Study of Shear Induced Blood Damage in a Bileaflet Mechanical Heart Valve
Heart Valves

- Pulmonary valve
- Tricuspid valve
- Aortic valve
- Mitral valve

[Diagram showing heart valves]
Why Care?

“Diseased valves annually account for 20,000 deaths in the US alone”

(Thom, 2006)
Is it treatable?

Prosthetic Heart Valves!

- Mechanical
- Bio-prosthetic
  - (from human or pig valves)

Bi-leaflet Mechanical Heart Valve (BHMV)
Before and After
What's the catch?

RISK # 1

- Hemolysis
What’s the catch?

OTHER RISKS

• Thromboembolic Complications
• Coagulation
• Platelet Activation
• Anti-coagulation therapy
• Hemorrhage
Why does this happen?

**Excessive Shear Stress** on the blood elements leads to Hemolysis, Platelet Activation and Thromboembolic complications.
Experimental Design

BHMV + Vortex Generators = Reduction of Shear Stress

→ Reduction of Blood damage!
Questions?

THANKS TO

[Images of logos]