

Platelets

Past, Present and Future

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Blood and Transplant

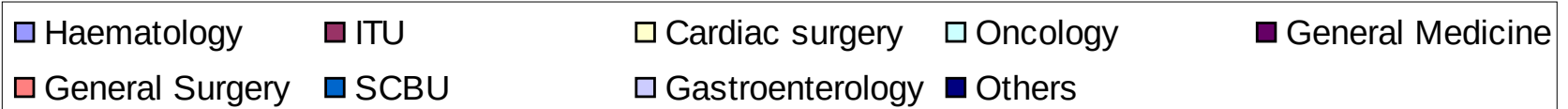
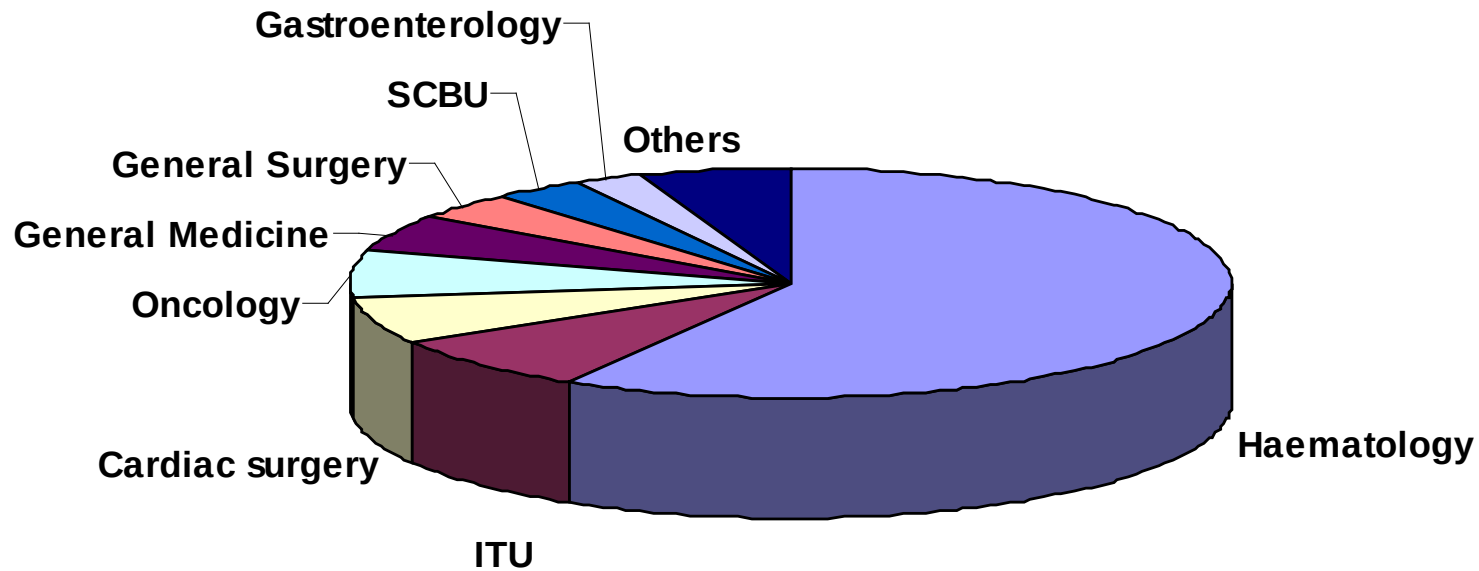

Radcliffe Department of Medicine



Why do we use platelet transfusions?



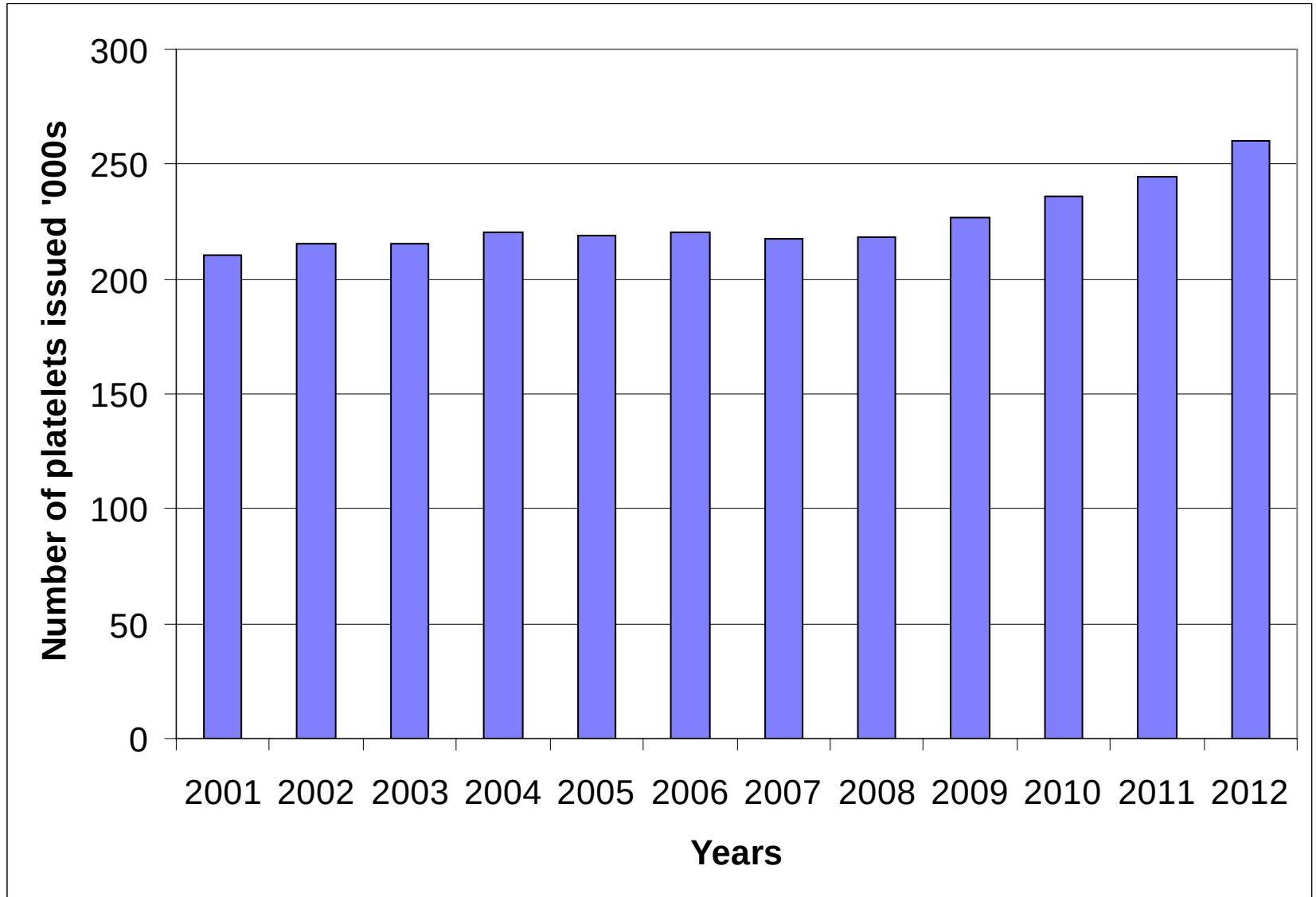
Haematology patients use the majority of platelet transfusions



Data from North West of England and Wales Audit of platelet use and wastage.

Pendry & Davies 2011. Blood and Transplant Matters. 17-19.

Platelet usage increasing



Majority of platelet transfusions are prophylactic

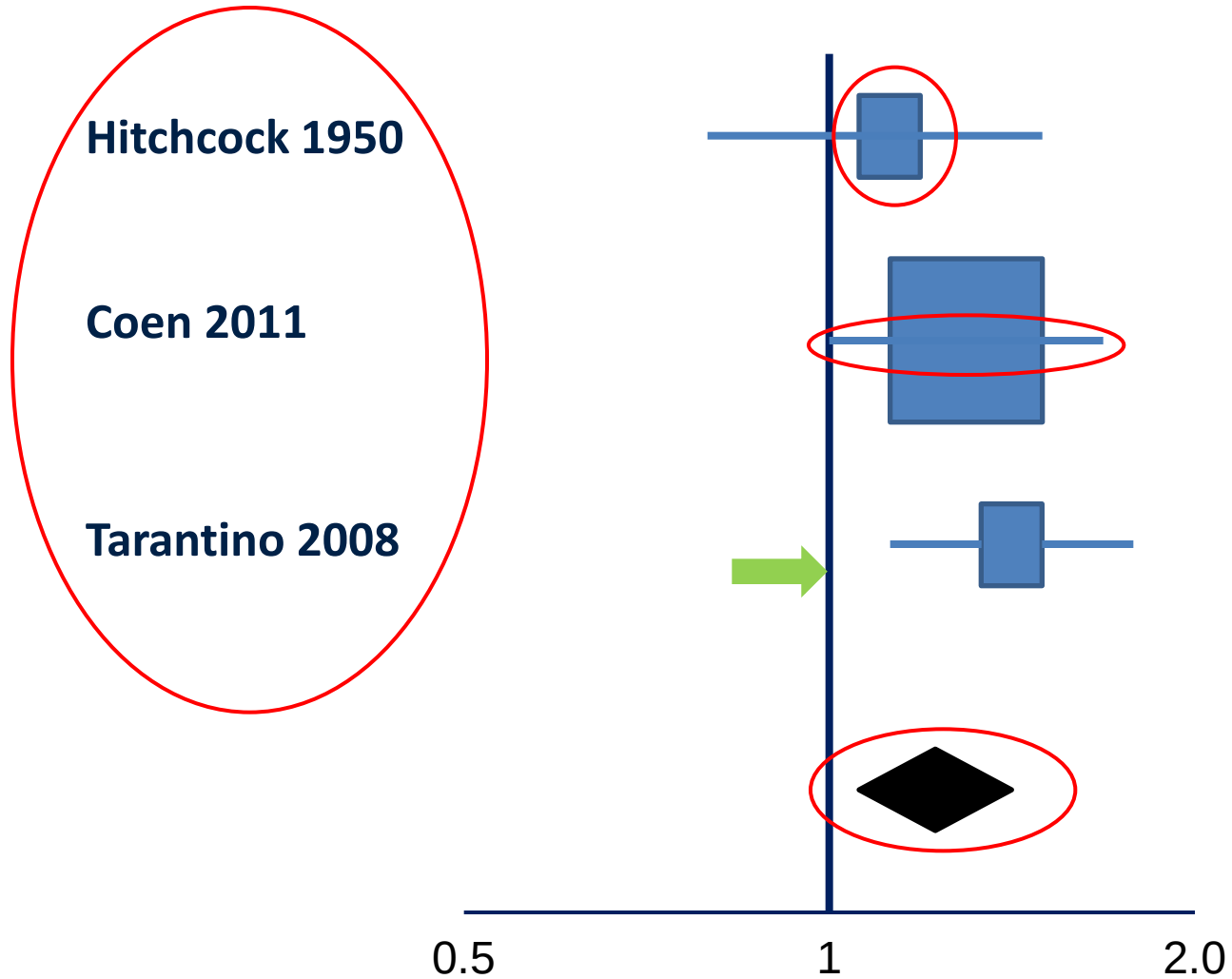
Reason for Transfusion	Audited episodes in each category	Appropriate	Indeterminate	Outside guidelines
Prophylactic	69%	60%	6%	34%
Pre -procedure	15%	64%	13%	23%
Therapeutic	13%	84%	12%	5%
Unclear	3%	0%	100%	0%



Current Issues in Prophylactic Platelet Transfusion Studies

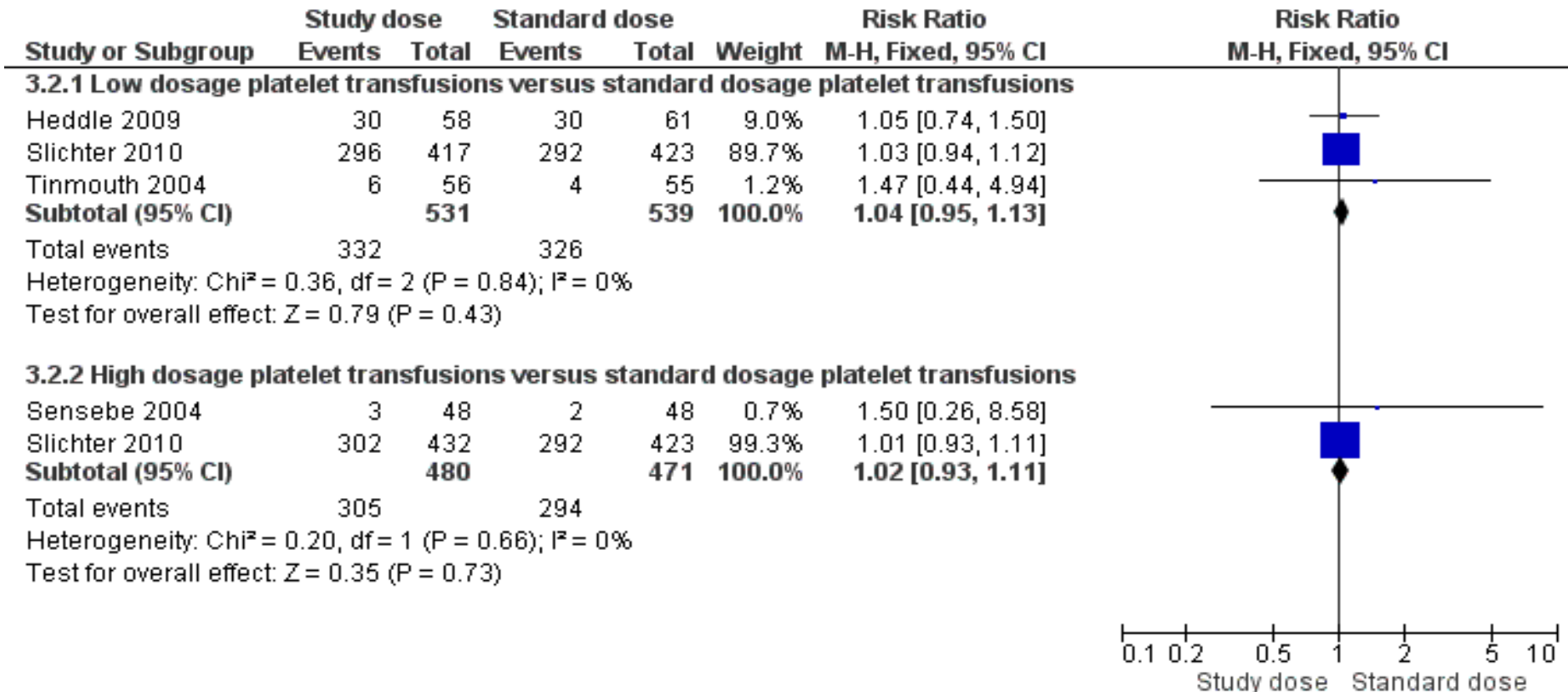
- Platelet dose
- Platelet threshold
- Therapeutic versus prophylactic
- Type of platelet component

Forest Plot



Platelet Dose

Number of Patients with clinically significant bleeding



Platelets

Don't use two...



...when one will do

For prophylactic use in a 70kg adult, one adult therapeutic dose (ATD) typically gives an immediate rise in platelet count of

approximately 20 - 40 x 10⁹/l⁽¹⁾

Do not administer double dose platelets for prophylactic transfusions as this practice does not decrease the risk of bleeding⁽²⁾

Request and administer one unit/ATD, then reassess your patient.

A platelet increment can be obtained 10 minutes after completion of the transfusion⁽³⁾

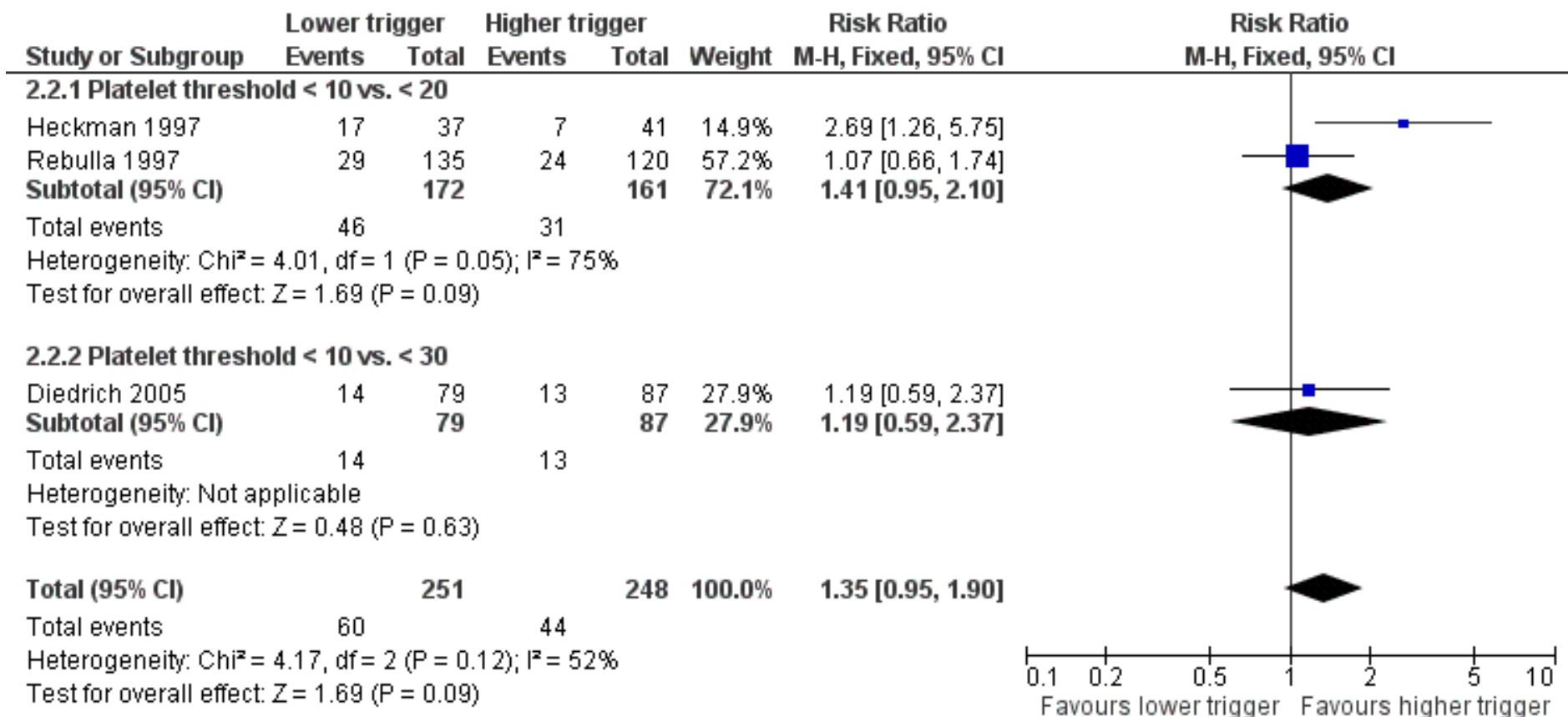
1. McColland DBL (Ed) (2006) Handbook of Transfusion Medicine 4th Edition, The Stationery Office
2. Sticher JL, Kaufman RM, Aszmann SF, et al. Dose of prophylactic platelet transfusions and prevention of haemorrhage. N Engl J Med 2010;362:600-12.
3. O'Connell B, Lee EJ, Schiffer CA. The value of 10-minute post transfusion platelet counts. Transfusion 1999; 39: 66-67.

Further copies available from MHBT.CustomerService@nhs.uk December 2011 V.1

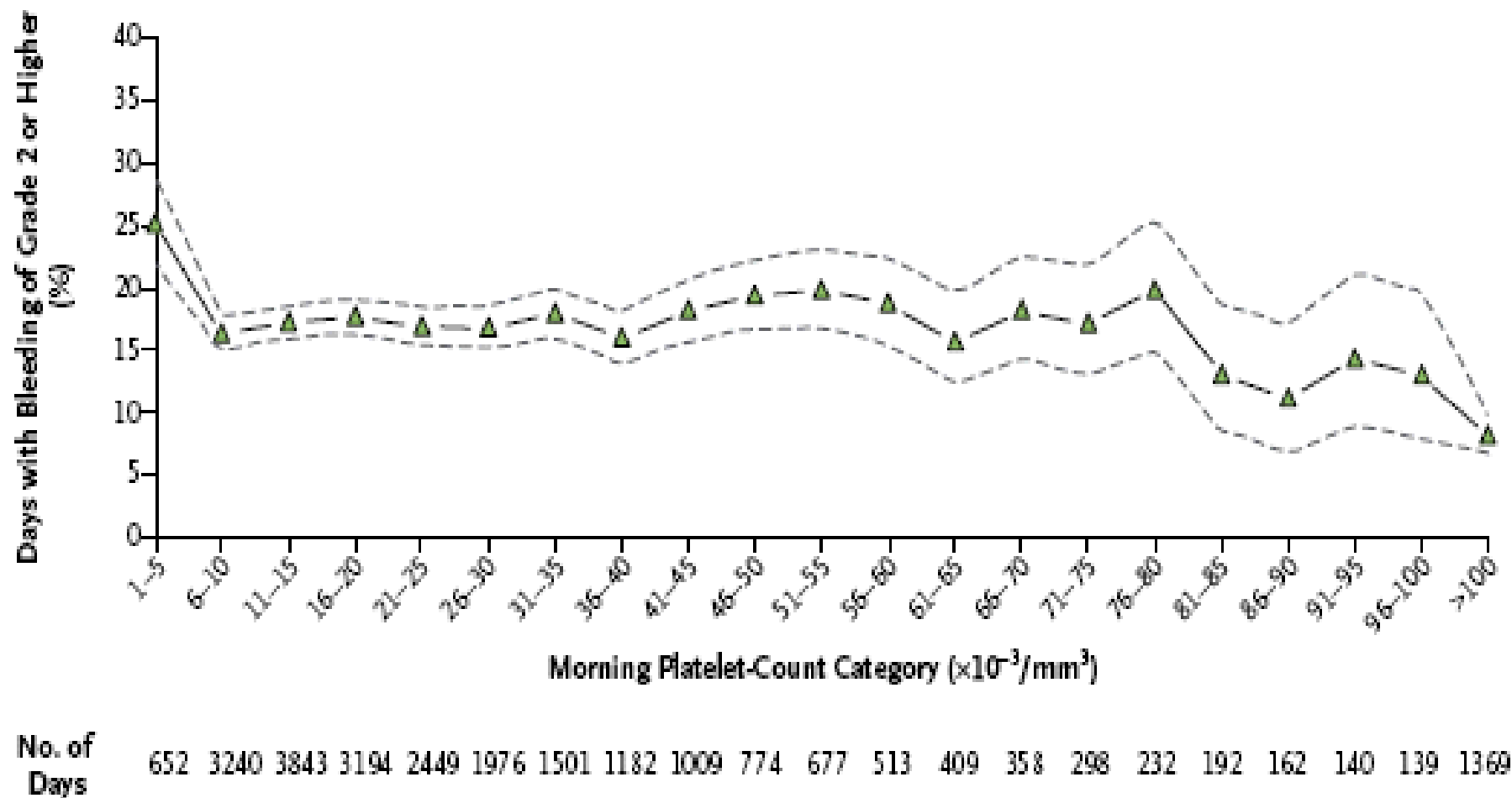
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Platelet Threshold

Number of Patients with clinically significant bleeding

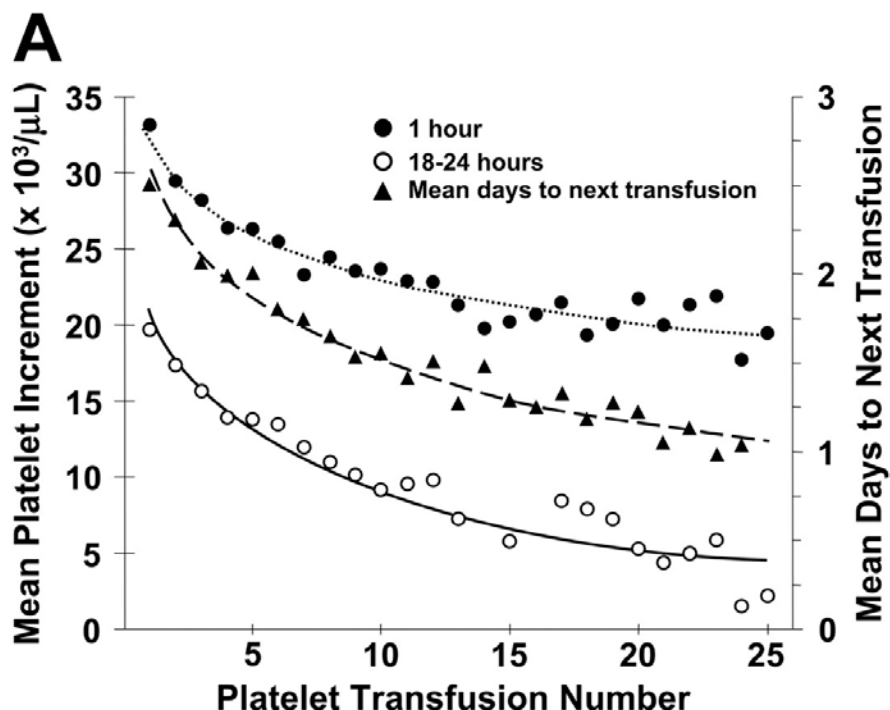
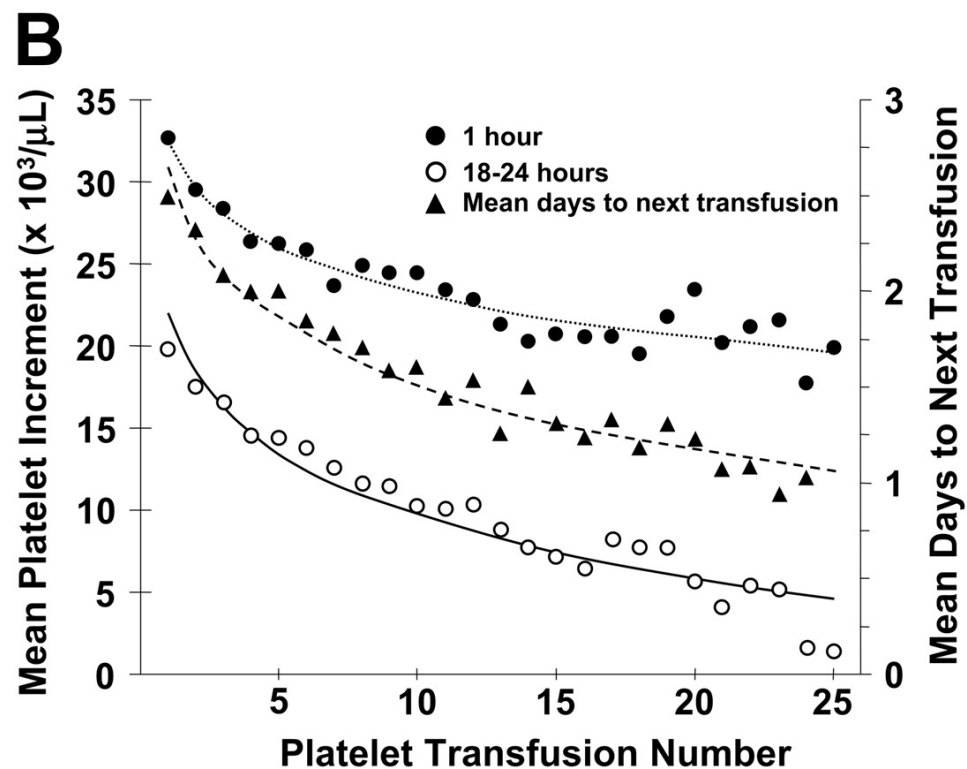


Morning platelet count is a poor predictor of bleeding risk



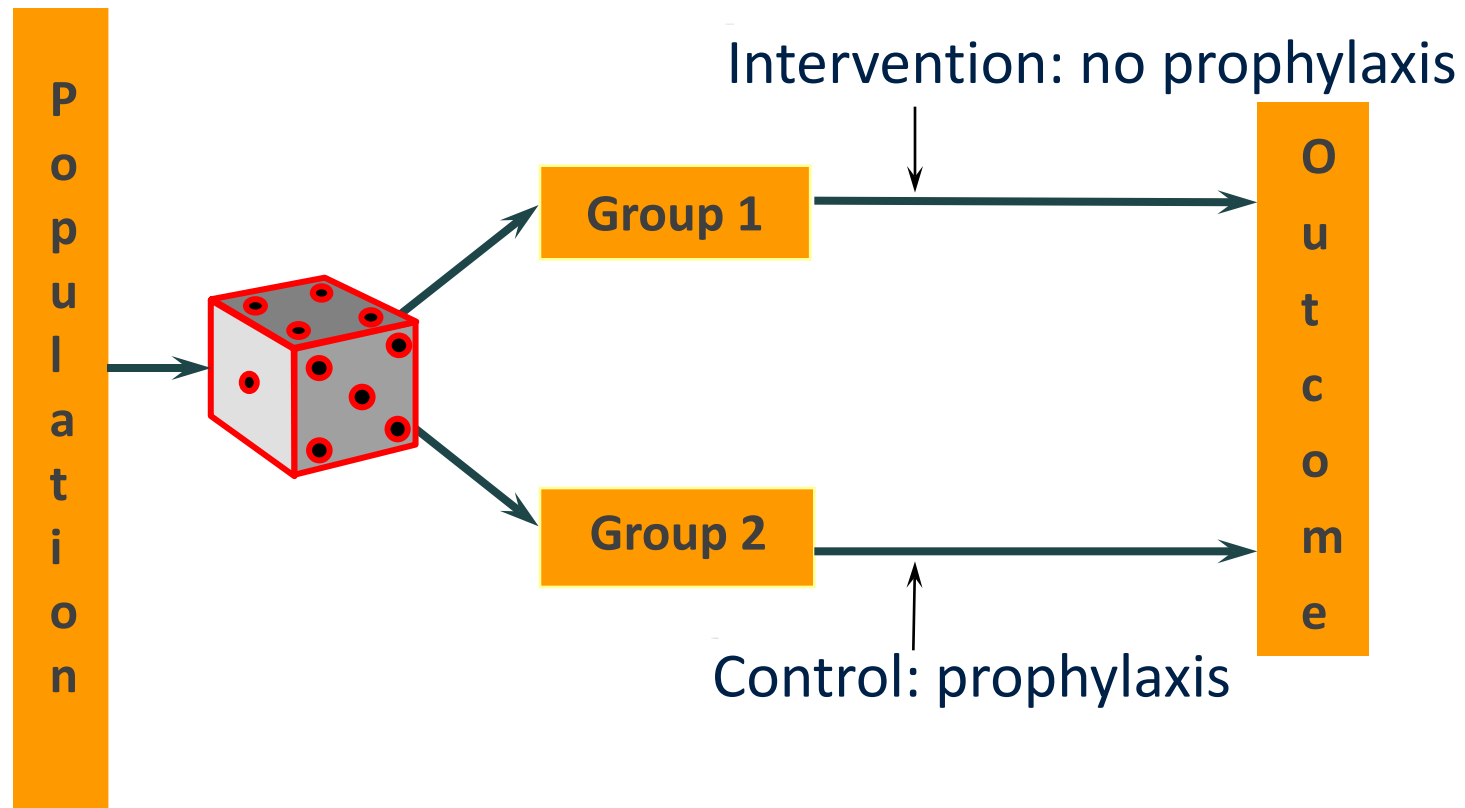
Dose of prophylactic platelet transfusions and prevention of hemorrhage. Slichter *et al.* *NEJM* 2010;362:600-613

Relationship between number of platelet transfusions, platelet increments and days to next transfusion



- 1-hr increment
- 18-24 hr increment
- ▲ Days to next transfusion
- A = all patients
- B = antibody negative patients

Multicentre trials of prophylaxis vs. no prophylaxis



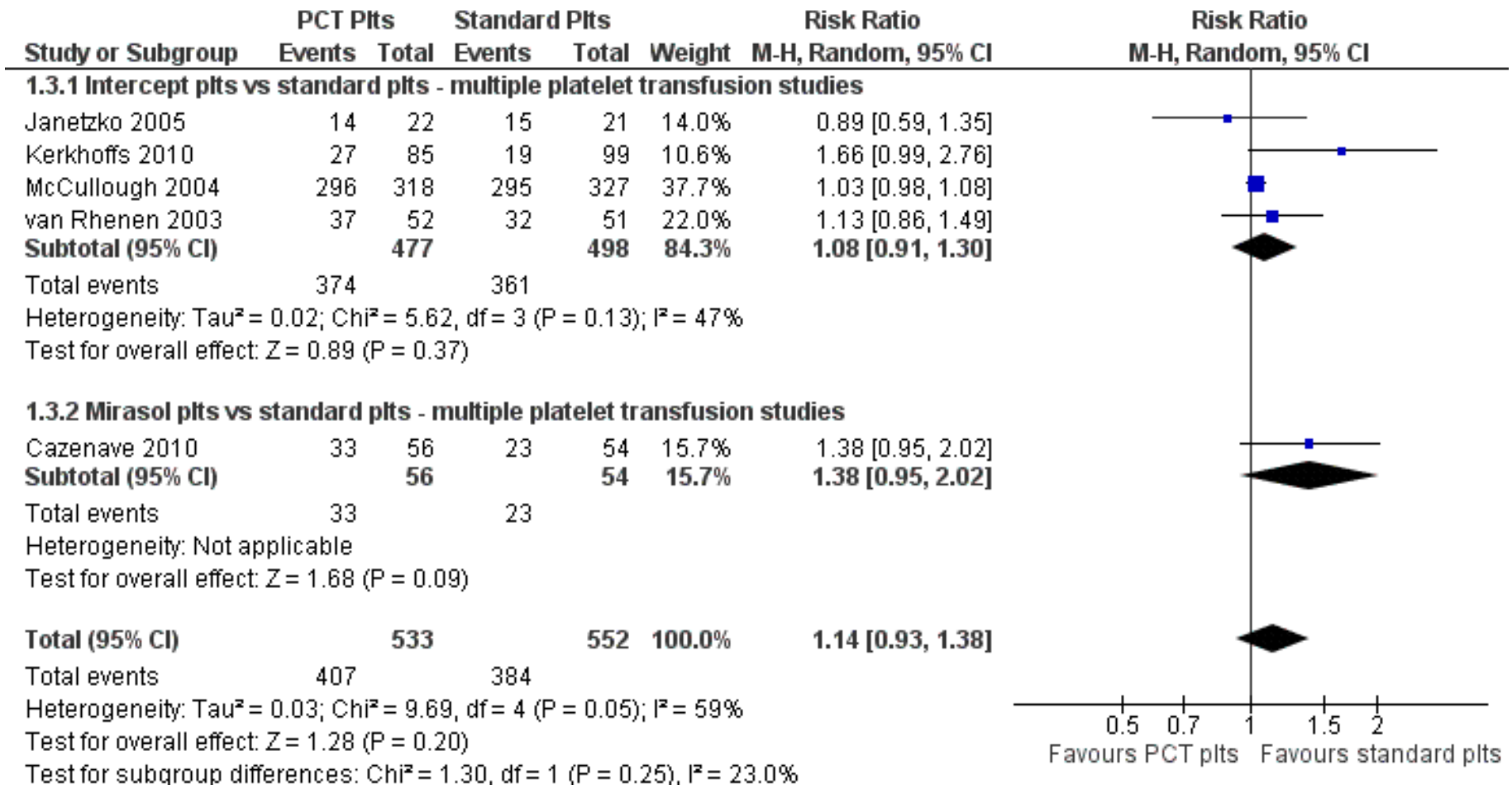
	German Study (Wandt 2012)		TOPPS (Stanworth 2013)	
	Prophylaxis	No Prophylaxis	Prophylaxis	No Prophylaxis
Number of Patients	194	197	298	300
AML Patients	96	94	55	55
Autologous SCT	98	103	210	210
Platelet transfusions/ patient	2.44 (2.22 to 2.67)	1.63 (1.42 to 1.83)	3.0 ± 3.2	1.7 ± 2.6
Proportion of patients receiving platelet transfusions	NR	NR	89% (266/298)	59% (176/300)
Clinically significant bleeding	19%	42%	43% (128/298)	50% (151/300)
Severe or life- threatening bleeding	2% (7/343 Rx cycles)	6% (21/301 Rx cycles)	0.3% (1/298)	2% (6/300)
Bleeding in autologous sub-group	8% (3 to 14)	28% (19 to 37)	45%	47%

Wandt *et al.* Therapeutic platelet transfusion versus routine prophylactic transfusion in patients with haematological malignancies: an open-label, multicentre, randomised study. *Lancet* 2012.

Stanworth *et al.* A no-prophylaxis platelet transfusion strategy for hematologic malignancies. *NEJM* 2013

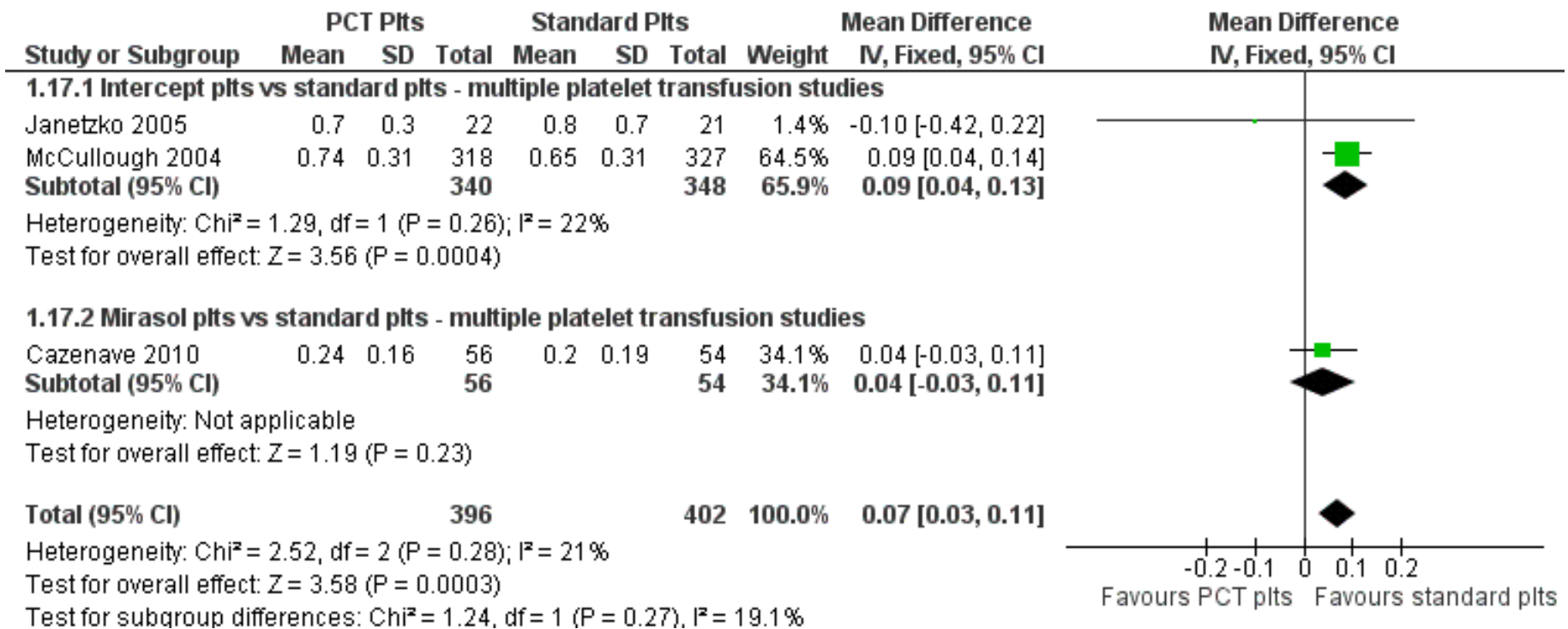
Pathogen-reduced platelets

Number of Patients with any bleeding

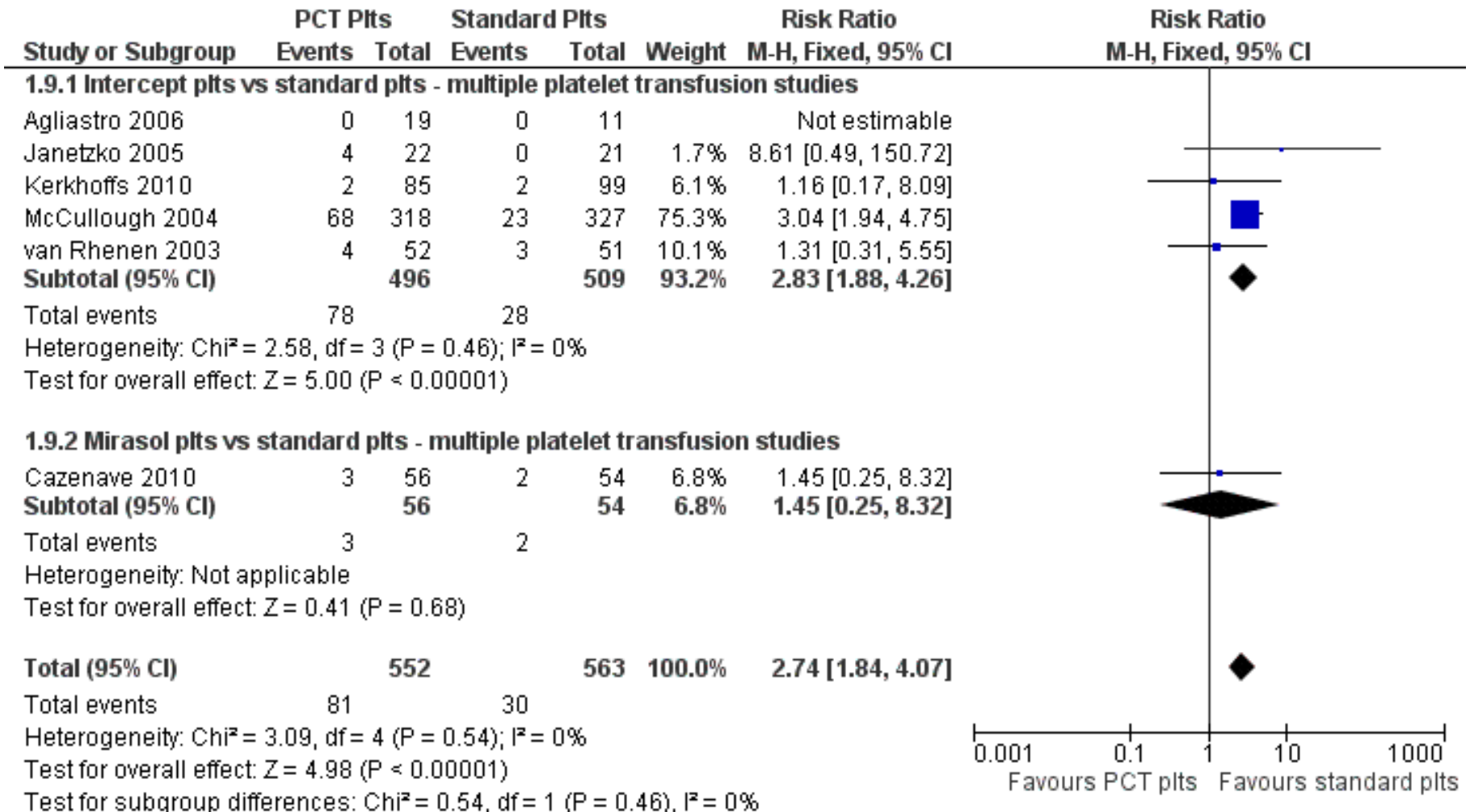


Pathogen-reduced platelets

Number of platelet transfusions/day



Pathogen-reduced platelets platelet refractoriness



Review of current Issues in Prophylactic Platelet Transfusion Studies

- Platelet dose
- Platelet threshold
- Therapeutic versus prophylactic
- Type of platelet component

Future research

- More evidence required for use of platelet transfusions prior to procedures
- A better understanding of all haemostatic changes in patients with haematological disorders
- A more patient-centred approach to platelet transfusions required

Acknowledgements

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