Von Willebrand Disease Testing

INDICATIONS FOR TESTING
Excessive mucosal bleeding (eg, epistaxis, bleeding of gums, menorrhagia, postsurgical bleeding)

PERFORM
Initial testing:
- FVIII activity testing
- VWF testing
- VWF:Ag testing

And consider:
- An assay that reflexes to multimeric analysis

PERFORM
Additional testing to confirm subtype:
- RCo:Ag ratio test
- Multimeric analysis
- von Willebrand Disease (VWF) gene sequencing
- RIPA test

Results compatible with VWD
- Type 1
  - VWF:Ag: <30 IU/dL
  - VWF:RCo: <30 IU/dL
  - FVIII: low or normal
  - RCo:Ag ratio: >0.5-0.7
  - Multimer pattern: normal but reduced intensity
  - RIPA: normal
  - Type 1 variant present
  - Desmopressin trial: <30% decrease from peak VWF 4 hrs after infusion

Results not compatible with VWD
- Type 3
  - VWF:Ag: Absent
  - VWF:RCo: Absent
  - FVIII: severely low (<10 IU/dL)
  - RCo:Ag ratio: n/a
  - Multimer pattern: no VWF present
  - RIPA: absent
  - Type 3 variant present

Type 1C
- VWF:Ag: <30 IU/dL
- VWF:RCo: <30 IU/dL
- FVIII: low or normal
- RCo:Ag ratio: >0.5-0.7
- Multimer pattern: normal but reduced intensity
- RIPA: normal
- Type 1 variant present
- Desmopressin trial: <30% decrease from peak VWF 4 hrs after infusion

Type 2A
- VWF:Ag: <30-200 (commonly <50) IU/dL
- VWF:RCo: <30 IU/dL
- FVIII: low or normal
- RCo:Ag ratio: <0.5-0.7
- Multimer pattern: abnormal
- RIPA: abnormal; enhanced aggregation at low ristocetin levels
- Type 2A variant present

Type 2B
- VWF:Ag: <30-200 (commonly <50) IU/dL
- VWF:RCo: <30 IU/dL
- FVIII: low or normal
- RCo:Ag ratio: <0.5-0.7
- Multimer pattern: abnormal
- RIPA: abnormal; enhanced aggregation at low ristocetin levels
- Type 2B variant present

Type 2B and Platelet Type
- VWF:Ag: <30-200 (commonly <50) IU/dL
- VWF:RCo: <30 IU/dL
- FVIII: low or normal
- RCo:Ag ratio: typically <0.5-0.7
- Multimer pattern: abnormal
- RIPA: abnormal; enhanced aggregation at low ristocetin levels
- Type 2B variant present or GP1BA variant present (for platelet type)

Type 2M
- VWF:Ag: <30 IU/dL
- VWF:RCo: <30 IU/dL
- FVIII: low or normal
- RCo:Ag ratio: <0.5-0.7
- Multimer pattern: normal pattern, may have reduced intensity
- RIPA: reduced at high ristocetin concentrations
- Type 2M variant present

Type 2N
- VWF:Ag: 30-200 IU/dL
- VWF:RCo: 30-200 IU/dL
- FVIII: mildly or markedly low
- RCo:Ag ratio: >0.5-0.7
- Multimer pattern: normal pattern, may have reduced intensity
- RIPA: normal
- Type 2N variant present

Type 3
- VWF:Ag: <30 IU/dL
- VWF:RCo: <30 IU/dL
- FVIII: low or normal
- RCo:Ag ratio: <0.5-0.7
- Multimer pattern: normal
- RIPA: normal
- Type 3 variant present

*Genetic testing for the GP1BA variant is not available at ARUP Laboratories.

References