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The ASH/ASPHO Choosing Wisely Campaign

Five Things Physicians and Patients Should Question

Choosing Wisely®
An initiative of the ABIM Foundation

Credits

These slides were modified from original presentations given by the following experts in the field. Thank you to these colleagues for their dedication to the ASH-ASPHO Choosing Wisely Campaign.

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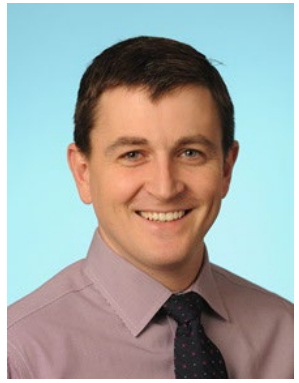

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What is Choosing Wisely?

- Choosing Wisely is a national medical stewardship campaign led by the ABIM Foundation in collaboration with leading specialty societies
- The campaign challenges medical professional societies to identify five tests, treatments or procedures that physicians and patients should question
- The ABIM Foundation recommends that societies consider evidence, cost, frequency, and clinical purview in making their recommendations
- The ASH/ASPHO campaign utilizes a fifth and preeminent guiding principle: avoidance of harm to patients

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How These Lists Were Created

- The American Society of Hematology (ASH) and the American Society of Pediatric Hematology/Oncology (ASPHO) formed a task force to solicit, evaluate, and select list items for a pediatric focused Choosing Wisely list
- The panel was composed of 13 members – two co-chairs (representing ASH and ASPHO), five members selected by each society, and one member serving as an advisor on Choosing Wisely methodology
- Suggestions were solicited from the membership of both societies (81 unique items were suggested). The task force then used nominal group technique to create a shortlist of 18 items

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How These Lists Were Created

- ASH and ASPHO members participated in a survey to rank these 18 items (n=135 responses)
- Formal systematic reviews of the evidence were completed for eight semi-finalist items
- Final item selections were made by the ASH-ASPHO CW task force with reference to the five guiding principles
- Final items were approved by ASH and ASPHO executive leadership, and the ABIM Foundation

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1 Don’t perform routine pre-operative hemostatic testing (PT, aPTT) in an otherwise healthy child with no prior personal or family history of bleeding

- Preoperative hemostatic screening in healthy pediatric patients with no personal or family history of excessive bleeding does not effectively identify those who will have unexpected surgical bleeding
- Artifacts or disorders that do not affect bleeding risk may be identified, such as factor XII deficiency or an infection-associated, transient lupus anticoagulant
- Hemostatic testing adds cost and may introduce additional stress, either due to blood sampling or if a child has “abnormal” results

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Background

- There is little evidence supporting coagulation testing in healthy children undergoing surgery
- Existing data generally recommend against such testing
- Despite this, there remain practitioners who perform such screening on a regular basis

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History of the PT and PTT

- PT was developed to measure coagulation in liver failure
  - Quick, Circ 1959;19:92-96
- Most commonly used to measure anticoagulation for patients on warfarin
- PTT developed to look for hemophilia in patients with bleeding
- Neither were developed specifically for screening

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PT and PTT Do Not Predict Operative Bleeding

	PT	PTT
Sensitivity	20%	26.3%
Specificity	66.8%	82.8%
Positive predictive value	3.3%	8.1%
Negative predictive value	93.6%	95%

Asaf et al, Int J Pediatr Otolaryngol 2001;61:217-222

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PT and PTT Cost $$$

- Anywhere from $10 to $100 in the US
- Patients pay anywhere from $0 to full price
  - Higher cost to patient with high deductible insurance or poor insurance
- Not screening is the most cost effective strategy
  - Cooper et al, Pediatr Blood Cancer 2010;55:1155-1159
- Not screening has similar quality of life as screening everyone
- 94.3% of PT tests and 99.9% of PTT tests ordered without justification
  - Capoor et al, PLOS ONE 2015;10:e0133317

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What Do the Guidelines Say?

- Guidelines on the assessment of bleeding risk prior to surgery or invasive procedures
- Recommend against indiscriminate testing
- Recommend taking a bleeding history in preoperative patients
- Recommend screening if extensive bleeding history
- No further workup if bleeding history is negative

Chee et al, Brit J Haematol 2008;140:496-504

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What Does the Literature Say?

- "Laboratory screening for coagulopathy has no significant power to predict an elevated haemorrhage risk."
  - Sarny et al, *European Archives of Oto-Rhino-Laryngology* 2013;270:1099-10
- "Actually no sound evidence from well-designed studies that confirm the usefulness" of PT and/or PTT in screening
  - Haas et al, *BJA: British Journal of Anaesthesia* 2015;114:217-224
- "Routine coagulation screening before surgery or invasive procedures to predict perioperative bleeding in unselected patients is not recommended"
  - Alzarani et al, Clin Med Insights Blood Disord 2019;1179545X18821158

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Why Choose Wisely?

- Testing adds cost to families and to society
- Testing adds stress to patients and families
  - Hematology/oncology referral = CANCER
- Testing adds inconvenience when surgery postponed or canceled
- Not all surgical bleeding is due to disorders of hemostasis
- Bleeding during or after surgery can be treated
- If malpractice is the underlying concern then take a bleeding history
- Screening tests won't help identify patients who bleed!

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2

Don’t transfuse platelets in an asymptomatic (i.e., non-bleeding) pediatric patient (e.g. aplastic anemia, leukemia, etc.), with a platelet count > 10,000/mcL unless other signs and/or symptoms for bleeding are present, or if the patient is to undergo an invasive procedure

The recommendation:

- Covers children ≥ 1 year old
- Is not condition specific
- Is not relevant to patients with immune-mediated thrombocytopenia (e.g., ITP, TTP, and HIT)

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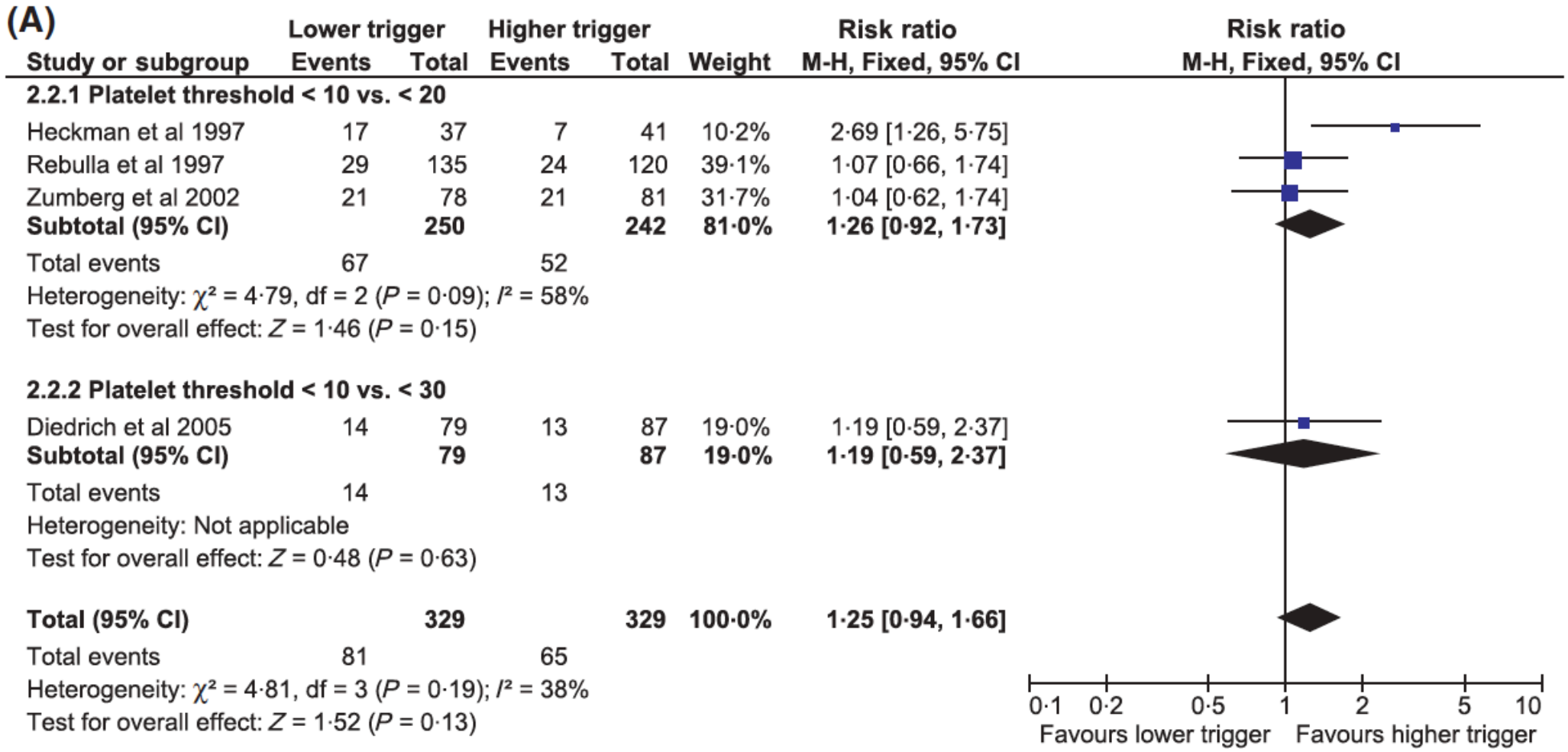
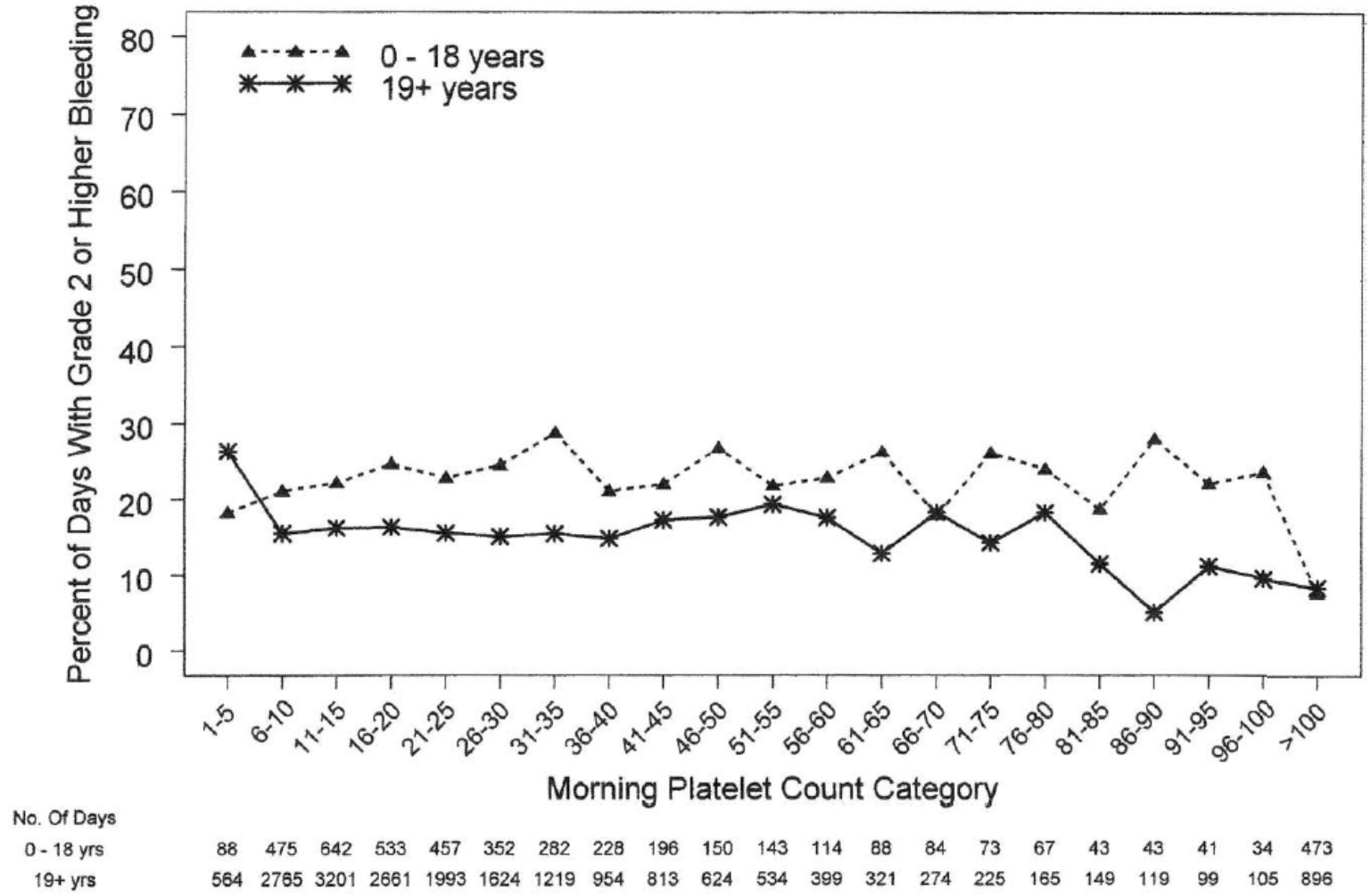
Lowering Platelet Count Threshold Does Not Result in Increased Bleeding Incidence



Estcourt LJ, Stanworth SJ, Murphy MF. (2011) *BJH*

Morning Platelet Count Does Not Predict Bleeding



Data from the PLAtelet Dose (PLADO) Trial

Slichter et al. Dose of prophylactic platelet transfusions and prevention of hemorrhage. *NEJM* 2010

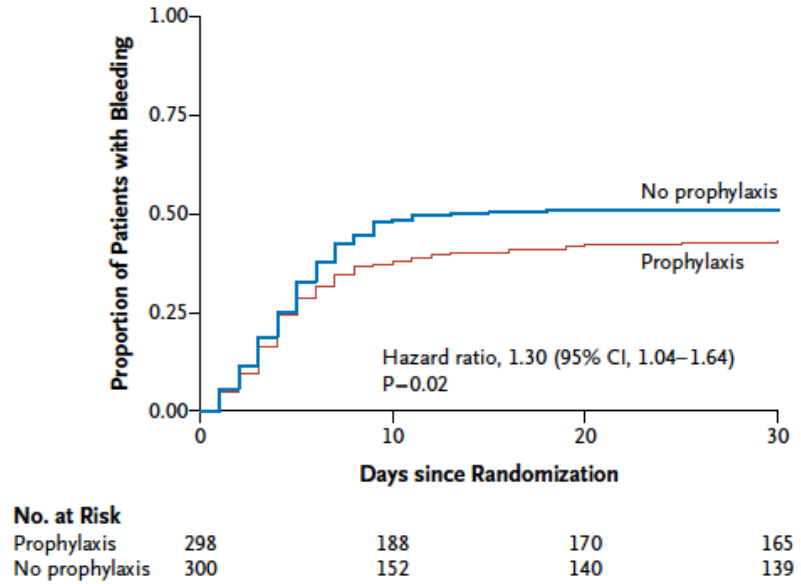
Pediatric subanalysis

Josephson et al. Bleeding risks are higher in children versus adults given prophylactic platelet transfusions for treatment-induced hypoproliferative thrombocytopenia. *Blood* 2012

Figure from: Bercovitz RS and Josephson CD. *Hematology* 2012

Having a Prophylactic Threshold Results in Fewer Bleeding Episodes

- Stanworth et al., showed that no prophylaxis (NP) was not non-inferior to prophylaxis (P) at 10,000/μL (P=50%, NP=57% bleeding). *P* for non-inferiority was 0.06.
- Wandt et al., found patients on prophylactic transfusion had less bleeding (P=19%, NP=42%) *P* < 0.0001



Stanworth et al.

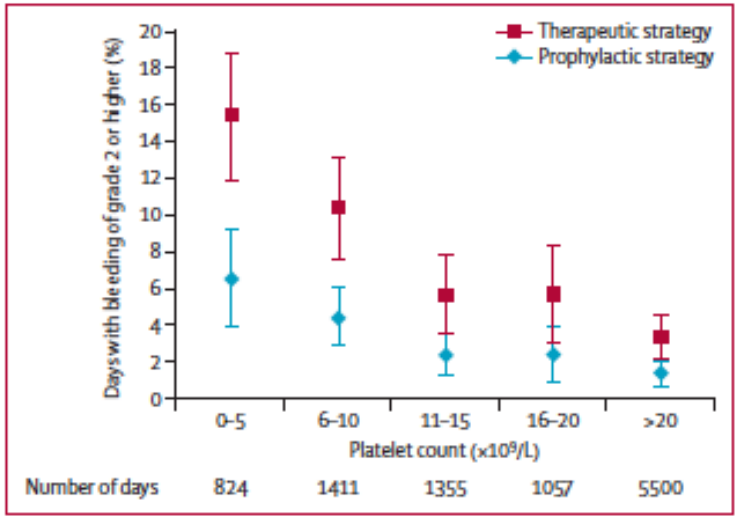


Figure 3: Days with bleeding of grade 2 or higher in both transfusion groups by categories of morning platelet count

Wandt et al.

Stanworth et al. (2013), *NEJM.*
Wandt et al. (2012), *Lancet.*

Choose Wisely:
Choose a Prophylactic Threshold of 10,000/µL

Don’t transfuse platelets in an asymptomatic (i.e., non-bleeding) pediatric patient (e.g. aplastic anemia, leukemia, etc.), with a platelet count > 10,000/µL unless other signs and/or symptoms for bleeding are present, or if the patient is to undergo an invasive procedure.

Recommendation is consistent with guidelines from:

- National Institute for Health and Care Excellence
- British Society for Haematology
- American Society of Clinical Oncology
- American Society of Hematology

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Why Bother to Choose Wisely?

- Platelets are a limited and expensive biologic resource
- Platelet transfusions have risks
  - Acute reactions (allergic, febrile, respiratory)
  - Infection (bacterial, viral, and prions)
  - Alloimmunization
- A lower threshold reduces number of platelet transfusions

3 Don’t order thrombophilia testing on children with venous access (i.e., peripheral or central) associated thrombosis in the absence of a positive family history

- Testing for inherited forms of thrombophilia does not influence the initial management of a first episode of provoked venous thrombosis and should not be performed routinely
- Results of such testing have not been shown to either predict recurrence of venous thrombosis or inform the intensity or duration of anticoagulant therapy
- Thrombophilia testing has substantial financial cost, and a positive result has the potential for misinterpretation of risk assessment leading to undue psychological distress or impact on childbearing plans, as well as possible life insurance discrimination for affected patients

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Pediatric venous thromboembolism (VTE)

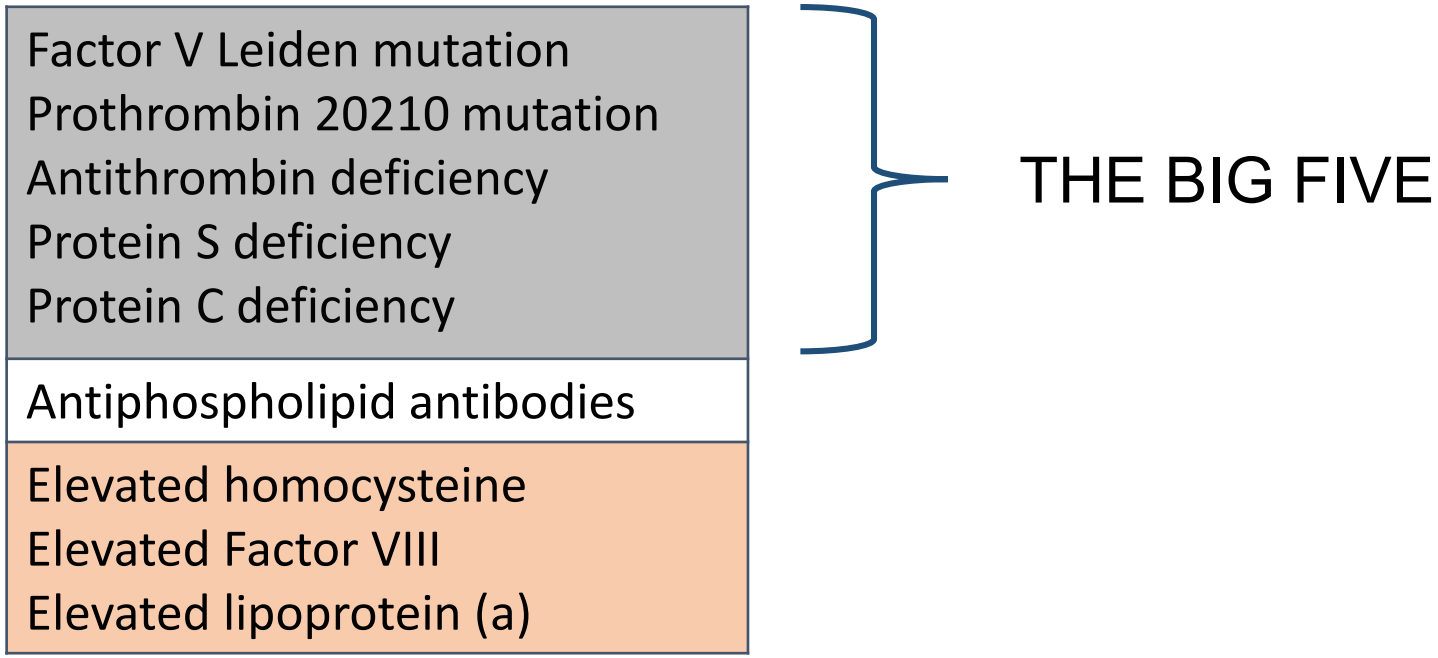
- Rare in healthy children- 1-2/100,000[1,2]
  - Relatively common in hospitalized children with chronic diseases- 580/100,000 tertiary care hospital admissions[3]
- Most common age groups are children < 1 year and adolescents
- Central Venous Catheter (CVC) is the most prevalent risk factor
  - 85% of pediatric VTE that occur in the hospital are CVC related[4]

Endothelial damage on placement + disruption of blood flow

+ ”Prothrombotic” host (infection, inflammation) = VTE

[1]van Ommen CH, et al. Venous thromboembolism in childhood: a prospective two-year registry in the Netherlands. *J Pediatr* 2001;139(5):676-681
[2]Andrew M, et al. Venous thromboembolic complications (VTE) in children: first analyses of the Canadian Registry of VTE *Blood* 1994;83(5):1251-1257
[3]Raffini et al. Dramatic increase in venous thromboembolism in children's hospitals in the United States from 2001 to 2007 *Pediatr* 2009;124:1001-8
[4]https://www.solutionsforpatientsafety.org

Laboratory Evaluation for Thrombophilia



Historical Perspective

2002 Subcommittee for Perinatal and Pediatric Thrombosis of the Scientific and Standardization Committee of the International Society of Thrombosis and Haemostasis[1]:

> *"A laboratory evaluation should be done on every child with thrombosis. Pediatric patients should be tested for a full panel of genetic and acquired prothrombotic states."*

but…..*future studies needed to address cost, efficacy of testing infants with catheter related thrombosis, role of thrombophilia in recurrent thrombosis and duration of therapy*.

[1]Manco-Johnson et al. Laboratory testing for thrombophilia in pediatric patients. *Thromb Haemost* 2002 Jul;88:155-6

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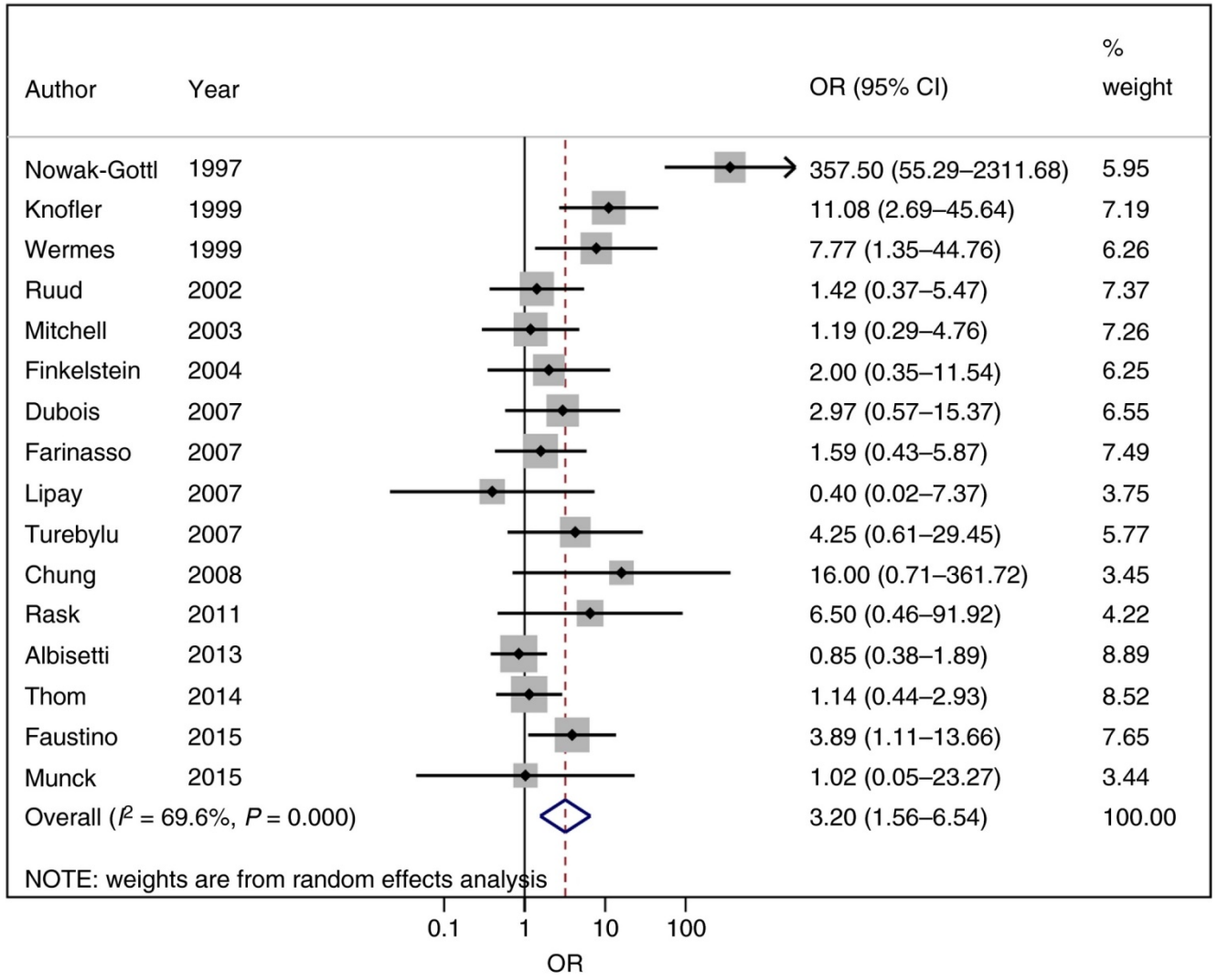
What is the Association of Thrombophilia *in CVC-VTE*?



Neshat-Vahid S. et al. Association of thrombophilia and catheter associated thrombosis in children: a systematic review and meta-analysis. J Thromb Haemost 2016, 9; 1749-1758

Does Thrombophilia Testing Influence Choice, Intensity or Duration of Anticoagulation for CVC-VTE?

CLINICAL GUIDELINES

blood advances

American Society of Hematology 2018 Guidelines for management of venous thromboembolism: treatment of pediatric venous thromboembolism

Paul Monagle,[1] Carlos A. Cuello,[2,3] Caitlin Augustine,[4] Mariana Bonduel,[5] Leonardo R. Brandão,[6] Tammy Capman,[7] Anthony K. C. Chan,[8] Sheila Hanson,[9] Christoph Male,[10] Joerg Meerpohl,[11] Fiona Newall,[12,13] Sarah H. O'Brien,[14] Leslie Raffini,[15] Heleen van Ommen,[16] John Wiernikowski,[17] Suzan Williams,[18] Meha Bhatt,[2] John J. Riva,[2,19] Yetiani Roldan,[2] Nicole Schwab,[2] Reem A. Mustafa,[2,20] and Sara K. Vesely[21]

27 NOVEMBER 2018 • VOLUME 2, NUMBER 22

Does Thrombophilia Testing Influence Choice, Intensity or Duration of Anticoagulation for CVC-VTE?

- *The ASH Guideline panel recommends* using anticoagulation rather than no anticoagulation in pediatric patients with symptomatic deep vein thrombosis (DVT) or pulmonary embolism (PE)
- *…….suggests* using anticoagulation for ≤ 3 months rather than anticoagulation for > 3 months in pediatric patients with provoked DVT or PE
- **Remarks:** In cases in which the provoking factor is resolved, treatment for > 3 months is unjustified. However, for patients who have persistence of the causative risk factor for provoked DVT/PE, longer anticoagulation could be considered.

Blood advances 2018;2(22):3292

Does Thrombophilia Predict Recurrent Catheter-Related DVT in Children?

Large, single center study of children with CVC-VTE from 1994-2014

- 347 children with incident CVC-VTE tested for thrombophilia
- 245 children required 941 subsequent catheters (45,833 catheter days)
  - Median number of catheters was 5; median duration 4 days
- Thrombophilia classification
  - Major- AT, PS, PC deficiency OR homozygous FV Leiden/PT mutation OR positive LA or anticardiolipin Ab
  - Minor- heterozygous FV Leiden/PT mutation, high lp(a), high FVIII
  - None

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Does Thrombophilia Predict Recurrent Cather-Related DVT in Children?

Results:

- Thrombophilia prevalence (n=245)
  - None 80%
  - Minor 12%
    - Elevated FVIII 5%
    - FVL/ PT Heterozygous 6.1%
    - Lp (a) 1%
  - Major 8%
    - ACLA 2%
    - PS/PC/AT deficiency 4%
    - Combined 1.6 %
    - FV Homozygous 0.4%

- Recurrent events
  - 245 children required 941 subsequent catheters
  - 84 children had 108 recurrent events

Thrombophilia was NOT associated with recurrence

Minor vs none OR 1.37 (0.72-2.53)
Major vs none OR 1.04 (0.49-2.07)

Avila L. et al. Can thrombophilia predict recurrent catheter-related deep vein thrombosis in children. Blood 2018;131(24)2712-19

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What Do Other Pediatric Guidelines Say?

- British Society for Haematology[1] (2011)
  - Routine testing for heritable thrombophilia in unselected children presenting with a first episode of VTE is not indicated (1B)
  - Initiation and intensity of anticoagulation following acute VTE is the same in children with and without heritable thrombophilia
  - Testing for heritable thrombophilia after first episode VTE has uncertain predictive value for recurrence
  - Children presenting with unprovoked VTE should be tested for antiphospholipid antibodies
- Thrombosis Canada[2] (2018): Guidance on diagnosis, treatment and prevention of catheter related VTE
  - The role of heritable thrombophilia is unclear, and screening for them is not indicated

[1]Chalmers et al. Guideline on the investigation, management and prevention of venous thrombosis in children. BJH 2011 (154):196-207
[2]http://thrombosiscanada.ca/wp-content/uploads/2017/07/Central-Venous-Catheter-2017June12-FINAL.pdf

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Don't order thrombophilia testing on children with venous access (i.e., peripheral or central) associated thrombosis in the absence of a positive family history

What, exactly, is a positive family history?

- 32 articles with *18 separate definitions* on what constitutes a positive family history in pediatric thrombosis studies
  - No consensus
  - Most common definition is first degree relative, but information regarding provoked vs unprovoked, age, or number of relatives affective not included
  - Studies are needed to refine definition of positive family history so that it can be better investigated as an independent risk factor for pediatric VTE

Hau, A. Family history of venous thromboembolism in the paediatric population: The need for a standard definition. Thrombosis Res 2019 (173):91-95

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Summary

- **Testing children with catheter related VTE for thrombophilia does not:**
  - influence the initial management of a first episode of provoked venous thrombosis
  - inform the intensity or duration of anticoagulant therapy
  - predict recurrence of venous thrombosis
- **Thrombophilia testing does have:**
  - substantial financial cost
  - the potential for misinterpretation of risk assessment leading to undue psychological distress or impact on childbearing plans
  - possible life insurance discrimination for affected patients

Chose Wisely, and do NOT send thrombophilia studies on children with catheter related VTE

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4 Don’t transfuse packed red blood cells (pRBC) for iron deficiency anemia in asymptomatic pediatric patients when there is no evidence of hemodynamic instability or active bleeding

- In pediatric patients with asymptomatic, iron deficiency anemia, do not transfuse packed red blood cells (pRBC) in the absence of hemodynamic instability or active bleeding
- Unnecessary pRBC transfusions put patients at risk for complications, such as transfusion reactions, blood borne infections and volume overload
- The judicious use of pRBCs transfusions would also be associated with cost savings for healthcare systems

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Iron Deficiency Anemia is a Common and Important Pediatric Condition

- Iron deficiency anemia affects more than 2 billion people worldwide, including ~5 million in the US
- IDA is a chronic process and is usually asymptomatic, even with a very low hemoglobin
- Although overtly “asymptomatic,” IDA can result in many neurologic sequelae and requires treatment
- The root cause must always be addressed

Camaschella C. NEJM 2015; 372:1832-1843.

Oral Iron Therapy is Effective

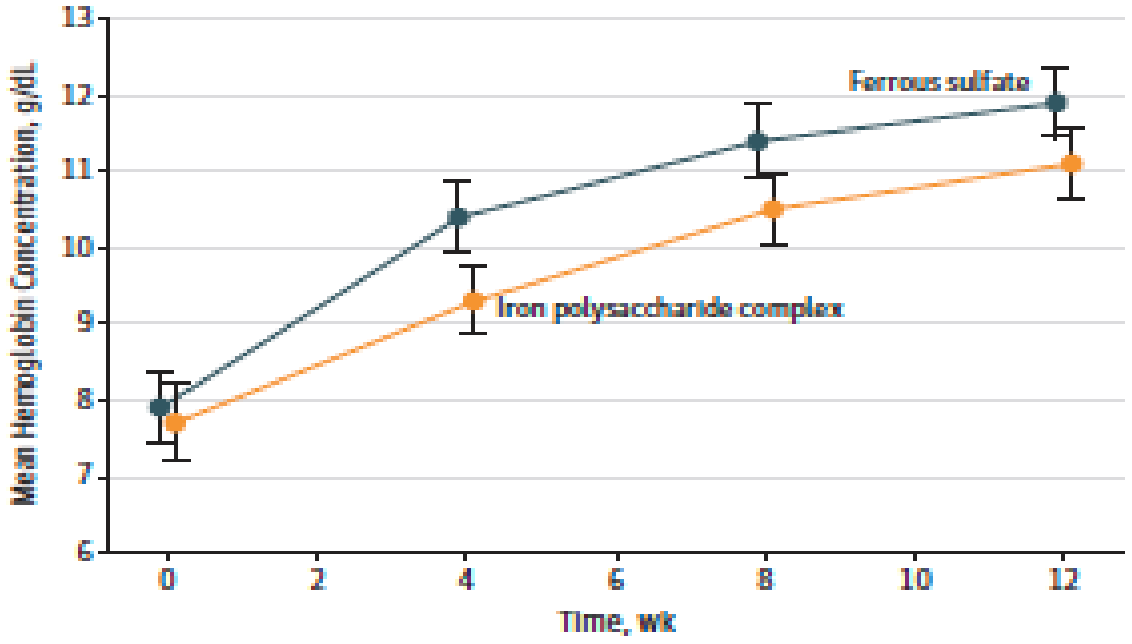
JAMA | Original Investigation

Effect of Low-Dose Ferrous Sulfate vs Iron Polysaccharide Complex on Hemoglobin Concentration in Young Children With Nutritional Iron-Deficiency Anemia

A Randomized Clinical Trial

Jacquelyn M. Powers, MD, MS; George R. Buchanan, MD; Leah Adix; Song Zhang, PhD; Ang Gao, M!

Figure 2. Hemoglobin Concentration Over Time



No. of patients				
Ferrous sulfate	40	35	31	28
Iron polysaccharide complex	40	38	34	31

IV Iron is a Rapid, Effective, and Safe Option

Pediatric Blood & Cancer

Intravenous Iron Sucrose for Children with Iron Deficiency Failing to Respond to Oral Iron Therapy

Shelley E. Crary, MD, MSCS[1,2], **Katherine Hall, BS**[1,2], and **George R. Buchanan, MD**[1,2]
[1]Department of Pediatrics, The University of Texas Southwestern Medical Center at Dallas, Dallas, TX
[2]Center for Cancer and Blood Disorders, Children's Medical Center, Dallas, TX

Response to both oral iron and IV iron sucrose based on indication for IV iron therapy

Primary indication for IV iron sucrose	n	Median hemoglobin rise after oral iron, g/dl (range)*	Median hemoglobin rise after IV iron sucrose, g/dl (range)
Non-adherent/intolerant to oral iron	13	0.05 (−1.0, 1.0)	3.1 (0.8, 7.6)
Malabsorption	13	0.4 (−0.4, 3.3)	1.9 (−2.7, 5.8)
Chronic blood loss	7	0.65 (−1.4, 5.7)	1.9 (0.2, 6.6)
Other†	5	1.1 (0, 2.2)	2.1 (0.6, 2.7)

Utilization trends and safety of intravenous iron replacement in pediatric specialty care: A large retrospective cohort study

Alexander A. Boucher[1] | **Amanda Pfeiffer**[1] | **Ashley Bedel**[2] | **Jennifer Young**[2] | **Patrick T. McGann**[1]

1,088 IV iron doses in 194 children

No severe infusion reactions

Only 1.8% of infusions with minor, transient adverse events

Blood is a Scarce Resource

American Red Cross

American Red Cross Issues Emergency Need for Blood Donors

July 09, 2019

Blood donations are being distributed to hospitals faster than donations are coming in; blood donors needed to help avoid delays in lifesaving medical care

Regional Blood Supply Deals with Annual Pre-Holiday Shortage

By BRAD PALMER • NOV 13, 2019

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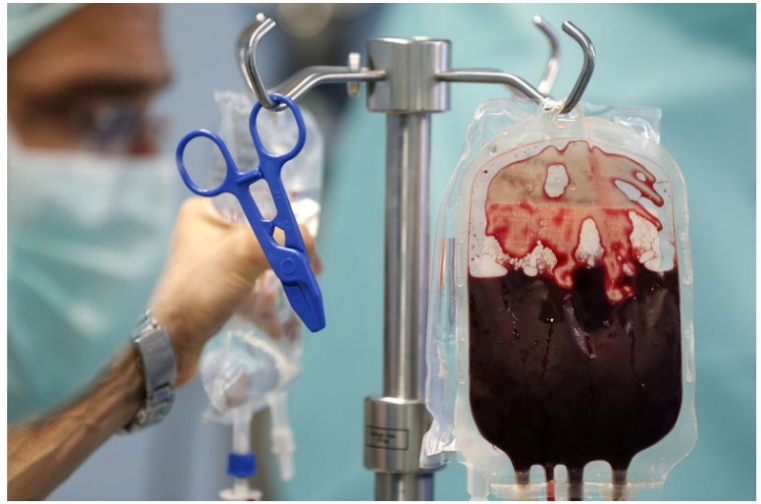
Goats and Soda STORIES OF LIFE IN A CHANGING WORLD

Hospitals Around The World Have A Dire Shortage Of Blood

October 22, 2019 · 1:[illegible]2 PM ET

TIM MCDONNELL



Transfusion is a Temporary Solution

- Effect of pRBC transfusion is transient
- Transfusion does not replete iron stores
- Iron within pRBCs is not available for erythropoiesis
- Iron supplementation is still necessary
- Severe anemia will recur if iron deficiency is not adequately treated

Transfusion Carries Infectious Risks

- HIV: 1 in 1,467,000
- Hepatitis C: 1 in 1,149,000
- Hepatitis B: 1 in 282,000
- Bacterial Infection: 1 in 2-3,000
- Zika/Other Infections: ???

Red blood cell transfusion: ASH Pocket Guide for the Clinician

Transfusion Carries Other Risks

- Transfusion—associated circulatory overload (TACO)
- Transfusion-associated acute lung injury (TRALI)
- Allergic Reactions
- Febrile non-hemolytic transfusion reactions
- Acute/Delayed hemolytic transfusion reactions
- Alloimmunization
- Allergic/Anaphylactic Reactions

Cost is a Factor

Oral Iron:
~$5-10 per month

IV Iron:
~$300-600 per dose (+infusion/facility costs)

Transfusion:
~$500 (+ED visit/hospitalization)

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Iron Deficiency – Diagnosis and Management

Blood transfusion is very rarely required for iron deficiency anemia in children because onset of anemia is gradual allowing for physiologic compensation and the response to iron supplementation is prompt. Judicious transfusion is indicated for very severe anemia in the setting of hemodynamic compromise/severe signs of anemia requiring emergent correction. In this case, transfused blood should be administered in small aliquots of 5 mL/kg over 4 hours with close monitoring, for prevention of fluid overload/cardiac failure.

Conclusions

- Iron deficiency anemia is common and needs treatment
- The anemia of IDA is chronic and well compensated
- Repletion of iron stores with oral or IV iron results in a rapid rise in hemoglobin
- Transfusion should not be provided to children with iron deficiency anemia in the absence of symptoms or hemodynamic compromise

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5

Don’t routinely administer granulocyte colony stimulating factor (G-CSF) for empiric treatment of pediatric patients with asymptomatic autoimmune neutropenia in the absence of recurrent or severe bacterial and/or fungal infections

- In pediatric patients with asymptomatic autoimmune neutropenia, there is insufficient evidence to support the routine use of granulocyte colony stimulating factor (G-CSF) as a prophylaxis strategy to improve health outcomes
- Use of G-CSF in this population should be guided by clinical evaluation
- Unnecessary routine use of G-CSF could lead to intolerable side effects, such as bone pain, as well as avoidable healthcare costs

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Autoimmune/Benign/Idiopathic Neutropenia and G-CSF

Clinical features

- Reported incidence from 1:100,000 children/year to 1:6300 live births
- Female:male ratio ~1
- Median age of diagnosis 8-11 months (range 3 - 38 months)
- Few and minor infections (mostly upper respiratory)
- Occasional gingivitis
- Only very rare serious or invasive infections, usually in young infants

Autoimmune/Benign/Idiopathic Neutropenia and G-CSF

Laboratory features

- Median ANC at time of diagnosis ≈200 cells/μL (range 0-500)
- ANC usually rises at times of stress or bacterial infection, or with glucocorticoid stimulation
- Bone marrow (if performed) shows normal to increased myelopoiesis, sometimes with a decrease in mature neutrophils
- Anti-neutrophil antibodies sometimes detected, but not sensitive or specific

Autoimmune/Benign/Idiopathic Neutropenia and G-CSF

Prognosis

- Recovery in almost all patients
- Median duration 20 months, range 6 - 54 months
- No evident risk of recurrence

Autoimmune/Benign/Idiopathic Neutropenia and G-CSF

Therapy

- NO need for ER visits unless clearly sick/toxic
- Antibiotics for acute bacterial infection
- Good dental hygiene
- Discourage excessive precautions (social isolation, “neutropenic diet,” antibacterial skin cleaners, household disinfection)
- Encourage PCP to continue all immunizations

Autoimmune/Benign/Idiopathic Neutropenia and G-CSF

G-CSF THERAPY

- What is current practice?
- What is the evidence?

RESEARCH ARTICLE

Idiopathic neutropenia of infancy: Data from the Italian Neutropenia Registry

Piero Farruggia[1] | Francesca Fioredda[2] | Giuseppe Puccio[3] | Daniela Onofrillo[4] | Giovanna Russo[5] | Angelica Barone[6] | Sonia Bonanomi[7] | Gianluca Boscarol[8] |

336 autoimmune:	G-CSF treatment used in 7.5%
85 idiopathic:	G-CSF treatment used in 2.8%

Am J Hematol. 2019;94(2):216-222. doi:10.1002/ajh.25353

DOI: 10.1002/pbc.28146

HEMATOLOGY: RESEARCH ARTICLE

Pediatric Blood & Cancer

The cost of a "benign" condition: Healthcare utilization and infectious outcomes in young children with primary autoimmune neutropenia

Susan E. Kirk[1,2] | Amanda Bell Grimes[1,2] | Sayali Shelke[3] | Jenny M. Despotovic[1,2] | Jacquelyn M. Powers[1,2]

2014-2016	43 Patients	
G-CSF Used	N = 7	16%
Due to recurrent infections	N = 3	7%
Due to planned invasive procedure	N = 2	5%
Due to family preference	N = 2	5%

Kirk SE, Grimes AB, Shelke S, Despotovic JM, Powers JM. *Pediatr Blood Cancer*. 2020;67(4):e28146.

TABLE 3 Cost data for emergency center evaluation of isolated fever for a child with autoimmune neutropenia at a large tertiary care center

Item	Facility / professional fees per EC[c] visit
Level 4 EC[a] service with procedure	$2257
Intravenous fluid infusion	$739
CBC[b] with differential	$255
Blood culture	$276
Ceftriaxone dose	$241
Ibuprofen/acetaminophen	$3
Subtotal charges per one F&N[c] EC[c] encounter	**$3771**
Total estimated charges for cohort ($n = 113$)	**$426 123**

[a] EC: emergency center.
[b] CBC: complete blood count.
[c] F&N: fever and neutropenia.

Kirk SE, Grimes AB, Shelke S, Despotovic JM, Powers JM. *Pediatr Blood Cancer*. 2020;67(4):e28146

Autoimmune/Benign/Idiopathic Neutropenia and G-CSF

What is current practice

- Variable: 2.8 – 22% rates of G-CSF administration

Basis for recommendations:

- Benign/autoimmune neutropenia resolves by age 4-5
- Risk of serious infection is extremely low
- So not possible to determine if G-CSF can reduce the already extremely low risk
- Major morbidity is trauma & cost of ER visits
- NO association of G-CSF with MDS/AML in this disease

Autoimmune/Benign/Idiopathic Neutropenia and G-CSF

G-CSF THERAPY: Recommendations for choosing wisely

- **NOT necessary in most cases**
- ***May* be appropriate for**
  - **serious infection (consider alternative diagnoses!)**
  - **to improve quality of life (ER visits, restrictions, anxiety)**
    - Start with LOW dose (1-2 mcg/kg)

1. Don’t perform routine pre-operative hemostatic testing (PT, aPTT) in an otherwise healthy child with no prior personal or family history of bleeding

2. Don’t transfuse platelets in an asymptomatic (i.e., non-bleeding) pediatric patient (e.g. aplastic anemia, leukemia, etc.), with a platelet count > 10,000/mcL unless other signs and/or symptoms for bleeding are present, or if the patient is to undergo an invasive procedure

3. Don’t order thrombophilia testing on children with venous access (i.e., peripheral or central) associated thrombosis in the absence of a positive family history

4. Don’t transfuse packed red blood cells (pRBC) for iron deficiency anemia in asymptomatic pediatric patients when there is no evidence of hemodynamic instability or active bleeding

5. Don’t routinely administer granulocyte colony stimulating factor (G-CSF) for empiric treatment of pediatric patients with asymptomatic autoimmune neutropenia in the absence of recurrent or severe bacterial and/or fungal infections

Choosing Wisely®
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