



The following slides are from the presenter, Dr. Ryan Metcalf, from the Breakthroughs in Blood webinar hosted on September 29, 2026.

The *Breakthroughs in blood: Advancements into action* series delves into the “So what?” and “Now what?” of blood science and medical research, with a dedicated focus on transfusion clinical trials and guidelines.

Coordinated by



THE 2025 AABB/ICTMG INTERNATIONAL PLATELET TRANSFUSION GUIDELINES



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Private Information



DISCLOSURES

Chair, Association for the Advancement of Blood and Biotherapies (AABB) Clinical Transfusion Medicine Committee

Scientific advising: Cerus

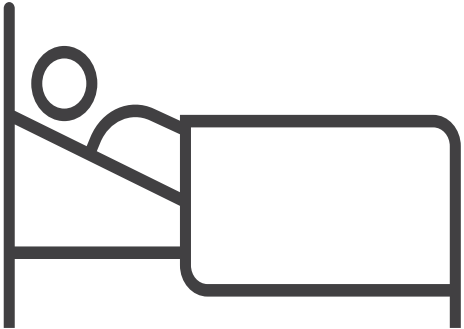
Grants: Haemonetics, Hemosonics, Octapharma, Werfen, Cerus

Co-inventor: Intelvia

“Clinicians and patients must base their decisions on the best current evidence. Action is required now, and clinicians appropriately look to the best current evidence to inform their current decisions. When the evidence is not high certainty, things may always change in the future. This is inevitable, but not a reason to avoid acting on the basis of best current evidence.”

-Dr. Gordon Guyatt

WHO GETS PLATELET TRANSFUSIONS?



- Hematology/Oncology
- Critical Illness
- Patients undergoing “minor” procedures
 - Key examples: lumbar puncture, central venous catheter placement, interventional radiology
- Cardiovascular Surgery
- Trauma

- Neurosurgery
- Obstetrics
- Other Surgical Settings: General Surgery, Orthopedic Surgery, Surgical Oncology, Burn Surgery, Urology, and more
- General Internal Medicine
- Neonates with Critical Illness

PLATELET USE IN THE UNITED STATES

- 2.2 million / year
- 50% more platelet transfusions per 1000 population than the United Kingdom and Canada

1. McDavid et al. Have we reached a new baseline for blood collection and transfusion in the United States? National Blood Collection and Utilization Survey, 2023. Transfusion. 2025.

2. Ohto et al. The 2024 international survey of platelet products and practice. Transfusion and Apheresis Science. 2025.

Platelet count minimums in one adult dose.

Platelet number dose	Country/area/center	
	n (%)	Specification
2.0×10^{11}	13 (38 %)	Australia, Austria, Denmark, Egypt, Germany, Greece, Finland, Ireland, Italy (Rome Gemelli), Japan, Malaysia, Sweden, Thailand, Turkey, UK
$2.5 \text{ (or } 2.4) \times 10^{11}$	6 (18 %)	Canada, Netherlands, New Zealand, Norway, Spain, Switzerland
3.0×10^{11}	13 (38 %)	Belgium, Brazil, Chinese Taipei, Croatia (2.8×10^{11}), India, Italy (Rome San Camillo, average), Poland, Republic of Korea, USA (Vitalant, NIH and NYBC), Vietnam
Different apheresis and pooled PCs	2 (6 %)	Mongolia (2.0×10^{11} for apheresis, 3.0×10^{11} for pooled platelets), Singapore (3.0×10^{11} for apheresis, 2.4×10^{11} for pooled platelets)
Total	34 (100 %)	

BENEFITS AND HARMS OF PLATELET TRANSFUSION

Benefits (presumed)

- Rationale: in patients with thrombocytopenia (or platelet dysfunction) platelet transfusion will increase platelet count and prevent/treat bleeding

Harms (known)

- Transfusion-related adverse events
 - Highest risk of any component
- Alloimmunization
- Infectious disease transmission

Narayan, S. et al., 2024. The 2024 Annual SHOT Report, Manchester: Serious Hazards of Transfusion (SHOT) Steering Group.

Platelet Transfusion

2025 AABB and ICTMG International Clinical Practice Guidelines

Ryan A. Metcalf, MD; Susan Nahirniak, MD; Gordon Guyatt, MD; Aarti Bathla, MPH; Sandra K. White, MS; Arwa Z. Al-Riyami, MD; Rachel C. Jug, MB, BCh, BAO; Ursula La Rocca, MD; Jeannie L. Callum, MD; Claudia S. Cohn, MD; Abe DeAnda, MD; Robert A. DeSimone, MD; Allan Dubon, MLS; Lise J. Estcourt, MB, BChir; Daniela C. Filipescu, MD; Mark K. Fung, MD; Ruchika Goel, MD; Aaron S. Hess, MD; Heather A. Hume, MD; Richard M. Kaufman, MD; Peter Kranke, MD; Vernon J. Louw, MBChB, MMed, PhD; Morten H. Møller, MD; Michael F. Murphy, MD; Jennifer A. Muszynski, MD; Cian J. O'Kelly, MD; Monica B. Pagano, MD; Gopal K. Patidar, MD; Katerina Pavenski, MD; Jacqueline N. Poston, MD; Nabiha H. Saifee, MD, PhD; Moritz Stolla, MD; Zbigniew M. Szczepiorkowski, MD, PhD; Aaron A.R. Tobian, MD; Raman Uberoi, MD; Jonathan Waters, MD; Brittney Williams, MD; Erica M. Wood, MD; Nicole D. Zantek, MD, PhD; Michelle P. Zeller, MD; Brenda J. Grossman, MD; Simon J. Stanworth, MD, DPhil

PODCAST

JAMA Clinical Reviews

JAMA editors and authors explore topics relevant to clinical practice and patient care.

Metcalf RA, Nahirniak S, Guyatt G, et al. Platelet Transfusion: 2025 AABB and ICTMG International Clinical Practice Guidelines. JAMA. 2025. doi:10.1001/jama.2025.7529.

PLATELET GUIDELINES: PURPOSE AND SCOPE

- Need for updated recommendations on clinical use of platelets
- Out of scope:
 - Component attributes
 - Platelet transfusion refractoriness
 - Patients with thrombocytopenia receiving anticoagulation
 - Massive hemorrhage protocols
 - Viscoelastic testing
 - Alternatives/adjuncts (e.g. antifibrinolytic agents)

Annals of Internal Medicine

CLINICAL GUIDELINE

Platelet Transfusion: A Clinical Practice Guideline From the AABB

Richard M. Kaufman, MD; Benjamin Djulbegovic, MD, PhD; Terry Gernsheimer, MD; Steven Kleinman, MD; Alan T. Tinmouth, MD; Kelley E. Capocelli, MD; Mark D. Cipolle, MD, PhD; Claudia S. Cohn, MD, PhD; Mark K. Fung, MD, PhD; Brenda J. Grossman, MD, MPH; Paul D. Mintz, MD; Barbara A. O'Malley, MD; Deborah A. Sesok-Pizzini, MD; Aryeh Shander, MD; Gary E. Stack, MD, PhD; Kathryn E. Webert, MD, MSc; Robert Weinstein, MD; Abu G. Welch, MD; Glenn J. Whitman, MD; Edward C. Wong, MD; and Aaron A.R. Tobian, MD, PhD

Background: The AABB (formerly, the American Association of Blood Banks) developed this guideline on appropriate use of platelet transfusion in adult patients.

Methods: These guidelines are based on a systematic review of the literature.

Conclusion 3: The AABB suggests prophylactic platelet transfusion for patients having elective diagnostic lumbar puncture with platelet count less than 50×10^9 cells/L. (Grade: weak recommendation, low-quality evidence)



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2015

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Original Articles

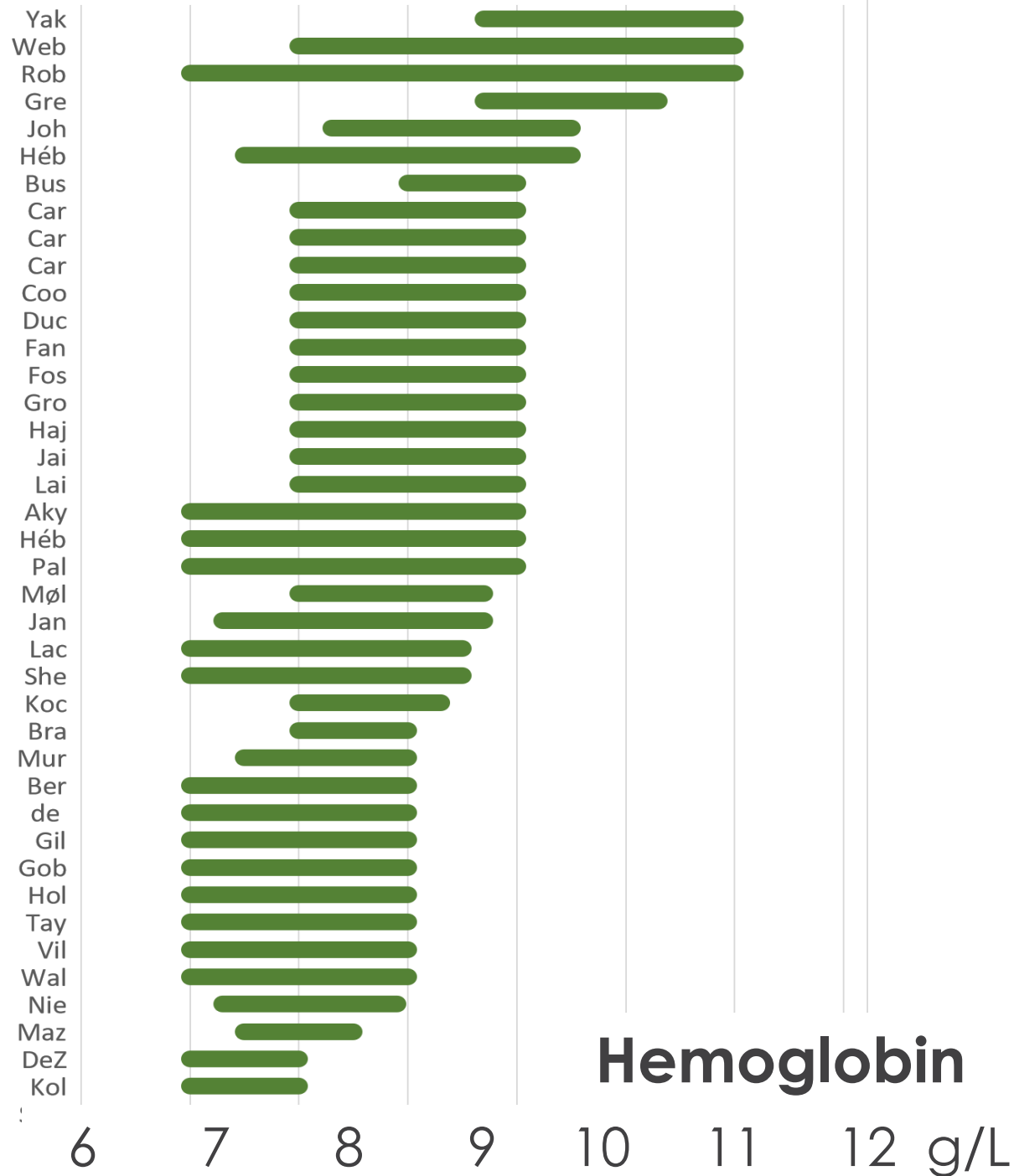
Guidance on Platelet Transfusion for Patients With Hypoproliferative Thrombocytopenia



See Editorial, pages 1-2

Susan Nahirniak^{a,*}, Sherrill J. Slichter^b, Susano Tanael^c, Paolo Rebulla^d, Katerina Pavenski^e, Ralph Vassallo^f, Mark Fung^g, Rene Duquesnoy^h, Chee-Loong Sawⁱ, Simon Stanworth^j, Alan Tinmouth^k, Heather Hume^l, Arjuna Ponnampalam^m, Catherine Moltzanⁿ, Brian Berry^o, Nadine Shehata^p, for the International Collaboration for Transfusion Medicine Guidelines (ICTMG)

**RESTRICTIVE VS.
LIBERAL RED
BLOOD CELL
TRANSFUSION
STRATEGIES:
RANDOMIZED
TRIALS**



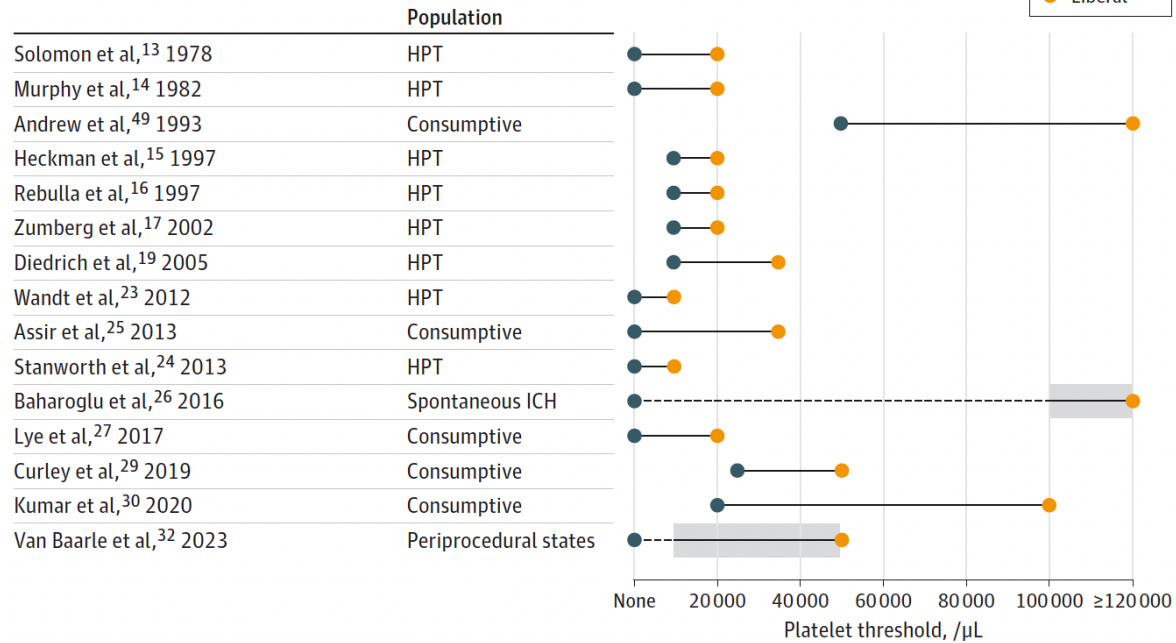
PLATELETS: RESTRICTIVE VS. LIBERAL PARADIGM

21 randomized trials
identified

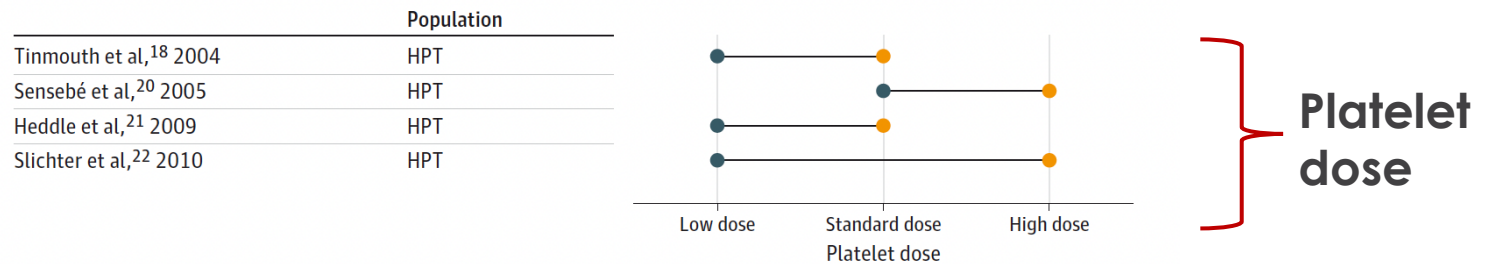
Metcalf RA, Nahirniak S, Guyatt G, et al.
*Platelet Transfusion: 2025 AABB and
ICTMG International Clinical Practice
Guidelines. JAMA. 2025.*
[doi:10.1001/jama.2025.7529](https://doi.org/10.1001/jama.2025.7529).

Figure. Restrictive and Liberal Transfusion Strategies Used Across Randomized Trials

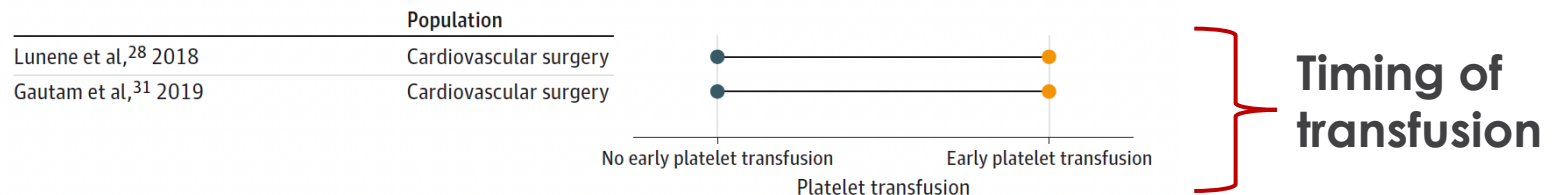
A Platelet threshold



B Platelet dose



C Platelet transfusion



GRADE METHODOLOGY

- Used by 100+ organizations
- Evaluate the certainty of the evidence
 - High (randomized trials start here)
 - Moderate
 - Low (observational studies start here)
 - Very low
- Evidence to decision: making recommendations
 - Strong recommendation (“90+% of patients would want”)
 - Conditional recommendation (“50-90% of patients would want”)

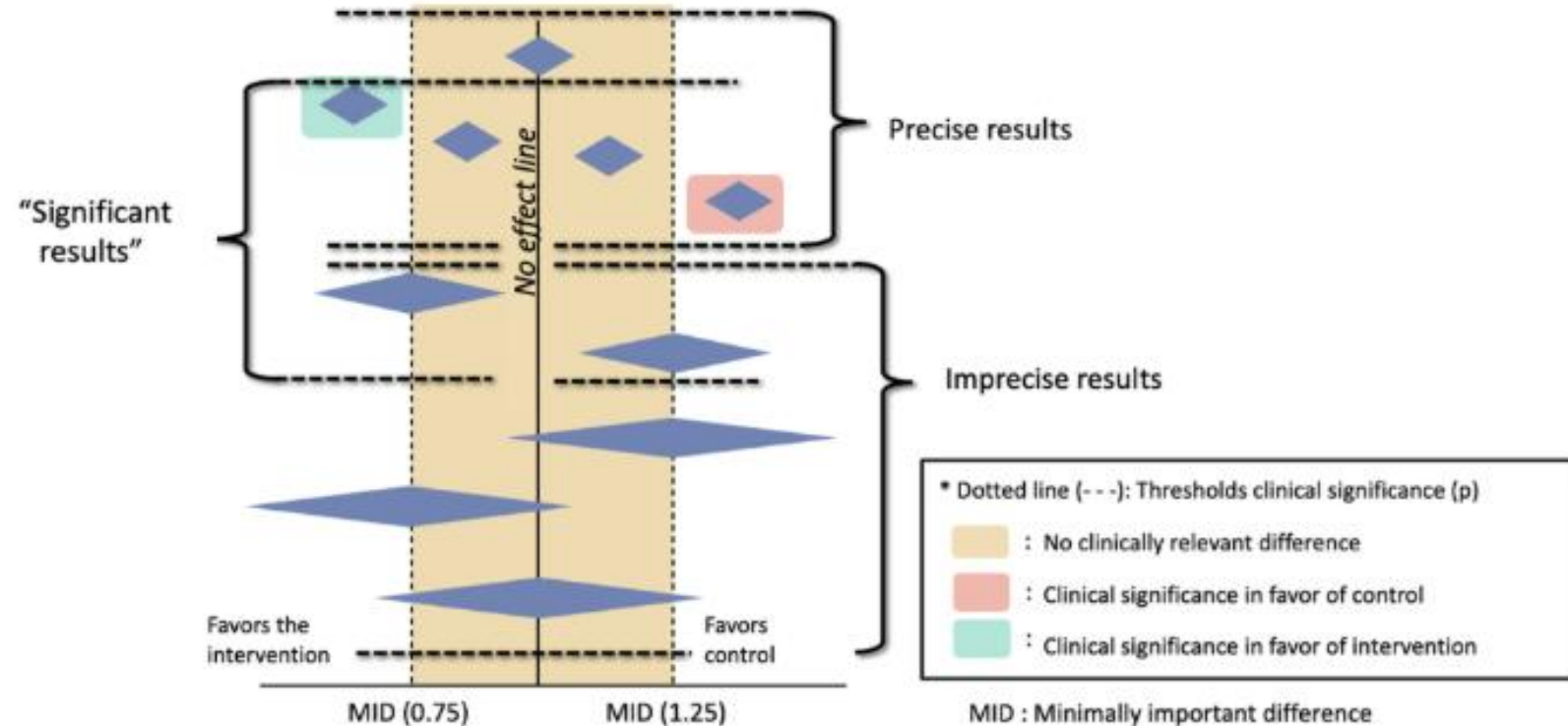


Guyatt et al. BMJ. 2008.

CERTAINTY (QUALITY) OF THE EVIDENCE

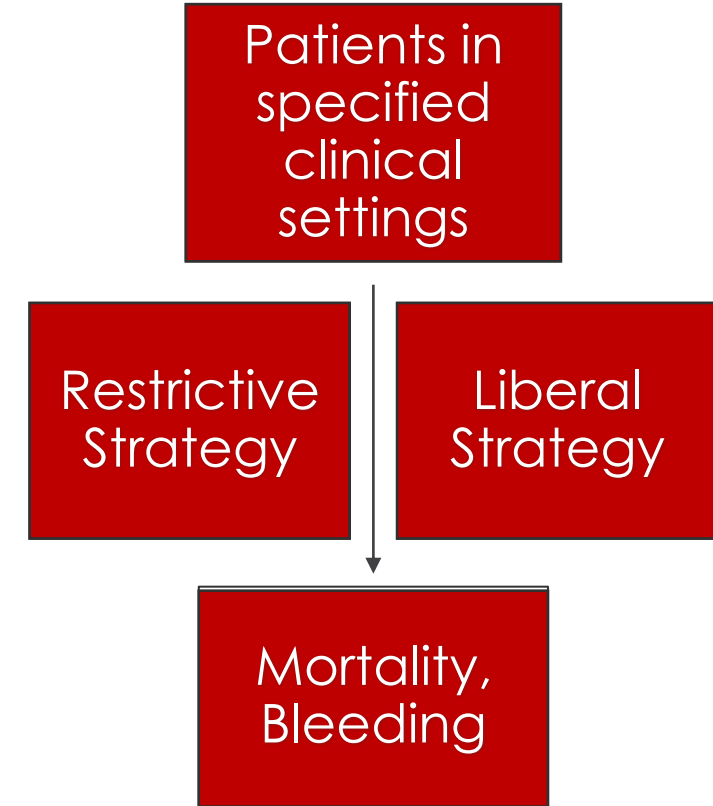
Must consider:

- Risk of bias
- Imprecision
- Inconsistency
- Indirectness



OVERARCHING POPULATION, INTERVENTION, COMPARISON, OUTCOME (PICO) QUESTION

- For patients in whom platelet transfusion might be considered, what is the impact of a restrictive versus a liberal strategy on mortality and bleeding?

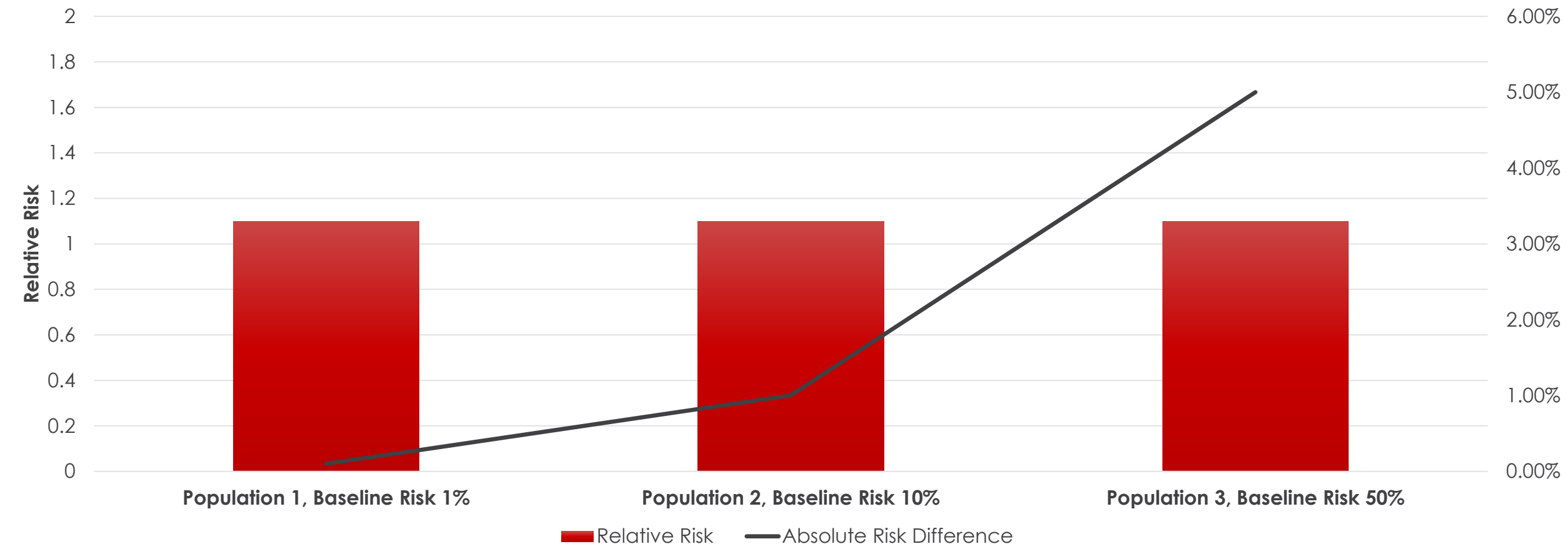


RELATIVE VS. ABSOLUTE EFFECTS OF CLINICAL INTERVENTIONS

- **Relative impact** tends to be constant across populations
- **Absolute impact** varies depending on baseline risk of the outcome
- Patients care about absolute impact (e.g., risk difference in events per 1000)
- Hypothetical example: mortality outcome
 - Relative risk = 1.1 across populations
 - Baseline risk = 1%, 10%, 50%
 - How does baseline risk impact absolute risk difference? ...

CONSTANT RELATIVE RISK; VARYING ABSOLUTE RISK DIFFERENCE

Relative vs Absolute Risks



RESTRICTIVE VS. LIBERAL: CONSTANT RELATIVE EFFECTS?

- Panel: no compelling reason for relative effects to vary by population, but not certain
 - Analyzed overall population
 - Also, analyzed by patient group
 - Facilitate making specific, practical recommendations

Metcalf RA, Nahirniak S, Guyatt G, et al. Platelet Transfusion: 2025 AABB and ICTMG International Clinical Practice Guidelines. JAMA. 2025. doi:10.1001/jama.2025.7529.

SUMMARY OF FINDINGS: OVERALL

Table 2. Summary of Findings of Overall Combined Studies and Populations^a

Outcomes	No. of participants (No. of trials)	No. of events/No. of patients (%)		Risk differences (95% CI)	Odds ratio (95% CI)	Certainty of the evidence (GRADE)	Summary
		Restrictive platelet strategy	Liberal platelet strategy				
Overall population							
All-cause mortality	4867 (20 RCTs)	255/2424 (10.5)	268/2443 (11.0)	-0.4% (-2.2% to 1.7%) 22 fewer to 17 more deaths per 1000	0.96 (0.78 to 1.18)	High	Restrictive probably results in little to no difference in all-cause mortality
WHO grades 2-4 bleeding or equivalent	2860 (11 RCTs)	589/1414 (41.7%)	544/1446 (37.6%)	6.8% (0.9% to 12.8%) 9 to 128 more patients per 1000 experiencing grade 2-4 bleeding with restrictive	1.32 (1.04 to 1.68)	Moderate ^b	Restrictive probably results in little or no difference in grade 2-4 bleeding or equivalent
WHO grades 3-4 bleeding or equivalent	3433 (11 RCTs)	148/1705 (8.7%)	146/1728 (8.4%)	0.3% (-1.9% to 3.0%) 19 fewer to 30 more patients per 1000 experiencing grade 3-4 bleeding with restrictive	1.04 (0.76 to 1.41)	Moderate ^b	Restrictive probably results in little or no difference in grade 3-4 bleeding

Metcalf RA, Nahirniak S, Guyatt G, et al. Platelet Transfusion: 2025 AABB and ICTMG International Clinical Practice Guidelines. JAMA. 2025. doi:10.1001/jama.2025.7529.

EVIDENCE → DECISION

- In the absence of clear benefit with liberal platelet transfusion strategies, favor the unequivocal benefits with restrictive strategies:
 - Avoiding transfusion-related adverse events
 - Maintaining adequate platelet supply
 - Avoiding unnecessary healthcare expenditures

Table 3. Recommendations for Platelet Transfusion

Population	Recommendation and guidance	Certainty of the evidence ^a	Summary justification
1. Strong recommendations			
1.1: Nonbleeding patients with hypoproliferative thrombocytopenia actively receiving chemotherapy or undergoing allogeneic stem cell transplant (SCT)	Platelet transfusion should be administered when the platelet count is $<10 \times 10^3/\mu\text{L}$	Moderate	The data support no benefit with liberal strategies and a platelet count threshold $<10 \times 10^3/\mu\text{L}$ is practical for implementation
1.2: Preterm neonates without major bleeding	Platelet transfusion should be administered when the platelet count is $<25 \times 10^3/\mu\text{L}$	High	The data support no benefits with liberal policies of $<50 \times 10^3/\mu\text{L}$ and the possibility of harm.
1.3: Patients undergoing lumbar puncture	Platelet transfusion should be administered when the platelet count is $<20 \times 10^3/\mu\text{L}$	Moderate	A platelet count threshold $<20 \times 10^3/\mu\text{L}$ is practical for implementation, and minimizes need for platelet transfusion, while recognizing the extremely low event rate estimate
1.4: Patients with Dengue-related consumptive thrombocytopenia in the absence of major bleeding	No platelet transfusion	Moderate	The data support no benefits with use of platelets as prophylaxis and possibility of harm

Metcalf RA, Nahirniak S, Guyatt G, et al. Platelet Transfusion: 2025 AABB and ICTMG International Clinical Practice Guidelines. JAMA. 2025. doi:10.1001/jama.2025.7529.

PLANET2 TRIAL

- Population: preterm neonates without major hemorrhage
- Intervention/Comparison:
 - Restrictive: platelet count <25,000/uI
 - Liberal: platelet count <50,000/uI
- Outcome: death or major bleeding at 28 days
- Results: OR 1.57 (95%CI 1.06-2.32)
 - Restrictive: 61/329 (19%)
 - Liberal: 85/324 (26%)

The NEW ENGLAND JOURNAL of MEDICINE

ORIGINAL ARTICLE

Randomized Trial of Platelet-Transfusion Thresholds in Neonates

Anna Curley, M.D., Simon J. Stanworth, F.R.C.P., D.Phil., Karen Willoughby, B.Sc., Susanna F. Fustolo-Gunnink, M.D., Vidheya Venkatesh, M.D., Cara Hudson, M.Sc., Alison Deary, M.Sc., Renate Hodge, M.Sc., Valerie Hopkins, B.Sc., Beatriz Lopez Santamaria, M.Sc., Ana Mora, Ph.D., Charlotte Llewelyn, Ph.D., Angela D'Amore, M.D., Rizwan Khan, M.R.C.P.I., Wes Onland, M.D., Ph.D., Enrico Lopriore, M.D., Ph.D., Karin Fijnvandraat, M.D., Ph.D., Helen New, F.R.C.Path., Ph.D., Paul Clarke, M.D., and Timothy Watts, M.D.,
for the PlaNeT2 MATISSE Collaborators*

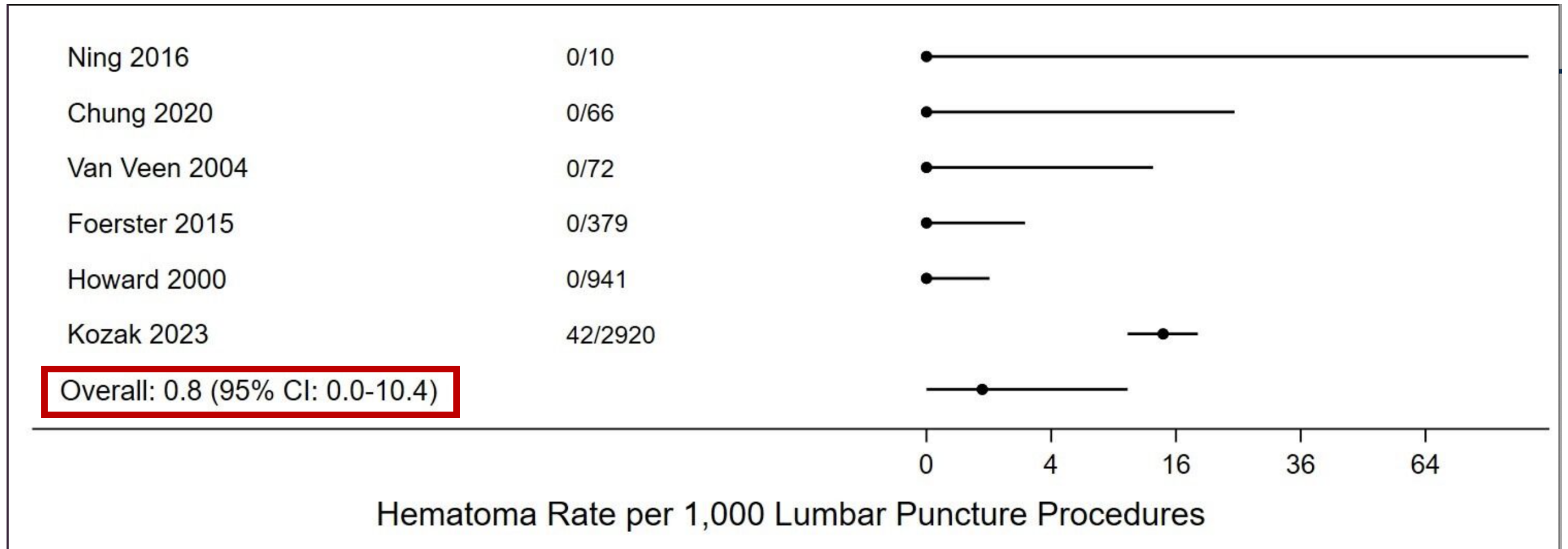
Curley et al. N Engl J Med. 2019.

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LUMBAR PUNCTURE HEMATOMA INCIDENCE: PLATELET COUNT $<50 \times 10^3/\text{ML}$



LUMBAR PUNCTURE: ANALYTICAL FRAMEWORK

- Studies evaluating impact of platelet transfusion for prevention of spinal hematoma among patients undergoing lumbar puncture are limited (very low certainty evidence)
- However, baseline risk of spinal hematoma outcome was near zero even at very low platelet counts (moderate certainty evidence)
- Apply constant relative effects from randomized trials to lumbar puncture baseline risk?

MODELING NUMBER NEEDED TO HARM (NNH) USING RESTRICTIVE

- Median NNH using restrictive: 18,754 (771 to 24,276,287)
 - 18,754 patients would need to be transfused to cause one spinal hematoma
- Assuming all 18,754 were transfused restrictively, then assuming risk of TACO being 6.3 per 1000 transfusion episodes and risk of death from TACO being 6.5%
 - Expect 119 fewer TACO cases
 - Expect 8 fewer TACO deaths

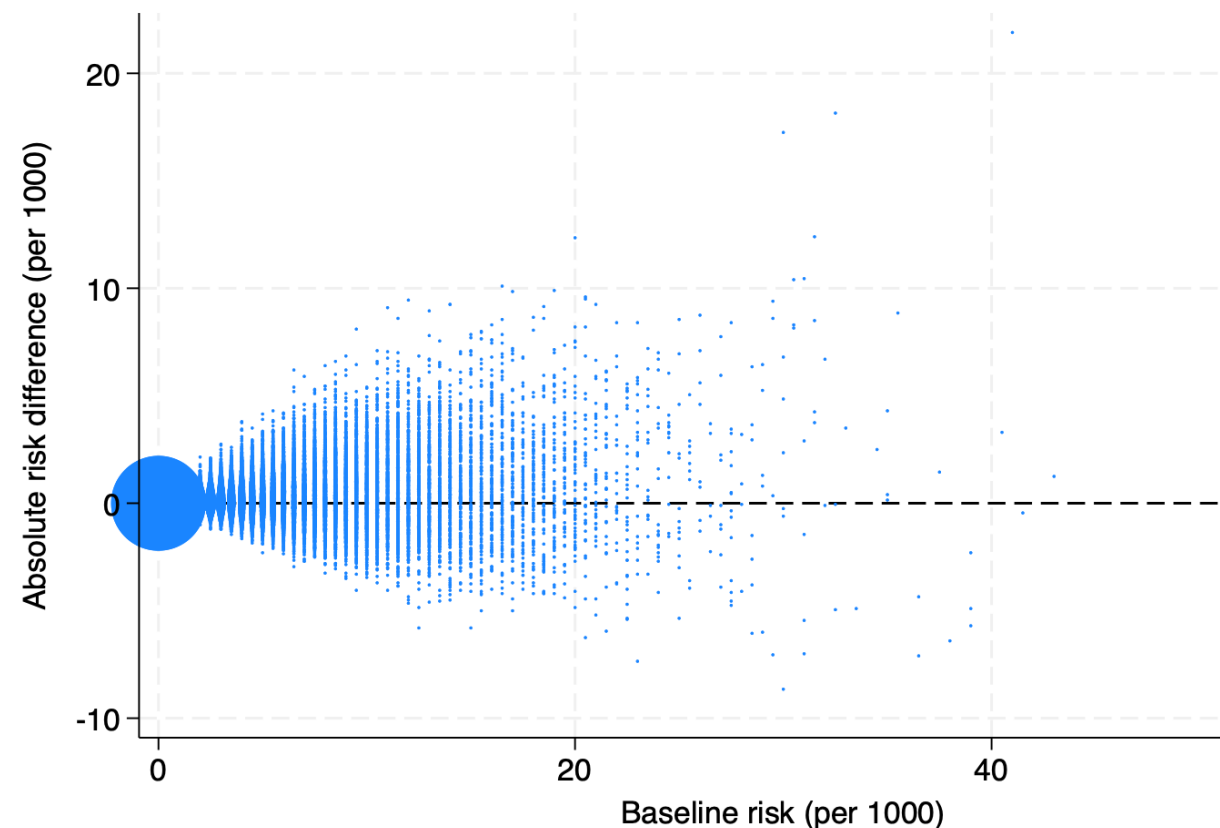


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Metcalf RA, Nahirniak S, Guyatt G, et al. Platelet Transfusion: 2025 AABB and ICTMG International Clinical Practice Guidelines. JAMA. 2025. doi:10.1001/jama.2025.7529.

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2. Conditional recommendations			
2.1: Nonbleeding adult patients with hypoproliferative thrombocytopenia undergoing autologous SCT or with aplastic anemia	No-prophylaxis strategy	Low to very low	The evidence includes subgroup analyses of bleeding outcomes in trials
2.2: Adult patients with consumptive thrombocytopenia due to critical illness (non-Dengue)	Platelet transfusion should be administered when the platelet count is $<10 \times 10^3/\mu\text{L}$	Very low	Lack of direct randomized trial data; a platelet count threshold $<10 \times 10^3/\mu\text{L}$ is practical for implementation and minimizes requirements for platelet transfusions with attendant risks
2.3: Adult patients undergoing central venous catheter (CVC) placement at anatomic sites amenable to manual compression	Platelet transfusion should be administered when the platelet count is $<10 \times 10^3/\mu\text{L}$	Moderate to very low	A platelet count threshold $<10 \times 10^3/\mu\text{L}$ is practical for implementation and minimizes need for platelet transfusion
2.4: Adult patients undergoing interventional radiology procedures	Platelet transfusion should be administered when the platelet count is $<20 \times 10^3/\mu\text{L}$ for low-risk procedures and $<50 \times 10^3/\mu\text{L}$ for high-risk procedures ⁷	Very low	A platelet count threshold $<20 \times 10^3/\mu\text{L}$ or $<50 \times 10^3/\mu\text{L}$ is practical for implementation; recognizes the varying degrees of bleeding risk by procedure

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CONDITIONAL RECOMMENDATIONS (CONTINUED)

2.5: Adult patients undergoing major nonneuraxial surgery	Platelet transfusion should be administered when the platelet count is $<50 \times 10^3/\mu\text{L}$	Very low	A platelet count threshold $<50 \times 10^3/\mu\text{L}$ is practical for implementation; recognizes the degree of potential risk of severe bleeding for these procedures
2.6: Nonthrombocytopenic patients undergoing cardiovascular surgery in the absence of major hemorrhage, including those receiving cardiopulmonary bypass	No platelet transfusion	Very low	The limited data available support no benefit with use of platelets
2.7: Adult patients with spontaneous or traumatic, nonoperative intracranial hemorrhage with platelet counts $>100 \times 10^3/\mu\text{L}$, including those receiving antiplatelet agents	No platelet transfusion	Low to very low	The limited data available support no benefit with use of platelets and the possibility of harm

Metcalfe RA, Nahirniak S, Guyatt G, et al. Platelet Transfusion: 2025 AABB and ICTMG International Clinical Practice Guidelines. JAMA. 2025. doi:10.1001/jama.2025.7529.

CONDITIONAL RECOMMENDATIONS (CONTINUED)

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PATCH TRIAL

- Adults with non-operative spontaneous intracranial hemorrhage (sICH) with platelet counts >100,000/ul, including those receiving anti-platelet agents
- Suggested harm with platelets
- Possible imbalance between study arms
 - May partly explain harm signal, but unlikely platelet transfusion provides benefit

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Platelet transfusion versus standard care after acute stroke due to spontaneous cerebral haemorrhage associated with antiplatelet therapy (PATCH): a randomised, open-label, phase 3 trial

[M Irem Baharoglu, MD^{a,*}](#) · [Prof Charlotte Cordonnier, PhD^{e,*}](#) · [Prof Rustam Al-Shahi Salman, PhD^{f,*}](#) · [Koen de Gans, MD^g](#) · [Maria M Koopman, PhD^h](#) · [Prof Anneke Brand, PhD^h](#) · et al. [Show more](#)

Baharoglu et al. Lancet. 2016.
Baharoglu et al. Blood. 2020.

CONDITIONAL RECOMMENDATIONS (CONTINUED)

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GOOD PRACTICE STATEMENT

- “...also consider symptoms, signs, other laboratory parameters, bleeding history, medications, patients’ values and preferences, alternative therapies, and overall clinical context....”

OVERALL MESSAGE OF THE GUIDELINE

- Advocates for restrictive platelet transfusion strategies
 - Practical recommendations for implementation
- Pattern of evidence
- No clear evidence of harm using restrictive strategies
- Benefits of restrictive strategies:
 - Minimizing transfusion-related adverse events
 - Maintaining adequate platelet supply
 - Reducing healthcare expenditures

RESEARCH PRIORITIES

RELATED TO PLATELET TRANSFUSION



RANDOMIZED TRIALS

Outside hematology/oncology
E.g., T4P Trial testing 5 thresholds



PERSONALIZED APPROACHES

Based on individual patient factors



ALTERNATIVES/ADJUNCTS

That modify important baseline risks of
bleeding



HOW TO APPROACH...

Patients taking anti-coagulants or anti-platelet agents



IMPROVED TESTING

To better identify which patients
may/may not benefit from platelet
transfusion

KEY TAKEAWAYS

CLINICAL USE OF PLATELET TRANSFUSIONS

1

Across populations, restrictive platelet transfusion strategies did not show clear evidence of harm

2

Benefits of restrictive strategies

3

Conditional recommendations:
consider values and preferences of
the individual patient

PLATELET GUIDELINE PANEL

AABB, ICTMG, and other partner organizations

Steering Committee:

- Aarti Bathla
- Brenda Grossman
- Gordon Guyatt
- Ryan Metcalf
- Susan Nahirniak
- Simon Stanworth

Patient Partners:

- Allan Dubon
- Manjusha Pawagi

Panel Members:

- Sandra White
- Arwa Al Riyami
- Rachel Jug
- Ursula La Rocca
- Jeannie Callum
- Claudia Cohn
- Abe DeAnda
- Robert DeSimone
- Lise Estcourt
- Daniela Filipescu
- Mark Fung
- Ruchika Goel
- Aaron Hess
- Heather Hume
- Richard Kaufman
- Peter Kranke
- Vernon Louw
- Morten Moeller
- Michael Murphy
- Jennifer Muszynski
- Cian O'Kelly
- Monica Pagano
- Gopal Patidar
- Katerina Pavenski
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- Nicole Zantek
- Michelle Zeller



THANK YOU

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