z= 0.98 (P = 0.33)	9.15 0.51 20 9.33 1 8.47 0.99 9 9.49 1.95 289 df=1 (P=0.34); P=0%	10 12.6% -0 7 10.4% -1 17 23.0% -0.	18 [-0.84, 0.48] .02 [-2.60, 0.56] 30 [-0.91, 0.30]		3.6.3 astrocytes Koichi hayashi 2011 (3d) Koichi hayashi 2011 (7d) Subtotai (95% CI) Heterogeneily: Tau*= 1.68; Chi*= 5.1 Test for overall effect. Z = 0.41 (P = 0.	9.41 0.32 20 8.95 0.9 8.17 1.05 9 9.75 2.0 29 20, df = 1 (P = 0.02); P = 81% 89)	8 10 12.7 1 7 10.2 17 22.9	6 0.46 [-0.16, 1.08] 6 -1.58 [-3.22, 0.06] N -0.41 [-2.39, 1.57]	
Total (95% Cl) Heterogeneih: Tau" = 2.39; Chi" = 388.2 Testfor overall effect $Z = 4.72$ ( $P < 0.00$ Testfor subaroup differences: Chi" = 88			2.65 [1.55, 3.75]	Favours [Control] Favours [PSCs] E	Total (95% CI) Heterogeneily: Tau" = 2.38; Chi" = 35 Test for overall effect. Z = 4.43 (P < 0. Test for subarous differences: Chi" =	116 (6.55, df = 7 (P < 0.00001); P = 98% (00001) : 16.64, df = 2 (P = 0.0002). P = 88.0%	96 100.0	5 2.49 [1.39, 3.59]	Favours (control) Favours (PSCs) F
Study or Subgroup	IPSCs Contr Mean SD Total Mean SI	ol Me: D Total Weight IV,F	an Difference Random, 95% Cl	Mean Difference IV, Random, 95% Cl					
3.7.1 neural precursors Jin Young Hong 2014 Jin Ruucika 2017 Nataliya Romanyuk 2015 Takashi Amemori 2015 (intraspinal) Takashi Amemori 2015 (intraspinal) Subtotal (9%) CI) Heterogenetik Tau <sup>2</sup> = 1.10; Chi <sup>2</sup> = 1.32 Test for overall effect Z = 8.57 (P < 0.0	11.87 0.73 12 9.57 1.0 10.74 0.41 24 5.2 0.2 10.8 0.38 21 6.13 0.3 11.99 0.62 9 6.67 0.9 11.36 0.35 9 8.65 0.8 75 09.6f = 4 (P < 0.0001) (P = 97%)	1 9 12.5% 8 16 13.0% 5 22 13.0%	2.30 [1.52, 3.08] 5.64 [5.33, 5.75] 4.67 [4.45, 4.89] 5.32 [4.85, 5.99] 2.71 [2.10, 3.32] 4.15 [3.20, 5.10]						
3.7.2 oligodendrocyte progenitors Angelo H. All 2015 Subtotal (95% CI) Heterogeneity: Not applicable Testfor overall effect Z = 12.21 (P < 0.	15.57 0.13 12 11.98 1.0 12 00001)	1 12 12.7% 12 12.7% :	3.59 [3.01, 4.17] 3.59 [3.01, 4.17]	÷					
3.7.3 astrocytes Koichi hayashi 2011 (3d) Koichi hayashi 2011 (7d) Subtotal (9% C) Heterogeneity: Tau <sup>a</sup> = 0.00; Chi <sup>a</sup> = 0.96 Testfor overall effect Z = 2.03 (P = 0.0	9.21 0.29 20 9.71 1.0 8.49 1 9 9.85 1.9 29 9, df=1 (P=0.33); P=0% 4)	3 10 12.6% -0 6 7 10.8% -1 17 23.4% -0.	0.50 [-1.15, 0.15] 1.36 [-2.95, 0.23] 62 [-1.23, -0.02]						
Total (95% CI) Heterogeneity: Tau <sup>a</sup> = 3.04; Chi <sup>a</sup> = 450 Test for overall effect: Z = 4.56 (P < 0.0	<b>116</b> .07, df = 7 (P < 0.00001); P = 98% 0001) 21.81. df = 2 (P < 0.00001). P = 98.4	96 100.0% 2		-4 -2 0 2 4 G					

**Fig. 6.** Forest plot of the differences in the BBB scores of the iPSC and control groups in different iPSC differentiation subgroups at different time-points after transplantation. (A–G) At 1–7 weeks, respectively, after iPSC transplantation. Including publications: Jiri Ruzicka et al. 2017 [26]; Nataliya Romanyuk et al. 2015 [27]; Takashi Amemori et al. 2015 [28]; Angelo H. All et al. 2015 [29]; Jin Young Hong et al. 2014 [30]; Koichi hayashi et al. 2011[31].

and total heterogeneities were the same as those in the other subgroups, favoring the iPSC groups, which suggested a protective effect. The heterogeneities between subgroups were also different ( $I^2 = 98.9\%$ , 97.2%, 95.3%, 92.3%, 97.7%, 88.0% and 98.4%, respectively).

#### BBB scores in subgroups of different transplantation methods

*BBB scores at 1 week after transplantation.* We divided the subgroups according to the different transplantation methods (intrathecal or intraspinal injection). As shown in Fig. 7A, there was no significant difference between the iPSC and control groups in terms of BBB scores in the intraspinal injection subgroup. In contrast, the BBB scores in the intrathecal injection subgroup were significantly higher in the iPSC groups than those in the control groups (same data as the other subgroups). Notably, because we analyzed the same included comparisons as those in the subgroups of different SCI models, we obtained the same results



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	IPSCs	Control		Mean Difference	Mean Difference			IPSCs	Control		Mean Difference	Mean Difference	
			Total Weight	Mean Difference IV, Random, 95% Cl	Mean Unterence		Study or Subgroup	Mean SD To		Total Weight	Mean Unterence IV, Random, 95% Cl	Nean Difference IV, Random, 95% C	1
6.1.1 intraspinal injection Angelo H. All 2015	2.51 0.85	12 4.98 0.61	12 12.7%	-2.47 [-3.06, -1.88]	-		6.2.1 intraspinal injection Angelo H. All 2015	8.21 0.75	12 5.71 0.48	12 13.0%	2.50 [2.00, 3.00]	-	•
Jin Young Hong 2014	7.35 0.78	12 5.1 1.02	9 12.5%	2.25 [1.45, 3.05]		÷	Jin Young Hong 2014	8.42 0.79	12 6.74 0.82	9 12.6%	1.68 [0.98, 2.38]		
Jiri Ruzicka 2017 Kolchi hayashi 2011 (3d)		24 2.41 0.37 20 4.34 1.06	16 12.9% 10 12.6%	3.32 [3.06, 3.58] 1.51 [0.77, 2.25]	-	· •	Jiri Ruzicka 2017 Kolchi hayashi 2011 (3d)	8.32 0.37 7.52 0.47	24 3.92 0.35 20 7.44 1.06	16 13.4% 10 12.7%	4.40 (4.17, 4.63) 0.08 (-0.61, 0.77)	-	
Koichi hayashi 2011 (7d)	2.49 0.99	9 5.35 1.97	7 11.4%	-2.86 [-4.46, -1.26]	_ <b>—</b>	_	Koichi hayashi 2011 (7d)	5.98 1.02	9 6.66 2	7 9.8%	-0.68 [-2.30, 0.94]		
Nataliya Romanyuk 2015 Takashi Amemori 2015 (intraspinal)	5.8 0.91 6.98 0.37	21 2.63 1.01 9 2.83 0.63	22 12.7% 11 12.8%	3.17 [2.60, 3.74] 4.15 [3.71, 4.59]		<b>-</b> +	Nataliya Romanyuk 2015 Takashi Amemori 2015 ( intraspinal)	8.36 0.38 8.99 0.7	21 4.27 0.43 9 4.03 0.83	22 13.4%	4.09 [3.85, 4.33] 4.96 [4.29, 5.63]		· -
Subtotal (95% CI)	1	107	87 87.5%	1.36 [-0.35, 3.07]	-	•	Subtotal (95% CI)	1	107	87 87.6%	2.56 [1.49, 3.63]		•
Heterogeneity: Tau <sup>2</sup> = 5.18; Chi <sup>2</sup> = 416.70, Test for overall effect: Z = 1.56 (P = 0.12)	dt = 6 (P < 0.000	JU1); I*= 99%					Heterogeneity: Tau <sup>2</sup> = 1.93; Chi <sup>2</sup> = 246.3 Test for overall effect Z = 4.70 (P < 0.000	4, dt = 6 (P < 0.000 301)	JU1); P= 98%				
6.1.2 intrathecal injection Takashi Amemori 2015 (intrathecal) Subtotal (95% CI)	7.78 0.94	9 3.11 0.85 9	9 12.5% 9 12.5%	4.67 [3.84, 5.50] 4.67 [3.84, 5.50]		÷	6.2.2 intrathecal injection Takashi Amemori 2015 (intrathecal) Subtotal (95% CI)	10.12 0.71	9 6.09 1 9	9 12.4% 9 12.4%	4.03 [3.23, 4.83] 4.03 [3.23, 4.83]		•
Heterogeneity: Not applicable Test for overall effect: Z = 11.05 (P < 0.000)	01)		0 1201	and fear if and		Ŧ	Heterogeneity: Not applicable Test for overall effect: Z = 9.86 (P < 0.000	001)		0 1211	uno forcol unol		
Total (95% CI) Heterogeneity: Tau* = 5.00; Chi* = 438.54,		116 101); I#= 98%	96 100.0%	1.77 [0.20, 3.35]			Total (95% Cl) Heterogeneity: Tau# = 1.81; Ch# = 246.6		116 001); P= 97%	96 100.0%	2.75 [1.78, 3.72]	4 2 2	•
Test for overall effect: Z = 2.21 (P = 0.03) Test for suboroup differences: ChiP = 11.63					-4 -2 U 2 Favours (control) Favours	s [IPSCs] A	Test for overall effect Z = 5.55 (P < 0.000 Test for subarous differences: Chi <sup>2</sup> = 4.6	001)				-4 -2 U 2 Favours (control) Favours	(IPSCs) <b>B</b>
	IPSCs	Control	*	Mean Difference	Mean Differen		<b>2</b>	IPSCs	Control		Mean Difference	Mean Difference	
Study or Subgroup 6.3.1 intraspinal injection	Mean SD T		Total Weight	IV, Random, 95% Cl	IV, Random, 953	(Cl	Study or Subgroup 6.4.1 intraspinal injection				IV, Random, 95% Cl	IV, Random, 95% C	3
Angelo H. All 2015		12 7.3 0.31	12 12.6%		-		Angelo H. All 2015	11.39 0.28	12 8.71 0.23	12 13.3%	2.68 [2.47, 2.89]		-
Jin Young Hong 2014 Jiri Ruzicka 2017	8.97 0.4	12 7.41 0.81 24 4.47 0.37	9 12.6% 16 13.2%	4.50 [4.26, 4.74]			Jin Young Hong 2014 Jiri Ruzicka 2017	9.42 0.37	12 8.19 0.72 24 4.72 0.32	16 13.3%	2.01 [1.41, 2.61] 4.70 [4.48, 4.92]	-	
Kolchi hayashi 2011 (3d)	8.28 0.55	20 8.19 0.91	10 12.7%	0.09 [-0.52, 0.70]			Koichi hayashi 2011 (3d)	8.99 0.43	20 8.95 0.98	10 12.6%	0.04 [-0.60, 0.68]		
Kolchi hayashi 2011 (7d) Nataliya Romanyuk 2015	7.65 1.01 9.03 0.33	9 8.79 1.95 21 5.13 0.27	7 10.2%			+	Koichi hayashi 2011 (7d) Nataliya Romanyuk 2015	7.8 1.01 9.41 0.39	9 9.14 2.04 21 5.55 0.29		-1.34 [-2.99, 0.31] 3.86 [3.65, 4.07]		+
Takashi Amemori 2015 (intraspinal) Subtotal (95% CI)	10.81 0.6	9 5.37 0.7 107	11 12.8% 87 87.3%			<b>▲</b> <sup>→</sup>	Takashi Amemori 2015 (intraspinal) Subtotal (95% CI)	11.01 0.53	9 6.48 0.88 107	11 12.7% 87 87.5%	4.53 [3.91, 5.15] 2.52 [1.52, 3.52]		▲
Heterogeneity: Tau <sup>a</sup> = 2.25; Chi <sup>a</sup> = 320.59, Test for overall effect: Z = 4.16 (P < 0.0001)	df = 6 (P < 0.00		6/ 6/.3%	2.43 [1.29, 3.36]		•	Heterogeneity: Tau <sup>2</sup> = 1.70; Chi <sup>2</sup> = 372.8 Test for overall effect: Z = 4.94 (P < 0.000	8, df = 6 (P < 0.000		6/ 6/.271	2.32 [1.32, 3.32]		•
6.3.2 intrathecal injection							6.4.2 intrathecal injection						
Takashi Amemori 2015 (intrathecal) Subtotal (95% CI) Heterogeneity: Not applicable		9 8.23 0.85 9	9 12.7% 9 12.7%			<b>♦</b>	Takashi Amemori 2015 (intrathecal) Subtotal (95% CI) Heterogeneity: Not applicable		9 8.45 0.88 9	9 12.5% 9 12.5%	2.17 [1.49, 2.85] 2.17 [1.49, 2.85]		•
Test for overall effect: Z = 6.80 (P < 0.0000							Test for overall effect: Z = 6.24 (P < 0.000						
Total (95% CI) Heterogeneity: Tau <sup>a</sup> = 2.20; Chi <sup>a</sup> = 341.04,		116	96 100.0%	2.41 [1.35, 3.47]		•	Total (95% Cl) Heterogeneity: Tau <sup>2</sup> = 1.68; Ch <sup>2</sup> = 387.9		116	96 100.0%	2.48 [1.55, 3.41]		•
Test for overall effect: Z = 4.46 (P < 0.0000 Test for subgroup differences: Chi <sup>2</sup> = 0.07.	1)				-4 -2 0 Favours (control) Favou	2 4 JIS [IPSCS] <b>C</b>	Test for overall effect Z = 5.21 (P < 0.000 Test for suborous differences: Chi <sup>2</sup> = 0.3	301)				-4 -2 0 2 Favours (control) Favours	
Study or Subgroup	IPSCs	Contro Total Mean SE		Mean Difference	Mean Differe		Stude or Subaroun	IPSCs Moon SD 1	Contro Contro		Mean Difference	Mean Difference	
Study or Subgroup 6.5.1 intraspinal injection				Mean Difference at IV, Random, 95% Cl	Mean Differe IV, Random, 93		Study or Subgroup 6.6.1 intraspinal injection				Mean Difference IV, Random, 95% Cl	Mean Difference IV, Random, 95% C	
6.5.1 intraspinal injection Angelo H. All 2015	Mean SD 1	Total Mean SE	Total Weigh	tt IV, Random, 95% Cl 6 3.36 [2.78, 3.94]			6.6.1 intraspinal injection Angelo H. All 2015	Mean SD 1	iotal Mean SE	<u>) Total Weight</u> 5 12 12.6%	N, Random, 95% Cl		
6.5.1 intraspinal injection Angelo H. All 2015	Mean SD 1	fotal Mean SE	Total Weigh	t IV, Random, 95% Cl 6 3.36 [2.78, 3.94] 6 1.90 [1.42, 2.38]			6.6.1 intraspinal injection	Mean SD 1 14.94 0.24 11.23 0.7	iotal Mean SE	<u>Total Weight</u> 12 12.6% 9 9 12.9%	IV, Random, 95% Cl		
6.5.1 intraspinal injection Angelo H. All 2015 Jin Young Hong 2014 Jini Ruzicka 2017 Kolichi hayashi 2011 (3d)	Mean SD 1 13.33 0.74 10.95 0.66 9.82 0.35 9.15 0.51	Iotal Mean         SE           12         9.97         0.72           12         9.05         0.47           24         4.77         0.34           20         9.33         1	Total Weigh 12 12.79 9 12.99 16 13.19 10 12.69	tt W. Random, 95% Cl 6 3.36 [2.78, 3.94] 6 1.90 [1.42, 2.38] 6 5.05 [4.83, 5.27] 6 -0.18 [-0.84, 0.48]			6.6.1 intraspinal injection Angelo H. All 2015 Jin Young Hong 2014 Jiri Ruzicka 2017 Kolchi hayashi 2011 (3d)	Mean SD 1 14.94 0.24 11.23 0.7 9.98 0.4 9.41 0.32	12 13.08 1.15 12 9.33 0.46 24 5.09 0.35 20 8.95 0.96	Total         Weight           5         12         12.6%           9         12.9%         16         13.1%           3         10         12.7%	N, Random, 95% Cl 1.86 (1.20, 2.52) 1.90 (1.39, 2.41) 4.89 (4.66, 5.12) 0.46 (-0.16, 1.08)		
6.5.1 intraspinal injection Angelo H. All 2015 Jin Young Hong 2014 Jin Ruzicka 2017 Kolichi hayashi 2011 (3d) Kolichi hayashi 2011 (7d)	Mean SD 1 13.33 0.74 10.95 0.66 9.82 0.35 9.15 0.51 8.47 0.99	International         Mean         SE           12         9.97         0.72           12         9.05         0.47           24         4.77         0.34           20         9.33         1           9         9.49         1.95	Total Weigh 12 12.79 9 12.99 16 13.19 10 12.69 7 10.49	tt IV. Random, 95% Cl 6 3.36 [2.76, 3.94] 6 1.90 [1.42, 2.38] 6 5.05 [4.83, 5.27] 6 -0.18 [-0.84, 0.48] 6 -1.02 [-2.60, 0.56]			6.6.1 intraspinal injection Angelo H. All 2015 Jin Young Hong 2014 Jiri Ruzicka 2017 Kolchi hayashi 2011 (3d) Kolchi hayashi 2011 (7d)	Mean SD 1 14.94 0.24 11.23 0.7 9.98 0.4 9.41 0.32 8.17 1.05	iotal         Mean         SE           12         13.08         1.15           12         9.33         0.46           24         5.09         0.35           20         8.95         0.96           9         9.75         2.01	Total         Weight           5         12         12.6%           9         9         12.9%           5         16         13.1%           3         10         12.7%           7         10.2%         7	N, Random, 95% Cl 1.86 (1.20, 2.52) 1.90 (1.39, 2.41) 4.89 (4.66, 5.12) 0.46 (-0.16, 1.08) -1.58 (-3.22, 0.06)		
6.5.1 intraspinal injection Angelo H. All 2015 Jin Young Hong 2014 Jin Rucicka 2017 Kolichi hayashi 2011 (3d) Kolichi hayashi 2011 (3d) Nataliya Romanyuk 2015 Takashi Amemon 2015 (intraspinal)	Mean         SD 1           13.33         0.74           10.95         0.66           9.82         0.35           9.15         0.51           8.47         0.99           9.86         0.32	Total         Mean         SC           12         9.97         0.72           12         9.05         0.47           24         4.77         0.34           20         9.33         1           9         9.49         1.96           21         5.67         0.33           9         6.59         0.94	Total Weigh 12 12.79 9 12.99 16 13.19 10 12.69 7 10.49 22 13.19 11 12.79	t N, Random, 95% Cl 6 3.36 [2.70, 3.94] 6 1.90 [1.42, 2.38] 6 5.05 [4.83, 5.27] 6 -0.18 [-0.84, 0.48] 6 -1.02 [-2.60, 0.56] 6 4.19 [3.98, 4.40] 6 4.72 [4.10, 5.34]			6.6.1 intraspinal injection Angelo H, 41 2015 Jin Young Hong 2014 Jini Ruzicka 2017 Kolchi hayashi 2011 (3d) Kolchi hayashi 2011 (7d) Nataliya Romanyuk 2015 Takashi Amemol 2015 (Intraspinal)	Mean SD 1 14.94 0.24 11.23 0.7 9.98 0.4 9.41 0.32 8.17 1.05 10.02 0.36 11.39 0.43	International         Mean         SE           12         13.08         1.16           12         9.33         0.46           24         5.09         0.36           20         8.95         0.96           9         9.75         2.01           21         5.82         0.33           9         6.66         0.92	Total         Weight           5         12         12.6%           9         12.9%         5           5         16         13.1%           3         10         12.7%           1         7         10.2%           7         22         13.1%           2         11         12.7%	N, Random, 95% Cl 1.86 [1.20, 2.52] 1.90 [1.38, 2.41] 4.89 [4.66, 5.12] 0.46 [0.16, 1.08] -1.58 [-3.22, 0.06] 4.20 [3.98, 4.42] 4.73 [4.12, 5.34]		
6.5.1 firstpinal injection Angelo H, All 2015 Jin Young Hong 2014 Jin Ruackia 2017 Kolichi hayashi 2011 (20) Kolichi hayashi 2011 (20) Nataliya Romanyuk 2015 Takash Amerona 2015 (Intraspinal) Subtotal (95° Ct)	Mean         SD 1           13.33         0.74           10.95         0.66           9.82         0.35           9.15         0.51           8.47         0.99           9.86         0.32           11.31         0.42	International         Mean         SE           12         9.97         0.72           12         9.05         0.43           24         4.77         0.34           20         9.33         1           9         9.49         1.95           21         5.67         0.33           9         6.59         0.94           107         107	Total Weigh 12 12.79 9 12.99 16 13.19 10 12.69 7 10.49 22 13.19	t N, Random, 95% Cl 6 3.36 [2.70, 3.94] 6 1.90 [1.42, 2.38] 6 5.05 [4.83, 5.27] 6 -0.18 [-0.84, 0.48] 6 -1.02 [-2.60, 0.56] 6 4.19 [3.98, 4.40] 6 4.72 [4.10, 5.34]			6.6.1 infraspinal injection Angelo H. All 2015 Uni Young Horong 2014 Jin Ruzicka 2017 Kolich Inayashi 2011 (3d) Kolich Inayashi 2011 (7d) Nataliya Romanyuk 2015 Taikashi Amemori 2015 (intraspinal) Subtotal (3%) CI)	Mean SD 1 14.94 0.24 11.23 0.7 9.98 0.4 9.41 0.32 8.17 1.05 10.02 0.36 11.39 0.43	Image         Sec           12         13.08         1.15           12         9.33         0.46           24         5.09         0.35           20         8.95         0.96           9         9.75         2.01           21         5.82         0.37           9         6.66         0.92           107         107	Total         Weight           5         12         12.6%           9         9         12.9%           5         16         13.1%           3         10         12.7%           1         7         10.2%           7         22         13.1%	N, Random, 95% Cl 1.86 [1.20, 2.52] 1.90 [1.39, 2.41] 4.89 [4.66, 5.12] 0.46 [-0.16, 1.08] -1.58 [-3.22, 0.06] 4.20 [3.98, 4.42]		
6.5.1 firstpinLingection Angelo H.A. 2015 dim Young Heng 2014 dim Young Heng 2014 dim Kindis 2017 Kolth Inyeshi 2011 (20) Kolth Inyeshi 2011 (70) Kolth Inyeshi 2011 (70) Sabtatal (95% CI) Heterogenetic T. 24/2 - 240, Chi <sup>2</sup> = 365.78, Test for overall effect Z = 4.47 (9 < 0.0002	Mean         SD           13.33         0.74           10.95         0.66           9.82         0.35           9.15         0.51           8.47         0.99           9.86         0.32           11.31         0.42           0.61 = 6 (P < 0.01)	International         Mean         SE           12         9.97         0.72           12         9.05         0.43           24         4.77         0.34           20         9.33         1           9         9.49         1.95           21         5.67         0.33           9         6.59         0.94           107         107	Total Weigh 12 12.79 9 12.99 16 13.19 10 12.69 7 10.49 22 13.19 11 12.79	t N, Random, 95% Cl 6 3.36 [2.70, 3.94] 6 1.90 [1.42, 2.38] 6 5.05 [4.83, 5.27] 6 -0.18 [-0.84, 0.48] 6 -1.02 [-2.60, 0.56] 6 4.19 [3.98, 4.40] 6 4.72 [4.10, 5.34]			6.6.1         transpinul mjection           Angelo H, All 2015         Jin Toung Hong 2014           Jin Toung Hong 2014         Jin Russka 2017           Kolch Inayash 2011 (7a)         Kolch Mayash 2011 (7b)           Kolch Mayash 2011 (7b)         Kolch Mayash 2011 (7b)           Kolch Mayash 2011 (7b)         Stabladya Romanayk 2015           Takash Amerond 2015 (Intraspinul)         Stablada (8b) (7b)           Heletorgenetic Tut" = 2.46, Chill= 337, Test for overall effect Z = 4.07 (P < 0.00	Mean         SD         T           14.94         0.24         11.23         0.7           9.98         0.4         9.41         0.32           9.41         0.32         8.17         1.05           10.02         0.36         11.39         0.43           28. of = 6 (P < 0.00	Image         Sec           12         13.08         1.15           12         9.33         0.46           24         5.09         0.35           20         8.95         0.96           9         9.75         2.01           21         5.82         0.37           9         6.66         0.92           107         107	Total         Weight           5         12         12.6%           9         12.9%         5           5         16         13.1%           3         10         12.7%           1         7         10.2%           7         22         13.1%           2         11         12.7%	N, Random, 95% Cl 1.86 [1.20, 2.52] 1.90 [1.38, 2.41] 4.89 [4.66, 5.12] 0.46 [0.16, 1.08] -1.58 [-3.22, 0.06] 4.20 [3.98, 4.42] 4.73 [4.12, 5.34]		
6.5.1 tirtraspinal higection Angelot A, All (2015 Jan Young Hong 2014 Jan Young Hong 2014 Jan Yang Hong 2017 Kolch hayashi 2011 (28) Kolch hayashi 2011 (28) Kolch hayashi 2017 (28) Katalaya Remanyak 2015 Takashi Amerinal 2015 (11f1sg)nal) Satiotal (95°C) Heterogenethy Tart 2 40, ChP = 365.78 Testfor versal feed to 2.4 47 (2 + 0.0000 6.5.2 intraflacet injection	Mean         SD           13.33         0.74           10.95         0.66           9.82         0.35           9.15         0.51           8.47         0.99           9.86         0.32           11.31         0.42           0.6f = 6 (P < 0.01	International         Mean         SE           12         9.97         0.72           12         9.05         0.43           24         4.77         0.34           20         9.33         1           9         9.49         1.95           21         5.67         0.33           9         6.59         0.94           107         107	Total Weigh 12 12.79 9 12.99 16 13.19 10 12.69 7 10.49 22 13.19 11 12.79 87 87.59 9 12.59	t         M, Random, 95% CI           6         3.36 [278, 3.94]           6         1.90 [1.42, 2.38]           6         5.05 [4.83], 5.27]           6         -0.18 [-9.84, 0.48]           6         -0.18 [-9.84, 0.48]           6         -1.02 [-2.80, 0.56]           6         4.19 [3.93, 4.40]           6         -4.72 [4.10, 5.34]           7.2 [4.10, 5.34]         2.89 [1.54, 3.87]           6         2.57 [1.86, 3.08]			6.6.1 intraspinal nijection Angelo H, 41 (2015 Jin Young Hong 2014 Jin Thurcka 2017 Kolch hayash 2017 (20) Kolch hayash 2017 (20) Kolch hayash 2017 (20) Natalay Romanyak 2015 Takash Anemodo 15 ( (traspinal) Stateta (45% C) Heletogenetic 21 ≤ 40.7 (p < 6.02 6.6.2 intrasheca Injection Takash Anemodo 15 ( (traspinal)	Mean         SD 1           14.94         0.24           11.23         0.7           9.98         0.4           9.41         0.32           8.17         1.05           10.02         0.36           11.39         0.43           28, of = 6 (P < 0.00	Image         Sec           12         13.08         1.15           12         9.33         0.46           24         5.09         0.35           20         8.95         0.96           9         9.75         2.01           21         5.82         0.37           9         6.66         0.92           107         107	O Total         Weight           5         12         12.6%           9         9         12.9%           5         16         13.1%           3         10         12.7%           1         7         10.2%           2         13.1%         87           87         87.3%         87.3%	N, Random, 95% Cl 1.86 [1.20, 2.52] 1.90 [1.38, 2.41] 4.89 [4.66, 5.12] 0.46 [0.16, 1.08] -1.58 [-3.22, 0.06] 4.20 [3.98, 4.42] 4.73 [4.12, 5.34]		
6.5.1 timzspinJ higection           Angelot A, JI215           Jm Young Hong 2014           Jm Young Hong 2014           Jm Rutcios 2017           Kotch huyssin 2017 (30)           Kotch huyssin 2017 (30)           Kotch huyssin 2017 (40)           Stabeth Aremanyk 2015           Tasksin Anemoto 2015 (intraspinal)           Stabeth Aremanyk 2015           Tasksin Anemoto 2015 (intraspinal)           Stabeth 495 (40)           Basebh Aremoto 2015 (intraspinal)           Stabeth 495 (40)           Basebh Aremoto 2015 (intraspinal)           Stabeth 495 (40)           Basebh Aremoto 2015 (intraspinal)           Basebh Aremoto 2015 (intrasp	Mean         SD         1           13.33         0.74         1         1         1         0.80         0         1	International Mean         SE           12         9.97         0.73           12         9.05         0.43           12         9.05         0.43           20         9.33         1           9         9.49         1.95           21         5.67         0.33           9         6.59         0.94           107         70001); P=98%         1001	Total Weigh 12 12.79 9 12.99 16 13.19 10 12.69 7 10.49 22 13.19 11 12.79 87 87.59	t         M, Random, 95% CI           6         3.36 [278, 3.94]           6         1.90 [1.42, 2.38]           6         5.05 [4.83], 5.27]           6         -0.18 [-9.84, 0.48]           6         -0.18 [-9.84, 0.48]           6         -1.02 [-2.80, 0.56]           6         4.19 [3.93, 4.40]           6         -4.72 [4.10, 5.34]           7.2 [4.10, 5.34]         2.89 [1.54, 3.87]           6         2.57 [1.86, 3.08]			6.6.1 direspinal nejection Argolici H, 10/5 Jin Young Hong 2014 Jin Young Hong 2014 Jin Russia 2017 Norachi Apessia 2011 (26) Natabig Memangha 2015 Tabatah Aremand 2015 (Tabashal) Sakatad Argolic 2015 (Tabashal)	Mean         SD           14.94         0.24           11.23         0.7           9.98         0.4           9.41         0.32           8.17         1.05           10.02         0.36           11.38         0.43           28, 0f = 6 (P < 0.00	iotal         Mean         SC           12         13.08         1.15           12         9.33         0.40           24         5.09         0.32           20         8.95         0.96           9         9.75         2.01           21         5.82         0.33           9         6.66         0.92           107         9         9.86	O Total         Weight           5         12         12.6%           9         9         12.9%           5         16         13.1%           3         10         12.7%           1         7         10.2%           2         13.1%         87           87         87.3%         87.3%	M. Random, 95% C1 1.86 [1 20, 2 52] 1.90 [1 38, 2 41] 4.89 [4.66, 512] 0.46 [0.16, 1.08] 4.20 [3.90, 4 42] 4.73 [4.12, 534] 2.48 [1.29, 3.68]		
6.5.1 tirraspinal injection Angelot H, All 2015 Jan Yuang Hong 2014 Jan Yuang Hong 2014 Jan Racitos 2017 Rocht Injection 2015 Rocht Angelon 2015 January Recensive 2015 Takasha Memorang 2015 Heterogeneth, Traiva 2.4 40; CP = 365.78 Takasha Memorang 2015 (Intrahecal) Heterogeneth, Traiva 2.4 47; P < 0.0001 6.5.2 infrathecal injection Takash Americal 2015 (Intrahecal) Heterogeneth, Traiva 2, 44.0; P < 0.0001 6.5.2 infrathecal injection Takash Americal 2015 (Intrahecal) Heterogeneth, Traip Capitable Testfor overall effect, Z = 6.58 (P < 0.0001	Mean         SD         T           13.33         0.74         10.95         0.66           9.92         0.35         9.15         0.51           9.96         0.32         11.31         0.42           .df = 6 (P < 0.01	fotal         Mean         SE           12         9.97         0.7           12         9.05         0.41           20         9.37         0.34           9         9.44         1.92           9         9.44         1.92           9         9.63         0.84           107         9.65         0.84           9         8.46         0.87           9         8.46         0.87	Total         Weight           12         12.79           9         12.99           16         13.19           10         12.69           7         10.49           22         13.11           11         12.79           87         87.59           9         12.59           9         12.51	it         M. Random, 95% C1           6         3.36 [2.78, 3.94]           6         1.80 [1.42, 2.36]           6         5.05 [4.83, 2.36]           6         5.05 [4.83, 2.36]           6        01 [2.90, 0.56]           6        10 [2.90, 0.56]           6        10 [2.90, 0.56]           6        10 [2.90, 0.56]           6        10 [2.90, 0.56]           6        10 [2.90, 0.56]           6        10 [2.90, 0.56]           6        10 [2.90, 0.56]           6         2.37 [1.05, 3.47]           6         2.37 [1.86, 3.08]           6         2.37 [1.66, 3.08]			6.5 tim scapeut articidos           Any Starpio H, Al 2015           Jin Young Hong 2014           Jin Frances 2017           Jin Carlo H, Barto H, San J,	Mean         SD         T           14.94         0.24         11.23         0.7           9.98         0.4         9.41         0.32         8.8           9.94         0.32         11.39         0.43         11.39         0.43           28, df = 6 (P < 0.00	iotal         Mean         SE           12         13.08         1.11           12         9.33         0.45           24         5.09         0.32           20         8.95         0.86           9         9.75         2.01           12         5.62         0.33           9         9.75         2.01           1007         0001); P= 90%         9           9         8.57         0.84           9         8.57         0.84	1         Otal         Weight           5         12         12.6%           9         12.9%         12.9%           5         16         13.1%           3         10         12.7%           7         10.2%         11           11         12.7%         87.3%           4         9         12.7%           9         12.7%         12.7%	M. Random, 95% C1 1.86 (1 20, 2.52) 1.90 (1 38, 2.41) 4.89 (4.68, 5.12) 0.46 (-0.16, 1.08) -1.58 (-0.22, 0.04) 4.20 (3.96, 4.42) 4.20 (3.96, 4.42) 4.23 (4.12, 5.34) 2.50 (1.86, 3.14) 2.50 (1.86, 3.14)		
6.5.1 timospinal injection Angelo H, All 2015 Jim Young Hong 2014 Jim Rhatcka 2017 (J Michael Hangschild Jim (J Kochh Inyaschild 2017 (J Natalay Romanyuk 2015 Tastoth American 2015 (Intracijonal) Satetal 46/60 (D) Heterogeneth: Trul – 2.40, Chilf – 365.70, Tastoth American 2015 (Intracijonal) Tastoth American 2015 (Intracijonal) Tastoth American 2015 (Intracijonal) Heterogeneth: Nkt applicable Test for versall affect z = 8.87 (P < 0.0000 Test for versall affect z = 8.85 (P < 0.0000	Mean         SD         1           13.33         0.74         10.95         0.66           9.82         0.35         9.15         0.51           9.84.7         0.99         9.06         0.32         11.31         0.42           11.31         0.42         0.33         0.64         0.01           01)         10.83         0.64         01)         01)	Total Mean         SE           12         9.97         0.7.7           12         9.05         0.41           24         4.77         0.32           20         9.33         1.9           9.43         1.92         9.65         0.34           9         8.46         0.87         9           9         8.46         0.87         9           9         8.46         0.87         9           116         116         116         116	Total Weigh 12 12.79 9 12.99 16 13.19 10 12.69 7 10.49 22 13.19 11 12.79 87 87.59 9 12.59	it         M. Random, 95% C1           6         3.36 [2.78, 3.94]           6         1.80 [1.42, 2.36]           6         5.05 [4.83, 2.36]           6         5.05 [4.83, 2.36]           6        01 [2.90, 0.56]           6        10 [2.90, 0.56]           6        10 [2.90, 0.56]           6        10 [2.90, 0.56]           6        10 [2.90, 0.56]           6        10 [2.90, 0.56]           6        10 [2.90, 0.56]           6        10 [2.90, 0.56]           6         2.37 [1.05, 3.47]           6         2.37 [1.86, 3.08]           6         2.37 [1.66, 3.08]	M. Bandem. 9		E.6.1 strengthal injection Argoin V.A. 2015 Jah Young Hong 2014 Jah Young Hong 2014 Jah Young Hong 2017 Hostish Inselsel 2011 (Ci) Natalay Remarkov 2015 Natalash Aremand Cis Chategoliul) Salatad Argoing Cis Chategoliul) Salatad Argoing Cis Chategoliul) Salatad Argoing Cis Chategoliul) Salatad Argoing Cis Chategoliul) Tasala Hermand 2015 (Interbecal) Salatad Argoing Cis Helmogenetic Tura 2 481, Cole 2 307 Test for warvail affect 2 a 7 67 p <sup>2</sup> o 007 Test for warvail effect 2 a 7 67 p <sup>2</sup> o 007 Test for warvail effect 2 a 7 67 p <sup>2</sup> o 007 Test for warvail effect 2 a 7 67 p <sup>2</sup> o 007 Test for warvail effect 2 a 7 67 p <sup>2</sup> o 007 Test for warvail effect 2 a 7 67 p <sup>2</sup> o 007 Test for warvail effect 2 a 7 67 p <sup>2</sup> o 007 Test for warvail effect 2 a 7 67 p <sup>2</sup> o 007 Test for warvail effect 2 a 7 67 p <sup>2</sup> o 007 Test for warvail effect 2 a 7 67 p <sup>2</sup> o 007 Test for warvail effect 2 a 7 67 p <sup>2</sup> o 007 Test for warvail effect 2 a 7 67 p <sup>2</sup> o 007 Test for warvail effect 2 a 7 67 p <sup>2</sup> o 007 Test for warvail effect 2 a 7 67 p <sup>2</sup> o 007 Test for warvail effect 2 a 7 67 p <sup>2</sup> o 007 Test for warvail effect 2 a 7 67 p <sup>2</sup> o 007 Test for warvail effect 2 a 7 67 p <sup>2</sup> o 007 Test for warvail effect 2 a 7 67 p <sup>2</sup> o 007 Test for warvail effect 2 a 7 67 p <sup>2</sup> o 007 Test for warvail effect 2 a 7 67 p <sup>2</sup> o 007 Test for warvail effect 2 a 7 67 p <sup>2</sup> o 007 Test for warvail effect 2 a 7 67 p <sup>2</sup> o 007 Test for warvail effect 2 a 7 67 p <sup>2</sup> o 007 Test for warvail effect 2 a 7 67 p <sup>2</sup> o 007 Test for warvail effect 2 a 7 67 p <sup>2</sup> o 007 Test for warvail effect 2 a 7 67 p <sup>2</sup> o 007 Test for warvail effect 2 a 7 67 p <sup>2</sup> o 007 Test for warvail effect 2 a 7 67 p <sup>2</sup> o 007 Test for warvail effect 2 a 7 67 p <sup>2</sup> o 007 Test for warvail effect 2 a 7 67 p <sup>2</sup> o 007 Test for warvail effect 2 a 7 67 p <sup>2</sup> o 007 Test for warvail effect 2 a 7 67 p <sup>2</sup> o 007 Test for warvail effect 2 a 7 67 p <sup>2</sup> o 007 Test for warvail effect 2 a 7 67 p <sup>2</sup> o 007 Test for warvail effect 2 a 7 67 p <sup>2</sup> o 007 Test for warvail effect 2 a 7 67 p <sup>2</sup> o 007 Te	Mean         SD         T           14.94         0.24         11.23         0.7           12.3         0.7         9.8         0.4           9.80         0.4         9.41         0.32           8.17         1.05         10.02         0.36           11.38         0.43         11.38         0.43           28, df = 6 (P < 0.00	iotal         Mean         SE           12         13.08         1.1f           12         9.33         0.44           24         5.09         0.32           20         8.95         0.92           20         8.95         0.92           9         9.66         0.92           107         9         6.66           9         8.57         0.84           9         8.57         0.84           9         8.57         0.84           9         116         116	O         Total         Weight           5         12         12.6%           9         9         12.9%           5         16         13.1%           3         10         12.7%           1         7         10.2%           2         13.1%           2         13.1%           87         87.3%           4         9         12.7%	M. Random, 95% C1 1.86 (1.20, 2.52) 1.90 (1.39, 2.41) 4.89 (4.66, 5.12) 0.46 (-0.16, 5.12) 0.46 (-0.16, 5.12) 1.58 (-3.22, 0.06) 4.20 (3.98, 4.43) 4.73 (4.12, 4.33) 4.73 (4.12, 4.34) 2.48 (1.29, 3.68) 2.50 (1.88, 3.14)	M. Banders 55). C	· · · · · · · · · · · · · · · · · · ·
6.5.1 titraspinal injection     Angelo H, All 2015     aim Young Hong 2014     aim Young Hong Young Young Hong 2014     aim Young Hong Young Young Hong 2014     aim Young Hong Young Young Young Young Hong Young Young Hong 2014     aim Young	Mean         SD         1           13.33         0.74         1         10.95         0.66           9.82         0.66         9.82         0.35         9.15         0.51           9.15         0.51         8.47         0.99         9.86         0.32         11.31         0.42         0.01           01)         10.83         0.64         01)         01)         01         01)	fotal         Mean         SE           12         9.97         0.72           12         9.05         0.41           24         4.77         0.34           20         9.33         11           9         9.44         1.92           21         5.67         0.33           9         6.59         0.84           107         9         6.59         0.84           9         8.46         0.87           9         8.46         0.87           9         8.46         0.87           9         8.98         9.846	Total         Weight           12         12.79           9         12.99           16         13.19           10         12.69           7         10.49           22         13.11           11         12.79           87         87.59           9         12.59           9         12.51	it         M. Random, 95% C1           6         3.36 [2.78, 3.94]           6         1.80 [1.42, 2.36]           6         5.05 [4.83, 2.36]           6         5.05 [4.83, 2.36]           6        01 [2.90, 0.56]           6        10 [2.90, 0.56]           6        10 [2.90, 0.56]           6        10 [2.90, 0.56]           6        10 [2.90, 0.56]           6        10 [2.90, 0.56]           6        10 [2.90, 0.56]           6        10 [2.90, 0.56]           6         2.37 [1.05, 3.47]           6         2.37 [1.86, 3.08]           6         2.37 [1.66, 3.08]			6.5 tim scapeut articidos           Any Starpio H, Al 2015           Jin Young Hong 2014           Jin Frances 2017           Jin Carlo H, Barto H, San J,	Mean         SD         T           14.94         0.24         1.123         0.7           11.23         0.7         9.41         0.32         8.17         1.05           11.02         0.86         11.138         0.43         3.28, df = 6 (P < 0.00	iotal         Mean         SE           12         13.08         1.16           12         8.33         0.43           24         5.09         0.32           20         8.55         0.84           9         9.75         2.01           9         6.66         0.92           107         0001); P= 90%         9           116         0001); P= 90%         1	1         Otal         Weight           5         12         12.6%           9         12.9%         12.9%           5         16         13.1%           3         10         12.7%           7         10.2%         11           11         12.7%         87.3%           4         9         12.7%           9         12.7%         12.7%	M. Random, 95% C1 1.86 (1 20, 2.52) 1.90 (1 38, 2.41) 4.89 (4.68, 5.12) 0.46 (-0.16, 1.08) -1.58 (-0.22, 0.04) 4.20 (3.96, 4.42) 4.20 (3.96, 4.42) 4.23 (4.12, 5.34) 2.50 (1.86, 3.14) 2.50 (1.86, 3.14)		· · · · ·
6.5.1 timtspinal injection Angelot A, J12015 Jm Young Hong 2014 Jm Young Hong 2014 Jm Raucka 2015 Koch Injessel 2011 (26) Koch Injessel 2015 (16) Natalava Kormanyuk 2015 Tastabi (46) Heterogeneth; Tai / 22 (Jk) CH = 26576 Test for versal affect 2 = 447 (24 - 0.0001 G-26.2 timtraffect anijection Taskabi Amerond 2015 (Intraßneta) Saukhata (45% C) Heterogeneth; Tai / 23 (26) CH = 2832 (27) Heterogeneth; Tai / 23 (26) CH = 2832 (27) Heterogeneth; Tai / 23 (26) CH = 2832 (27) Heterogeneth; Tai / 23 (26) CH = 2832 (27) Test for versal defect 2 = 432 (24) (24) (24) (24) (24) (24) (24) (24	Mean         SD         1           13.33         0.74         1         10.85         0.66           94.20         0.35         9.15         0.61         9.42         0.35           9.15         0.51         8.47         0.99         9.96         0.32         11.31         0.42         0.96         0.32         11.31         0.42         0.01         0.11         10.83         0.64         011         011         0.61         07         0.7         0.01         011         0.61         07         0.67         0.01         011         0.61         107         0.61         107         0.62         107         0.61         107         0.61         107         0.61         107         0.61         107         0.62         107         0.61         107         0.61         107         0.61         107         0.61         107         0.61         107         0.61         107         0.61         107         0.61         107         0.52         107         0.61         107         0.62         107         0.61         107         0.61         107         0.62         107         0.61         107         0.62         107         0.62 <td< td=""><td>Optimized         Mean         SE           12         9.97         0.72           12         9.05         0.47           12         9.05         0.47           20         9.33         1           9         9.44         16.7           9         9.43         16.9           9         9.43         19.8           9         8.46         0.87           9         8.46         0.87           9         8.46         0.87           9         8.46         0.87           9         8.46         0.87           9         8.46         0.87           9         8.46         0.87           9         8.98         9.87           116         0.001); P= 98%         51. P= 0%           Constr         Constr         0.98</td><td>Total         Weight           1         12         12.73           9         12.93         12.93           16         13.11         12.63           7         10.45         22.13.11           22         13.11         12.27           9         12.51         9           9         12.51         9           96         100.05         24</td><td>it         M. Random, 95% C1           6         3.36 [2.78, 3.94]           6         1.80 [1.42, 2.36]           6         5.05 [4.83, 2.36]           6         5.05 [4.83, 2.36]           6        01 [2.90, 0.56]           6        10 [2.90, 0.56]           6        10 [2.90, 0.56]           6        10 [2.90, 0.56]           6        10 [2.90, 0.56]           6        10 [2.90, 0.56]           6        10 [2.90, 0.56]           6        10 [2.90, 0.56]           6         2.37 [1.05, 3.47]           6         2.37 [1.86, 3.08]           6         2.37 [1.66, 3.08]</td><td>M. Bandem .9</td><td>esce 25.a + + + + + + + + + + + + + + + + +</td><td>E.5. Intracipilar direction Argoin V.A. 2015 Jin Young Hong 2014 Jin Young Hong 2014 Jin Young Hong 2014 Jin Practice 2017 Natability Remanyuk 2015 Natabili Remanyuk 2015 Natabili Remanyuk 2015 Natabili Remanyuk 2015 Natabili Remanyuk 2015 Cali Santabili Argoing 2015 Natabili Remanyuk 2015 Natabi</td><td>Mean         SD         T           14.94         0.24         1.123         0.7           11.23         0.7         9.41         0.32         8.17         1.05           11.02         0.86         11.138         0.43         3.28, df = 6 (P &lt; 0.00</td>         0.001)           11.07         0.5         0.55, df = 7 (P &lt; 0.00</td<>	Optimized         Mean         SE           12         9.97         0.72           12         9.05         0.47           12         9.05         0.47           20         9.33         1           9         9.44         16.7           9         9.43         16.9           9         9.43         19.8           9         8.46         0.87           9         8.46         0.87           9         8.46         0.87           9         8.46         0.87           9         8.46         0.87           9         8.46         0.87           9         8.46         0.87           9         8.98         9.87           116         0.001); P= 98%         51. P= 0%           Constr         Constr         0.98	Total         Weight           1         12         12.73           9         12.93         12.93           16         13.11         12.63           7         10.45         22.13.11           22         13.11         12.27           9         12.51         9           9         12.51         9           96         100.05         24	it         M. Random, 95% C1           6         3.36 [2.78, 3.94]           6         1.80 [1.42, 2.36]           6         5.05 [4.83, 2.36]           6         5.05 [4.83, 2.36]           6        01 [2.90, 0.56]           6        10 [2.90, 0.56]           6        10 [2.90, 0.56]           6        10 [2.90, 0.56]           6        10 [2.90, 0.56]           6        10 [2.90, 0.56]           6        10 [2.90, 0.56]           6        10 [2.90, 0.56]           6         2.37 [1.05, 3.47]           6         2.37 [1.86, 3.08]           6         2.37 [1.66, 3.08]	M. Bandem .9	esce 25.a + + + + + + + + + + + + + + + + +	E.5. Intracipilar direction Argoin V.A. 2015 Jin Young Hong 2014 Jin Young Hong 2014 Jin Young Hong 2014 Jin Practice 2017 Natability Remanyuk 2015 Natabili Remanyuk 2015 Natabili Remanyuk 2015 Natabili Remanyuk 2015 Natabili Remanyuk 2015 Cali Santabili Argoing 2015 Natabili Remanyuk 2015 Natabi	Mean         SD         T           14.94         0.24         1.123         0.7           11.23         0.7         9.41         0.32         8.17         1.05           11.02         0.86         11.138         0.43         3.28, df = 6 (P < 0.00	iotal         Mean         SE           12         13.08         1.16           12         8.33         0.43           24         5.09         0.32           20         8.55         0.84           9         9.75         2.01           9         6.66         0.92           107         0001); P= 90%         9           116         0001); P= 90%         1	1         Otal         Weight           5         12         12.6%           9         12.9%         12.9%           5         16         13.1%           3         10         12.7%           7         10.2%         11           11         12.7%         87.3%           4         9         12.7%           9         12.7%         12.7%	M. Random, 95% C1 1.86 (1 20, 2.52) 1.90 (1 38, 2.41) 4.89 (4.68, 5.12) 0.46 (-0.16, 1.08) -1.58 (	M.Banden, 59: C	- - - - - - - - - - - - - - - - - - -
6.5.1 tirtrasplinal injection Angelot A, All 2015 Jin Young Hong 2014 Jin Young Hong 2014 Jin Rhadoka 2015 Jin Rhadoka 2015 Koch Hayasah 2015 (Jin Kabona) Satabat Agencom 2015 (Intrasplinal) Satabat Agencom 2015 (Intrasplinal) Satabat Agencom 2015 (Intrasplinal) Satabat Agencom 2015 (Intrasplinal) Satabat Agencom 2015 (Intrasplinal) Takaba Amemond 2015 (Intrasplinal) Takaba Amemond 2015 (Intrasplinal) Takabat Amemond 2015 (Intrasplinal) Takabat Amemond 2015 (Intrasplinal) Takabat Agencom 2015 (Intrasplinal)	Mean         SD           13.33         0.74           10.95         0.66           94.20         0.35           915         0.61           9.42         0.35           915         0.51           9.47         0.99           9.46         0.32           11.31         0.42           01         10.83           0.64         01)           01	Optical Mean         SEC           12         9.97         0.72           12         9.05         0.41           12         9.05         0.41           20         9.33         1           9         9.43         16           9         9.43         16           9         9.43         16           9         9.43         16           9         8.46         0.87           9         8.46         0.87           9         8.46         0.87           9         8.46         0.87           9         8.46         0.87           9         8.46         0.87           9         8.46         0.87           9         8.46         0.87           9         8.46         0.87           9         8.46         0.87           9         8.99         8.96           9         8.97         9.97           116         0.001); P= 99%         50.97           0.004         0.005         0.005	Total         Weight           1         12         12.73           9         12.93         12.93           10         12.63         7           10         12.63         22         13.14           21         31.11         12.73         87         87.51           9         12.51         9         12.51         9           96         100.07         96         100.07           pl         2.51         94         2.51         100.07	d. M. Rendern, 395; Cl.           6         336 (27, 394)           1         1301 (42, 236)           6         336 (27, 394)           6         1301 (42, 236)           6         505 (183, 527)           6         -0181 (94, c04)           6         -122 (220, 058)           6         -227 (166, 308)           6         2.371 (166, 308)           6         2.371 (166, 308)           6         2.371 (166, 308)           6         2.371 (166, 308)           6         2.371 (166, 308)           6         2.371 (166, 308)           7         2.455 (1.55, 3.75)           Mome Ofference         Mome Ofference           Mem Ofference         Mem Ofference	M. Bandem, 92	esce 25.a + + + + + + + + + + + + + + + + +	E.5. Intracipilar direction Argoin V.A. 2015 Jin Young Hong 2014 Jin Young Hong 2014 Jin Young Hong 2014 Jin Practice 2017 Natability Remanyuk 2015 Natabili Remanyuk 2015 Natabili Remanyuk 2015 Natabili Remanyuk 2015 Natabili Remanyuk 2015 Cali Santabili Argoing 2015 Natabili Remanyuk 2015 Natabi	Mean         SD         T           14.94         0.24         1.123         0.7           11.23         0.7         9.41         0.32         8.17         1.05           11.02         0.86         11.138         0.43         3.28, df = 6 (P < 0.00	iotal         Mean         SE           12         13.08         1.16           12         8.33         0.43           24         5.09         0.32           20         8.55         0.84           9         9.75         2.01           9         6.66         0.92           107         0001); P= 90%         9           116         0001); P= 90%         1	1         Otal         Weight           5         12         12.6%           9         12.9%         12.9%           5         16         13.1%           3         10         12.7%           7         10.2%         11           11         12.7%         87.3%           4         9         12.7%           9         12.7%         12.7%	M. Random, 95% C1 1.86 (1 20, 2.52) 1.90 (1 38, 2.41) 4.89 (4.68, 5.12) 0.46 (-0.16, 1.08) -1.58 (	M.Banden, 59: C	· · · · ·
6.5.1 titraspinal highcrisin Angelo H, All 2015 Jin Young Hong 2014 Jin Ruckicka 2014 Jin Ruckicka 2014 Jin Ruckicka 2015 Jin Ruckicka 2015 Nadalay Romanyak 2015 Takaschi Alemond 2015 (Intragrinal) Sadatal 496% CD Heterogenetic Trail – 2.40, Chi# = 365.78, Takato Henerol 2015 (Intragrinal) Calculation and the Calculation Takato Henerol 2015 (Intragrinal) Takato Henerol 2015 (Intragrinal) Takato Henerol 2015 (Intragrinal) Takato Henerol 2015 (Intragrinal) Takato Henerol 2015 (Intragrinal) Heterogenetic Trail – 2.40, Chi# = 388.23, Takato result effect: 2.47.29 € 0.0000 Takato yanati effect: 2.47.29 € 0.0000 Taktor versil effect: 2.47.	Mean         SD           13.33         0.74           10.95         0.66           9.92         0.35           9.15         0.51           8.47         0.99           9.86         0.32           11.31         0.42           .df = 6 (P < 0.01	Gatal         Mean         SE           12         9.97         0.7.1           12         9.95         0.41           24         4.77         0.32           20         9.33         1           9         8.43         1.92           9         9.43         1.93           9         8.45         0.81           9         8.45         0.81           9         8.45         0.81           9         8.45         0.81           9         8.45         0.81           9         8.45         0.81           9         8.45         0.81           9         8.45         0.81           9         8.45         0.81           9         8.45         0.81           9         8.45         0.82           9         8.45         0.81           9         8.45         0.82           9         8.45         0.82           9         8.45         0.83           116         0.04         0.95           12         1.97         0.12           12         9.57         0.95 </td <td>Total Weight           1         12         12.71           9         12.93         12.93           16         13.13         10         12.63           7         10.44         22.23         13.13           11         12.75         9         12.55           9         12.55         9         12.57           96         100.07         36           0         Total Weight         12         12.71           91         12.51         9         12.51           96         100.07         12.51         10.12           91         12.51         12.51         12.51</td> <td>4         M. Random, 255:Cl.           6         3.36 (77, 3.94)           5         1.50 (74, 2.34)           6         3.81 (77, 3.94)           6         5.65 (6.34, 5.77)           6         2.67 (1.50, 0.58)           6         1.71 (20, 0.58)           6         2.67 (1.56, 3.08)           6         2.37 (1.66, 3.08)           6         2.37 (1.66, 3.08)           6         2.37 (1.66, 3.08)           6         2.37 (1.65, 3.08)           6         2.65 (1.55, 3.75)           Mean Difference         M. Pankon (557 Cl.           7         2.265 (1.25, 1.75)           7         3.200 (1.21, 0.28)</td> <td>M. Bandem, 92</td> <td>esce 25.a + + + + + + + + + + + + + + + + +</td> <td>E.5. Intracipilar direction Argoin V.A. 2015 Jin Young Hong 2014 Jin Young Hong 2014 Jin Young Hong 2014 Jin Practice 2017 Natability Remanyuk 2015 Natabili Remanyuk 2015 Natabili Remanyuk 2015 Natabili Remanyuk 2015 Natabili Remanyuk 2015 Cali Santabili Argoing 2015 Natabili Remanyuk 2015 Natabi</td> <td>Mean         SD         T           14.94         0.24         1.123         0.7           11.23         0.7         9.41         0.32         8.17         1.05           11.02         0.86         11.138         0.43         3.28, df = 6 (P &lt; 0.00</td> 0.001)           11.07         0.5         0.55, df = 7 (P < 0.00	Total Weight           1         12         12.71           9         12.93         12.93           16         13.13         10         12.63           7         10.44         22.23         13.13           11         12.75         9         12.55           9         12.55         9         12.57           96         100.07         36           0         Total Weight         12         12.71           91         12.51         9         12.51           96         100.07         12.51         10.12           91         12.51         12.51         12.51	4         M. Random, 255:Cl.           6         3.36 (77, 3.94)           5         1.50 (74, 2.34)           6         3.81 (77, 3.94)           6         5.65 (6.34, 5.77)           6         2.67 (1.50, 0.58)           6         1.71 (20, 0.58)           6         2.67 (1.56, 3.08)           6         2.37 (1.66, 3.08)           6         2.37 (1.66, 3.08)           6         2.37 (1.66, 3.08)           6         2.37 (1.65, 3.08)           6         2.65 (1.55, 3.75)           Mean Difference         M. Pankon (557 Cl.           7         2.265 (1.25, 1.75)           7         3.200 (1.21, 0.28)	M. Bandem, 92	esce 25.a + + + + + + + + + + + + + + + + +	E.5. Intracipilar direction Argoin V.A. 2015 Jin Young Hong 2014 Jin Young Hong 2014 Jin Young Hong 2014 Jin Practice 2017 Natability Remanyuk 2015 Natabili Remanyuk 2015 Natabili Remanyuk 2015 Natabili Remanyuk 2015 Natabili Remanyuk 2015 Cali Santabili Argoing 2015 Natabili Remanyuk 2015 Natabi	Mean         SD         T           14.94         0.24         1.123         0.7           11.23         0.7         9.41         0.32         8.17         1.05           11.02         0.86         11.138         0.43         3.28, df = 6 (P < 0.00	iotal         Mean         SE           12         13.08         1.16           12         8.33         0.43           24         5.09         0.32           20         8.55         0.84           9         9.75         2.01           9         6.66         0.92           107         0001); P= 90%         9           116         0001); P= 90%         1	1         Otal         Weight           5         12         12.6%           9         12.9%         12.9%           5         16         13.1%           3         10         12.7%           7         10.2%         11           11         12.7%         87.3%           4         9         12.7%           9         12.7%         12.7%	M. Random, 95% C1 1.86 (1 20, 2.52) 1.90 (1 38, 2.41) 4.89 (4.68, 5.12) 0.46 (-0.16, 1.08) -1.58 (	M.Banden, 59: C	· · · · ·
6.5.1 timospinal injection Angelot A, J12015 Jan Young Hong 2014 Jan Young Hong 2014 Jan Kaucha 2017 Kocht harsekal 2011 (Jah Kocht harsekal 2011 (Jah Kabalay Konamark 2016 Heterogeneh, Trail va 2 44; CP 4 0.0001 6.5.2 timtraffection Eastbor users and execution Statistical (Silos Col Heterogeneh, Trail va 2 44; CP 4 0.0001 6.5.2 timtraffection Takash Americal 2015 (Intraffection Statistical (Silos Col Heterogeneh, Trail va 2 36; SOF 4 0.0001 Takash Americal 2015 (Intraffection Takash Americal 2015 (Intraffection Takash Americal 2015 (Intraffection Heterogeneh, Trail va 23; SOF 4 0.0001 Takal (Silos Col Heterogeneh, Trail va 23; SOF 4 0.0001 Takal (Silos Col Heterogeneh, Trail va 23; SOF 4 0.0001 Takat (Silos Col Heterogeneh, Trail va 23; SOF 20001 Takat (Silos Col Heterogeneh, Takat va 2001 Takat va 2	Mean         SD           13.33         0.74           10.95         0.66           9.92         0.35           9.15         0.51           8.47         0.99           9.86         0.32           11.31         0.42           ,df=6 (P < 0.01	Gatal Mean         SE           12         9.97         0.72           12         9.05         0.41           12         9.05         0.42           20         9.33         1           9         9.43         19           9         9.43         19           9         9.43         19           9         9.43         19           9         9.43         19           9         9.43         19           9         9.53         0.9           9         9.53         0.9           9         6.50         0.9           9         6.50         0.9           9         8.46         0.81           9         8.46         0.81           116         0001), P= 99%         5.0           51, P= 0%         Construct         Construct           12         1.95         1.0           12         2.57         1.0           2.4         5.2         2.4	Total Weight           1         12         12.73           9         12.83         12.83           16         13.11         10         12.63           7         10.44         22         13.11           11         12.73         87         87.53           9         12.55         9         12.59           96         100.07         96         100.07           0         Total Weight         12         12.71           9         12.59         96         100.07	d. M. Rendem, 355; C.I.           6         336 (72, 334)           1         150; 142, 236           5         56; 183, 527;           6         150; 142, 236           6         162; 120; 164; 120;           6         120; 142, 230, 536;           6         120; 120; 120;           6         237; 156; 330;           6         237; 156; 308;           6         237; 156; 308;           6         237; 156; 308;           6         237; 156; 308;           6         237; 156; 308;           7         Assen Difference           6         259; 114; 52; 328;           7         559; 123; 238;           7         545; 152; 328;	M. Bandem, 92	esce 25.a + + + + + + + + + + + + + + + + +	E.5. Intracipilar direction Argoin V.A. 2015 Jin Young Hong 2014 Jin Young Hong 2014 Jin Young Hong 2014 Jin Practice 2017 Natability Remanyuk 2015 Natabili Remanyuk 2015 Natabili Remanyuk 2015 Natabili Remanyuk 2015 Natabili Remanyuk 2015 Cali Santabili Argoing 2015 Natabili Remanyuk 2015 Natabi	Mean         SD         T           14.94         0.24         1.123         0.7           11.23         0.7         9.41         0.32         8.17         1.05           11.02         0.86         11.138         0.43         3.28, df = 6 (P < 0.00	iotal         Mean         SE           12         13.08         1.16           12         8.33         0.43           24         5.09         0.32           20         8.55         0.84           9         9.75         2.01           9         6.66         0.92           107         0001); P= 90%         9           116         0001); P= 90%         1	1         Otal         Weight           5         12         12.6%           9         12.9%         12.9%           5         16         13.1%           3         10         12.7%           7         10.2%         11           11         12.7%         87.3%           4         9         12.7%           9         12.7%         12.7%	M. Random, 95% C1 1.86 (1 20, 2.52) 1.90 (1 38, 2.41) 4.89 (4.68, 5.12) 0.46 (-0.16, 1.08) -1.58 (	M.Banden, 59: C	· · · · ·
6.5.1 titraspinal injection Angelot A, Al (2015 Jm Young Hong 2014 Jm Young Hong 2014 Jm Young Hong 2014 (2016) Angelon JM (2017) Notative Romanyuk 2015 Tasath Americal 2015 (Intraspinal) Tasath Stathar (2017) Tasath Stathar (2017) Tasath Stathar (2017) Tasath Stathar (2017) American 2017 (2017) American 2017 (2017)	Mean         SD           13.33         0.74           10.95         0.65           9.82         0.35           9.15         0.51           9.84         0.32           11.31         0.42           cdf = 6 (P < 0.01	Intel Mean         SE           12         997         0.7.           2         905         0.4.           24         4.7.7         0.3.           9         0.4.4.         1.9.           9         0.4.4.         1.9.           9         0.9.3.         1.9.           9         0.9.3.         1.9.           9         5.9.         0.3.           9         6.59.         0.3.           9         8.45.         0.6.           9         8.45.         0.6.           9         8.45.         0.6.           116         0.001); P= 90%.         5.9.           116         Contra         S.           12         1.96.         Contra           12         1.95.7.         1.0.           12         2.97.1.         0.1.           9         9.85.5.         9.9.	Total         Weight           1         12         12.73           9         12.93         16         13.11           10         12.63         7         10.43           22         13.13         11         12.73           87         87.53         9         12.51           96         100.05         9         12.51           91         30         3         10         12           1         12         12.71         19         12.51           91         30         3         10         12           96         100.05         12.52         12.51           91         31         3         10         12.52           91         3         10         12.52         12.51	4         M. Bandom, 255:01           6         3.36 (77, 3.94)           6         3.36 (77, 3.94)           6         1.90 (14, 2.37)           6         3.91 (14, 2.37)           6         0.10 (14, 14, 3.67)           6         2.97 (1.96, 2.06)           6         2.37 (1.96, 2.06)           6         2.37 (1.96, 2.06)           6         2.37 (1.96, 2.06)           6         2.37 (1.96, 2.06)           6         2.37 (1.96, 2.06)           6         2.37 (1.96, 2.06)           6         2.37 (1.96, 2.06)           7         2.08 (1.51, 3.87)           7         2.08 (1.51, 3.87)           7         2.08 (1.51, 3.87)           7         2.08 (1.91, 3.17)           7         2.08 (1.91, 1.91)           7         2.28 (1.91, 1.91)           7         2.28 (1.91, 1.91)           7         2.28 (1.91, 1.91)           7         3.91 (1.91, 1.91)           8         -2.91 (1.91, 1.91)           8         -2.91 (1.91, 1.91)           8         -3.91 (1.91, 1.91)           8         -3.91 (1.91, 1.91)           8         -3.91 (1.91, 1.91)	M. Bandem, 92	esce 25.a + + + + + + + + + + + + + + + + +	E.5. Intracipilar direction Argoin V.A. 2015 Jin Young Hong 2014 Jin Young Hong 2014 Jin Young Hong 2014 Jin Practice 2017 Natability Remanyuk 2015 Natabili Remanyuk 2015 Natabili Remanyuk 2015 Natabili Remanyuk 2015 Natabili Remanyuk 2015 Cali Santabili Argoing 2015 Natabili Remanyuk 2015 Natabi	Mean         SD         T           14.94         0.24         1.123         0.7           11.23         0.7         9.41         0.32         8.17         1.05           11.02         0.86         11.138         0.43         3.28, df = 6 (P < 0.00	iotal         Mean         SE           12         13.08         1.16           12         8.33         0.43           24         5.09         0.32           20         8.55         0.84           9         9.75         2.01           9         6.66         0.92           107         0001); P= 90%         9           116         0001); P= 90%         1	1         Otal         Weight           5         12         12.6%           9         12.9%         12.9%           5         16         13.1%           3         10         12.7%           7         10.2%         11           11         12.7%         87.3%           4         9         12.7%           9         12.7%         12.7%	M. Random, 95% C1 1.86 (1 20, 2.52) 1.90 (1 38, 2.41) 4.89 (4.68, 5.12) 0.46 (-0.16, 1.08) -1.58 (	M.Banden, 59: C	· · · · ·
6.5.1 titraspiral tripection     Anglo H, All 2015     Jin Young Hong 2014     Jin Young Hong 2015     Jin Young Hong 2015     Jin Young Hong 2015     Jin Young Hong 2015     Jin Young Hong 2014     Jin Young Hong 201	Mean         SD           13.33         0.74           10.95         0.66           10.95         0.66           9.15         0.51           9.15         0.51           9.86         0.32           11.33         0.64           01)         10.83           0.64         01)           10.83         0.64           01)         .4f = 1 (P = 0.6           Mean         SD           11.87         0.73           11.87         0.73           11.87         0.73           11.87         0.73           11.87         0.73           10.80         0.84           11.87         0.73	Contail Mean         SE           12         9.97         0.77           2         9.95         0.47           24         4.77         0.32           0         9.44         1.92           0.9         3.3         1           9         9.44         1.92           1.9         9.44         1.92           1.9         9.44         1.92           1.9         9.44         1.92           1.9         9.44         1.92           1.00         1.01         .9           9         8.46         0.87           9         8.46         0.87           9         8.46         0.87           9         8.46         0.87           9         8.46         0.87           9         8.46         0.87           9         8.46         0.87           116         0.01         1.9           12         9.57         0.1           12         9.57         0.2           12         1.93         0.0           12         9.57         0.2           12         1.93         0.35     <	Total         Weight           12         12.75           9         12.97           16         13.11           10         12.81           7         10.43           22         13.11           11         12.73           87         87.51           9         12.59           96         100.07           91         12.52           96         100.07           91         12.27           96         100.07           91         12.27           92         12.51           93         12.51           94         12.51           95         12.51           96         100.07           91         12.12           92         12.51           93         10           94         12.97           95         12.51           97         12.51           98         13.11           91         12.52           91         12.52           92         13.01           93         10           94         12.51	d. M. Rendem, 355:0.1           6         336 (77, 394)           1         150 (74, 234)           6         556 (343, 527)           6         0.716 (304, 004)           6         0.716 (304, 004)           6         0.716 (304, 004)           6         2.827 (146, 334)           6         2.827 (146, 334)           6         2.237 (146, 334)           6         2.237 (146, 336)           6         2.237 (146, 336)           6         2.237 (146, 336)           6         2.237 (146, 336)           6         2.237 (146, 336)           7         2.35 (152, 337)           7         3.55 (152, 137)           7         3.55 (152, 137)           7         3.55 (152, 137)           7         3.55 (152, 137)           7         3.55 (152, 137)           7         3.55 (152, 137)           7         3.55 (152, 137)           7         3.55 (152, 137)           7         3.55 (152, 137)           7         3.55 (152, 137)           7         3.55 (152, 137)           7         3.55 (152, 137)           7         3.55 (152, 137)	M. Bandem, 92	esce 25.a + + + + + + + + + + + + + + + + +	E.5. Intracipilar direction Argoin V.A. 2015 Jin Young Hong 2014 Jin Young Hong 2014 Jin Young Hong 2014 Jin Practice 2017 Natability Remanyuk 2015 Natabili Remanyuk 2015 Natabili Remanyuk 2015 Natabili Remanyuk 2015 Natabili Remanyuk 2015 Cali Santabili Argoing 2015 Natabili Remanyuk 2015 Natabi	Mean         SD         T           14.94         0.24         1.123         0.7           11.23         0.7         9.41         0.32         8.17         1.05           11.02         0.86         11.138         0.43         3.28, df = 6 (P < 0.00	iotal         Mean         SE           12         13.08         1.16           12         8.33         0.43           24         5.09         0.32           20         8.55         0.84           9         9.75         2.01           9         6.66         0.92           107         0001); P= 90%         9           116         0001); P= 90%         1	1         Otal         Weight           5         12         12.6%           9         12.9%         12.9%           5         16         13.1%           3         10         12.7%           7         10.2%         11           11         12.7%         87.3%           4         9         12.7%           9         12.7%         12.7%	M. Random, 95% C1 1.86 (1 20, 2.52) 1.90 (1 38, 2.41) 4.89 (4.68, 5.12) 0.46 (-0.16, 1.08) -1.58 (	M.Banden, 59: C	· · · · ·
6.5.1 tirthaspinal injection Angelot A, J12015 Jan Yuang Hong 2014 Jan Yuang Hong 2014 Jan Yuang Hong 2014 Jan Haucha 2011 (Jah Koch Inyelan J111 (Jah Koch Inyelan J111 (Jah Heterogeneh, Traiv-2 40, Cher 2057b Takabi Anemoni 2015 (Intraspinal) Sadetal (JSh Co 4.5.2 hirtaffactal injection Takash Anemoni 2015 (Intraspinal) Heterogeneh, Traiv-2 43, Cher 2000 6.5.2 hirtaffactal Le 2.6 St (P < 0.0001 Heterogeneh, Traiv-2 38, Cher 2002 Takash Anemoni 2015 (Intraspinal) Heterogeneh, Traiv-2 38, Cher 2002 Takash Kashara Jaho La 2, St (P < 0.0001 Takash Kashara Jaha Jah Heterogeneh, Traiv-2 38, Cher 2002 Takash Kashara Jah Heterogeneh, Traiv-2 38, Cher 2002 Takash Kashara Jaha Jah Kashara Jaha Jaha Jah Kashara Jaha Jah Kashara Jaha Jah Kashara Jah Kashara Jaha Jah Kashara	Mean         SD           13.33         0.74           10.85         0.66           10.95         0.66           9.15         0.51           9.15         0.51           9.86         0.32           11.33         0.42           df = 6 (P < 0.01	Contal Mean         SE           12         997         07.7           2         950         84.7           24         47.7         0.3           14         47.7         0.3           9         9.44         1.9           9         9.43         1.9           15         67.03         9           107         9         8.46         0.67           9         8.46         0.67         9           116         0001), P= 90%.         51.1         50.0           12         1.9.2         0.57         0.2           12         1.9.2         1.9.2         0.0.2           12         1.9.2         1.0.2         0.2.2           12         1.9.2         0.2.2         0.2.2           0         9.8.5         1.0.2         0.2.2           12         1.9.2         0.2.2         0.2.2           12         1.9.2         0.2.2         0.2.2           12         1.9.2         0.2.2         0.2.2           12         1.9.2         0.2.2         0.2.2           12         1.9.2         0.2.2         0.2.2	Total         Weight           12         12.75           9         12.97           16         13.11           10         12.81           7         10.43           22         13.11           11         12.73           87         87.51           9         12.59           96         100.07           91         12.52           96         100.07           91         12.27           96         100.07           91         12.27           92         12.51           93         12.51           94         12.51           95         12.51           96         100.07           91         12.12           92         12.51           93         10           94         12.97           95         12.51           97         12.51           98         13.11           91         12.52           91         12.52           92         13.01           93         10           94         12.51	d. M. Random, 255:01	M. Bandem, 92	esce 25.a + + + + + + + + + + + + + + + + +	E.5. Intracipilar direction Argoin V.A. 2015 Jin Young Hong 2014 Jin Young Hong 2014 Jin Young Hong 2014 Jin Practice 2017 Natability Remanyuk 2015 Natabili Remanyuk 2015 Natabili Remanyuk 2015 Natabili Remanyuk 2015 Natabili Remanyuk 2015 Cali Santabili Argoing 2015 Natabili Remanyuk 2015 Natabi	Mean         SD         T           14.94         0.24         1.123         0.7           11.23         0.7         9.41         0.32         8.17         1.05           11.02         0.86         11.138         0.43         3.28, df = 6 (P < 0.00	iotal         Mean         SE           12         13.08         1.16           12         8.33         0.43           24         5.09         0.32           20         8.55         0.84           9         9.75         2.01           9         6.66         0.92           107         0001); P= 90%         9           116         0001); P= 90%         1	1         Otal         Weight           5         12         12.6%           9         12.9%         12.9%           5         16         13.1%           3         10         12.7%           7         10.2%         11           11         12.7%         87.3%           4         9         12.7%           9         12.7%         12.7%	M. Random, 95% C1 1.86 (1 20, 2.52) 1.90 (1 38, 2.41) 4.89 (4.68, 5.12) 0.46 (-0.16, 1.08) -1.58 (	M.Banden, 59: C	· · · · ·
6.5.1 tirthraspinal higheriton Angelot A, All 2015 Jin Young Hong 2014 Jin Young Hong 2014 Jin Rhackis 2017 Koch hingsal 2011 (28) Koch hingsal 2011 (28) Koch hingsal 2010 (20) Katalaga Anemoral 2015 (Intraponal) Statistical Anemoral 2015 (Intraponal) Statistical 469% CI Heterogenetity: Turk = 2.40, CP = 385.78 Tactor overall effect 2 = 4.47 (P < 0.0001 6.2.2 Lintraffacted Integricial Tacksh Anemoral 2015 (Intraponal) Heterogenetity: Turk = 2.63, CP = 0.0001 Tacksh Anemoral 2015 (Intraponal) Heterogenetity: Turk = 2.53, CP = 0.0001 Tacksh Anemoral 2015 (Intraponal) Heterogenetity: Turk = 2.53, CP = 0.0001 Tacksh Anemoral 2015 (Intraponal) Tacksh Anemoral 2015 (Intraponal) Heterogenetity: Turk = 2.03, CP = 0.0001 Tacksh Anemoral 2011 (28) Coch hingsal 2011 (28) Koch hingsal 2011 (28) Koch hingsal 2014 (28) Koch hings	Mean         SD           13.33         0.74           10.95         0.65           9.92         0.35           9.15         0.51           9.47         0.95           9.86         0.32           11.31         0.42	Contal Mean         SE           12         997         07.7           2         950         84.7           24         47.7         0.3           14         47.7         0.3           9         9.44         1.9           9         9.43         1.9           15         67.03         9           107         9         8.46         0.67           9         8.46         0.67         9           116         0001), P= 90%.         51.1         50.0           12         1.9.2         0.57         0.2           12         1.9.2         1.9.2         0.0.2           12         1.9.2         1.0.2         0.2.2           12         1.9.2         0.2.2         0.2.2           0         9.8.5         1.0.2         0.2.2           12         1.9.2         0.2.2         0.2.2           12         1.9.2         0.2.2         0.2.2           12         1.9.2         0.2.2         0.2.2           12         1.9.2         0.2.2         0.2.2           12         1.9.2         0.2.2         0.2.2	Total         Weish           1         12         12.71           9         12.91         16         13.11           10         12.61         7         10.43           22         13.11         12.73         87         87.51           9         12.55         9         12.51           96         100.05         9         12.51           91         2.25         9         12.51           9         12.51         9         12.51           9         12.51         9         12.51           9         12.51         9         12.51           9         12.51         9         12.51           9         12.51         9         12.51           9         12.52         10.01         12.85           9         12.25         12.51         12.25           9         12.25         13.01         12.85           9         12.25         12.25         12.25           9         12.25         12.25         12.25           9         12.25         12.25         12.25	d. M. Random, 255:01	M. Bandem, 92	esce 25.a + + + + + + + + + + + + + + + + +	E.5. Intracipilar direction Argoin V.A. 2015 Jin Young Hong 2014 Jin Young Hong 2014 Jin Young Hong 2014 Jin Practice 2017 Natability Remanyuk 2015 Natabili Remanyuk 2015 Natabili Remanyuk 2015 Natabili Remanyuk 2015 Natabili Remanyuk 2015 Cali Santabili Argoing 2015 Natabili Remanyuk 2015 Natabi	Mean         SD         T           14.94         0.24         1.123         0.7           11.23         0.7         9.41         0.32         8.17         1.05           11.02         0.86         11.138         0.43         3.28, df = 6 (P < 0.00	iotal         Mean         SE           12         13.08         1.16           12         8.33         0.43           24         5.09         0.32           20         8.55         0.84           9         9.75         2.01           9         6.66         0.92           107         0001); P= 90%         9           116         0001); P= 90%         1	1         Otal         Weight           5         12         12.6%           9         12.9%         12.9%           5         16         13.1%           3         10         12.7%           7         10.2%         11           11         12.7%         87.3%           4         9         12.7%           9         12.7%         12.7%	M. Random, 95% C1 1.86 (1 20, 2.52) 1.90 (1 38, 2.41) 4.89 (4.68, 5.12) 0.46 (-0.16, 1.08) -1.58 (	M.Banden, 59: C	· · · · ·
6.5.1 tirthaspinal injection Angelot A, J12015 Jan Yuang Hong 2014 Jan Yuang Hong 2014 Jan Yuang Hong 2014 Jan Haucha 2011 (Jah Koch Inyelan J111 (Jah Koch Inyelan J111 (Jah Heterogeneh, Traiv-2 40, Cher 2057b Takabi Anemoni 2015 (Intraspinal) Sadetal (JSh Co 4.5.2 hirtaffactal injection Takash Anemoni 2015 (Intraspinal) Heterogeneh, Traiv-2 43, Cher 2000 6.5.2 hirtaffactal Le 2.6 St (P < 0.0001 Heterogeneh, Traiv-2 38, Cher 2002 Takash Anemoni 2015 (Intraspinal) Heterogeneh, Traiv-2 38, Cher 2002 Takash Kashara Jaho La 2, St (P < 0.0001 Takash Kashara Jaha Jah Heterogeneh, Traiv-2 38, Cher 2002 Takash Kashara Jah Heterogeneh, Traiv-2 38, Cher 2002 Takash Kashara Jaha Jah Kashara Jaha Jaha Jah Kashara Jaha Jah Kashara Jaha Jah Kashara Jah Kashara Jaha Jah Kashara	Mean         SD           13.33         0.74           10.95         0.65           9.92         0.35           9.15         0.51           9.47         0.95           9.86         0.32           11.31         0.42	Contal Mean         SE           12         997         07.7           2         950         84.7           24         47.7         0.3           14         47.7         0.3           9         9.44         1.9           9         9.43         1.9           15         67.03         9           107         9         8.46         0.67           9         8.46         0.67         9           116         0001), P= 90%.         51.1         50.0           12         1.9.2         0.57         0.2           12         1.9.2         1.9.2         0.0.2           12         1.9.2         1.0.2         0.2.2           12         1.9.2         0.2.2         0.2.2           0         9.8.5         1.0.2         0.2.2           12         1.9.2         0.2.2         0.2.2           12         1.9.2         0.2.2         0.2.2           12         1.9.2         0.2.2         0.2.2           12         1.9.2         0.2.2         0.2.2           12         1.9.2         0.2.2         0.2.2	Total         Weish           1         12         12.71           9         12.91         16         13.11           10         12.61         7         10.43           22         13.11         12.73         87         87.51           9         12.55         9         12.51           96         100.05         9         12.51           91         2.25         9         12.51           9         12.51         9         12.51           9         12.51         9         12.51           9         12.51         9         12.51           9         12.51         9         12.51           9         12.51         9         12.51           9         12.52         10.01         12.85           9         12.25         12.51         12.25           9         12.25         13.01         12.85           9         12.25         12.25         12.25           9         12.25         12.25         12.25           9         12.25         12.25         12.25	d. M. Random, 255:01	M. Bandem, 92	esce 25.a + + + + + + + + + + + + + + + + +	E.5. Intracipilar direction Argoin V.A. 2015 Jin Young Hong 2014 Jin Young Hong 2014 Jin Young Hong 2014 Jin Practice 2017 Natability Remanyuk 2015 Natabili Remanyuk 2015 Natabili Remanyuk 2015 Natabili Remanyuk 2015 Natabili Remanyuk 2015 Cali Santabili Argoing 2015 Natabili Remanyuk 2015 Natabi	Mean         SD         T           14.94         0.24         1.123         0.7           11.23         0.7         9.41         0.32         8.17         1.05           11.02         0.86         11.138         0.43         3.28, df = 6 (P < 0.00	iotal         Mean         SE           12         13.08         1.16           12         8.33         0.43           24         5.09         0.32           20         8.55         0.84           9         9.75         2.01           9         6.66         0.92           107         0001); P= 90%         9           116         0001); P= 90%         1	1         Otal         Weight           5         12         12.6%           9         12.9%         12.9%           5         16         13.1%           3         10         12.7%           7         10.2%         11           11         12.7%         87.3%           4         9         12.7%           9         12.7%         12.7%	M. Random, 95% C1 1.86 (1 20, 2.52) 1.90 (1 38, 2.41) 4.89 (4.68, 5.12) 0.46 (-0.16, 1.08) -1.58 (	M.Banden, 59: C	· · · · ·
6.5.1 timospinal injection Angelot A, J12015 Jan Yuang Hong 2014 Jan Yuang Hong 2014 Jan Yuang Hong 2014 Jan Haudioa 2011 (Jah) Kotch Injestia J12015 Takash Amerima 2015 (Intrahesal) Sakhetat (J5% Co Heterogeneth; Traiv=2.40, Cher. 365.70; Takash Amerima 2015 (Intrahesal) Sakhetat (J5% Co Heterogeneth; Traiv=2.48, Cher. 385.70; Takash Amerima 2015 (Intrahesal) Sakhetat (J5% Co Heterogeneth; Traiv=2.28, Cher. 385.20; Testfor versal effect. 24.4.70; e 4.0.000 Fala (J5% Co) Heterogeneth; Traiv=2.39; Cher. 385.20; Testfor versal effect. 24.4.70; e 4.0.000 Fala (J5% Co) Heterogeneth; Traiv=2.39; Cher. 385.20; Testfor versal effect. 24.4.70; e 4.0.000 Fala (J5% Co) Heterogeneth; Traiv=2.30; Cher. 385.20; Testfor versal effect. 24.4.72; e 4.0.000 Fala (J5% Co) Heterogeneth; Traiv=2.30; Cher. 385.20; Takash Ameroni 2015 (Intrahesa) Stakhetat (J5% Co) Heterogeneth; Traiv=2.00; Cher. 4.13.55 Takash Ameroni 2015 (Intrahesa) 6.2,2 intrahescal insection 6.2,2 intrahescal insection	Mean         SO         I           133         074         1         0	Contal Mean         SE           12         997         07.7           2         950         84.7           24         47.7         0.3           14         47.7         0.3           9         9.44         1.9           9         9.43         1.9           15         67.03         9           107         9         8.46         0.67           9         8.46         0.67         9           116         0001), P= 90%.         51.1         50.0           12         1.9.2         0.57         0.2           12         1.9.2         1.9.2         0.0.2           12         1.9.2         1.0.2         0.2.2           12         1.9.2         0.2.2         0.2.2           0         9.8.5         1.0.2         0.2.2           12         1.9.2         0.2.2         0.2.2           12         1.9.2         0.2.2         0.2.2           12         1.9.2         0.2.2         0.2.2           12         1.9.2         0.2.2         0.2.2           12         1.9.2         0.2.2         0.2.2	Total Weish           1         12         127           9         1295         1295           10         1287         10           11         127         141           9         1291         11           12         127         1041           9         1255         9           9         1255         9           11         127         12           9         1000         10           11         122         10           12         11         122           11         122         22           11         122         22           11         122         22           11         122         22           12         12         12           11         122         22           11         122         22           11         112         22           12         12         13           12         12         22           13         11         22           14         12         22           15         12         22	H. Rendem, 555:12           6         3367,77,394           6         3167,77,394           6         5167,77,394           6         5167,77,394           6         5167,77,394           6         5167,77,394           6         1917,42,200,058           6         2471,918,207           6         2471,918,407           6         2271,165,308           6         2271,156,308           6         2251,155,3,378           7         2255,153,378           7         239,123,238           7         7           7         329,123,120           7         239,123,120           7         239,123,120           7         239,123,120           7         239,123,120           7         329,123,120           7         329,123,120           7         239,123,120           7         329,123,120           7         347,145,424           7         239,153,140           7         239,153,140           7         239,153,140           7         239,153,140           7         239,1	M. Bandem, 92	esce 25.a + + + + + + + + + + + + + + + + +	E.5. Intracipilar direction Argoin V.A. 2015 Jin Young Hong 2014 Jin Young Hong 2014 Jin Young Hong 2014 Jin Practice 2017 Natability Remanyuk 2015 Natabili Remanyuk 2015 Natabili Remanyuk 2015 Natabili Remanyuk 2015 Natabili Remanyuk 2015 Cali Santabili Argoing 2015 Natabili Remanyuk 2015 Natabi	Mean         SD         T           14.94         0.24         1.123         0.7           11.23         0.7         9.41         0.32         8.17         1.05           11.02         0.86         11.138         0.43         3.28, df = 6 (P < 0.00	iotal         Mean         SE           12         13.08         1.16           12         8.33         0.43           24         5.09         0.32           20         8.55         0.84           9         9.75         2.01           9         6.66         0.92           107         0001); P= 90%         9           116         0001); P= 90%         1	1         Otal         Weight           5         12         12.6%           9         12.9%         12.9%           5         16         13.1%           3         10         12.7%           7         10.2%         11           11         12.7%         87.3%           4         9         12.7%           9         12.7%         12.7%	M. Random, 95% C1 1.86 (1 20, 2.52) 1.90 (1 38, 2.41) 4.89 (4.68, 5.12) 0.46 (-0.16, 1.08) -1.58 (	M.Banten, 59: C	· · · · ·
6.5.1 timtraspinal injection Angelot A, J12015 Jan Yuung Hong 2014 Jan Yuung Hong 2014 Jan Yuung Hong 2014 Koch hayash 2015 (Jan Koch Hayash 2016) Natalaya Kreanzyk 2015 Natalaya Kreanzyk 2015 Heterogenekh: Tai V = 2.40, CPF = 26576 Test for versal effect 2 = 4.47 (P < 0.0001 G.S.2 birthaffect alignection Takash Amerond 2015 (Intraspinal) Heterogenekh: Tai V = 2.40, CPF = 26576 Takash Amerond 2015 (Intraspinal) Heterogenekh: Tai V = 2.40, CPF = 26576 Takash Amerond 2015 (Intraspinal) Heterogenekh: Tai V = 2.40, CPF = 28570 Takash Amerond 2015 (Intraspinal) Heterogenekh: Tai V = 2.40, CPF = 282 Heterogenekh: Tai V = 2.90, CPF = 282 Takash Z = 285, CPF = 282 Staky er Staborous differences: CPF = 0.21 Staky er Staborous 2017 (Jan Kasha) Natasha Amerond 2015 (Intraspinal) Sabital (GPS) CI Heterogenekh (Z = 4.27, CPF = 0.2007) Takash Amerond 2017 (Jan Kasha) Heterogenekh (Z = 4.27, CPF = 0.2007) Natalaya Romanyck 2015 (Jan Kasha) Heterogenekh (Z = 4.27, CPF = 0.2007) Takash Amerond 2015 (Intraspinal) Sabital (GPS) CI Heterogenekh (Z = 4.27, CPF = 0.2007) Takash Amerond 2015 (Intraspinal) Sabital (GPS) CI Heterogenekh (Z = 4.27, CPF = 0.2007) Takash Amerond 2015 (Intraspinal) Sabital (GPS) CI Heterogenekh (Z = 4.27, CPF = 0.210) Takash Amerond 2015 (Intraspinal) Sabital (GPS) CI Heterogenekh (Z = 4.27, CPF = 0.2007) Takash Amerond 2015 (Intraspinal)	Mean         SO           133         074           155         055           922         035           947         036           947         036           948         037           948         037           948         037           948         037           910         1083           911         1083           913         042           914         1083           915         013           916         91           917         91           918         91           919         92           911         91           911         91           911         91           911         91           911         91           911         91           91         91           91         91           91         91           91         91           91         91           91         91           91         91           91         91           91         91     <	Cotal Mean         SE           12         9.97         0.71           24         9.77         0.32           20         9.33         1.9           9         9.44         1.92           19         9.44         1.92           19         9.45         0.81           9         5.85         0.94           90011, P= 90%         9         8.45           116         0.0011, P= 90%         Contr           12         1.96         1.97           2.0         9.71         1.0           12         1.95         0.31           12         1.96         1.03           9         8.57         9         9.85           9         9.85         9         9.85	Total Weight         Weight           1         12         127           1         12         127           1         12         12           9         1261         1           1         12         127           9         1255         9           9         1257         9           9         1259         1259           9         1200         12           9         1259         1259           9         1259         1259           9         1259         1259           9         1259         1259           9         1259         1259           9         1259         1259           9         1259         1259           9         1271         12           1         12         12           1         12         12           1         12         12           1         12         12           1         12         12           1         12         12           1         12         12           1         12         <	H. Rendem, 555:12           6         3367,77,394           6         3167,77,394           6         5167,77,394           6         5167,77,394           6         5167,77,394           6         5167,77,394           6         1917,42,200,058           6         2471,918,207           6         2471,918,407           6         2271,165,308           6         2271,156,308           6         2251,155,3,378           7         2255,153,378           7         239,123,238           7         7           7         329,123,120           7         239,123,120           7         239,123,120           7         239,123,120           7         239,123,120           7         329,123,120           7         329,123,120           7         239,123,120           7         329,123,120           7         347,145,424           7         239,153,140           7         239,153,140           7         239,153,140           7         239,153,140           7         239,1	M. Bandem, 92	esce 25.a + + + + + + + + + + + + + + + + +	E.5. Intracipilar direction Argoin V.A. 2015 Jin Young Hong 2014 Jin Young Hong 2014 Jin Young Hong 2014 Jin Practice 2017 Natability Remanyuk 2015 Natabili Remanyuk 2015 Natabili Remanyuk 2015 Natabili Remanyuk 2015 Natabili Remanyuk 2015 Cali Santabili Argoing 2015 Natabili Remanyuk 2015 Natabi	Mean         SD         T           14.94         0.24         1.123         0.7           11.23         0.7         9.41         0.32         8.17         1.05           11.02         0.86         11.138         0.43         3.28, df = 6 (P < 0.00	iotal         Mean         SE           12         13.08         1.16           12         8.33         0.43           24         5.09         0.32           20         8.55         0.84           9         9.75         2.01           9         6.66         0.92           107         0001); P= 90%         9           116         0001); P= 90%         1	1         Otal         Weight           5         12         12.6%           9         12.9%         12.9%           5         16         13.1%           3         10         12.7%           7         10.2%         11           11         12.7%         87.3%           4         9         12.7%           9         12.7%         12.7%	M. Random, 95% C1 1.86 (1 20, 2.52) 1.90 (1 38, 2.41) 4.89 (4.68, 5.12) 0.46 (-0.16, 1.08) -1.58 (	M.Banten, 59: C	· · · · ·
6.5.1 tirraspiral injection Angelot A, J12015 Jan Yuang Hong 2014 Jan Yuang Hong 2014 Heterogenethy: Tarking L 44 ( <i>D</i> P - 365/16) Takash American 2015 (Intrahecal) Sakindar (dB): Cu Heterogenethy: Tarking L 44 ( <i>D</i> P - 0.0001 <b>6.5.2 intrafficient J</b> Takash American 2015 (Intrahecal) Sakindar (dB): Cu Heterogenethy: Tarking L 44 ( <i>D</i> P - 0.0001 <b>6.5.2 intrafficient J</b> Takash American 2015 (Intrahecal) Sakindar (dB): Cu Heterogenethy: Tarking L 44 ( <i>D</i> P - 0.0001 Takash Jan Hong Jan	Mean         SO         I           133         074         5         0.6           921         035         0.6         0.6         0.6           921         035         0.6         0.6         0.7         0.6           921         035         0.6         0.7         0.6         0.6         0.7           1033         0.64         0.7         0.6         0.6         0.6         0.7         0.6 <t< td=""><td>Contail Mean         SE           12         9.97         0.77           12         9.97         0.77           12         9.97         0.77           12         9.97         0.77           12         9.97         0.77           13         9.44         1.92           19         9.44         1.92           107         9.59         0.84           9         8.45         0.87           9         8.46         0.87           9         8.46         0.87           9         8.45         0.87           9         1.1         1.95         1.0           12         1.95         1.0         1.2           12         1.95         1.0         2.4         5.2         2.0           12         1.95         1.0         1.4         9         9         6.87         0.9           9         9.67         0.8         9         9         9         9         9           9         9         9         9         0.5         0.9         1.0         1.0         1.0         1.0         1.0         1.0         1.0<td>Total Weish           1         12         127           9         1295         1295           10         1287         10           11         127         141           9         1291         11           12         127         1041           9         1255         9           9         1255         9           11         127         12           9         1000         10           11         122         10           12         11         122           11         122         22           11         122         22           11         122         22           11         122         22           12         12         12           11         122         22           11         122         22           11         112         22           12         12         13           12         12         22           13         11         22           14         12         22           15         12         22</td><td>d. M. Rendem, 255:01         6         3.85 (72, 134)           6         3.85 (72, 134)         5.55 (43, 527)           6         1.80 (14, 238)         5.55 (43, 527)           6         0.119 (14, 128)         5.55 (43, 527)           6         2.87 (158, 527)         5.55 (43, 527)           6         2.27 (156, 238)         5.55 (43, 308)           6         2.27 (156, 3.08)         5.55 (155, 3.75)           7         Mom Difference         6ff M. Almithen, 555 (12, 51, 527)           7         5.20 (15, 12, 51, 128)         5.20 (15, 128, 128)           7         5.20 (15, 128, 128)         5.20 (15, 128, 128)           7         5.20 (15, 128, 128)         5.20 (15, 128, 128)           7         5.20 (15, 128, 128)         5.20 (15, 128, 128)           8         5.20 (15, 128, 128)         5.20 (15, 128, 128)           8         5.20 (15, 128, 128)         5.20 (15, 128, 128)           8         5.20 (15, 128, 128)         5.20 (15, 128, 128)           9         5.20 (15, 128, 128)         5.20 (15, 128, 128)           9         5.20 (15, 128, 128)         5.20 (15, 128, 128)           9         5.20 (15, 128, 128)         5.20 (15, 128, 128)           9         5.20 (15, 128, 128)</td><td>M. Bandem, 92</td><td>esce 25.a + + + + + + + + + + + + + + + + +</td><td>E.5. Intracipilar direction Argoin V.A. 2015 Jin Young Hong 2014 Jin Young Hong 2014 Jin Young Hong 2014 Jin Practice 2017 Natability Remanyuk 2015 Natabili Remanyuk 2015 Natabili Remanyuk 2015 Natabili Remanyuk 2015 Natabili Remanyuk 2015 Cali Santabili Argoing 2015 Natabili Remanyuk 2015 Natabi</td><td>Mean         SD         T           14.94         0.24         1.123         0.7           11.23         0.7         9.41         0.32         8.17         1.05           11.02         0.86         11.138         0.43         3.28, df = 6 (P &lt; 0.00</td>         0.001)           11.07         0.5         0.55, df = 7 (P &lt; 0.00</td>         0.001)         0.001)</t<>	Contail Mean         SE           12         9.97         0.77           12         9.97         0.77           12         9.97         0.77           12         9.97         0.77           12         9.97         0.77           13         9.44         1.92           19         9.44         1.92           107         9.59         0.84           9         8.45         0.87           9         8.46         0.87           9         8.46         0.87           9         8.45         0.87           9         1.1         1.95         1.0           12         1.95         1.0         1.2           12         1.95         1.0         2.4         5.2         2.0           12         1.95         1.0         1.4         9         9         6.87         0.9           9         9.67         0.8         9         9         9         9         9           9         9         9         9         0.5         0.9         1.0         1.0         1.0         1.0         1.0         1.0         1.0 <td>Total Weish           1         12         127           9         1295         1295           10         1287         10           11         127         141           9         1291         11           12         127         1041           9         1255         9           9         1255         9           11         127         12           9         1000         10           11         122         10           12         11         122           11         122         22           11         122         22           11         122         22           11         122         22           12         12         12           11         122         22           11         122         22           11         112         22           12         12         13           12         12         22           13         11         22           14         12         22           15         12         22</td> <td>d. M. Rendem, 255:01         6         3.85 (72, 134)           6         3.85 (72, 134)         5.55 (43, 527)           6         1.80 (14, 238)         5.55 (43, 527)           6         0.119 (14, 128)         5.55 (43, 527)           6         2.87 (158, 527)         5.55 (43, 527)           6         2.27 (156, 238)         5.55 (43, 308)           6         2.27 (156, 3.08)         5.55 (155, 3.75)           7         Mom Difference         6ff M. Almithen, 555 (12, 51, 527)           7         5.20 (15, 12, 51, 128)         5.20 (15, 128, 128)           7         5.20 (15, 128, 128)         5.20 (15, 128, 128)           7         5.20 (15, 128, 128)         5.20 (15, 128, 128)           7         5.20 (15, 128, 128)         5.20 (15, 128, 128)           8         5.20 (15, 128, 128)         5.20 (15, 128, 128)           8         5.20 (15, 128, 128)         5.20 (15, 128, 128)           8         5.20 (15, 128, 128)         5.20 (15, 128, 128)           9         5.20 (15, 128, 128)         5.20 (15, 128, 128)           9         5.20 (15, 128, 128)         5.20 (15, 128, 128)           9         5.20 (15, 128, 128)         5.20 (15, 128, 128)           9         5.20 (15, 128, 128)</td> <td>M. Bandem, 92</td> <td>esce 25.a + + + + + + + + + + + + + + + + +</td> <td>E.5. Intracipilar direction Argoin V.A. 2015 Jin Young Hong 2014 Jin Young Hong 2014 Jin Young Hong 2014 Jin Practice 2017 Natability Remanyuk 2015 Natabili Remanyuk 2015 Natabili Remanyuk 2015 Natabili Remanyuk 2015 Natabili Remanyuk 2015 Cali Santabili Argoing 2015 Natabili Remanyuk 2015 Natabi</td> <td>Mean         SD         T           14.94         0.24         1.123         0.7           11.23         0.7         9.41         0.32         8.17         1.05           11.02         0.86         11.138         0.43         3.28, df = 6 (P &lt; 0.00</td> 0.001)           11.07         0.5         0.55, df = 7 (P < 0.00	Total Weish           1         12         127           9         1295         1295           10         1287         10           11         127         141           9         1291         11           12         127         1041           9         1255         9           9         1255         9           11         127         12           9         1000         10           11         122         10           12         11         122           11         122         22           11         122         22           11         122         22           11         122         22           12         12         12           11         122         22           11         122         22           11         112         22           12         12         13           12         12         22           13         11         22           14         12         22           15         12         22	d. M. Rendem, 255:01         6         3.85 (72, 134)           6         3.85 (72, 134)         5.55 (43, 527)           6         1.80 (14, 238)         5.55 (43, 527)           6         0.119 (14, 128)         5.55 (43, 527)           6         2.87 (158, 527)         5.55 (43, 527)           6         2.27 (156, 238)         5.55 (43, 308)           6         2.27 (156, 3.08)         5.55 (155, 3.75)           7         Mom Difference         6ff M. Almithen, 555 (12, 51, 527)           7         5.20 (15, 12, 51, 128)         5.20 (15, 128, 128)           7         5.20 (15, 128, 128)         5.20 (15, 128, 128)           7         5.20 (15, 128, 128)         5.20 (15, 128, 128)           7         5.20 (15, 128, 128)         5.20 (15, 128, 128)           8         5.20 (15, 128, 128)         5.20 (15, 128, 128)           8         5.20 (15, 128, 128)         5.20 (15, 128, 128)           8         5.20 (15, 128, 128)         5.20 (15, 128, 128)           9         5.20 (15, 128, 128)         5.20 (15, 128, 128)           9         5.20 (15, 128, 128)         5.20 (15, 128, 128)           9         5.20 (15, 128, 128)         5.20 (15, 128, 128)           9         5.20 (15, 128, 128)	M. Bandem, 92	esce 25.a + + + + + + + + + + + + + + + + +	E.5. Intracipilar direction Argoin V.A. 2015 Jin Young Hong 2014 Jin Young Hong 2014 Jin Young Hong 2014 Jin Practice 2017 Natability Remanyuk 2015 Natabili Remanyuk 2015 Natabili Remanyuk 2015 Natabili Remanyuk 2015 Natabili Remanyuk 2015 Cali Santabili Argoing 2015 Natabili Remanyuk 2015 Natabi	Mean         SD         T           14.94         0.24         1.123         0.7           11.23         0.7         9.41         0.32         8.17         1.05           11.02         0.86         11.138         0.43         3.28, df = 6 (P < 0.00	iotal         Mean         SE           12         13.08         1.16           12         8.33         0.43           24         5.09         0.32           20         8.55         0.84           9         9.75         2.01           9         6.66         0.92           107         0001); P= 90%         9           116         0001); P= 90%         1	1         Otal         Weight           5         12         12.6%           9         12.9%         12.9%           5         16         13.1%           3         10         12.7%           7         10.2%         11           11         12.7%         87.3%           4         9         12.7%           9         12.7%         12.7%	M. Random, 95% C1 1.86 (1 20, 2.52) 1.90 (1 38, 2.41) 4.89 (4.68, 5.12) 0.46 (-0.16, 1.08) -1.58 (	M.Banten, 59: C	· · · · ·
6.5.1 timospinal injection Angoli M, All 2015 Jin Yuang Hong 2014 Jin Yuang Hong 2014 Jin Yuang Hong 2014 Jin Haucha 2017 Kocht havskil 2017 (26) Kocht havskil 2017 (26) Katalay Romanyuk 2015 Heterogeneh; Trail v 2 40; Chr e 26576 Takashi Amemoil 2015 (IntraBneal) Saukhata (95% Co Heterogeneh; Trail v 2 41; Chr e 26576 Takashi Amemoil 2015 (IntraBneal) Saukhata (95% Co Heterogeneh; Trail v 2 38; Chr e 38578 Test for werall affect 2 = 6357 e 4 0.000 Falat (95% Co) Heterogeneh; Trail v 2 38; Chr e 385 27 Test for werall affect 2 = 6357 e 4 0.000 Falat (95% Co) Heterogeneh; Trail v 2 38; Chr e 385 27 Test for werall affect 2 = 6370 e 4 0.000 Falat (95% Co) Heterogeneh; Trail v 238; Chr e 385 27 Test for werall affect 2 = 6270 e 4 0.000 Falat (95% Co) Heterogeneh; Trail v 2 30; Chr e 385 23 Test for werall affect 2 = 6270 e 4 0.000 Falat (95% Co) Heterogeneh; Trail v 2 30; Chr e 3051 (30) Kocht hayashi 2017 (30) Kocht hayashi 2017 (30) Kocht hayashi 2017 (30) Heterogeneh; Trail v 2 30; Chr e 413.58 Heterogeneh; Trail v 2 30; Chr e 413	Mean         S)           133         074           133         074           132         055           150         055           151         051           151         051           113         074           113         042           113         042           113         042           113         042           1137         042           1137         042           1137         042           1137         042           1137         042           1138         033           1138         033           1139         022           1139         022           1139         023           1139         025           1139         025           030         03	Contail Mean         SE           12         9.97         0.77           12         9.97         0.77           12         9.97         0.77           12         9.97         0.77           12         9.97         0.77           13         9.44         1.92           19         9.44         1.92           107         9.59         0.84           9         8.45         0.87           9         8.46         0.87           9         8.46         0.87           9         8.45         0.87           9         1.1         1.95         1.0           12         1.95         1.0         1.2           12         1.95         1.0         2.4         5.2         2.0           12         1.95         1.0         1.4         9         9         6.87         0.9           9         9.67         0.8         9         9         9         9         9           9         9         9         9         0.5         0.9         1.0         1.0         1.0         1.0         1.0         1.0         1.0 <td>Total         Weish           1         12         127           1         12         129           1         10         128           7         10.41         11           11         127         9           9         1295         9           9         1297         10.41           11         127         9           9         1297         10.12           1         12         127           9         12.91         10.12           1         12         127           1         12         127           1         12         127           1         12         127           1         12         127           1         12         12           1         12         12           1         12         12           1         12         12           1         12         12           1         12         12           1         12         12           1         12         12           1         12         12     <td>4.         M. Rendem, 525:C1           6.         3.56 (72, 3.94)           6.         3.56 (72, 3.94)           6.         3.56 (74, 3.94)           6.         5.65 (43, 5.27)           6.         3.56 (74, 3.94)           6.         2.57 (1.94)           6.         2.27 (1.95, 3.94)           6.         2.27 (1.96, 3.06)           6.         2.27 (1.96, 3.06)           6.         2.27 (1.96, 3.06)           6.         2.26 (1.55, 3.76)           7.         2.26 (1.55, 3.76)           7.         3.92 (1.95, 3.97)           7.         3.92 (1.95, 3.97)           7.         3.92 (1.95, 3.97)           7.         3.92 (1.95, 3.97)           7.         3.92 (1.95, 3.97)           7.         3.92 (1.95, 3.97)           7.         3.92 (1.95, 3.97)           8.         2.39 (1.52, 3.12)           8.         3.21 (1.95, 3.12)           9.         3.22 (1.95, 4.24)           9.         3.21 (1.95, 3.22)           9.         3.21 (1.95, 3.22)           9.         3.21 (1.95, 3.22)           9.         3.21 (1.95, 3.22)           9.         3.21 (1.95, 3.22)<td>M. Bandem, 92</td><td></td><td>E.5. Intracipilar direction Argoin V.A. 2015 Jin Young Hong 2014 Jin Young Hong 2014 Jin Young Hong 2014 Jin Practice 2017 Natability Remanyuk 2015 Natabili Remanyuk 2015 Natabili Remanyuk 2015 Natabili Remanyuk 2015 Natabili Remanyuk 2015 Cali Santabili Argoing 2015 Natabili Remanyuk 2015 Natabi</td><td>Mean         SD         T           14.94         0.24         1.123         0.7           11.23         0.7         9.41         0.32         8.17         1.05           11.02         0.86         11.138         0.43         3.28, df = 6 (P &lt; 0.00</td>         0.001)           11.07         0.5         0.55, df = 7 (P &lt; 0.00</td>         0.001)         0.001)</td> <td>iotal         Mean         SE           12         13.08         1.16           12         8.33         0.43           24         5.09         0.32           20         8.55         0.84           9         9.75         2.01           9         6.66         0.92           107         0001); P= 90%         9           116         0001); P= 90%         1</td> <td>1         Otal         Weight           5         12         12.6%           9         12.9%         12.9%           5         16         13.1%           3         10         12.7%           7         10.2%         11           11         12.7%         87.3%           4         9         12.7%           9         12.7%         12.7%</td> <td>M. Random, 95% C1 1.86 (1 20, 2.52) 1.90 (1 38, 2.41) 4.89 (4.68, 5.12) 0.46 (-0.16, 1.08) -1.58 (</td> <td>M.Banten, 59: C</td> <td>· · · · ·</td>	Total         Weish           1         12         127           1         12         129           1         10         128           7         10.41         11           11         127         9           9         1295         9           9         1297         10.41           11         127         9           9         1297         10.12           1         12         127           9         12.91         10.12           1         12         127           1         12         127           1         12         127           1         12         127           1         12         127           1         12         12           1         12         12           1         12         12           1         12         12           1         12         12           1         12         12           1         12         12           1         12         12           1         12         12 <td>4.         M. Rendem, 525:C1           6.         3.56 (72, 3.94)           6.         3.56 (72, 3.94)           6.         3.56 (74, 3.94)           6.         5.65 (43, 5.27)           6.         3.56 (74, 3.94)           6.         2.57 (1.94)           6.         2.27 (1.95, 3.94)           6.         2.27 (1.96, 3.06)           6.         2.27 (1.96, 3.06)           6.         2.27 (1.96, 3.06)           6.         2.26 (1.55, 3.76)           7.         2.26 (1.55, 3.76)           7.         3.92 (1.95, 3.97)           7.         3.92 (1.95, 3.97)           7.         3.92 (1.95, 3.97)           7.         3.92 (1.95, 3.97)           7.         3.92 (1.95, 3.97)           7.         3.92 (1.95, 3.97)           7.         3.92 (1.95, 3.97)           8.         2.39 (1.52, 3.12)           8.         3.21 (1.95, 3.12)           9.         3.22 (1.95, 4.24)           9.         3.21 (1.95, 3.22)           9.         3.21 (1.95, 3.22)           9.         3.21 (1.95, 3.22)           9.         3.21 (1.95, 3.22)           9.         3.21 (1.95, 3.22)<td>M. Bandem, 92</td><td></td><td>E.5. Intracipilar direction Argoin V.A. 2015 Jin Young Hong 2014 Jin Young Hong 2014 Jin Young Hong 2014 Jin Practice 2017 Natability Remanyuk 2015 Natabili Remanyuk 2015 Natabili Remanyuk 2015 Natabili Remanyuk 2015 Natabili Remanyuk 2015 Cali Santabili Argoing 2015 Natabili Remanyuk 2015 Natabi</td><td>Mean         SD         T           14.94         0.24         1.123         0.7           11.23         0.7         9.41         0.32         8.17         1.05           11.02         0.86         11.138         0.43         3.28, df = 6 (P &lt; 0.00</td>         0.001)           11.07         0.5         0.55, df = 7 (P &lt; 0.00</td> 0.001)         0.001)	4.         M. Rendem, 525:C1           6.         3.56 (72, 3.94)           6.         3.56 (72, 3.94)           6.         3.56 (74, 3.94)           6.         5.65 (43, 5.27)           6.         3.56 (74, 3.94)           6.         2.57 (1.94)           6.         2.27 (1.95, 3.94)           6.         2.27 (1.96, 3.06)           6.         2.27 (1.96, 3.06)           6.         2.27 (1.96, 3.06)           6.         2.26 (1.55, 3.76)           7.         2.26 (1.55, 3.76)           7.         3.92 (1.95, 3.97)           7.         3.92 (1.95, 3.97)           7.         3.92 (1.95, 3.97)           7.         3.92 (1.95, 3.97)           7.         3.92 (1.95, 3.97)           7.         3.92 (1.95, 3.97)           7.         3.92 (1.95, 3.97)           8.         2.39 (1.52, 3.12)           8.         3.21 (1.95, 3.12)           9.         3.22 (1.95, 4.24)           9.         3.21 (1.95, 3.22)           9.         3.21 (1.95, 3.22)           9.         3.21 (1.95, 3.22)           9.         3.21 (1.95, 3.22)           9.         3.21 (1.95, 3.22) <td>M. Bandem, 92</td> <td></td> <td>E.5. Intracipilar direction Argoin V.A. 2015 Jin Young Hong 2014 Jin Young Hong 2014 Jin Young Hong 2014 Jin Practice 2017 Natability Remanyuk 2015 Natabili Remanyuk 2015 Natabili Remanyuk 2015 Natabili Remanyuk 2015 Natabili Remanyuk 2015 Cali Santabili Argoing 2015 Natabili Remanyuk 2015 Natabi</td> <td>Mean         SD         T           14.94         0.24         1.123         0.7           11.23         0.7         9.41         0.32         8.17         1.05           11.02         0.86         11.138         0.43         3.28, df = 6 (P &lt; 0.00</td> 0.001)           11.07         0.5         0.55, df = 7 (P < 0.00	M. Bandem, 92		E.5. Intracipilar direction Argoin V.A. 2015 Jin Young Hong 2014 Jin Young Hong 2014 Jin Young Hong 2014 Jin Practice 2017 Natability Remanyuk 2015 Natabili Remanyuk 2015 Natabili Remanyuk 2015 Natabili Remanyuk 2015 Natabili Remanyuk 2015 Cali Santabili Argoing 2015 Natabili Remanyuk 2015 Natabi	Mean         SD         T           14.94         0.24         1.123         0.7           11.23         0.7         9.41         0.32         8.17         1.05           11.02         0.86         11.138         0.43         3.28, df = 6 (P < 0.00	iotal         Mean         SE           12         13.08         1.16           12         8.33         0.43           24         5.09         0.32           20         8.55         0.84           9         9.75         2.01           9         6.66         0.92           107         0001); P= 90%         9           116         0001); P= 90%         1	1         Otal         Weight           5         12         12.6%           9         12.9%         12.9%           5         16         13.1%           3         10         12.7%           7         10.2%         11           11         12.7%         87.3%           4         9         12.7%           9         12.7%         12.7%	M. Random, 95% C1 1.86 (1 20, 2.52) 1.90 (1 38, 2.41) 4.89 (4.68, 5.12) 0.46 (-0.16, 1.08) -1.58 (	M.Banten, 59: C	· · · · ·

Fig. 7. Forest plot of the differences in the BBB scores of the iPSC and control groups in different transplantation method subgroups at different time-points after transplantation. (A-G) At 1-7 weeks, respectively, after iPSC transplantation. Including publications: Jiri Ruzicka et al. 2017 [26]; Nataliya Romanyuk et al. 2015 [27]; Takashi Amemori et al. 2015 [28]; Angelo H. All et al. 2015 [29]; Jin Young Hong et al. 2014 [30]; Koichi hayashi et al. 2011[31].

in terms of the overall BBB scores and total heterogeneities, favoring the iPSC groups, which suggested a protective effect. The heterogeneity between subgroups was high ( $I^2 = 91.4\%$ ).

BBB scores at 2-7 weeks after transplantation. As shown in Figures 7B-7G, similar changes in BBB scores between the iPSC and control groups were found at 2–7 weeks after iPSC transplantation. Specifically, the BBB scores of the intraspinal injection subgroup were significantly higher in the iPSC groups than those in the control groups (WMD = 2.56; 95%CI: 1.49–3.63; *P* < 0.001; WMD = 2.43; 95% CI: 1.29–3.58; *P* < 0.001; WMD = 2.52; 95% CI: 1.52–3.52; *P* < 0.001; WMD = 2.69; 95% CI: 1.51–3.87; *P* < 0.001; WMD = 2.48; 95% CI: 1.29– 3.68; P < 0.001 and WMD = 2.91; 95% CI:1.57–4.24; P < 0.001, respectively). The relevant heterogeneities were high ( $I^2$  = 98%, 98%, 98%, 98%, 98% and 99%, respectively). The BBB



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scores in the intrathecal injection subgroup were significantly higher in the iPSC groups than those in the control groups (same data as the other subgroups). Notably, because we analyzed the same included comparisons, we obtained the same data in the overall BBB scores and total heterogeneities, favoring the iPSC groups. The heterogeneities between subgroups were also different ( $I^2 = 78.5\%$ , 0%, 0%, 0%, 0% and 0%, respectively).

#### Level of evidence assessment

The GRADE evidence profiles are shown in Table 8. The GRADE level of evidence was moderate for locomotor recovery in rats with SCI at 1–7 weeks after iPSC transplantation.

#### Reasons to reject iPSC-SCI related publications

We rejected 3 iPSC-SCI related publications according to our filter criterion. As a result, Table 9 was made to list these controversial publications with clear explanation to increase the rigor of our study.

#### Discussion

In this meta-analysis, we comprehensively reviewed the current literature and demonstrated that iPSC promote locomotor recovery in rats with SCI. We also provide a description of the different factors underlying SCI recovery, including SCI models, doses of cells, iPSC sources, iPSC differentiation and transplantation methods, which are considered to play critical roles in the repair process. In reviewing the literature, no pre-clinical evidence was summarized on iPSC transplantation in SCI models. Given this, the meta-analysis of iPSC on locomotor recovery is, to our knowledge, the first meta-analysis in this field.

**Table 8.** GRADE evidence profile. Moderate quality = further research is likely to have an important impact on our confidence in the estimate of the effect and may change the estimate

Quality asse	essment							No of patients			Effect		
No of studies	Design	Risk of bias	Inconsistency	Indirectness	Imprecision	Other considerations	Induced p	oluripotent stem cells	Control	Relative (95% CI)	Absolute	Quality	Importance
Locomotor	recovery at 1 week	after transpl	antation (follow-up me	an 1 weeks; measured	with: BBB score; Bette	er indicated by lower	values)						
8	Randomised trials	Serious <sup>1</sup>	No serious inconsistency	No serious indirectness	No serious imprecision	None		116	96		MD 1.77 higher (0.2 to 3.35 higher)	⊕⊕⊕0 MODERATI	CRITICAL
Locomotor	recovery at 2 week	s after transp	lantation (follow-up m	an 2 weeks; measured	l with: BBB score; Bett	er indicated by lowe	r values)						
8	Randomised trials	Serious <sup>1</sup>	No serious inconsistency	No serious indirectness	No serious imprecision	None		116	96	-	MD 2.72 higher (1.41 to 4.03 higher)	⊕⊕⊕0 MODERATI	CRITICAL
Locomotor	recovery at 3 week	s after transp	lantation (follow-up m	an 3 weeks; measured	l with: BBB score; Bett	er indicated by lowe	r values)						
8	Randomised trials	Serious <sup>1</sup>	No serious inconsistency	No serious indirectness	No serious imprecision	None		116	96		MD 2.41 higher (1.35 to 3.47 higher)	⊕⊕⊕0 MODERATI	CRITICAL
Locomotor	recovery at 4 week	s after transp	lantation (follow-up m	an 4 weeks; measured	l with: BBB score; Bett	er indicated by lowe	r values)						
8	Randomised trials	Serious <sup>1</sup>	No serious inconsistency	No serious indirectness	No serious imprecision	None		116	96		MD 2.48 higher (1.55 to 3.41 higher)	⊕⊕⊕0 MODERATI	CRITICAL
Locomotor	recovery at 5 week	s after transp	lantation (follow-up m	an 5 weeks; measured	l with: BBB score; Bett	er indicated by lowe	r values)						
8	Randomised trials	Serious <sup>1</sup>	No serious inconsistency	No serious indirectness	No serious imprecision	None		116	96	-	MD 2.65 higher (1.55 to 3.75 higher)	⊕⊕⊕0 MODERATI	CRITICAL
Locomotor	comotor recovery at 6 weeks after transplantation (follow-up mean 6 weeks; measured with: BBB score; Better indicated by bwer values)												
8	Randomised trials	Serious <sup>1</sup>	No serious inconsistency	No serious indirectness	No serious imprecision	None		116	96	-	MD 2.49 higher (1.39 to 3.59 higher)	⊕⊕⊕0 MODERATI	CRITICAL
Locomotor	recovery at 7 week	s after transp	lantation (follow-up m	an 7 weeks; measured	l with: BBB score; Bett	er indicated by lowe	r values)						
8	Randomised trials	Serious <sup>1</sup>	No serious inconsistency	No serious indirectness	No serious imprecision	None		116	96	-	MD 2.88 higher (1.64 to 4.12 higher)	⊕⊕⊕0 MODERATI	CRITICAL

**Table 9.** Reasons to reject iPSC-SCI related publications. SCI: spinal cord injury; FHFLF: female (IMR90)

 human fetal lung fibroblasts; AHDF: Adult human dermal fibroblasts

Author and Year	Animal model	SCI model and transplanting time	Immuno- suppression	Cell sources	Reasons for exclusion
Samuel E. Nutt; 2013 [43]	Adult female Long-Evans rats	Contusion; 4 weeks after injury	No	FHFLF	<ol> <li>An early chronic injury model was established in this study which is different from acute and sub-acute phases in microenvironment;</li> <li>BBB score was not used.</li> </ol>
Yuriy Pomeshchik; 2015 [44]	Adult female C57BL/6J mice	Contusion; 7 days after SCI	Yes; Via injections of tacrolimus	AHDF	<ol> <li>They used mouse models which is different from rat models;</li> <li>BMS score instead of BBB score was used.</li> </ol>
Clara López- Serrano; 2016 [45]	Adult female SD rats	Contusion; 0 and 7days postinjury	Yes; Via injections of FK506	AHDF	<ol> <li>The derivation protocol of neural lineage cells from iPSC was different;</li> <li>Adult cells were used which are more vulnerable to changes induced by the injured environment than fetal cells.</li> </ol>



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To arrive at robust conclusions, data were discussed when an outcome was reported from at least three simultaneous comparisons. In our present meta-analysis, we included six publications with eight comparisons [26-31]. The most obvious finding to emerge from our analyses was that in rats with SCI, iPSC transplantation significantly promotes the locomotor recovery according to the BBB score. A possible explanation for this might be that iPSC are one of the most widely used cell types for transplantation performed to recover the functions impaired as a result of injury [32]. In addition, the mechanism by which iPSC transplantation mediated functional improvements after SCI is multifaceted [33-35] although it is commonly accepted that iPSC transplantation can [7]: 1) reduce the area of syringomyelia and increase the area of spared tissue; 2) promote local microvascular regeneration and nerve regeneration for the repair of damaged cells; 3) reduce inflammation and inhibit oxidative stress after SCI; and 4) improve axonal growth and reconstruction of neural pathways by secreting substrates. Moreover, our findings are consistent with the data obtained in the study reported by Führmann et al., which demonstrated that transplantation of pluripotent stem cells and their differentiated progeny has the potential to regenerate functional pathways and improve locomotor function after SCI [36].

It is worth noting that several intriguing discoveries were made because of the subgroup analyses. First, in the compression subgroups, the BBB score was significantly higher in the iPSC groups than that in the control groups at 1–7 weeks after transplantation. This suggests that iPSC transplantation exerts a significantly favorable influence on locomotor recovery in a rat model of SCI, especially in the compression injury models, rather than in the contusion models. This result may be explained by the fact that all the studies of compression models used the same parameters with a balloon-induced injury lesion. However, different impactors and parameters were adopted in the studies of contusion models. Thus, more studies with compression injury models should be conducted to verify the beneficial effects of iPSC on contusion injury models. Namely, in compression models, the inflammation and edema, even hemorrhage, are increasing to a similar level after SCI, which can significantly change the intramedullary pressure to a certain extent. Accordingly, the pathophysiology after the primary injury is likely to result in an undesirable microenvironment for iPSC transplantation, with swelling or the spinal cord as well as intramedullary hemorrhagic necrosis hindering tissue repair in compression models. Second, our subgroup analyses of different cell counts indicated that iPSC at doses of  $5 \times 10^5$  improve the locomotor recovery of rats with SCI at 1–7 weeks after transplantation. This indicates that the optimal dose for iPSC transplantation is  $5 \times 10^5$ , which is consistent with the results of earlier studies [33, 37]. although further relevant studies should be conducted to validate these results. We also found that after transplantation, rats showed better functional recovery in subgroups transplanted with iPSC induced from female (IMR90) human fetal lung fibroblasts, which may survive at the lesion site. This finding is in accordance with previous findings [38] showing that transplantation of iPSC derived from this source also facilitate axonal regrowth as well as improved functional and electrophysiological recovery.

Next, we found that after grafting of human iPSC-derived neural precursors into the injured spinal cord of rats, the locomotor recovery was significantly promoted in the neural precursor groups compared with that observed in the control groups. It can be speculated that this is because the transplanted cells differentiate mainly into neurons and form synapses, improve axonal reconstruction and angiogenesis, and prevent demyelination [39]. Last, but not least, our analyses indicate that intraspinal implantation is an appropriate transplantation method, which was adopted in most of the included studies. These results are in accordance with recent publications [28, 40] indicating that direct injection of human iPSC promotes locomotor recovery. However, this type of transplantation may cause additional damage leading to further damage to the injured spinal cord [41]. Notably, one publication included in our meta-analysis [28] demonstrated that intrathecal injection had a moderate therapeutic benefit on SCI via a paracrine mechanism that does not require the cells to be present in the tissue. However, the relevant publications are too few to confirm the efficacy of this method.



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Surprisingly, relatively high heterogeneity was found in many subgroup analyses. There are, however, several possible explanations. As shown in Table 2, a total of 212 experimental rats were included in our meta-analysis, which consisted of different breeds, sexes, body weights and age. In addition, compared with patients, rodent models are more vulnerable to unpredictable factors, such as different parameters of injury impactors (NYU or Infinite Horizon Impactor, height of impactors and injury level, etc.), operative details (surgical procedures, time, blood loss, etc.) and post-operative nursing (temperature, humidity and adjuvant therapy, etc.). As a result, these inconsistencies may lead to the heterogeneity under this circumstance. It can also be assumed that fewer publications in subgroups may have some unexpected impacts on the results and explanations. Thus, a higher heterogeneity might be achieved which requires much more publications to be conducted to verify our findings. Yet despite this, all the publications included in our analyses evaluated locomotor function in rats with SCI using BBB scores, which is a sensitive and reliable method used to assess the behavioral changes of rats [42]. In addition, in this review, the BBB score in most iPSC groups were at least 2 points higher than those in the corresponding control groups, suggesting that iPSC transplantation promotes locomotor function in rats subjected to SCI.

We focused on the studies with acute and sub-acute injury models and exclude those with chronic injury models. They have different factors in terms of microenvironment which may have a significant influence in the functional recovery. As a result, we analyzed the publications of acute and sub-acute phases of spinal cord injury to make our conclusions clear and definite.

We also eliminate one publication with a negative outcome for iPSC-derived cells according to our filter criteria [43-45]. First, they used Adult human dermal fibroblasts as cells source. Regarding the source of NSCs, the derivation protocol of neural lineage cells from iPSC may be crucial to obtain different NSCs. Second, adult cells are more vulnerable to changes induced by the injured environment than fetal cells which is the main reason for a negative outcome. Furthermore, the use of certain factors during reprogramming may enhance neurite outgrowth, maturation, and expression of different neural markers, influencing engraftment and differentiation within the injured nervous system. Thus, we will keep a watchful eye on the field of adult human dermal fibroblasts and more studies about the functional effect of these cells on SCI should be conducted in the future.

The effect of immunosuppression on graft survival should not be neglected. In our metaanalysis, only one publication [27] mentioned the use of triple drug immunosuppression containing Cyclosporine A (10 mg/kg), azathioprine sodium (2 mg/kg), methylprednisolone (2 mg/kg, tapered to 0.5 mg/kg) and methylprednisolone (2 mg/kg, tapered to 0.5 mg/kg) to prevent graft rejection. Generally, it is necessary to use initial combined immunosuppressive therapy in order to achieve consistent cell survival at intervals of 2–2.5 months after grafting [46]. Few publications are included, as a result, we need more studies and evidence to valid this method.

Notably, GRADE provides explicit criteria for rating the quality of evidence that include study design, risk of bias, imprecision, inconsistency, indirectness and magnitude of effect. On the basis of "animal research reporting: *in vivo* experiment guidelines" [47] and "gold standard publication checklist" [48], we also attempted to determine the GRADE level of evidence to provide an indication of the value of this line of inquiry in the development of human studies on SCI. This information is important in allowing more precise decisions to be made in clinical settings for future research. Therefore, this meta-analysis provides up-to-date and convincing evidence of the ability of iPSC transplantation to promote locomotor recovery in rats with SCI.

#### Limitations

The generalizability of the results of this meta-analysis are subject to certain limitations. First, the number of publications is limited, which may influence the interpretation of the results. Thus, further relevant studies are required to validate our conclusions. Second,



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although the BBB score is a valid and convenient method to evaluate the neurological recovery effects in rat models after SCI, which is widely used in most publications, this method is based on subjective observations that may increase bias. Accordingly, we recommend that investigators should use the BBB score only when blinded to the intervention groups. Third, we strongly suggest that future research should focus on the other animal models to study the effects of iPSC transplantation after SCI.

#### Conclusion

Taken together, the results of our systematic review and meta-analyses support the hypothesis that iPSC transplantation from human fetal lung or mouse embryonic fibroblasts improves locomotor recovery in rats subjected to SCI and represents a substantially beneficial therapy. However, further studies are required to validate our conclusions and ultimately, to facilitate the development of human studies in SCI.

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#### **Disclosure Statement**

The authors declare no conflict of interests.

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