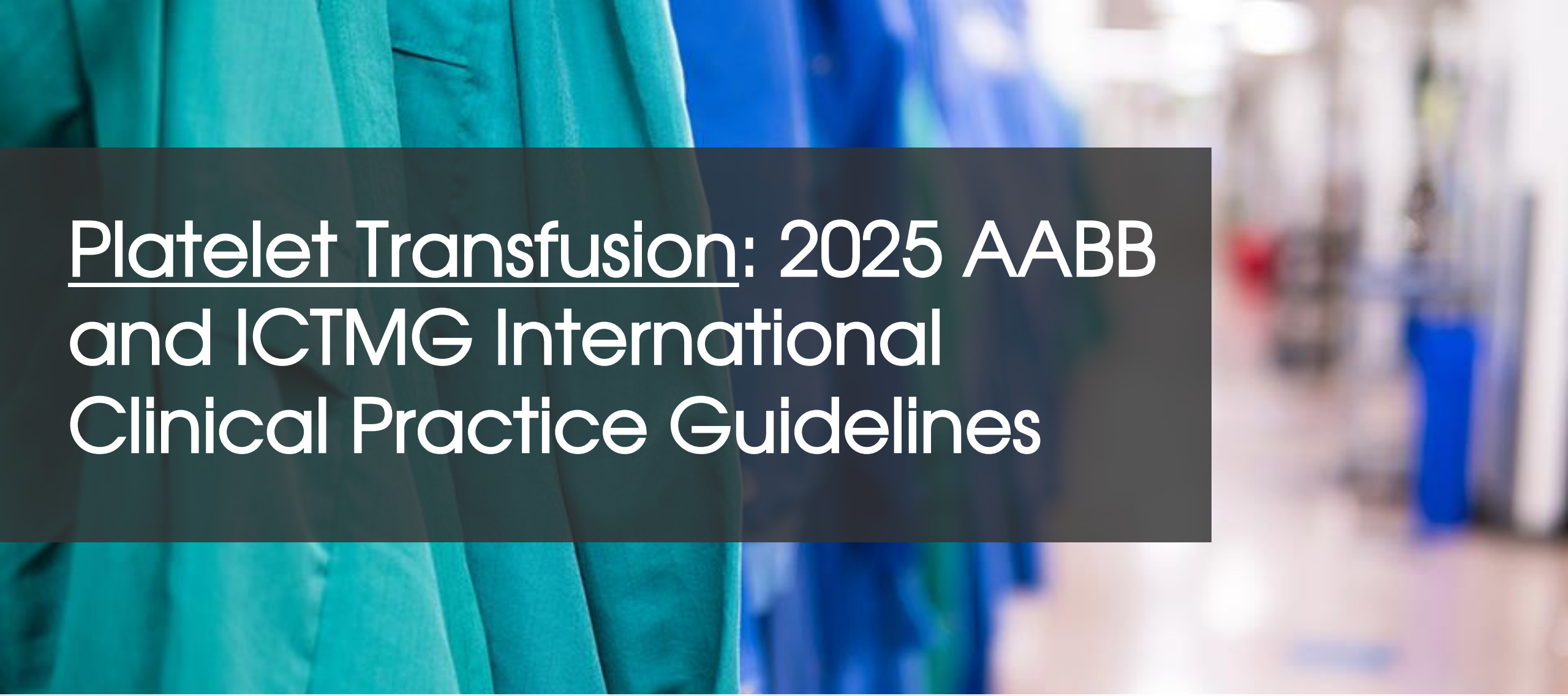

# Platelet Transfusion: 2025 AABB and ICTMG International Clinical Practice Guidelines

**Ryan A. Metcalf, MD, CQA**

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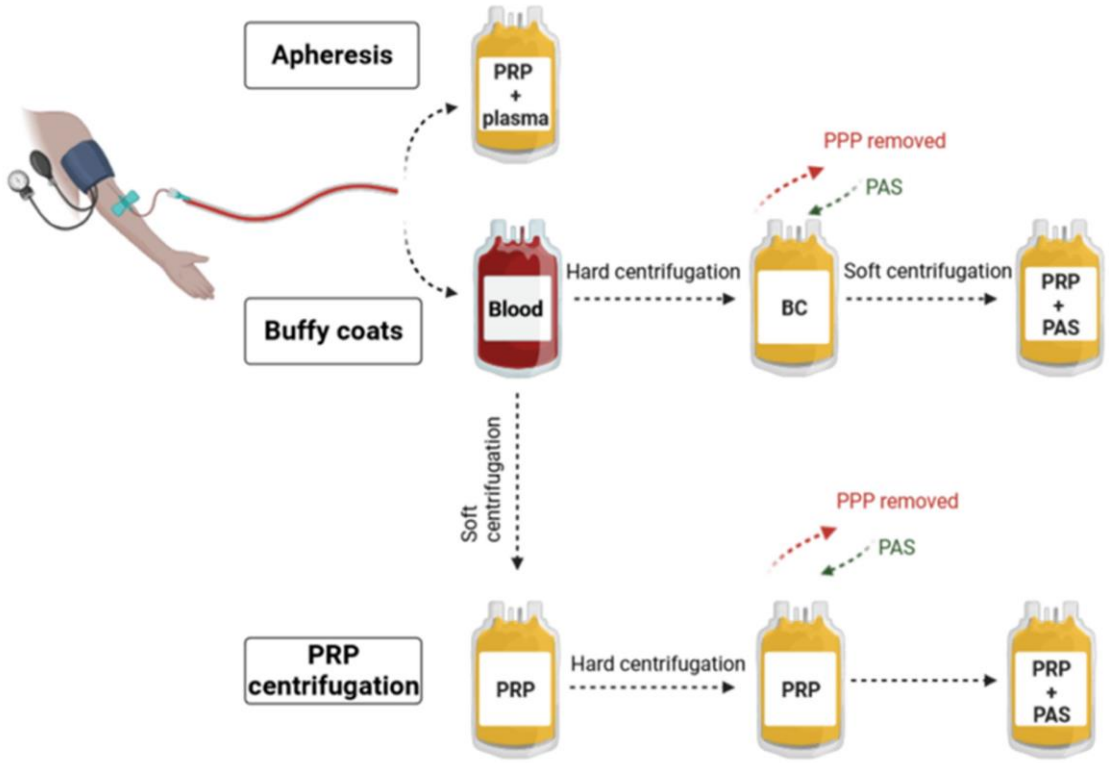
JUNE 2025

# Disclosures

- Chair, Association for the Advancement of Blood and Biotherapies (AABB) Clinical Transfusion Medicine Committee
- Scientific advising, Werfen
- Unrestricted education grants: Octapharma, Werfen, Haemonetics, Hemosonics
- Co-inventor, Intelvia data visualization software

# What are Platelet Components?

- Apheresis vs. pooled
- Contents: ~300 billion platelets/bag, plasma or plasma + additive solution (PAS)
- Volume: ~300ml (varies)
- Storage: room temp (20-24C), 5–7-day shelf life




https://www.mdpi.com/1422-0067/25/14/7779

# Who Gets Platelet Transfusions?

- Hematology/Oncology
- Critical Illness
- Patients undergoing “minor” procedures (LP, CVC, IR, etc)
- Cardiovascular Surgery
- Trauma
- Transplant Surgery
- Neurosurgery
- Obstetrics
- Other specialties: General Surgery, Orthopedic Surgery, Surgical Oncology, Burn Surgery, Urology, and more
- General Internal Medicine
- Neonates

# Platelet Use in the United States

| | Blood centers | Hospitals | Combined 2023 totals | 95% CI | 2021 totals[a] | % change 2023–2021 |
|---|---|---|---|---|---|---|
| Distributed | | | | | | |
| Apheresis platelets | 2,458 | 99 | 2,557 | (2,429–2,685) | 2,422 | 5.6% |
| Whole blood-derived PLTs[b] | 54 | 7 | 61 | (24–98) | 107 | −43.1% |
| Total platelets | 2,511 | 107 | 2,618 | (2,483–2,753) | 2,528 | 3.6% |
| Transfused | | | | | | |
| Apheresis platelets | | 2,160 | | (1,988–2,332) | 2,091 | 3.3% |
| Whole blood-derived PLTs[b] | | 55 | | (28–83) | 80 | −30.6% |
| Total platelets (includes directed units) | | 2,220 | | (2,040–2,400) | 2,175 | 2.1% |

*McDavid K, Lien R, Chavez Ortiz J, Bradley T, Luciano A, Griffin I, 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*

# Benefits and Harms of Platelet Transfusion

- Benefits (presumed)
  - » Rationale: in patients with thrombocytopenia (or platelet dysfunction), transfusion of platelets will increase platelet count and prevent/treat bleeding
- Harms (known)
  - » Transfusion reactions
    - Highest risk of any component
  - » Infectious disease transmission

JAMA | Special Communication

# Platelet Transfusion
## 2025 AABB and ICTMG International Clinical Practice Guidelines

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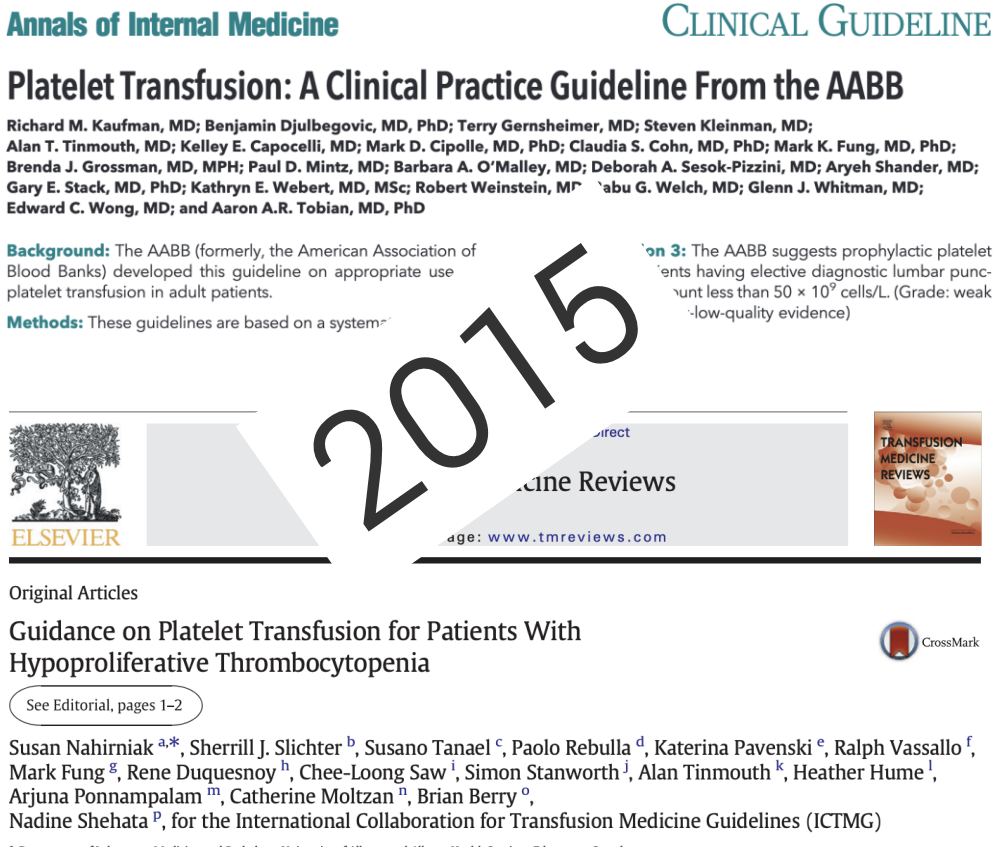
*Metcalf RA, Nahirniak S, Guyatt G, et al. Platelet Transfusion: 2025 AABB and ICTMG International Clinical Practice Guidelines. JAMA. 2025. doi:10.1001/jama.2025.7529.*

# Guideline Panel Composition

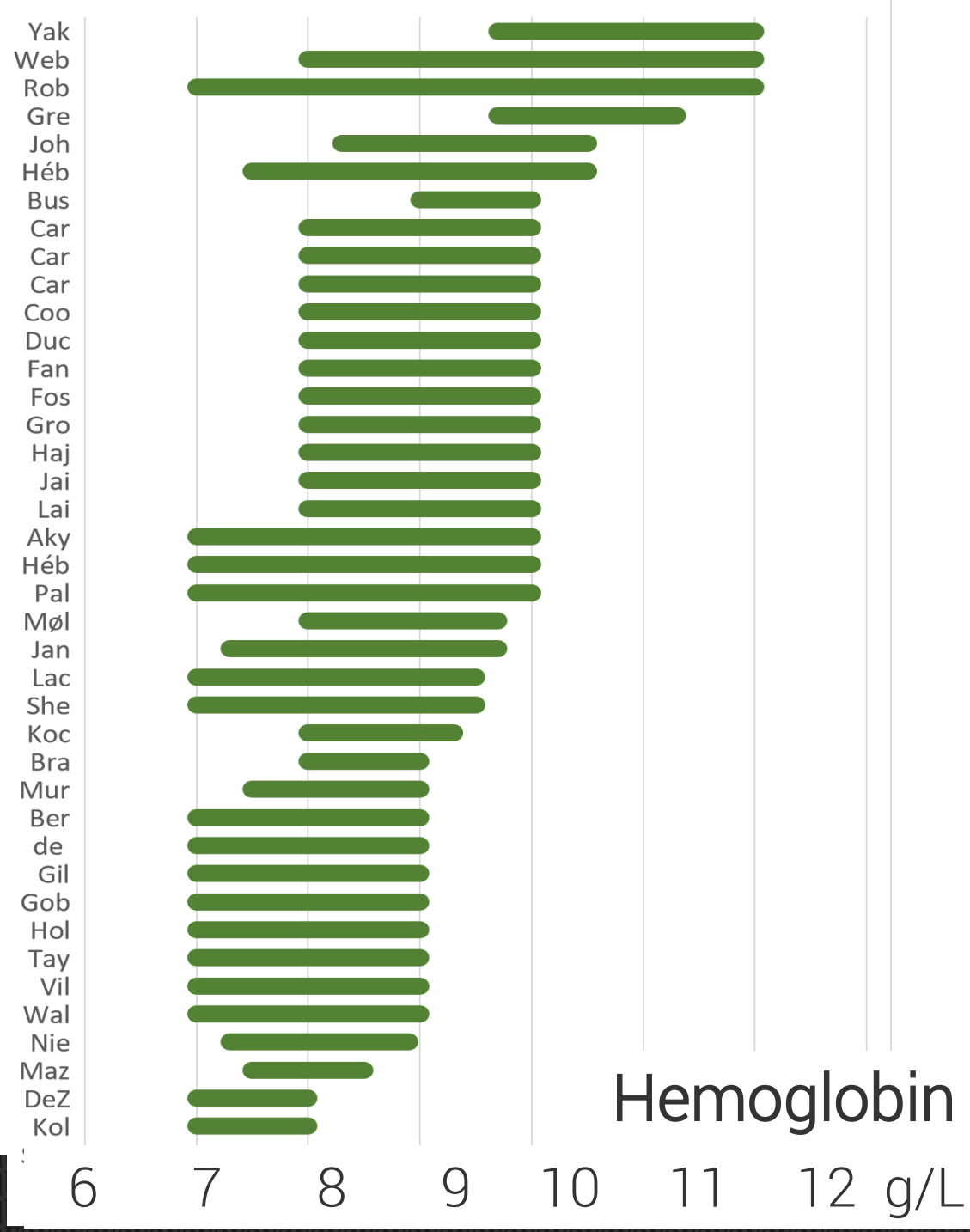
- Steering Committee
- Patient partners
- Experts
  - » Transfusion Medicine
  - » Hematology/Oncology
  - » Pediatrics
  - » Critical Care
  - » Anesthesiology
  - » Interventional Radiology
  - » Cardiovascular Surgery
  - » Neurosurgery
- Systematic Review and GRADE Methodologists
- Disclose, mitigate potential conflicts

# Platelet Guidelines: Purpose and Scope

- Need for updated recommendations on clinical use of platelets
- Out of scope: component attributes, transfusion refractoriness, immune thrombocytopenias, patients with thrombocytopenia receiving anticoagulation, massive hemorrhage protocols, viscoelastic testing, and alternatives/adjuncts (e.g. antifibrinolytics)



# Restrictive vs. Liberal Red Blood Cell Transfusion Strategies: Randomized Trials




*Courtesy Pamela Stanworth*

# Platelets: Restrictive vs. Liberal Paradigm

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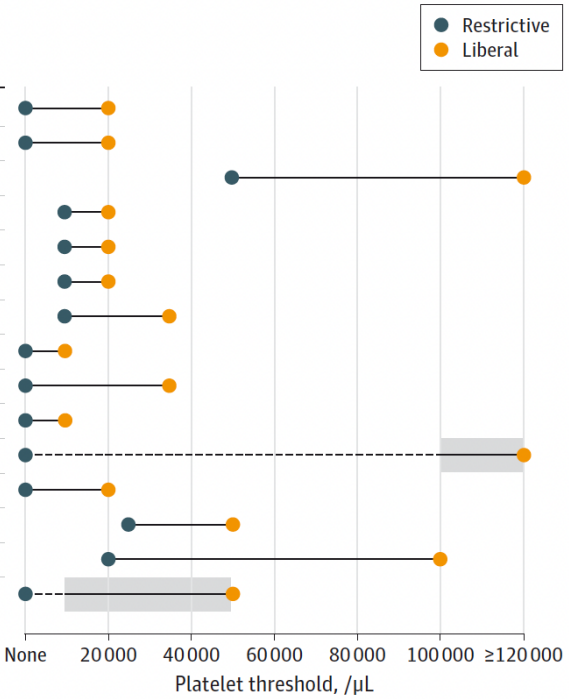
**Figure. Restrictive and Liberal Transfusion Strategies Used Across Randomized Trials**

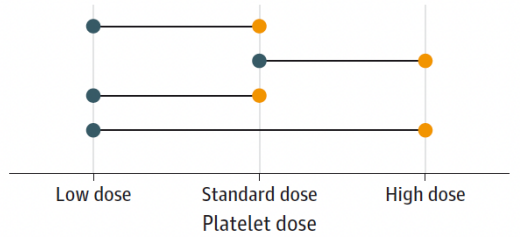
**A** Platelet threshold

| | Population |
|---|---|
| Solomon et al,[13] 1978 | HPT |
| Murphy et al,[14] 1982 | HPT |
| Andrew et al,[49] 1993 | Consumptive |
| Heckman et al,[15] 1997 | HPT |
| Rebulla et al,[16] 1997 | HPT |
| Zumberg et al,[17] 2002 | HPT |
| Diedrich et al,[19] 2005 | HPT |
| Wandt et al,[23] 2012 | HPT |
| Assir et al,[25] 2013 | Consumptive |
| Stanworth et al,[24] 2013 | HPT |
| Baharoglu et al,[26] 2016 | Spontaneous ICH |
| Lye et al,[27] 2017 | Consumptive |
| Curley et al,[29] 2019 | Consumptive |
| Kumar et al,[30] 2020 | Consumptive |
| Van Baarle et al,[32] 2023 | Periprocedural states |



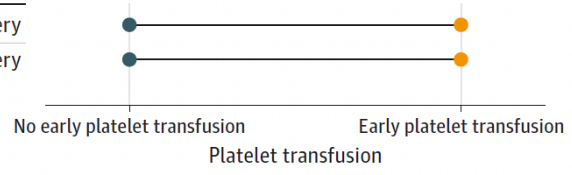

**B** Platelet dose

| | Population |
|---|---|
| Tinmouth et al,[18] 2004 | HPT |
| Sensebé et al,[20] 2005 | HPT |
| Heddle et al,[21] 2009 | HPT |
| Slichter et al,[22] 2010 | HPT |




**C** Platelet transfusion

| | Population |
|---|---|
| Lunene et al,[28] 2018 | Cardiovascular surgery |
| Gautam et al,[31] 2019 | Cardiovascular surgery |



# Guideline Development Process

- Synthesize available evidence
  - » Systematic review*
    - Population, Intervention, Comparison, Outcome (PICO) questions
- GRADE methodology
- Formulate trustworthy clinical practice guidelines with recommendations

**Jug R, La Rocca U, Al-Riyami AZ, et al. The clinical use of platelet transfusions: A systematic literature review and meta-analysis on behalf of the International Collaboration on Transfusion Medicine Guidelines (ICTMG). Transfusion. 2025. doi:10.1111/trf.18277*

# Overarching PICO Question

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

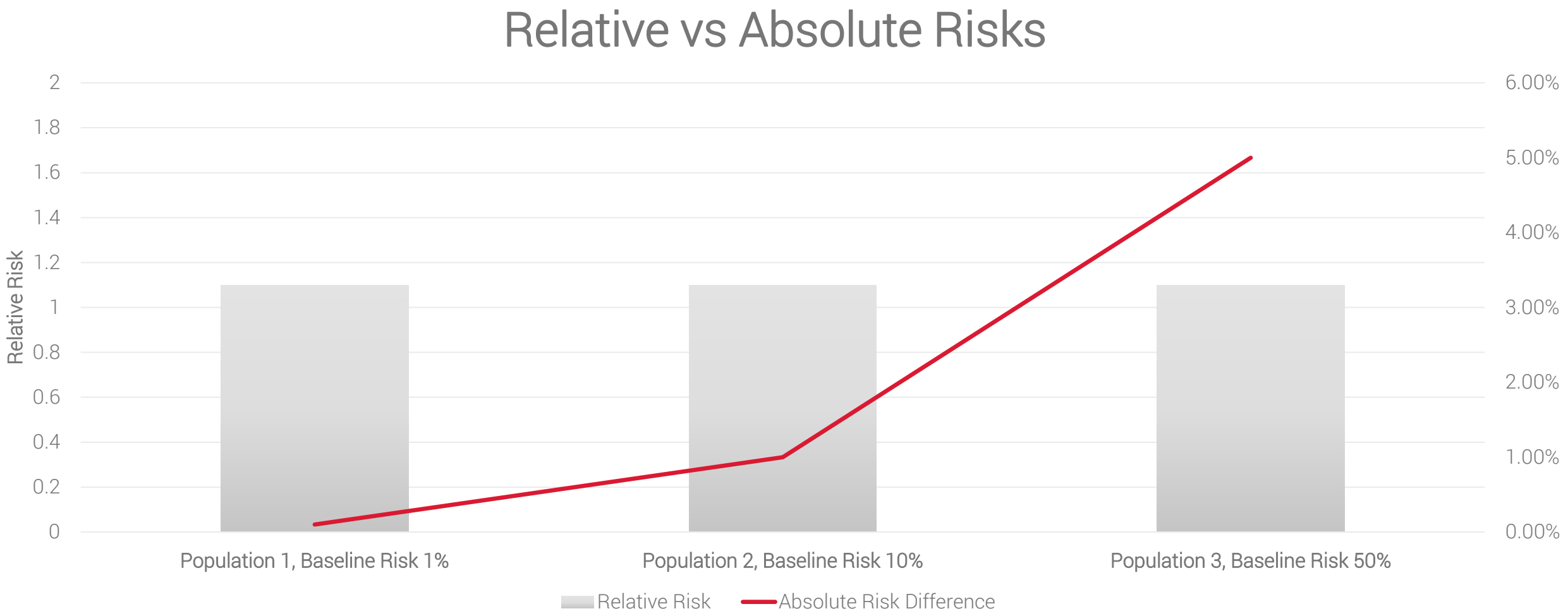
*Metcalf RA, Nahirniak S, Guyatt G, et al. Platelet Transfusion: 2025 AABB and ICTMG International Clinical Practice Guidelines. JAMA. 2025. doi:10.1001/jama.2025.7529.*

# Relative and 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
  - » Risk ratio = 1.1 across populations
  - » Baseline risk = 1%, 10%, 50%
  - » How does baseline risk impact absolute risk difference? …

# Constant Relative Risk; Varying Absolute Risk Difference



# 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

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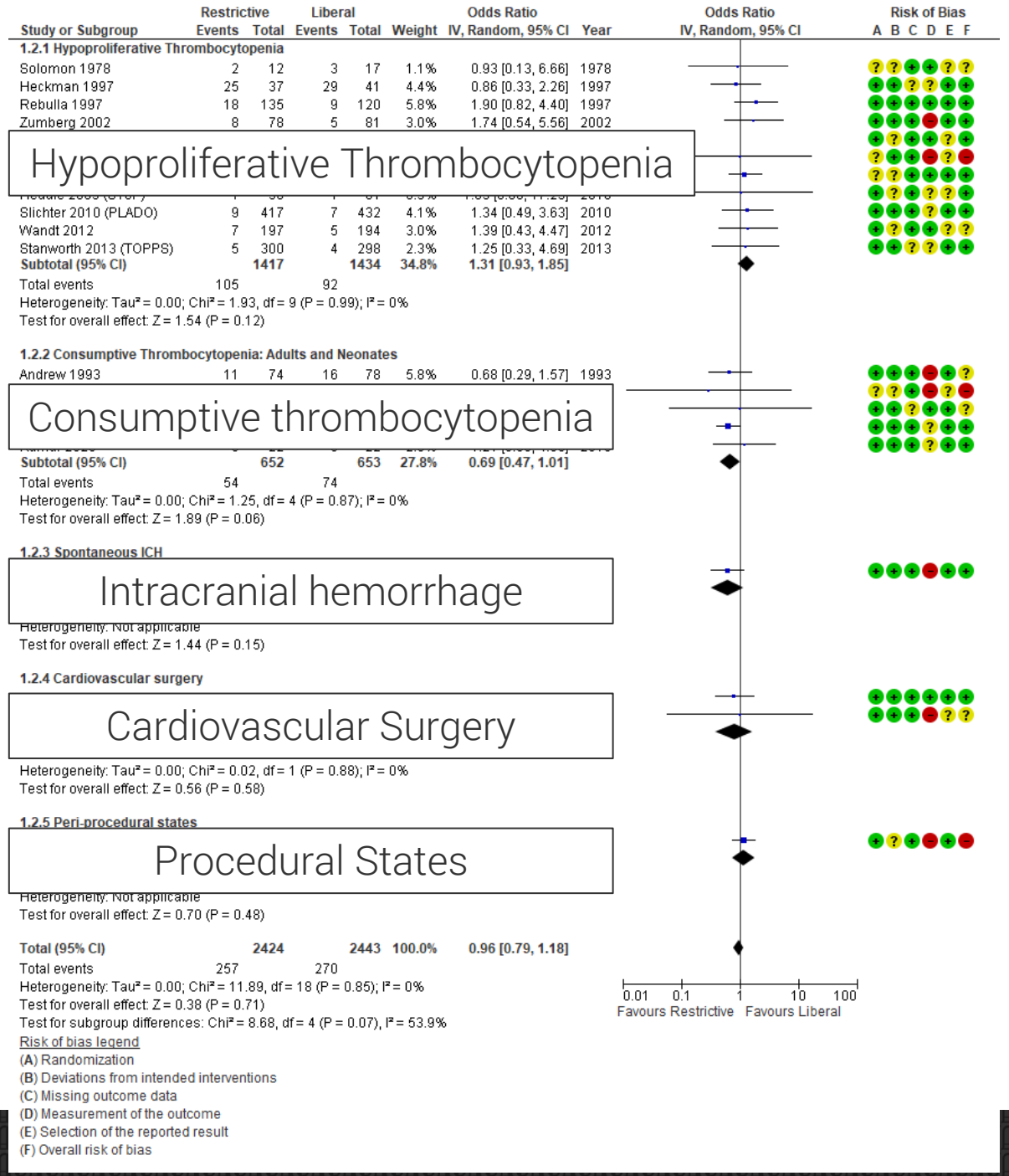
# Analysis of Randomized Trials Across Clinical Populations

Outcome: Mortality



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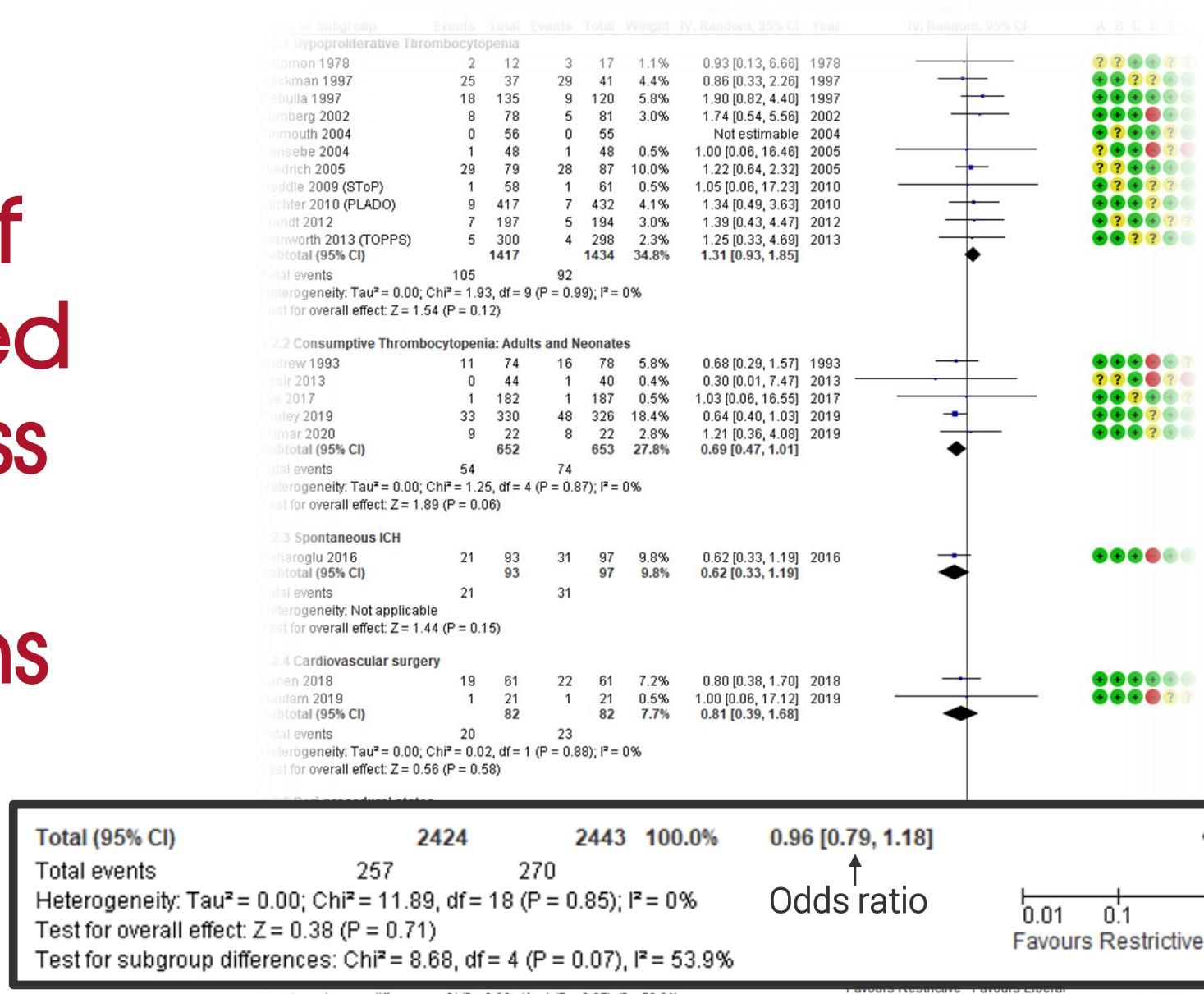


Outcome: Mortality

# 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 |

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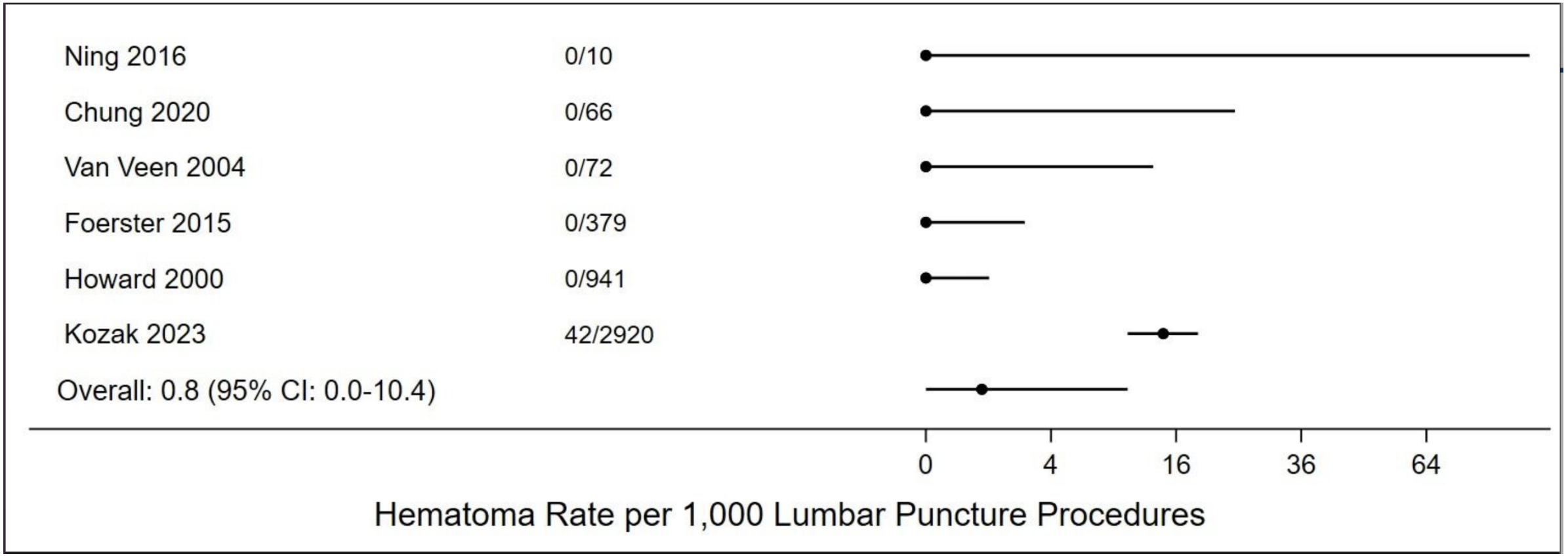
# Lumbar Puncture Hematoma Incidence: Platelet Count <50x10$^3$/µL



# 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 $<10 \times 10^3/\mu L$ | Moderate | The data support no benefit with liberal strategies and a platelet count threshold $<10 \times 10^3/\mu L$ is practical for implementation |
| 1.2: Preterm neonates without major bleeding | Platelet transfusion should be administered when the platelet count is $<25 \times 10^3/\mu L$ | High | The data support no benefits with liberal policies of $<50 \times 10^3/\mu L$ and the possibility of harm. |
| 1.3: Patients undergoing lumbar puncture | Platelet transfusion should be administered when the platelet count is $<20 \times 10^3/\mu L$ | Moderate | A platelet count threshold $<20 \times 10^3/\mu L$ 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 |

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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 $<10 \times 10^3/\mu L$ | Very low | Lack of direct randomized trial data; a platelet count threshold $<10 \times 10^3/\mu L$ 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 $<10 \times 10^3/\mu L$ | Moderate to very low | A platelet count threshold $<10 \times 10^3/\mu L$ 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 $<20 \times 10^3/\mu L$ for low-risk procedures and $<50 \times 10^3/\mu L$ for high-risk procedures[7] | Very low | A platelet count threshold $<20 \times 10^3/\mu L$ or $<50 \times 10^3/\mu L$ 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 $<50 \times 10^3/\mu L$ | Very low | A platelet count threshold $<50 \times 10^3/\mu L$ 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 $>100 \times 10^3/\mu L$, 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 |

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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.*

# Conditional Recommendations (Continued)

| | | | |
|---|---|---|---|
| 2.5: Adult patients undergoing major nonneuraxial surgery | Platelet transfusion should be administered when the platelet count is $<50 \times 10^3/\mu L$ | Very low | A platelet count threshold $<50 \times 10^3/\mu L$ 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 $>100 \times 10^3/\mu L$, 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 |

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# Good Practice Statement

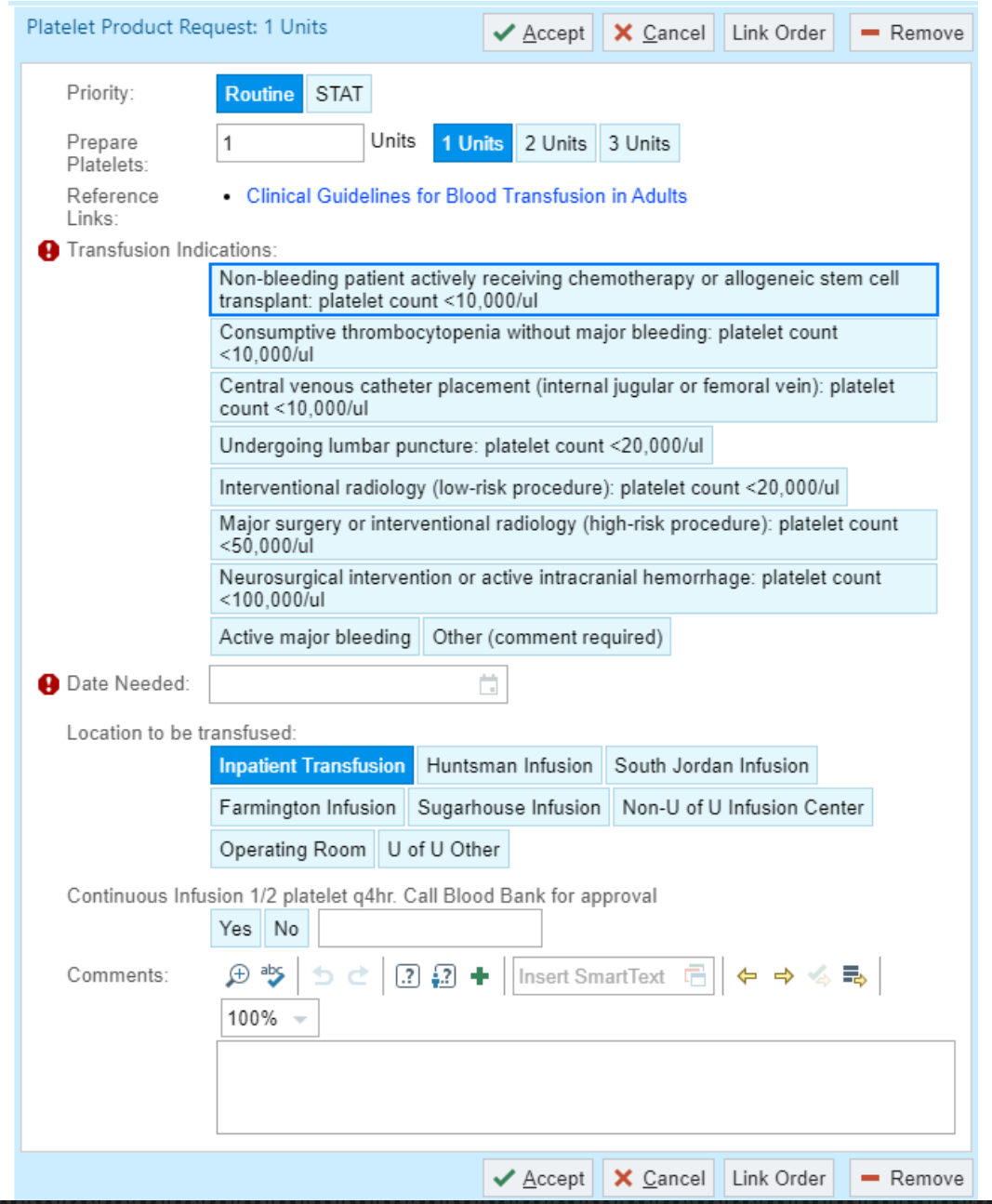
- The panel considered it good clinical practice to also consider symptoms, signs, other laboratory parameters, bleeding history, medications, patients' values and preferences, alternative therapies, and overall clinical context when decided to perform a platelet transfusion on a particular patient.
- It is possible that this guideline, although not intended for legal proceedings but rather as a guide for patient care, may reassure clinicians contemplating not administering unnecessary platelet transfusions whose behavior may be influenced by worries about litigation.

# Overall Message of the Guideline

- Advocates for restrictive platelet transfusion strategies with practical recommendations for implementation
- Pattern of evidence across populations
- No clear evidence of harm using restrictive strategies
- Benefits of restrictive strategies:
  - » Minimizing transfusion-related adverse events
  - » Maintaining adequate platelet supply for situations more likely to yield important benefit (e.g., major bleeding)
  - » Reducing healthcare expenditures

# Next Steps: Implementation

- Effective implementation expected to reduce unnecessary platelet transfusions
- Meet with key stakeholder groups
- Updated local guidelines
- Dissemination, education underway
- Updated order set design →
- Prospectively review orders (as possible)
- Clinical Decision Support



# Thank You
# Platelet Guideline Panel

AABB, ICTMG, and other partner organizations

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- Simon Stanworth

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- Brittney Williams
- Erica Wood
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