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### Bleeding Disorder Referrals to Hematology Clinic: A Single Institution Experience

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# Bleeding Disorder Referrals to Hematology Clinic: A Single Institution Experience

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# Bleeding Disorder Referrals

- Retrospective chart review was utilized to characterize hematology referrals for bleeding disorder evaluation
- Of 373 subjects, 40 (11%) were diagnosed with a bleeding disorder with 21 (6%) being diagnosed with von Willebrand disease
- 9% of Otolaryngology referrals compared with 15% of Primary Care resulted in a bleeding disorder diagnosis

# Outline

- Background
- Objectives
- Methods/Design
- Results
- Conclusion
- Summary

# Bleeding Disorder Diagnosis

- A 2014 study showed that 4% of patients referred to hematology based on a preoperative coagulation evaluation had a clinically relevant bleeding disorder

# Bleeding Disorder Evaluation

- Mild bleeding symptoms are common in the general population and have been reported in 25-40% of healthy individuals
- Evaluations can be time consuming and costly, often requiring multiple visits for stepwise laboratory testing

# Pre-Operative Screening

- Various studies of routine preoperative testing in the prediction of operative hemorrhage in adenotonsillectomy have shown abnormal screening labs are common in the healthy population, ranging from 2% to 4%
- Burk et al prospectively evaluated 1603 children undergoing tonsillectomy; 31 children had initial laboratory abnormalities with 2% of the population had post-operative bleeding

# Standardized Bleeding Assessment Tools

- International Society on Thrombosis and Haemostasis bleeding assessment tool ISTH BAT has high sensitivity and negative predictive value for bleeding disorders that makes it suitable as a screening tool, but it has not been shown to be able to predict future bleeding events



# Purpose

- To characterize our hematology referrals for bleeding disorder work up
- To describe the diagnostic outcomes from these referrals
- To estimate the proportion of bleeding disorders diagnosed from these referrals
- To identify referral factors that are associated with being diagnosed with a bleeding disorder

# Design

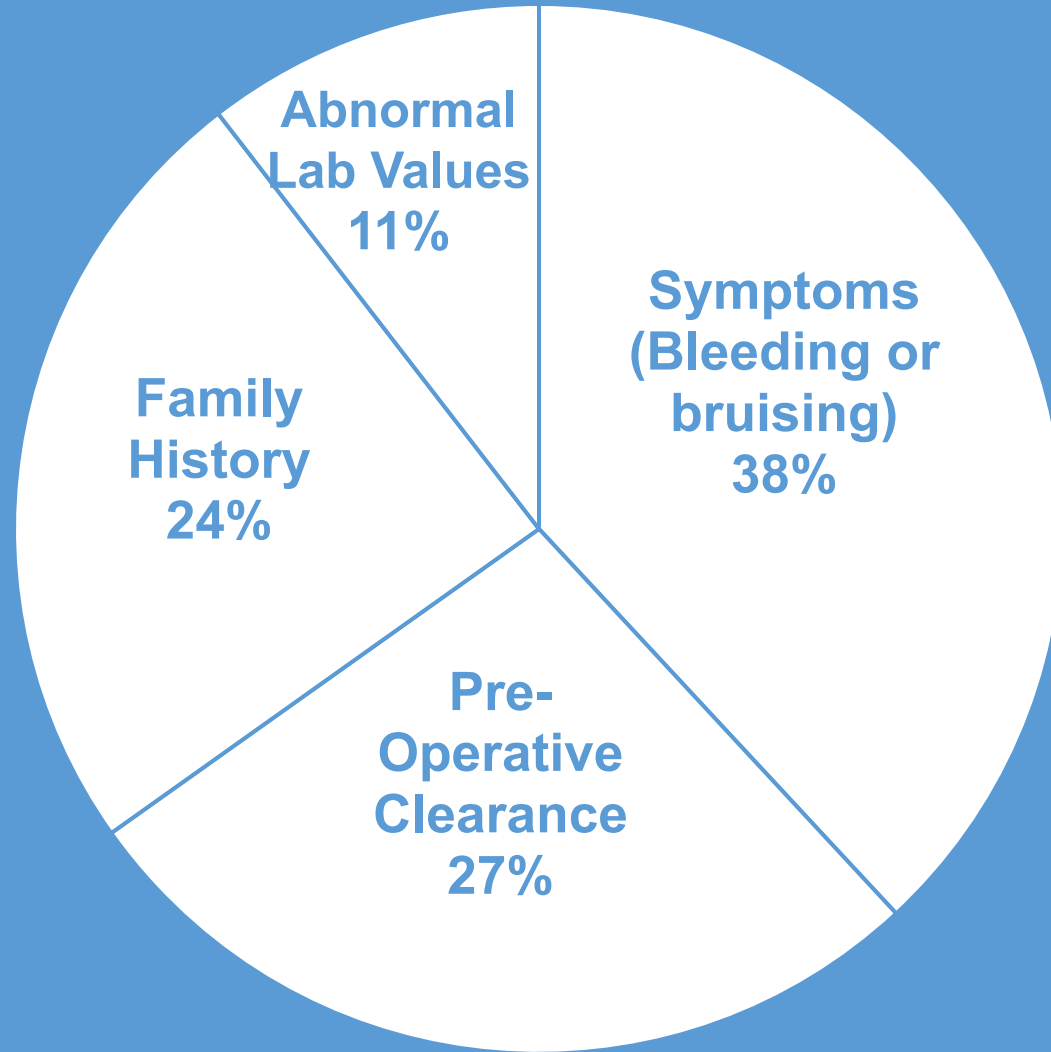
- Patients referred and/or seen for a bleeding disorder evaluation at Children's Mercy Hospital from 07/1/2018 until 06/30/19 were evaluated for demographics, reason for consultation, referring provider, and outcome of referral
- Each eligible subject's electronic health record (EHR) was accessed and reviewed to collect study-related information compiled within RedCap

# Population Characteristics

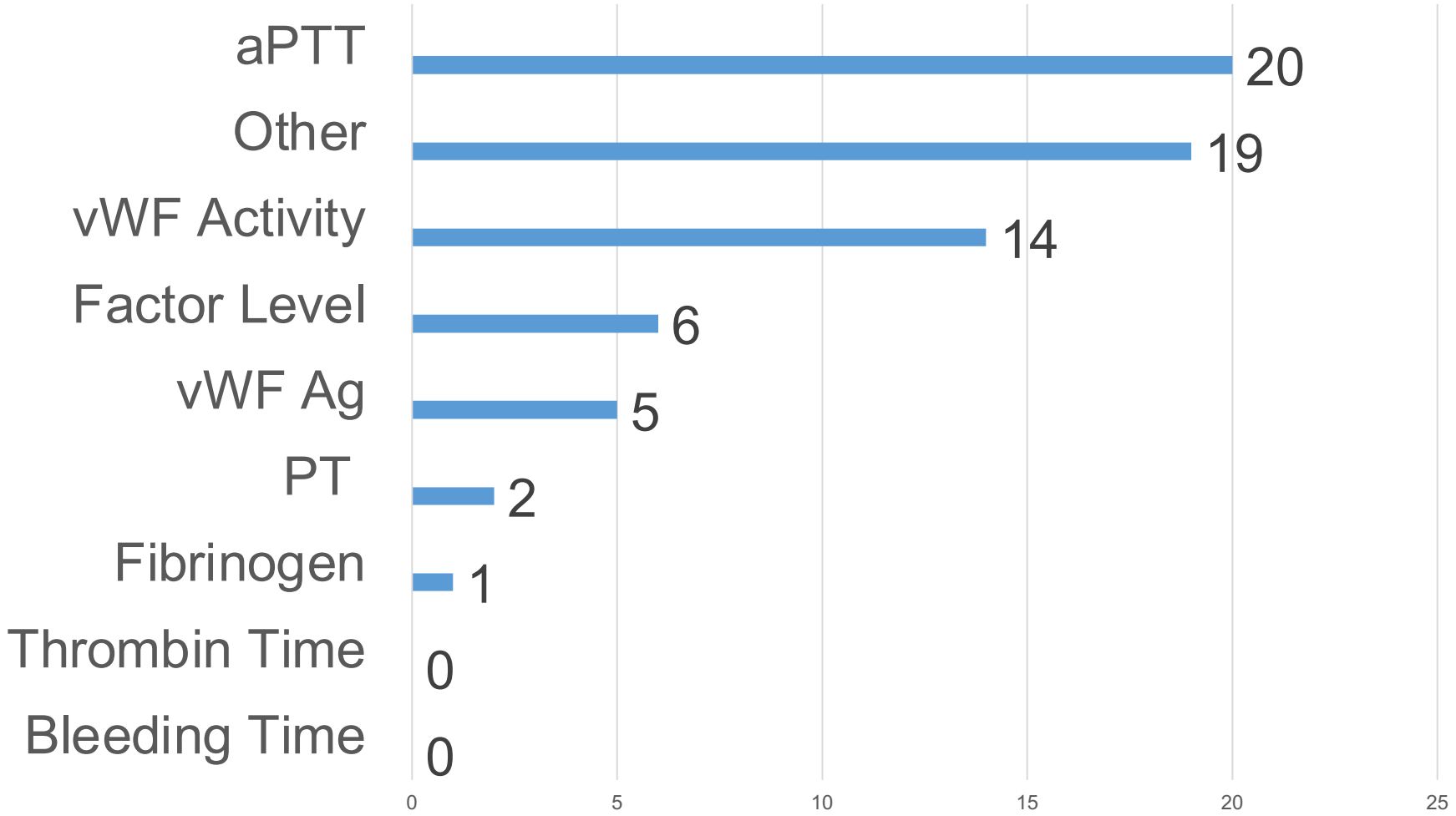
Total n = 373	
Age (years) mean (SD)	8.3 (8.4)
Gender, n (%)	
Female	210 (56.3)
Race/Ethnicity, n (%)	
White	256 (68.6)
Black	69 (18.5)
Hispanic	52 (13.9)
Other/Unknown Race	4 (1.1)
Native American	4 (1.1)
Asian	4 (1.1)
Pacific Islander	2 (0.5)

- 20 subjects had work up still in progress at the time of data collection
- 7 subjects were seen but lost to follow up prior to diagnosis
- 29 cancelled or did not show for appointments

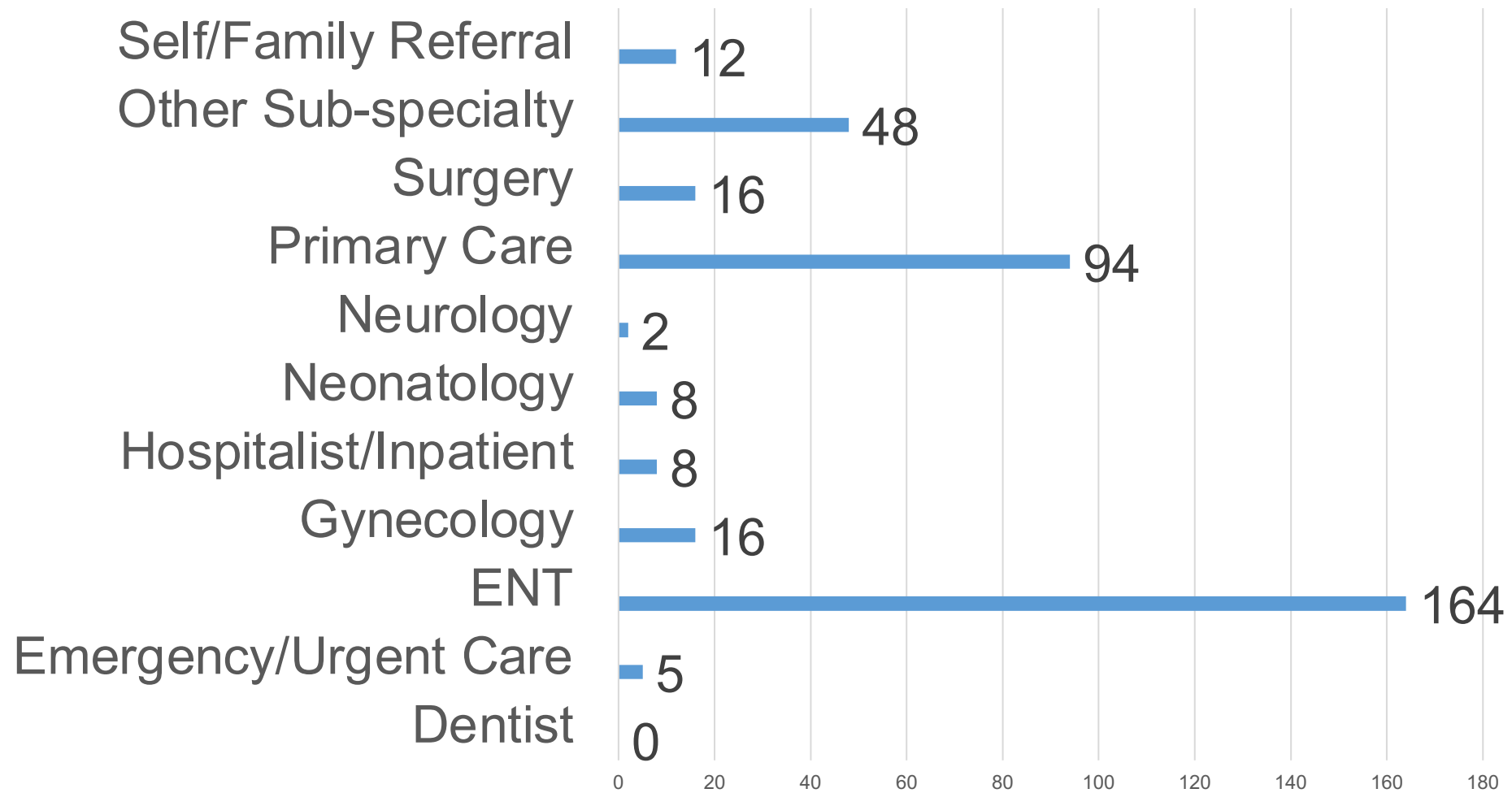
## REFERRAL REASON



# Abnormal Labs



# Referring Specialties



# Bleeding Disorder Diagnosis: Referring Specialties

- 40% (164/373) of the referrals were from Otolaryngology (ENT), 30% (112/373) from primary care, and 27% from other specialties
- Of those referred from Otolaryngology and Primary Care (Adolescent Medicine and Gynecology):
  - 9% (15/164) were diagnosed from ENT
  - 15% (17/112) were diagnosed from primary care

# Bleeding Disorder Diagnosis

- Of our referred patient sample:
  - 6% (21/373) were diagnosed with von Willebrand disease
  - 4% (14/373) were diagnosed with a platelet function disorder
  - 1.3% (4/373) were diagnosed with a factor deficiency
- The median number of days between referral and appointment was 31.5 days with a median of 2 [1-5] total visits including clinic and laboratory visit for a clinical diagnosis



# Logistic Regression

<i>Predictors</i>	<i>Odds Ratio</i>	<i>95% CI</i>	<i>p-value</i>
Age	0.92	0.85 – 0.99	<b>0.038</b>
Gender [Male vs. female]	1.75	0.82 – 3.83	0.151
Ref Reason: Pre-operative clearance [Yes vs. No]	0.51	0.23 – 1.09	0.088
Referral Reason: Abnormal Labs [Yes vs. No]	3.03	1.29 – 6.98	<b>0.010</b>
Treatment: Nasal Cauterization [Yes vs. No]	2.86	0.82 – 8.82	0.078

# Bleeding Disorder Diagnosis: Referral Patterns

- 11% of subjects in this study were diagnosed with a bleeding disorder
- This coincides with rates of bleeding disorders within the general population
  - 1 in 1,000 people have von Willebrand disease
  - With this prevalence, our study's 21 out of 373 subjects (6%) is reasonable

# Bleeding Disorder Diagnosis: Referral Factors

- Certain referral factors including age and abnormal laboratory values had a significant p value
- 35% (14/40) were diagnosed with a bleeding disorder with at least one abnormal coagulation test
  - Shaw et al demonstrated 19% (9/48) prevalence of a bleeding disorder in pediatric patients with abnormal screening coagulations tests.

# Bleeding Disorder: Referring Specialties

- 9% of Otolaryngology referrals compared with 15% of Primary Care resulted in a bleeding disorder diagnosis indicating higher screening positivity from primary care
- The utility of bleeding histories has previously been demonstrated and this study highlights that as primary care tended to refer for bleeding symptoms including menorrhagia and epistaxis

# Limitations

- Small number of subjects with confirmed diagnosis
- Conducted at a single center
- 25% of the referred population did not have a complete work up at the time of data collection with an 8% (n = 29) no show or cancellation rate

# Bleeding Disorder Referrals

- Age and abnormal laboratory values can predict the diagnosis of a bleeding disorder
- Most diagnoses were von Willebrand's disease (6%), coinciding with the general population having the highest rate of diagnosis within bleeding disorders
- Primary care has a higher screening positivity than Otolaryngology who likely refer more for the higher risk of immediate bleeding

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