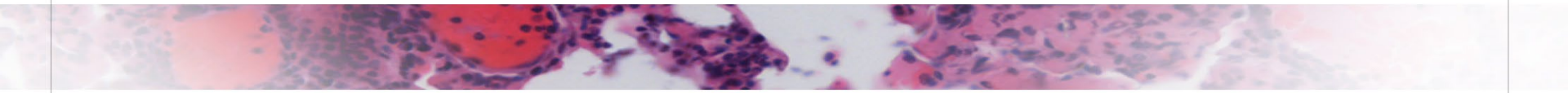
American Society of Hematology
Helping hematologists conquer blood diseases worldwide



ICD-10-CM Diagnosis Topic

Duffy-null Associated Neutrophil Count (DANC)

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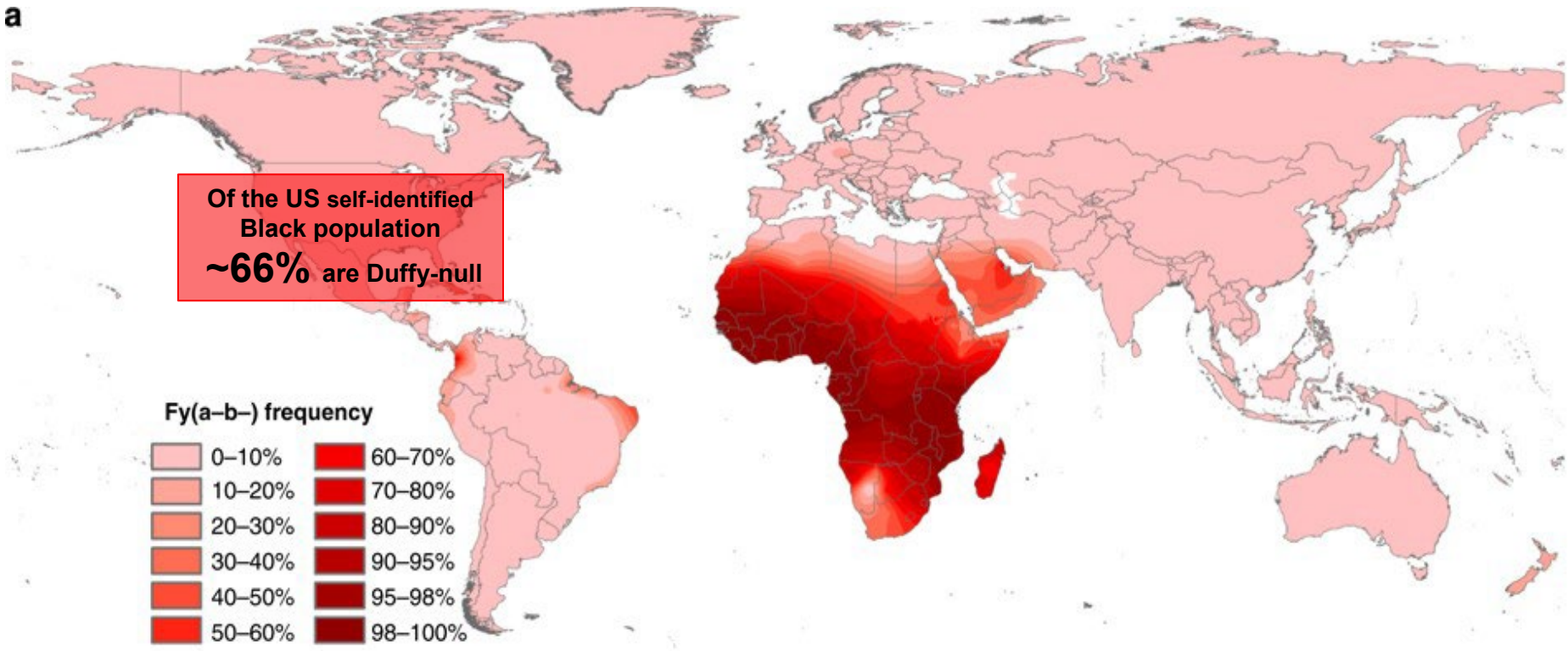
Outline

- The Duffy Antigen and Duffy null phenotype
- Prevalence of Duffy null phenotype
- **Duffy-null associated neutrophil count (DANC)**
- Our Request

The Duffy (Fy) Antigen and Duffy-null Phenotype

- Duffy blood group was discovered in 1950
- Minor red blood cell antigen, two co-dominant alleles – **Duffy A and B**
- **Implicated in blood transfusion reactions**
- Duffy antigen plays a role in inflammation and in malaria infection
- People with **Duffy null phenotype** are protected against *P. vivax* malaria

Prevalence of the Duffy Null Phenotype



Howes RE, Patil AP, Piel FB, et al. *Nat Commun.* 2011;2:266.
Merz LE, Story CM, Osei MA et al. Blood Adv. 2023 Feb 14;7(3):317-320.

Duffy-null Associated Neutrophil Count (DANC)

- We have known for decades that those of African ancestry have lower ANC without any increased risk for infection previously called *'Benign Ethnic Neutropenia (BEN)'*

- Now we know 1) BEN is associated with the **Duffy-null phenotype**

  2) Mechanism: Neutrophils that migrate out of blood into tissues
- "Apparent neutropenia" and not at all a true neutropenia

- **Total body neutrophil count (TBNC) is normal, function normal**

Consequences of an Inappropriate Diagnosis of Neutropenia

Patients

- Anxiety to patient/family
- Referral to Hematology
- Extensive work-up, > once

Physicians

- Concern of primary care providers
- Unnecessary specialist referral
- Workforce burn-out

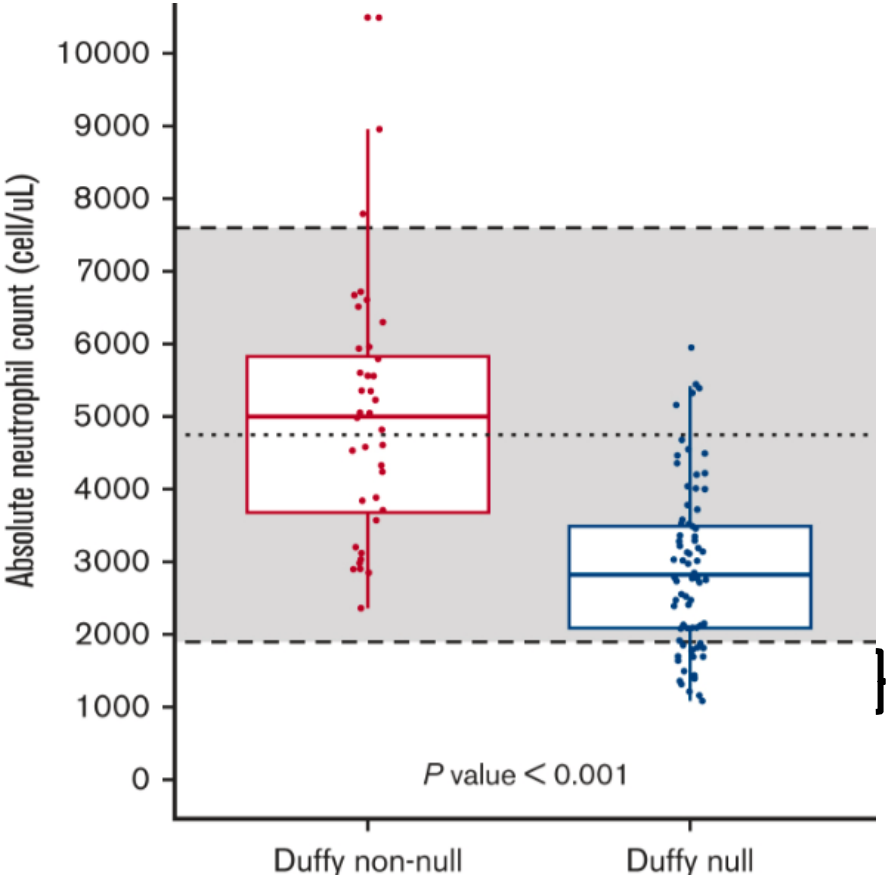
Impacts on Treatment

- Premature discontinuation of meds
- Exclusion from medication use
- Chemotherapy dose-reductions – worse outcomes

Impacts on Clinical trials

- Exclusion from clinical trials
- Slower recruitment – longer trials
- Lack of diversity & generalizability of results

ANC Among Healthy US Blacks by Duffy Status



27 million Americans

Merz LE et al. Blood Adv. 2023 Feb 14;7(3):317-320.

Impetus for Change

- Currently, Duffy antigen only has ICD-10-CM codes related to its ability to cause blood transfusion incompatibility and reactions

- No ICD-10-CM codes related to the influence of the Duffy antigen on white blood cell/neutrophil counts. This is critical in order to designate accurate ANC normal ranges.

Request for 4 New ICD-10-CM Codes

- We request codes to describe the Duffy phenotypes that predict WBC/neutrophil counts

  - **Duffy null:** absence of Duffy A and Duffy B antigens *[Fy(a-b-)]*
  - **Duffy A positive:** presence of Duffy A antigen alone *[Fy(a+b-)]*
  - **Duffy B positive:** presence of Duffy B antigen alone *[Fy(a-b+)]*
  - **Duffy AB positive:** presence of Duffy A&B antigens *[Fy(a+b+)]*

Collaborations

- American Society of Clinical Pathology – Choosing Wisely campaign
- UpToDate – section on neutropenia
- American Society of Hematology – DDCF grant

QUESTIONS?