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Testing for Bleeding Disorders in Child Abuse: Adherence to AAP Recommendations and Results of Testing

Lyndsey Hultman

Angela Doswell

Henry T. Puls

Shannon L. Carpenter

Angela Bachim

See next page for additional authors

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Creators

Lyndsey Hultman, Angela Doswell, Henry T. Puls, Shannon L. Carpenter, Angela Bachim, Kristine Campbell, Daniel Lindberg, Joanne Wood, and James Anderst

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Disclosure

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- Author disclosures: None



Background

- Bleeding disorders may present with bruising or ICH that could initially be concerning for abuse.
 - Differentiating bleeding disorders and physical abuse is important for accurate diagnosis, provision of medical information to MDT, and/or subspecialty referrals.
- AAP guidelines published for bleeding disorder testing in children evaluated for physical abuse.
- Adherence to AAP guidelines and frequency of identification of bleeding disorders among children evaluated for physical abuse unknown.



Objectives

- Using CAPNET
- Evaluate the frequency of adherence to AAP recommendations for testing for bleeding disorders in children with bruising, bleeding, or ICH concerning for abuse.
 - Hypothesis: Complete testing would occur in more than 50% of study cases meeting AAP criteria for testing.
- Evaluate the frequency of identification of bleeding disorders in children with bruising, bleeding, or ICH concerning for abuse.
 - Hypothesis: Bleeding disorders would be identified in less than 1% of cases in which they were tested.



CAPNET – A Multicenter Research Network

- Who
 - < 10 years old, evaluated by CAP
 - Recent concern for physical abuse
 - Evaluated at CAPNET site
- How
 - Data entry by CAPs and data operators
 - >700 potential data points for each encounter
 - Data quality assurance
 - Passive
 - Active
 - 10% double data entry



Methods

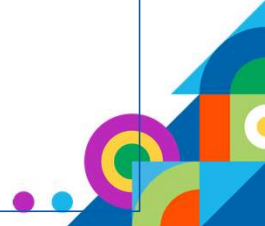
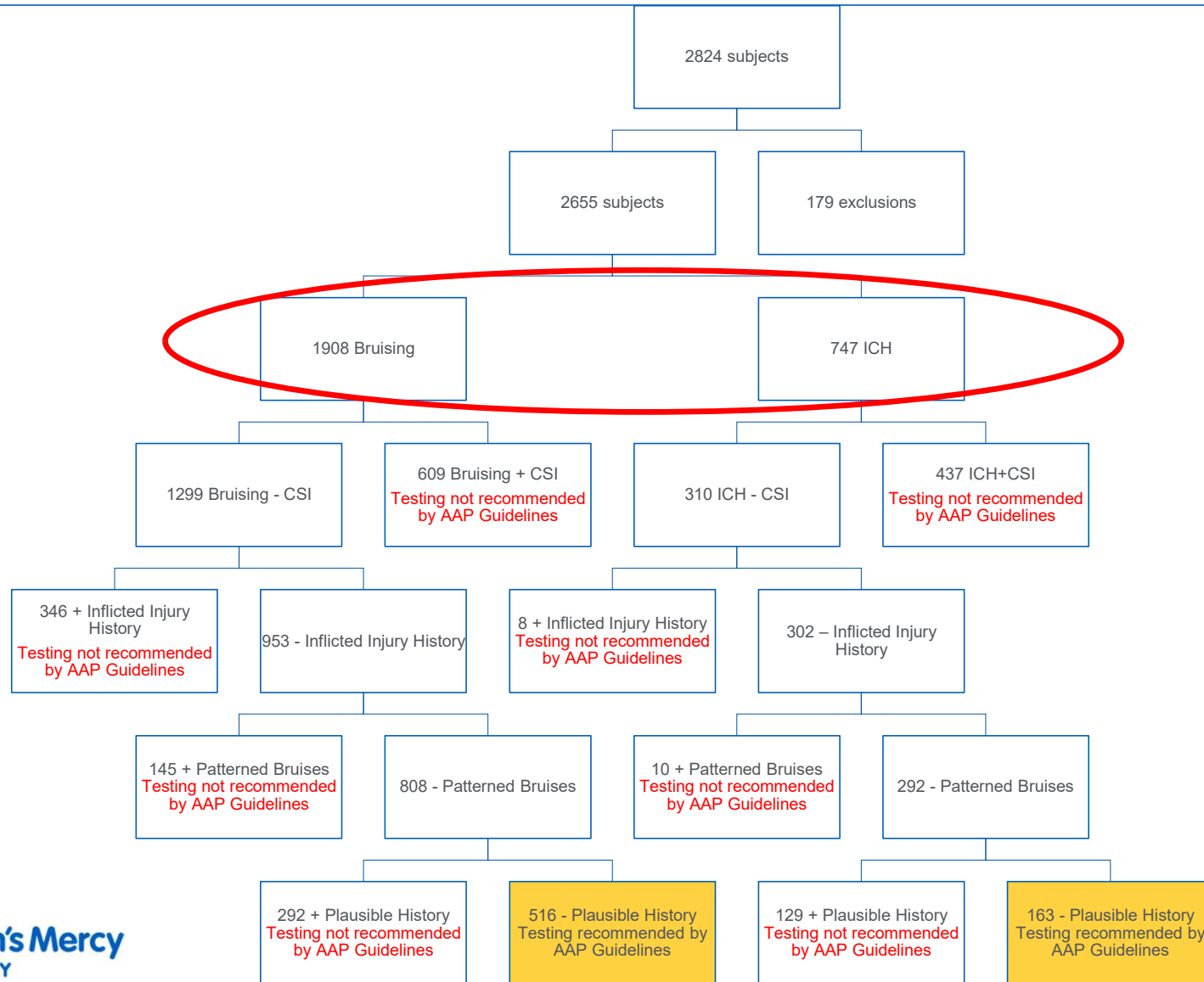
- Retrospective, multicenter, descriptive
- February 1, 2021- May 31, 2022
- Presenting for bruising or ICH concerning for abuse
- First CAPNET episode



Testing recommended

- No Concomitant Suspicious Injuries (CSIs)
 - Injuries unrelated to bleeding: fractures, burns, retinoschisis, abdominal injuries, spinal ligamentous injuries
- No history of inflicted injury
- No patterned bruising
- No plausible history
 - Defined by Likert rating by CAP of 1-2 (low likelihood of abuse)





AAP Testing Recommendations

Bruising

- CBC
- INR
- PTT
- Factor VIII level
- Factor IX level
- von Willebrand antigen
- von Willebrand activity

ICH

- CBC
- INR
- PTT
- Factor VIII level
- Factor IX level
- Fibrinogen
- D-dimer



Recommendation adherence

- Rates of recommended testing completion analyzed by
 - Individual component test
 - Full testing completion
- Hypothesis: Adherence analyzed by
 - Total study sample meeting AAP criteria for testing
 - Anonymized CAPNET center

Subjects meeting AAP criteria for testing with all AAP testing completed

Subjects meeting AAP criteria for testing



Results- Bruising

- Adherence for all AAP recommended tests among all subjects: 9.5%
 - Ranged from 0-34.1% among CAPNET centers
- Component test practices by Center
 - 2 Centers with low testing overall: less than 27% for each test
 - 1 Center with similar testing rates: 37.5-54.6% for each test
 - 7 Centers with variable testing
 - High rates of CBC, INR, PTT: 68.4-87.5%
 - Lower rates of factor and vWD testing: less than 34% for each test



Results- ICH

- Adherence for all AAP recommended tests among all subjects: 32.5%
 - Ranged from 0-100% among CAPNET centers
- Component test practices by Center
 - No Centers with low testing overall
 - 3 Centers with similar testing rates: at least 70% for all
 - 7 Centers with variable testing
 - High rates of CBC, INR, PTT: at least 88%
 - Lower rates of factor and fibrinogen testing: 21.6-83.3%



Identification of Bleeding Disorders

- 25/2655 (0.94%) with bleeding disorder affecting diagnosis as identified by evaluating CAP
 - 5 Hemophilia, 2 other factor deficiencies, 1 von Willebrand, 2 DIC, 5 medication effects, 1 multiple bleeding risks, 1 without final diagnosis of von Willebrand and/or platelet function disorder
 - 8/251 (3.2%) of those with all AAP testing completed
- 17/25 (68%) did not meet AAP criteria for testing
 - 7 CSIs, 1 inflicted injury history, 9 Likert 1-2
- 3/25 (12%) had high final likelihood rating for abuse (Likert 6-7)



Abnormal Bleeding Disorder Testing Results

- 52/679 (7.66%) of subjects with testing recommended had abnormal results of at least one test but were not diagnosed with a bleeding disorder during the data entry period.
- Completion of any follow-up testing and results unknown.



Limitations

- Retrospective
- Limited CAPNET data entry window
 - Hematologic testing may be ongoing
- Details of full medical record not available for review



Conclusions

- Adherence to AAP recommendations for testing is low
 - Although rare, bleeding disorders present among cases with testing
 - Approximately 1% of study population identified to have a bleeding disorder
- Concern for unidentified bleeding disorders
 - 7.66% with abnormal results among those with testing recommended



Conclusions

- Variability in bleeding disorder testing practices among CAPNET centers
 - Higher adherence among ICH cases: admitted to hospital, more severe injury, more likely to have legal proceedings
 - Many centers utilizing a screening approach of CBC, INR, PTT
 - Poor sensitivity and specificity for children presenting with bruising or bleeding
 - Advanced testing may be more difficult to obtain
- Further research into bleeding disorder testing practices warranted
 - Understand factors associated with decision to obtain testing
 - Understand prevalence of bleeding disorders among children evaluated for physical abuse



CAPNET Site PIs

- James Anderst – Children’s Mercy
- Angela Bachim – Texas Children’s
- Rachel Berger – UPMC Children’s Hospital of Pittsburgh
- Farah Brink – Nationwide Children’s
- Kristine Campbell – University of Utah
- Lori Frasier – Penn State
- Nancy Harper – University of Minnesota
- Natalie Laub – Rady Children’s
- Dan Lindberg – Children’s Colorado
- John Melville – MUSC
- Joanne Wood – CHOP

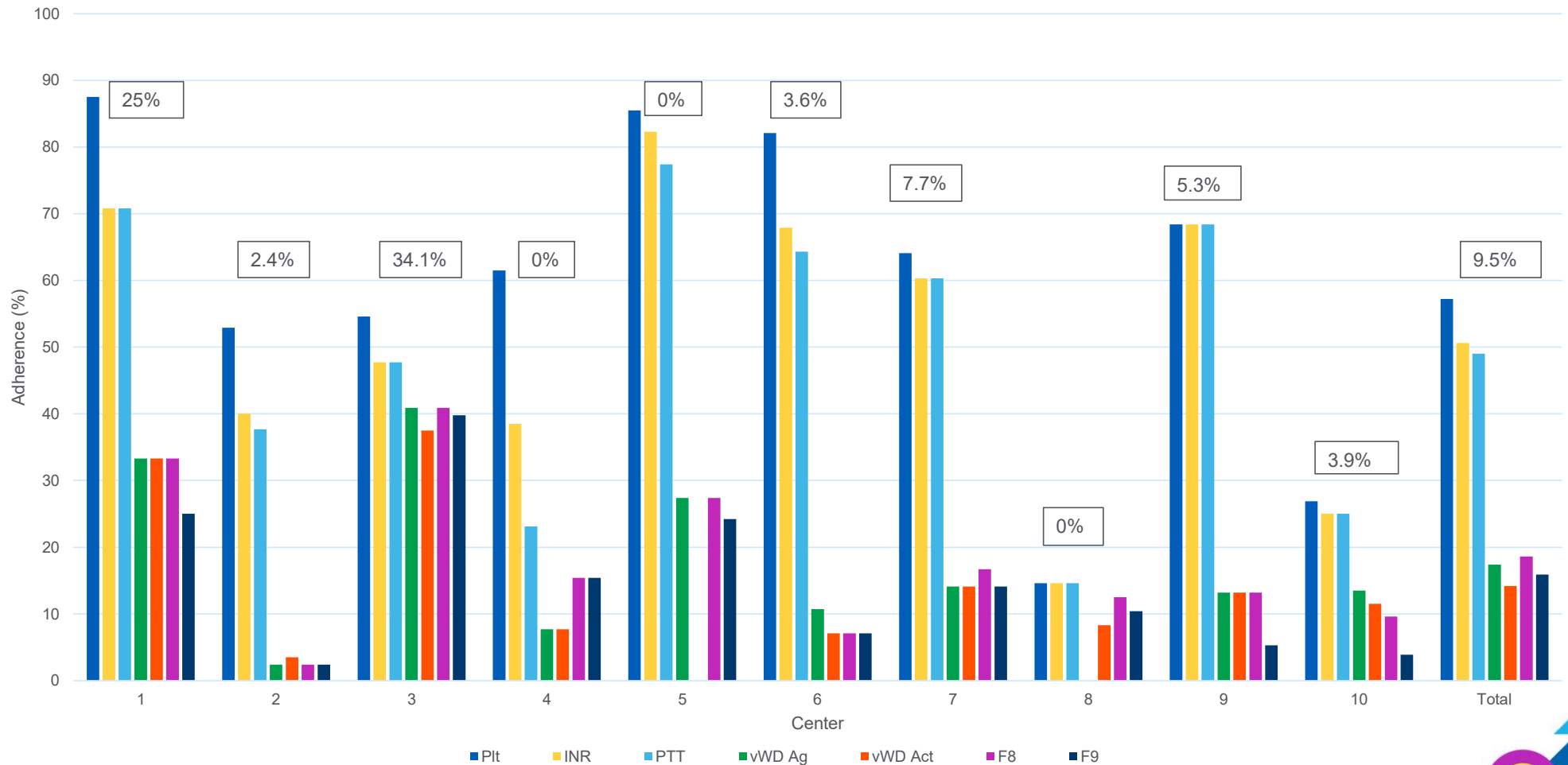


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Adherence to AAP Bleeding Disorder Evaluation for Bruising, by Center



Adherence to AAP Bleeding Disorder Evaluation for ICH, by Center

