NHS Blood and Transplant

Pathogen-Reduced Platelets for the Prevention of Bleeding

Cochrane Systematic Review

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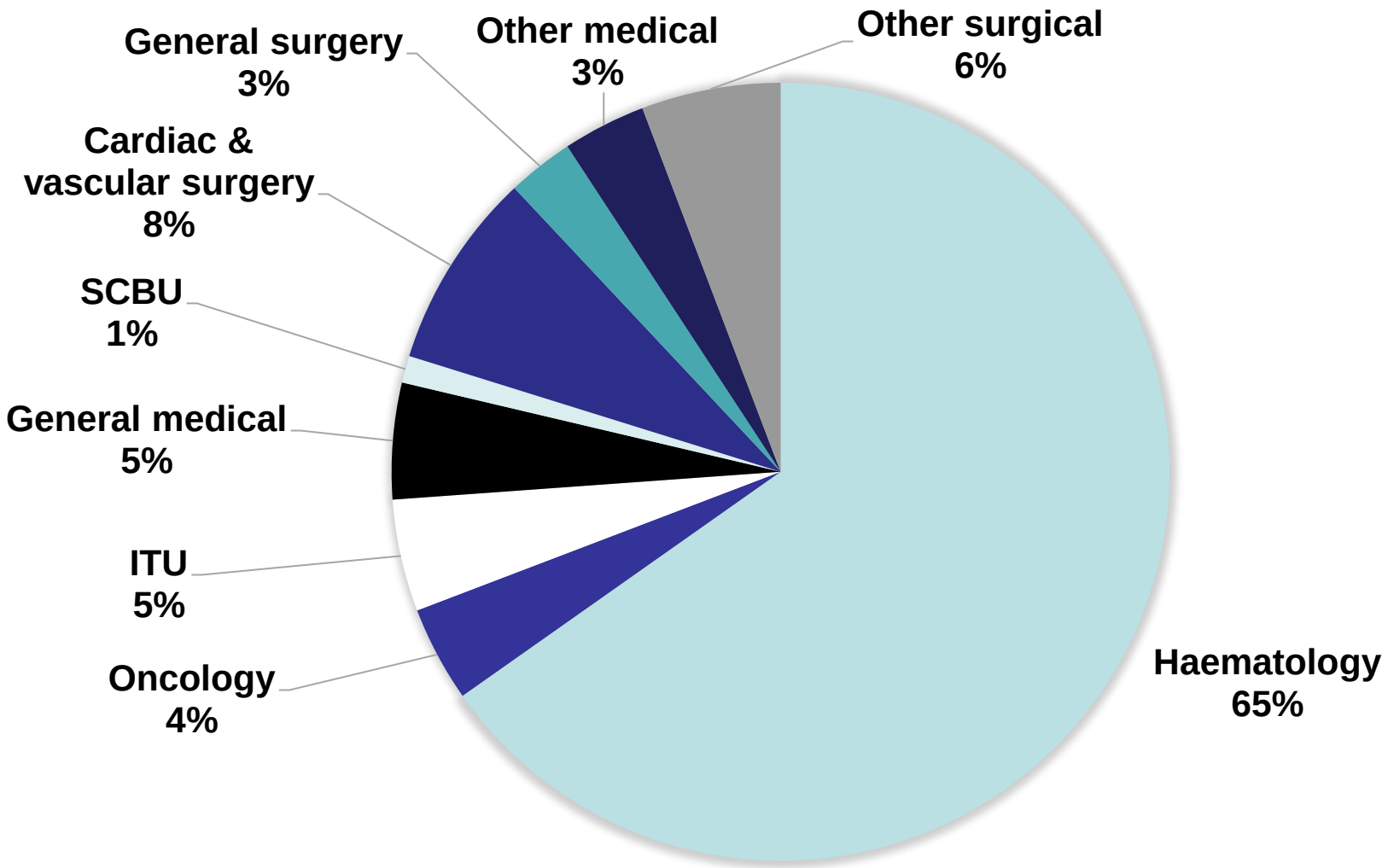
NHSBT

Summary of talk

NHS Blood and Transplant

- Pathogen-inactivation
  - Why it may be important for platelet transfusions
  - PRP methods assessed in RCTs
  - Findings from the review

Haematology patients use the majority of platelet transfusions



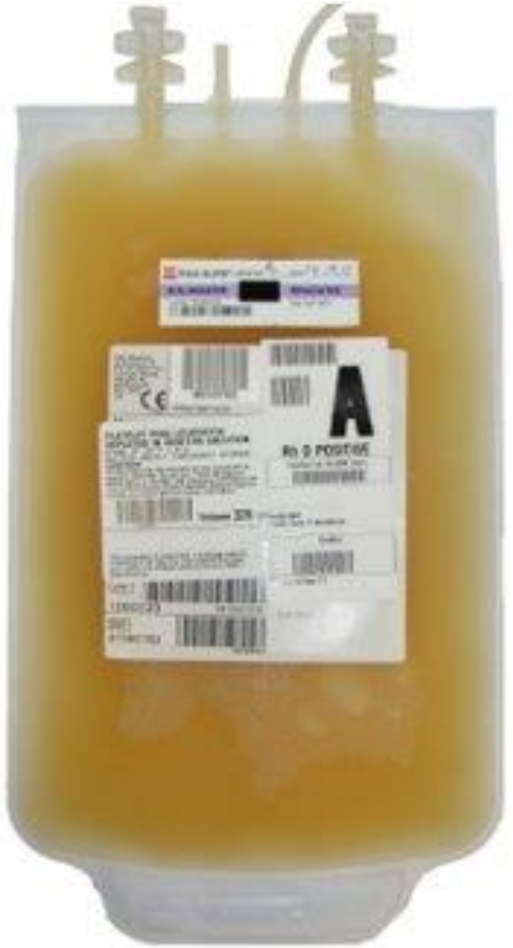
A survey of where and why platelets are used in hospitals in the South West region of England. Jones et al 2013. Transfusion Medicine 23(S2):P034

Transfusion transmitted infections in the UK from 1996 to 2017

	Bacteria	HAV	HBV	HCV	HEV	HIV	HTLV1	Parvo	Malaria	vCJD	Total
Transfusion transmitted infections for all types of blood component											
Overall incidents	41	4	12	2	10	2	2	1	2	3	79
Infected recipients	44	4	14	2	13	4	2	1	2	4	90
Overall deaths	11	-	-	-	1	-	-	-	1	3	16
Transfusion transmitted infection incidents for platelet transfusion											
Pooled platelets	21	2	1	-	2	1	-	-	-	-	27
Apheresis platelets	16	1	1	-	1	-	-	-	-	-	19
Total incidents	37 (90%)	3 (75%)	2 (17%)	-	3 (30%)	1 (50%)	-	-	-	-	46 (58%)
Total deaths	9 (82%)	-	-	-	1 (100%)	-	-	-	-	-	

Ideal PRP platelet component

- ↓ infectious agents below level required to cause infection
- Cost effective (reduction in risk or reduction in the need for other tests)
- Platelets as effective (or more so) than untreated platelets
- Additional benefits
  - ↓ Ta-GvHD
  - ↓ allergic reactions
  - No need for irradiation
  - No need for CMV negative components



PRP methodologies for platelets

- **Intercept® (Cerus Corporation, Concord, CA, USA)**
  - UV light and amotosalen

- **Mirasol® (CaridianBCT, Lakewood, CO, USA)**
  - UV light and riboflavin (vitamin B2)

- **THERAFLEX (MacoPharma, Mouvaux, France)**
  - UV light alone

PRP methodologies for platelets not perfect

- **Some bacteria relatively resistant**
  - *Pseudomonas aeruginosa, Bacillus cereus,* some strains of *K. pneumoniae*, *S. pneumoniae* and *S. agalactiae*

- **Some viruses relatively resistant (non-enveloped viruses)**
  - Hepatitis A, Hepatitis E, parvovirus

- **If high infectious load, component could still transmit infection**

BUT

- **May prevent the transmission of unexpected, or emerging infections**
  - SARS-CoV-2, Dengue virus, West Nile Virus, Chikungunya virus, Influenza A (H5N1), HIV variants, hepatitis B variants and Babesia spp


What is the evidence?

Systematic review

NHS Blood and Transplant

- 16 completed RCTS (3429 Participants). 4 new RCTs.
- All trials were in high-income countries
- No trials compared different methodologies head-to-head
- Search up to February 2023
- 1 ongoing RCT – PEDITREC – planned to recruit 252 children, cardiac surgery NCT05293106

Intercept PRT (11 trials)

Study	Participants	Type of participant	Type of platelet	Platelet dose (Mean, SD)
De Francisci 2004	44 (22/22)	Adult liver transplant/ paediatric cardiac surgery	NR	NR
Lozano 2011 (TESSI)	211 (105/106)	Adult haemato-oncological disease	86% BC 14% Aph (Control In PAS)	Intermediate (Both arms 4.2; 0.67)
Simonsen 2006 Cross-over	20 PCT-std: 9 std-PCT: 11	Adult haemato-oncological disease	BC (Control In PAS)	Low/intermediate (PCT 2.8; 0.38) (C 3.0; 0.43)
Slichter 2006 Cross-over	32 PCT-std: NR std-PCT: NR	Adult haemato-oncological disease	Aph (Control In plasma)	High (PCT 7.6; 1.3) (C 7.4; 0.9)
Agliastro 2006	30 (19/11)	Paediatric haemato-oncological disease	PCT plts BC Std plts Aph (Control unknown)	Low/intermediate (Both arms 2.9; NR)
Garban 2018 (EFFIPAP)	790 (263/262)	Adult haemato-oncological disease	PCT: BC 48.5% PCT Aph 51.5% C: BC 46.4% C: Aph 53.6% Controls in PAS and plasma	Intermediate **(PCT 4.1; 0.4)** **(PAS 4.4; 0.5)** **(C 4.9; 0.6)**

Intercept PRT (cont.)

Study	Participants	Type of participant	Type of platelet	Platelet dose (Mean, SD)
Janetzko 2005	43 (22/21)	Adult haemato-oncological disease	Aph (Control in plasma)	Intermediate (PCT 4.1; 1.2) (C 3.8; 0.4)
Kerkhoffs 2010	184 (85/99)	Adult haemato-oncological disease	BC (Controls In PAS and plasma)	Intermediate **(PCT 3.4; 0.8) (C 3.9; 1.0)**
McCullough 2004 (SPRINT)	645 (318/327)	Paediatric + adult haemato-oncological disease	Aph (Control in plasma)	Intermediate **(PCT 3.7; 0.51) (C 4.0; 0.67)**
Rebulla 2017 (IPTAS)	228 (113/115)	Adult haemato-oncological disease	1% Aph 99% BC (Control in PAS)	Low/intermediate (PCT 2.9; 0.3) (C 3.1; 0.4)
van Rhenen 2003 (euroSPRITE)	103 (52/51)	Paediatric + adult haemato-oncological disease	BC (Control in PAS or plasma	Intermediate **(PCT 3.9; 1.0) (C 4.3; 1.2)**

Mirasol PRT (5 trials)

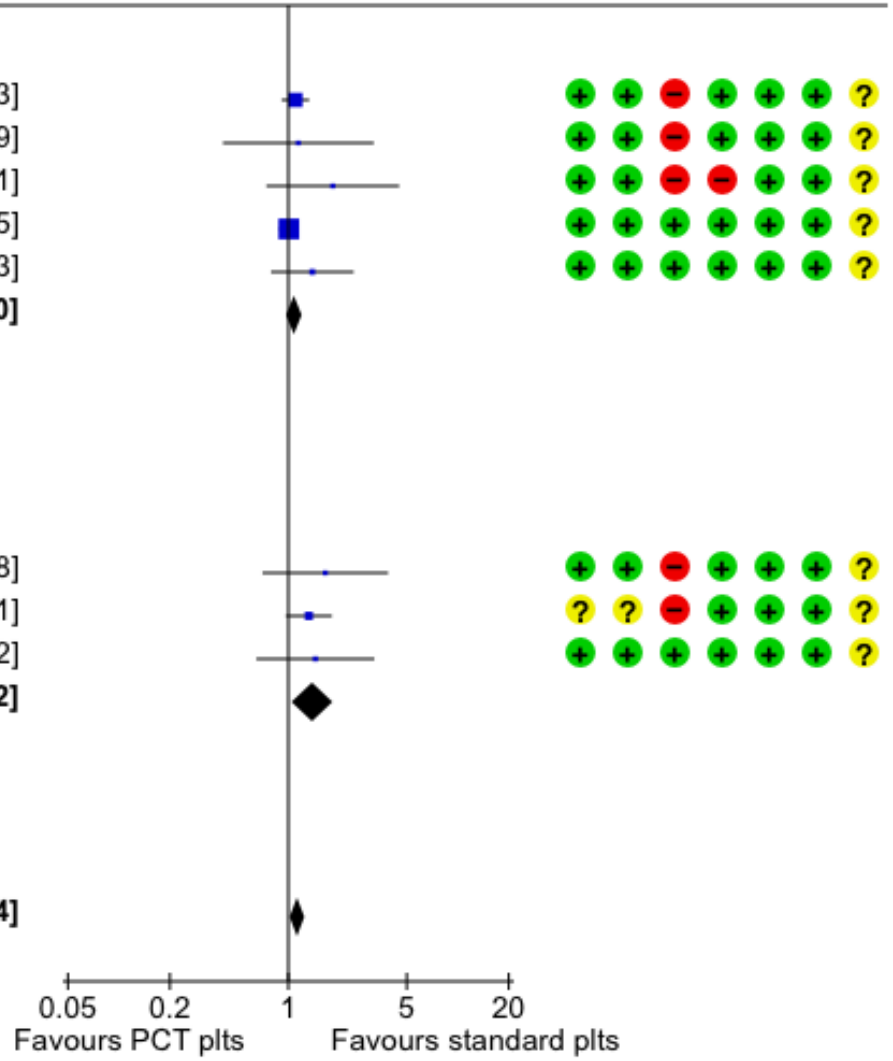
Study	Participants	Type of participant	Type of platelet	Platelet dose (Mean, SD)
Johansson (PRESS) Crossover	15 PCT-std: 8 std-PCT: 7	Adult haemato-oncological disease	BC (Control in PAS)	Low/intermediate (PCT 2.7; 0.4) (C 3.0; 0.2)
Cazenave 2010	110 (56/54)	Adult haemato-oncological disease	25% BC 75% Aph (Control in plasma)	Intermediate (PCT 5.2; 2.1) (C 5.2; 2.0)
Rebulla 2017 (IPTAS)	196 (99/97)	Adult haemato-oncological disease	49% Aph 51% BC (Control in PAS)	Low/intermediate (PCT 3.3; 0.7) (C 3.3; 0.6)
van der Meer 2018 (PREPAReS)	469 (244/225)	Adult haemato-oncological disease	BC (Control in plasma)	Low/intermediate (PCT 3.3; 0.6) (C 3.5; 0.8)
MIPLATE 2021	330 (164/166)	Paediatric + adult haemato-oncological disease	Aph (Control in plasma)	NR

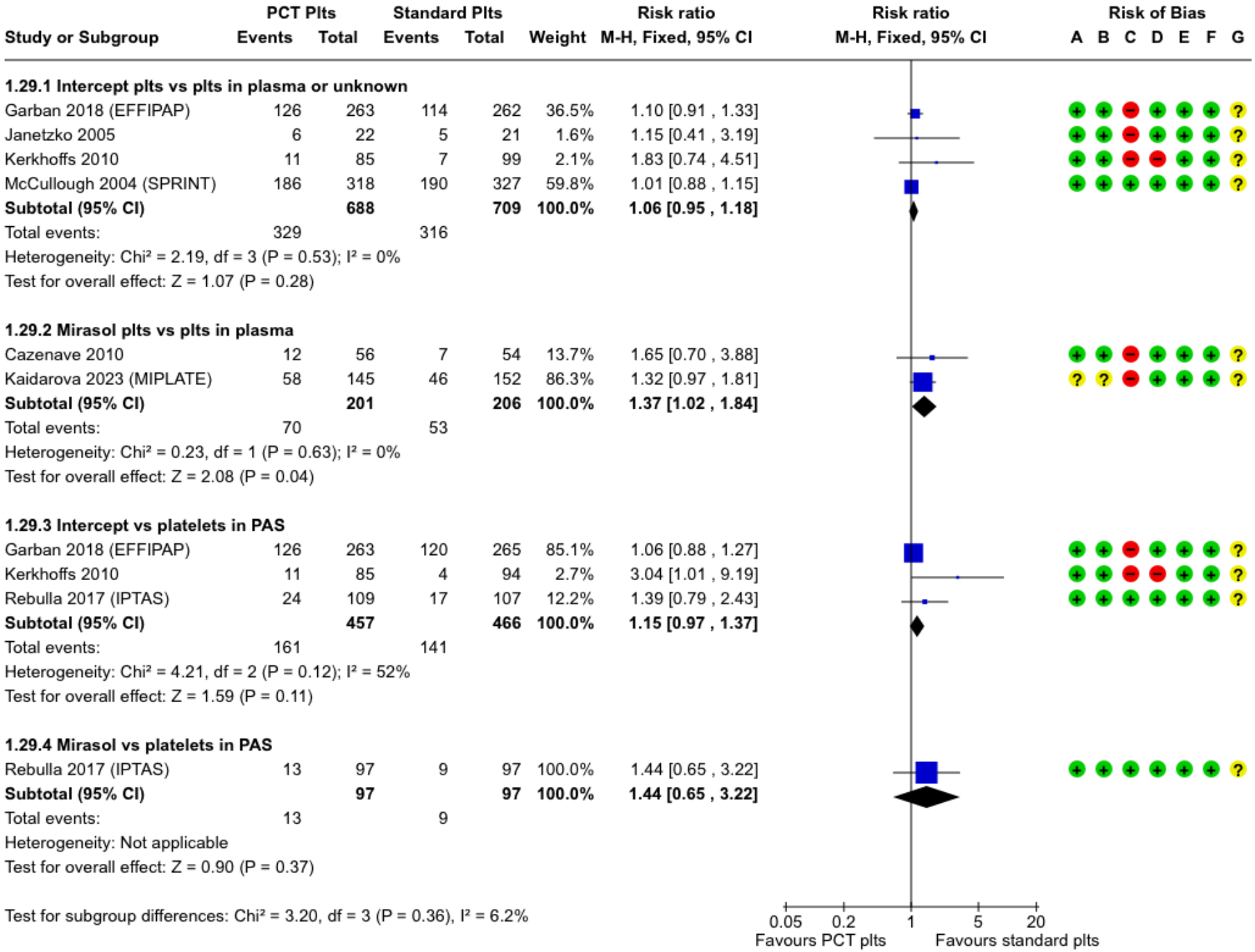
Theraflex PRT (1 trial)

Study	Participants	Type of participant	Type of platelet	Platelet dose (Mean, SD)
Brixner 2021 (CAPTURE)	175 (89/86)	Adult haemato-oncological disease	68% BC 32% Aph (Control in PAS)	Low/intermediate (PCT 3.26, 0.37) (C 3.30, 0.37)

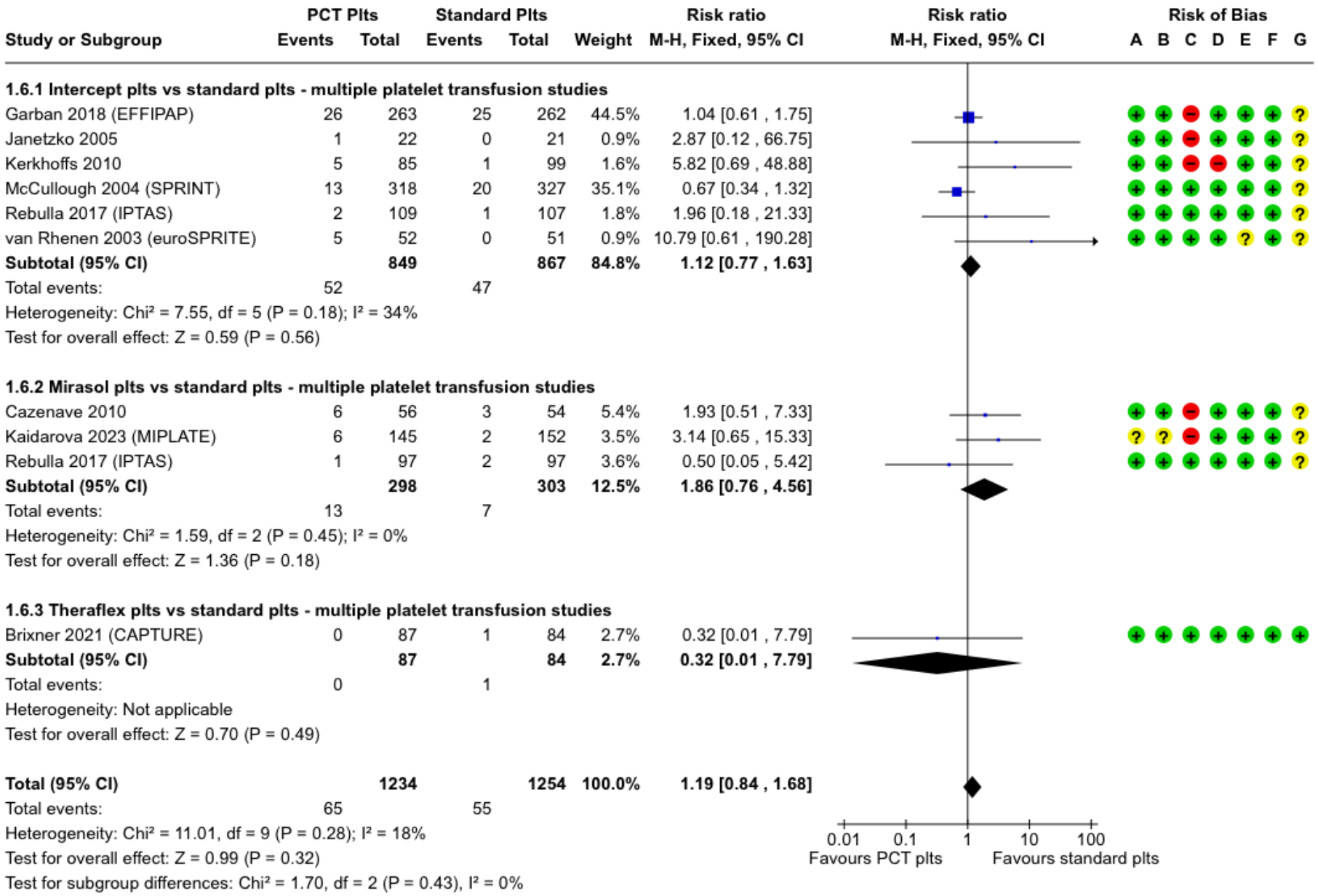
Clinically significant bleeding (WHO grade 2 or above)

Study or Subgroup	PCT Plts Events	PCT Plts Total	Standard Plts Events	Standard Plts Total	Weight	Risk ratio M-H, Fixed, 95% CI
1.4.1 Intercept plts vs standard plts - multiple platelet transfusion studies						
Garban 2018 (EFFIPAP)	126	263	114	262	29.2%	1.10 [0.91 , 1.33]
Janetzko 2005	6	22	5	21	1.3%	1.15 [0.41 , 3.19]
Kerkhoffs 2010	11	85	7	99	1.7%	1.83 [0.74 , 4.51]
McCullough 2004 (SPRINT)	186	318	190	327	47.9%	1.01 [0.88 , 1.15]
Rebulla 2017 (IPTAS)	24	109	17	107	4.4%	1.39 [0.79 , 2.43]
Subtotal (95% CI)		**797**		**816**	**84.4%**	**1.08 [0.97 , 1.20]**
Total events:	353		333			
Heterogeneity: Chi² = 3.20, df = 4 (P = 0.52); I² = 0%						
Test for overall effect: Z = 1.37 (P = 0.17)						
1.4.2 Mirasol plts vs standard plts - multiple platelet transfusion studies						
Cazenave 2010	12	56	7	54	1.8%	1.65 [0.70 , 3.88]
Kaidarova 2023 (MIPLATE)	58	145	46	152	11.5%	1.32 [0.97 , 1.81]
Rebulla 2017 (IPTAS)	13	97	9	97	2.3%	1.44 [0.65 , 3.22]
Subtotal (95% CI)		**298**		**303**	**15.6%**	**1.38 [1.04 , 1.82]**
Total events:	83		62			
Heterogeneity: Chi² = 0.26, df = 2 (P = 0.88); I² = 0%						
Test for overall effect: Z = 2.26 (P = 0.02)						
Total (95% CI)		**1095**		**1119**	**100.0%**	**1.12 [1.02 , 1.24]**
Total events:	436		395			
Heterogeneity: Chi² = 6.64, df = 7 (P = 0.47); I² = 0%						
Test for overall effect: Z = 2.29 (P = 0.02)						
Test for subgroup differences: Chi² = 2.63, df = 1 (P = 0.10), I² = 62.0%						



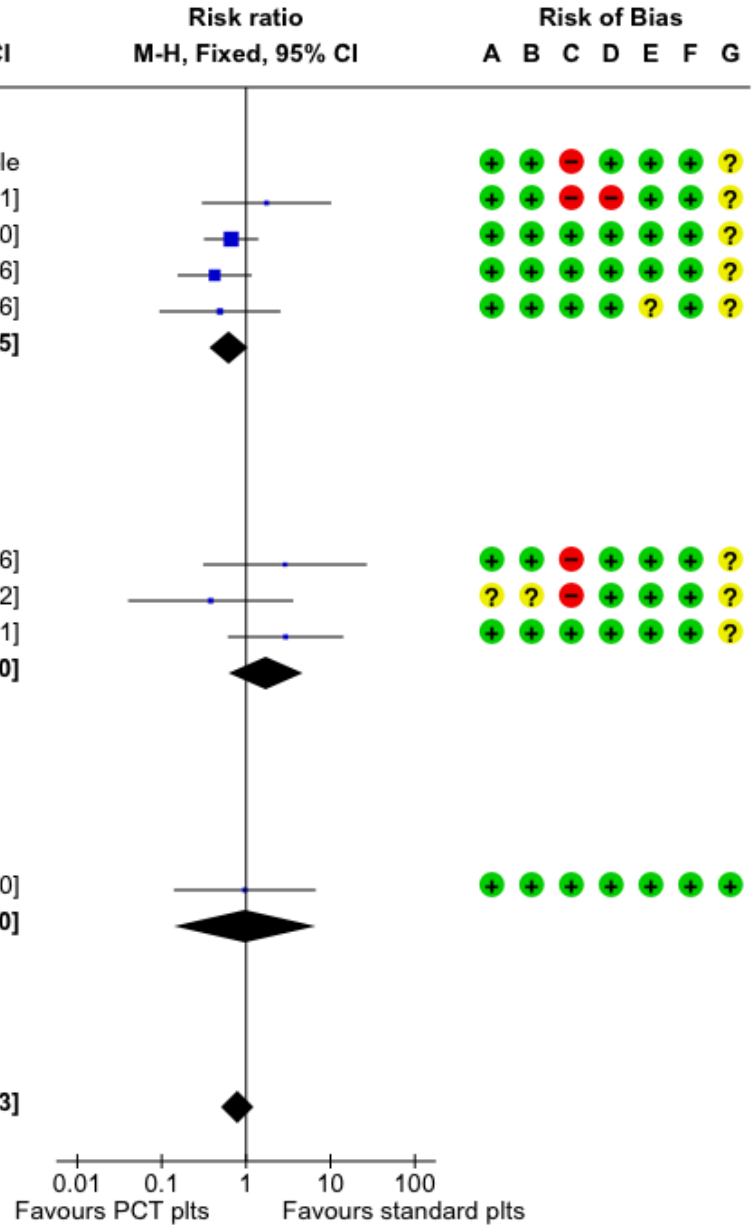


Clinically severe bleeding (WHO grade 3 or above)

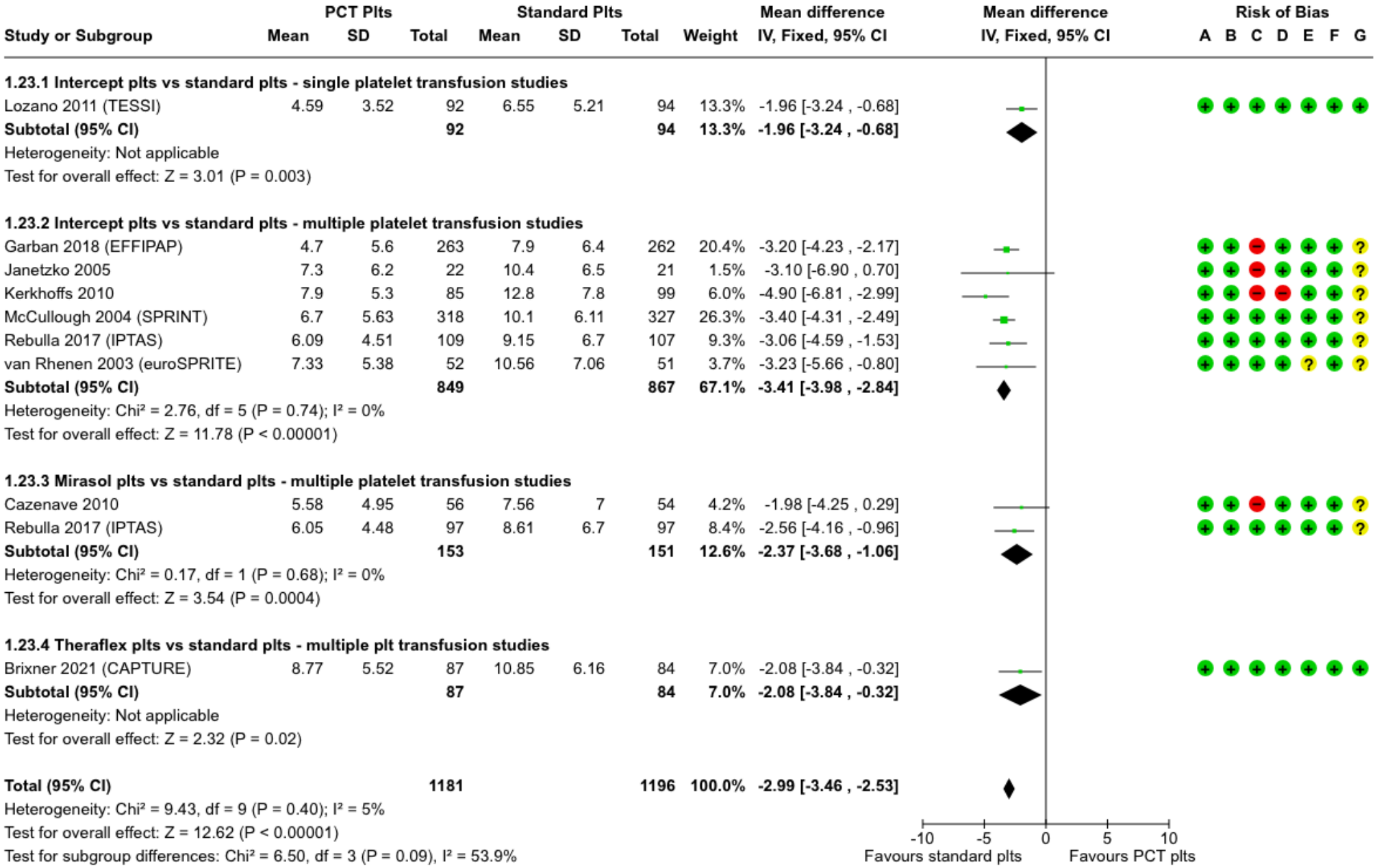


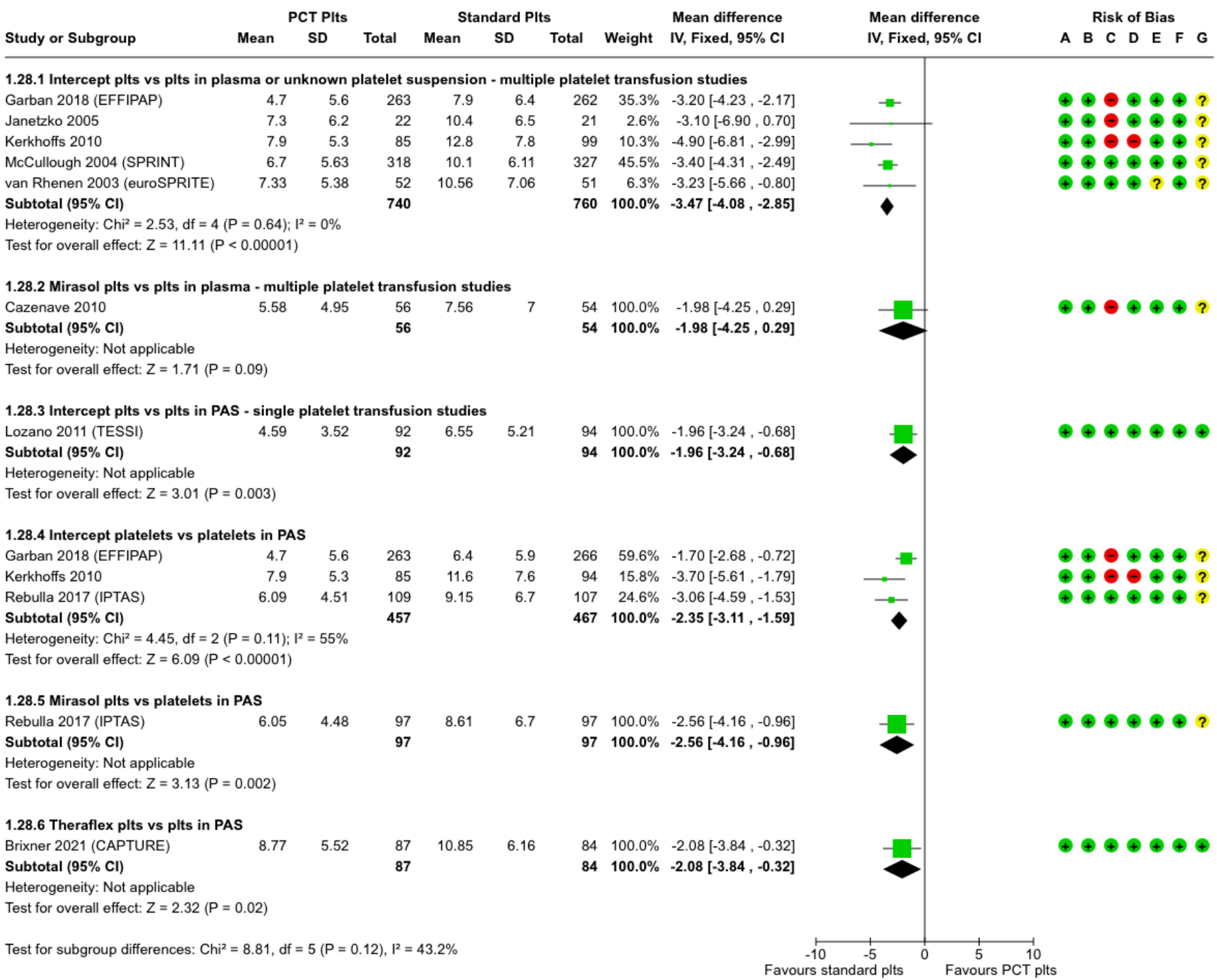
All-cause mortality

Study or Subgroup	PCT Plts Events	PCT Plts Total	Standard Plts Events	Standard Plts Total	Weight	Risk ratio M-H, Fixed, 95% CI
1.8.1 Intercept plts vs standard plts - multiple platelet transfusion studies						
Janetzko 2005	0	22	0	21		Not estimable
Kerkhoffs 2010	3	85	2	99	4.4%	1.75 [0.30 , 10.21]
McCullough 2004 (SPRINT)	11	318	17	327	39.5%	0.67 [0.32 , 1.40]
Rebulla 2017 (IPTAS)	5	113	12	115	28.0%	0.42 [0.15 , 1.16]
van Rhenen 2003 (euroSPRITE)	2	52	4	51	9.5%	0.49 [0.09 , 2.56]
Subtotal (95% CI)		**590**		**613**	**81.4%**	**0.62 [0.37 , 1.05]**
Total events:	21		35			
Heterogeneity: Chi² = 1.98, df = 3 (P = 0.58); I² = 0%						
Test for overall effect: Z = 1.78 (P = 0.07)						
1.8.2 Mirasol plts vs standard plts - multiple platelet transfusion studies						
Cazenave 2010	3	56	1	54	2.4%	2.89 [0.31 , 26.96]
Kaidarova 2023 (MIPLATE)	1	141	3	161	6.6%	0.38 [0.04 , 3.62]
Rebulla 2017 (IPTAS)	6	99	2	97	4.8%	2.94 [0.61 , 14.21]
Subtotal (95% CI)		**296**		**312**	**13.8%**	**1.70 [0.62 , 4.70]**
Total events:	10		6			
Heterogeneity: Chi² = 2.38, df = 2 (P = 0.30); I² = 16%						
Test for overall effect: Z = 1.03 (P = 0.30)						
1.8.3 Theraflex plts vs standard plts - multiple platelet transfusion studies						
Brixner 2021 (CAPTURE)	2	87	2	84	4.8%	0.97 [0.14 , 6.70]
Subtotal (95% CI)		**87**		**84**	**4.8%**	**0.97 [0.14 , 6.70]**
Total events:	2		2			
Heterogeneity: Not applicable						
Test for overall effect: Z = 0.04 (P = 0.97)						
Total (95% CI)		**973**		**1009**	**100.0%**	**0.79 [0.50 , 1.23]**
Total events:	33		43			
Heterogeneity: Chi² = 7.17, df = 7 (P = 0.41); I² = 2%						
Test for overall effect: Z = 1.06 (P = 0.29)						
Test for subgroup differences: Chi² = 3.06, df = 2 (P = 0.22), I² = 34.6%						



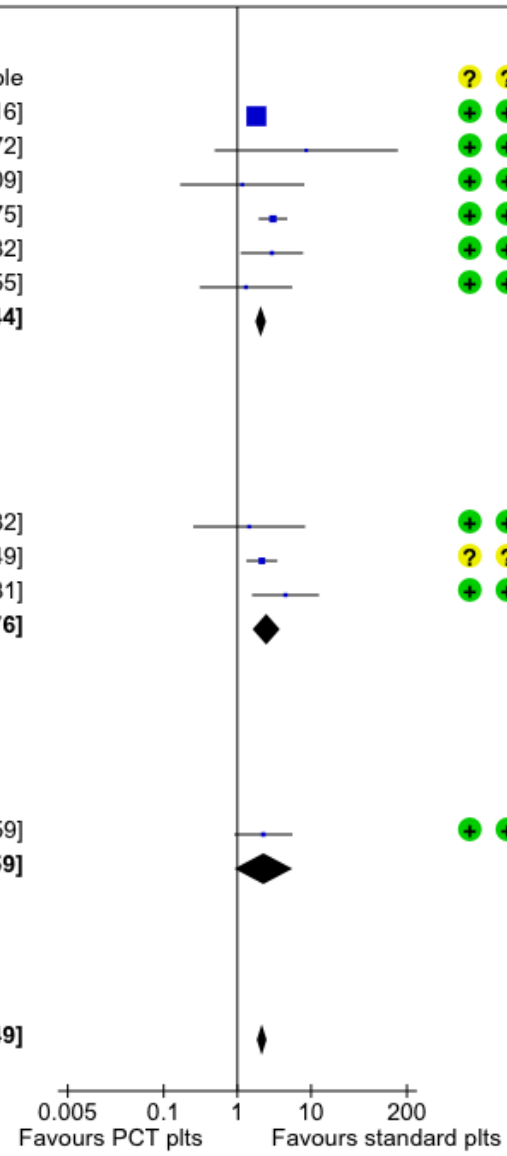
24 hour corrected count increment

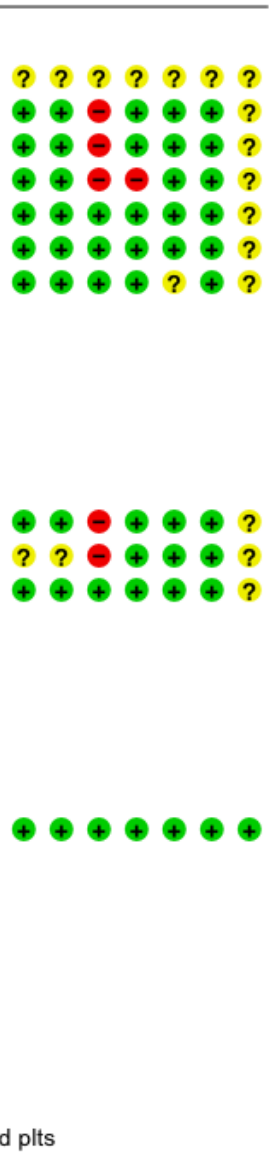



PCT Plts
Standard Plts
Mean difference
Mean difference
Risk of Bias
Study or Subgroup
Mean SD Total Mean SD Total Weight IV, Fixed, 95% CI
IV, Fixed, 95% CI
A B C D E F G
1.28.1 Intercept plts vs plts in plasma or unknown platelet suspension - multiple platelet transfusion studies
Garban 2018 (EFFIPAP) 4.7 5.6 263 7.9 6.4 262 35.3% -3.20 [-4.23 , -2.17]
Janetzko 2005 7.3 6.2 22 10.4 6.5 21 2.6% -3.10 [-6.90 , 0.70]
Kerkhoffs 2010 7.9 5.3 85 12.8 7.8 99 10.3% -4.90 [-6.81 , -2.99]
McCullough 2004 (SPRINT) 6.7 5.63 318 10.1 6.11 327 45.5% -3.40 [-4.31 , -2.49]
van Rhenen 2003 (euroSPRITE) 7.33 5.38 52 10.56 7.06 51 6.3% -3.23 [-5.66 , -0.80]
Subtotal (95% CI) 740 760 100.0% -3.47 [-4.08 , -2.85]
Heterogeneity: Chi² = 2.53, df = 4 (P = 0.64); I² = 0%
Test for overall effect: Z = 11.11 (P < 0.00001)
1.28.2 Mirasol plts vs plts in plasma - multiple platelet transfusion studies
Cazenave 2010 5.58 4.95 56 7.56 7 54 100.0% -1.98 [-4.25 , 0.29]
Subtotal (95% CI) 56 54 100.0% -1.98 [-4.25 , 0.29]
Heterogeneity: Not applicable
Test for overall effect: Z = 1.71 (P = 0.09)
1.28.3 Intercept plts vs plts in PAS - single platelet transfusion studies
Lozano 2011 (TESSI) 4.59 3.52 92 6.55 5.21 94 100.0% -1.96 [-3.24 , -0.68]
Subtotal (95% CI) 92 94 100.0% -1.96 [-3.24 , -0.68]
Heterogeneity: Not applicable
Test for overall effect: Z = 3.01 (P = 0.003)
1.28.4 Intercept platelets vs platelets in PAS
Garban 2018 (EFFIPAP) 4.7 5.6 263 6.4 5.9 266 59.6% -1.70 [-2.68 , -0.72]
Kerkhoffs 2010 7.9 5.3 85 11.6 7.6 94 15.8% -3.70 [-5.61 , -1.79]
Rebulla 2017 (IPTAS) 6.09 4.51 109 9.15 6.7 107 24.6% -3.06 [-4.59 , -1.53]
Subtotal (95% CI) 457 467 100.0% -2.35 [-3.11 , -1.59]
Heterogeneity: Chi² = 4.45, df = 2 (P = 0.11); I² = 55%
Test for overall effect: Z = 6.09 (P < 0.00001)
1.28.5 Mirasol plts vs platelets in PAS
Rebulla 2017 (IPTAS) 6.05 4.48 97 8.61 6.7 97 100.0% -2.56 [-4.16 , -0.96]
Subtotal (95% CI) 97 97 100.0% -2.56 [-4.16 , -0.96]
Heterogeneity: Not applicable
Test for overall effect: Z = 3.13 (P = 0.002)
1.28.6 Theraflex plts vs plts in PAS
Brixner 2021 (CAPTURE) 8.77 5.52 87 10.85 6.16 84 100.0% -2.08 [-3.84 , -0.32]
Subtotal (95% CI) 87 84 100.0% -2.08 [-3.84 , -0.32]
Heterogeneity: Not applicable
Test for overall effect: Z = 2.32 (P = 0.02)
Test for subgroup differences: Chi² = 8.81, df = 5 (P = 0.12), I² = 43.2%
-10 -5 0 5 10
Favours standard plts
Favours PCT plts

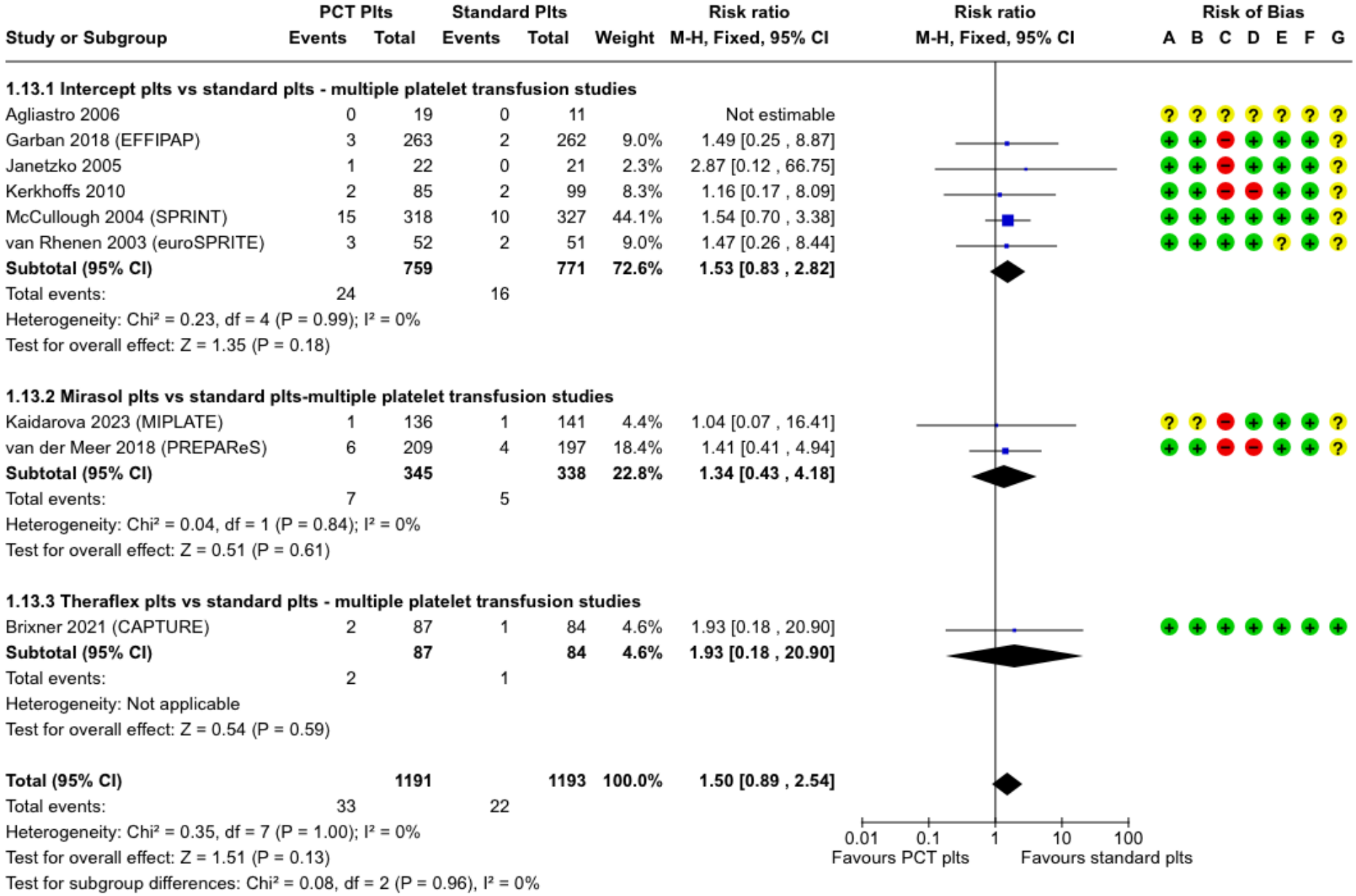
Platelet refractoriness

Study or Subgroup	PCT Plts Events	PCT Plts Total	Standard Plts Events	Standard Plts Total	Weight	Risk ratio M-H, Fixed, 95% CI
1.12.1 Intercept plts vs standard plts - multiple platelet transfusion studies						
Agliastro 2006	0	19	0	11		Not estimable
Garban 2018 (EFFIPAP)	180	263	99	262	60.5%	1.81 [1.52 , 2.16]
Janetzko 2005	4	22	0	21	0.3%	8.61 [0.49 , 150.72]
Kerkhoffs 2010	2	85	2	99	1.1%	1.16 [0.17 , 8.09]
McCullough 2004 (SPRINT)	68	318	23	327	13.8%	3.04 [1.94 , 4.75]
Rebulla 2017 (IPTAS)	15	109	5	107	3.1%	2.94 [1.11 , 7.82]
van Rhenen 2003 (euroSPRITE)	4	52	3	51	1.8%	1.31 [0.31 , 5.55]
Subtotal (95% CI)		**868**		**878**	**80.7%**	**2.07 [1.76 , 2.44]**
Total events:	273		132			
Heterogeneity: Chi² = 7.25, df = 5 (P = 0.20); I² = 31%						
Test for overall effect: Z = 8.62 (P < 0.00001)						
1.12.2 Mirasol plts vs standard plts - multiple platelet transfusion studies						
Cazenave 2010	3	56	2	54	1.2%	1.45 [0.25 , 8.32]
Kaidarova 2023 (MIPLATE)	41	145	20	152	11.9%	2.15 [1.32 , 3.49]
Rebulla 2017 (IPTAS)	18	97	4	97	2.4%	4.50 [1.58 , 12.81]
Subtotal (95% CI)		**298**		**303**	**15.6%**	**2.46 [1.61 , 3.76]**
Total events:	62		26			
Heterogeneity: Chi² = 1.93, df = 2 (P = 0.38); I² = 0%						
Test for overall effect: Z = 4.16 (P < 0.0001)						
1.12.3 Theraflex plts vs standard plts - multiple platelet transfusion studies						
Brixner 2021 (CAPTURE)	14	87	6	84	3.7%	2.25 [0.91 , 5.59]
Subtotal (95% CI)		**87**		**84**	**3.7%**	**2.25 [0.91 , 5.59]**
Total events:	14		6			
Heterogeneity: Not applicable						
Test for overall effect: Z = 1.75 (P = 0.08)						
Total (95% CI)		**1253**		**1265**	**100.0%**	**2.14 [1.83 , 2.49]**
Total events:	349		164			
Heterogeneity: Chi² = 10.10, df = 9 (P = 0.34); I² = 11%						
Test for overall effect: Z = 9.72 (P < 0.00001)						
Test for subgroup differences: Chi² = 0.57, df = 2 (P = 0.75), I² = 0%						





Platelet refractoriness and alloimmunisation



Study or Subgroup	PCT Plts Events	PCT Plts Total	Standard Plts Events	Standard Plts Total	Weight	Risk ratio M-H, Fixed, 95% CI
1.13.1 Intercept plts vs standard plts - multiple platelet transfusion studies						
Agliastro 2006	0	19	0	11		Not estimable
Garban 2018 (EFFIPAP)	3	263	2	262	9.0%	1.49 [0.25 , 8.87]
Janetzko 2005	1	22	0	21	2.3%	2.87 [0.12 , 66.75]
Kerkhoffs 2010	2	85	2	99	8.3%	1.16 [0.17 , 8.09]
McCullough 2004 (SPRINT)	15	318	10	327	44.1%	1.54 [0.70 , 3.38]
van Rhenen 2003 (euroSPRITE)	3	52	2	51	9.0%	1.47 [0.26 , 8.44]
Subtotal (95% CI)		**759**		**771**	**72.6%**	**1.53 [0.83 , 2.82]**
Total events:	24		16			
Heterogeneity: Chi² = 0.23, df = 4 (P = 0.99); I² = 0%						
Test for overall effect: Z = 1.35 (P = 0.18)						
1.13.2 Mirasol plts vs standard plts-multiple platelet transfusion studies						
Kaidarova 2023 (MIPLATE)	1	136	1	141	4.4%	1.04 [0.07 , 16.41]
van der Meer 2018 (PREPAReS)	6	209	4	197	18.4%	1.41 [0.41 , 4.94]
Subtotal (95% CI)		**345**		**338**	**22.8%**	**1.34 [0.43 , 4.18]**
Total events:	7		5			
Heterogeneity: Chi² = 0.04, df = 1 (P = 0.84); I² = 0%						
Test for overall effect: Z = 0.51 (P = 0.61)						
1.13.3 Theraflex plts vs standard plts - multiple platelet transfusion studies						
Brixner 2021 (CAPTURE)	2	87	1	84	4.6%	1.93 [0.18 , 20.90]
Subtotal (95% CI)		**87**		**84**	**4.6%**	**1.93 [0.18 , 20.90]**
Total events:	2		1			
Heterogeneity: Not applicable						
Test for overall effect: Z = 0.54 (P = 0.59)						
Total (95% CI)		**1191**		**1193**	**100.0%**	**1.50 [0.89 , 2.54]**
Total events:	33		22			
Heterogeneity: Chi² = 0.35, df = 7 (P = 1.00); I² = 0%						
Test for overall effect: Z = 1.51 (P = 0.13)						
Test for subgroup differences: Chi² = 0.08, df = 2 (P = 0.96), I² = 0%						

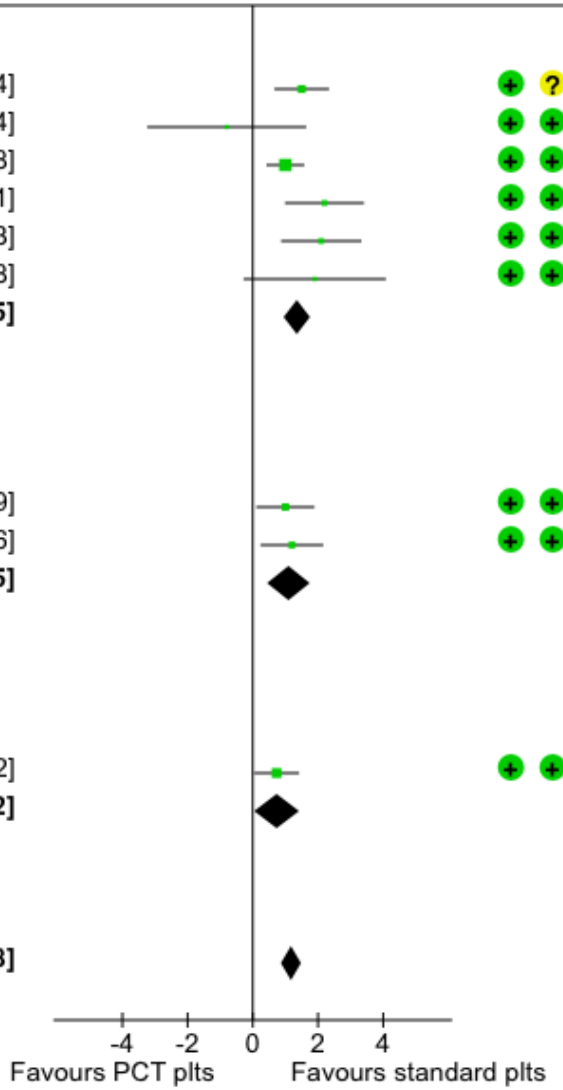
Majority of platelet transfusions are prophylactic

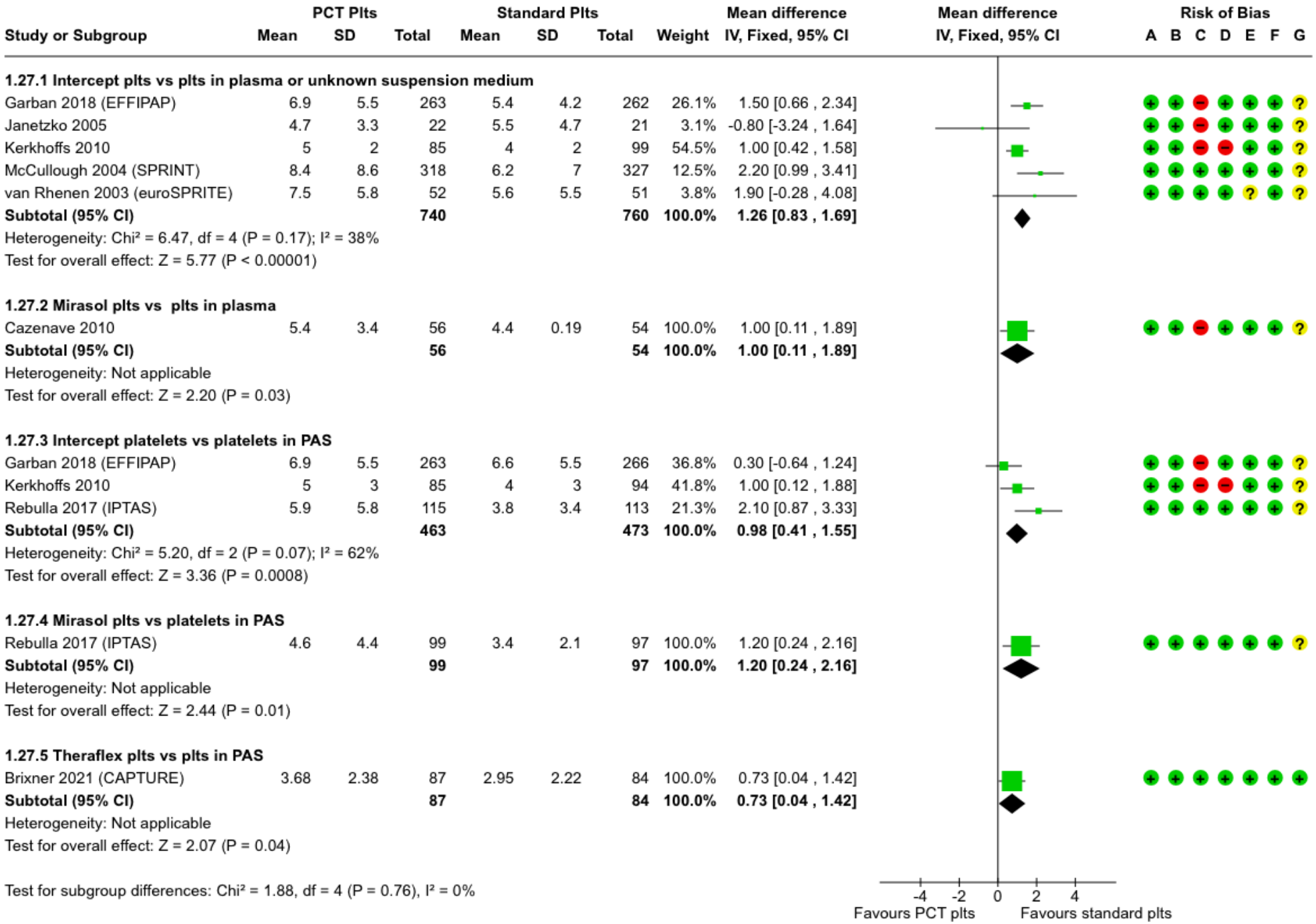
Reason for Transfusion	Audited episodes in each category	Appropriate	Indeterminate	Outside guidelines
Prophylactic	77%	55%	8%	37%
Pre - procedure	9%	61%	20%	19%
Therapeutic	10%	87%	7%	6%
Unclear	4%	0%	100%	0%

NCABT Audit in Haematology Patients 2016

Platelet transfusions required

Study or Subgroup	PCT Plts Mean	PCT Plts SD	PCT Plts Total	Standard Plts Mean	Standard Plts SD	Standard Plts Total	Weight	Mean difference IV, Fixed, 95% CI	Risk of Bias A B C D E F G
1.24.1 Intercept plts vs standard plts - multiple platelet transfusion studies									
Garban 2018 (EFFIPAP)	6.9	5.5	263	5.4	4.2	262	13.5%	1.50 [0.66 , 2.34]	+ ? − + + + ?
Janetzko 2005	4.7	3.3	22	5.5	4.7	21	1.6%	-0.80 [-3.24 , 1.64]	+ + − + + + ?
Kerkhoffs 2010	5	2	85	4	2	99	28.2%	1.00 [0.42 , 1.58]	+ + − − + + ?
McCullough 2004 (SPRINT)	8.4	8.6	318	6.2	7	327	6.4%	2.20 [0.99 , 3.41]	+ + + + + + ?
Rebulla 2017 (IPTAS)	5.9	5.8	115	3.8	3.4	113	6.2%	2.10 [0.87 , 3.33]	+ + + + + + ?
van Rhenen 2003 (euroSPRITE)	7.5	5.8	52	5.6	5.5	51	2.0%	1.90 [-0.28 , 4.08]	+ + + + ? + ?
Subtotal (95% CI)			**855**			**873**	**58.0%**	**1.35 [0.95 , 1.75]**	
Heterogeneity: Chi² = 8.07, df = 5 (P = 0.15); I² = 38%									
Test for overall effect: Z = 6.55 (P < 0.00001)									
1.24.2 Mirasol plts vs standard plts - multiple platelet transfusion studies									
Cazenave 2010	5.4	3.4	56	4.4	0.19	54	11.9%	1.00 [0.11 , 1.89]	+ + − + + + ?
Rebulla 2017 (IPTAS)	4.6	4.4	99	3.4	2.1	97	10.2%	1.20 [0.24 , 2.16]	+ + + + + + ?
Subtotal (95% CI)			**155**			**151**	**22.1%**	**1.09 [0.44 , 1.75]**	
Heterogeneity: Chi² = 0.09, df = 1 (P = 0.77); I² = 0%									
Test for overall effect: Z = 3.27 (P = 0.001)									
1.24.3 Theraflex plts vs standard plts - multiple transfusion studies									
Brixner 2021 (CAPTURE)	3.68	2.38	87	2.95	2.22	84	19.9%	0.73 [0.04 , 1.42]	+ + + + + + +
Subtotal (95% CI)			**87**			**84**	**19.9%**	**0.73 [0.04 , 1.42]**	
Heterogeneity: Not applicable									
Test for overall effect: Z = 2.07 (P = 0.04)									
Total (95% CI)			**1097**			**1108**	**100.0%**	**1.17 [0.86 , 1.48]**	
Heterogeneity: Chi² = 10.54, df = 8 (P = 0.23); I² = 24%									
Test for overall effect: Z = 7.45 (P < 0.00001)									
Test for subgroup differences: Chi² = 2.38, df = 2 (P = 0.30), I² = 15.9%									

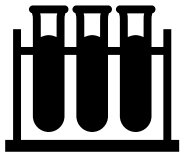




So what do we know?

Nearly all the evidence is in adults with haematological malignancies in high-income countries

It may increase the risk of clinically significant bleeding (WHO 2 or above). It may or may not increase the risk of severe bleeding (WHO 3 or above)



It probably decreases the platelet count increment and corrected count increment, and therefore the risk of meeting trial definitions of platelet refractoriness. It probably does not affect the risk of alloimmunisation

It probably increases the number of platelet transfusions patients with haematological malignancies require to support them through their treatment

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