



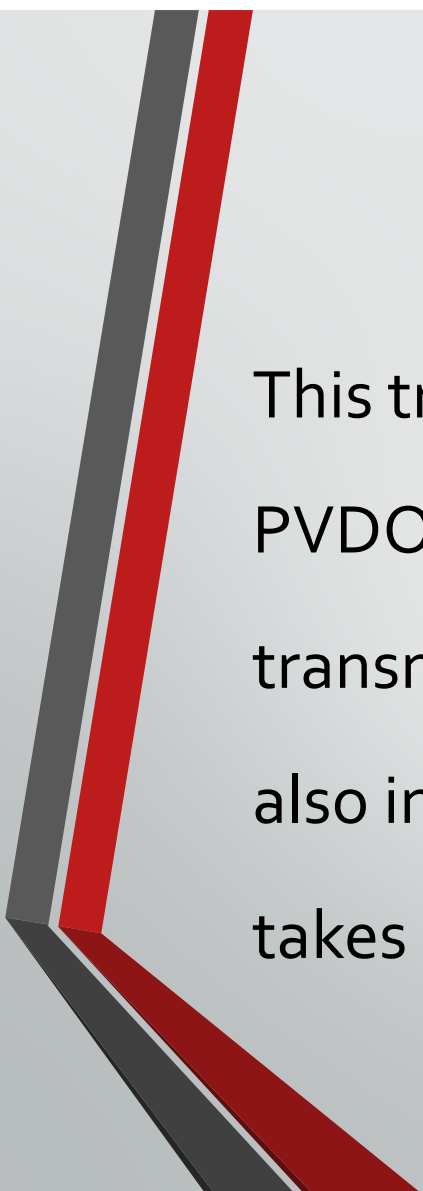
# PVDOMICS: Right Heart Catheterization

Cardiovascular Physiology Core  
Cleveland Clinic, Cleveland OH  
November 7, 2016



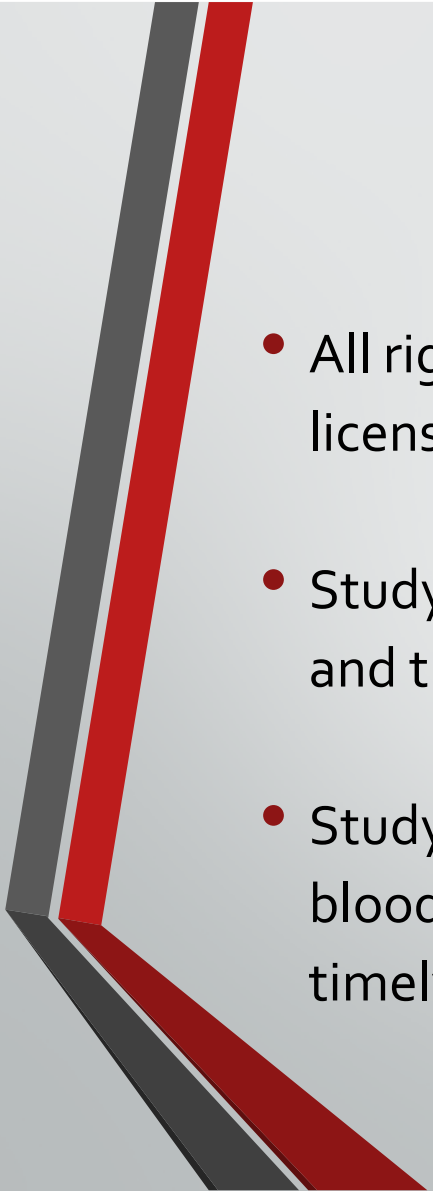
## **NHLBI Pulmonary Vascular Disease Phenomics Program**

*Funded by the National Heart, Lung, and Blood Institute of the  
National Institutes of Health with support from  
the Pulmonary Hypertension Association*



# Introduction

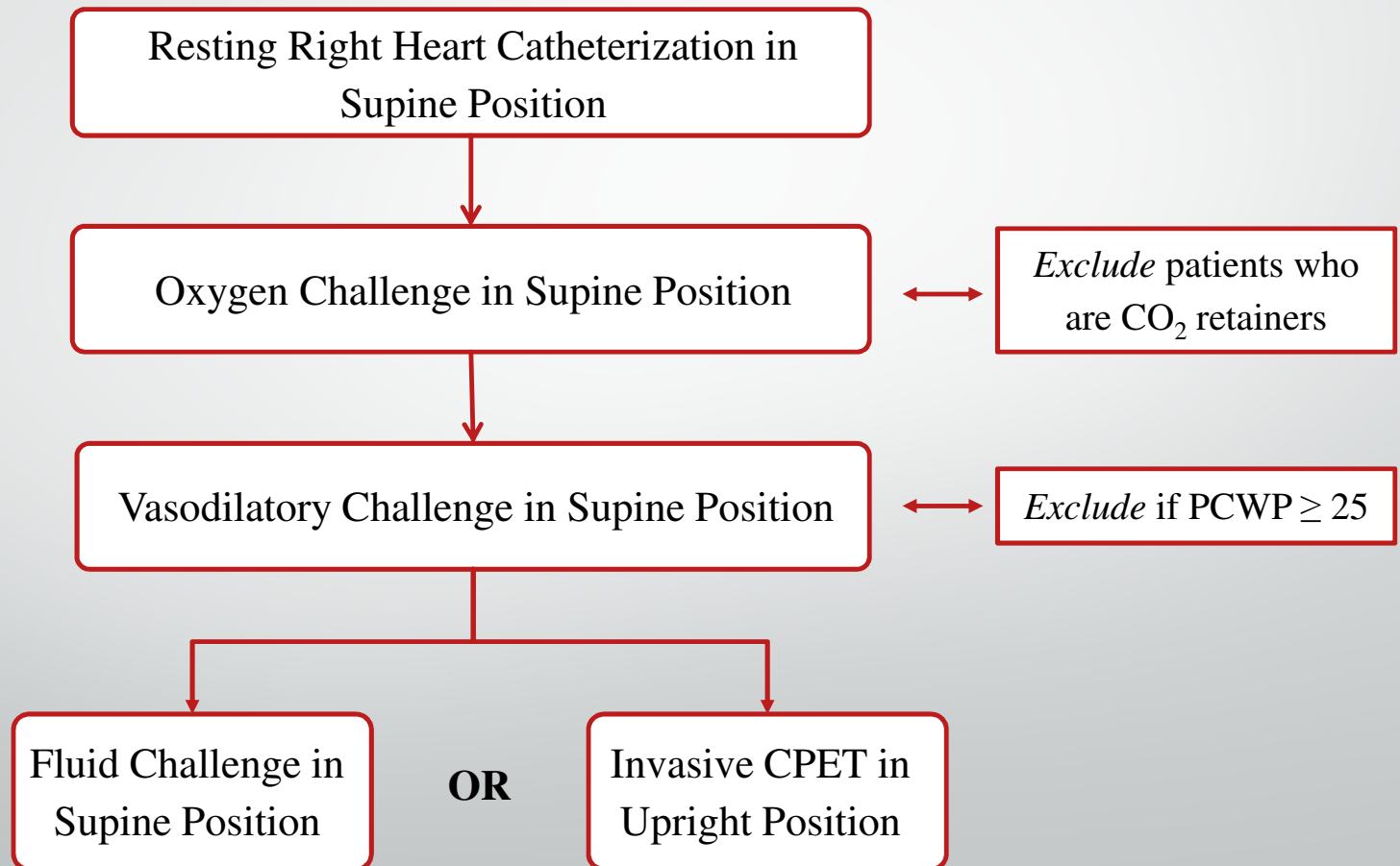
This training is intended to serve as a reference document for PVDOMICS study coordinators who will be collecting and transmitting right heart catheterization (RHC) data. It will also include information and training on the blood draw that takes place during the right heart catheterization procedure.



# Coordinator Responsibilities

- All right heart catheterizations will be performed by a trained and licensed medical professional.
- Study coordinators are responsible for ensuring that all data is obtained and transmitting that data to the Cardiovascular Physiology Core (CPC)
- Study coordinators may need to supervise the collection of “omics” blood during the RHC and assist in transporting this blood to the lab in a timely fashion.

# Order of Procedures



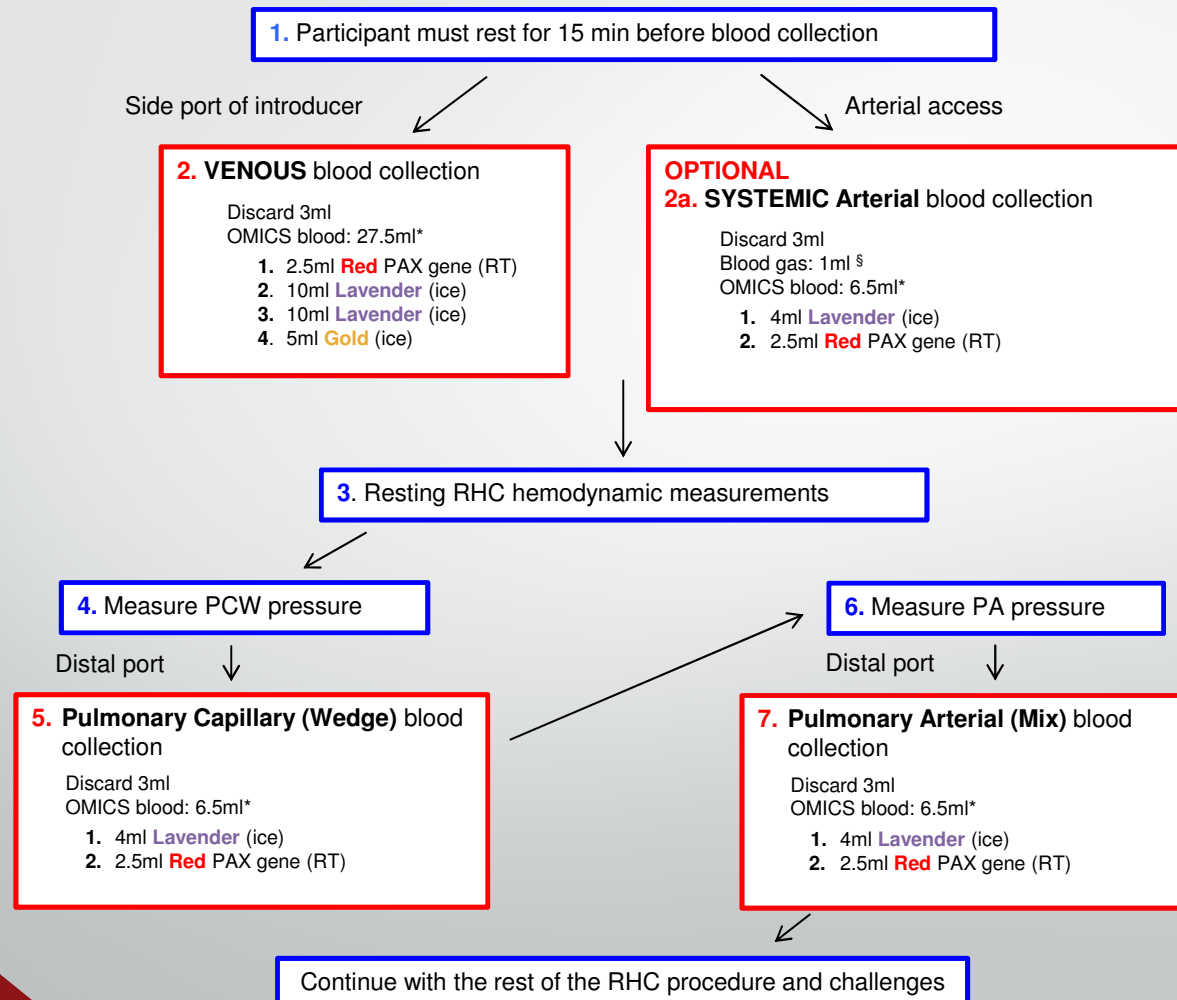
# Data To Be Obtained

| Pressures | Saturations | Outputs                         |
|-----------|-------------|---------------------------------|
| RA        | SVC         | Thermodilution                  |
| RV        | PA          | Direct Fick ( <i>optional</i> ) |
| PCWP      | PCWP        |                                 |
| PA        |             |                                 |
| DPG       |             |                                 |

## Data Obtained: Blood Samples

- The following blood samples will be obtained during the resting RHC per the blood protocol.
  - Venous (via introducer, *before* RHC) (27.5mL)
  - Systemic Arterial (optional, *before* RHC) (6.5mL)
  - Pulmonary Capillary (Wedge) (6.5mL)
  - Pulmonary Arterial (Mix) (6.5mL)
- All blood samples must reach the lab within 1 hour of the draw time.

# Data Obtained: Blood Samples



□ Order of RHC  
□ Order of OMICS Blood Collection 2

\* non-heparinized syringe  
§ heparinized syringe  
RT = room temperature  
ice = place on wet ice

# Blood Collection Supplies

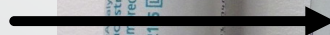
- Vacutainers
  - Four 2.5mL PAXgene (Red)
  - Two 10mL EDTA (Lavender)
  - Three 4mL EDTA (Lavender)
  - One 5mL SST (Gold)
- Blood Transfer Device
  - Allows you to transfer blood from the syringe to the vacutainer tubes

# Vacutainer Blood Tubes

2.5mL PAXgene



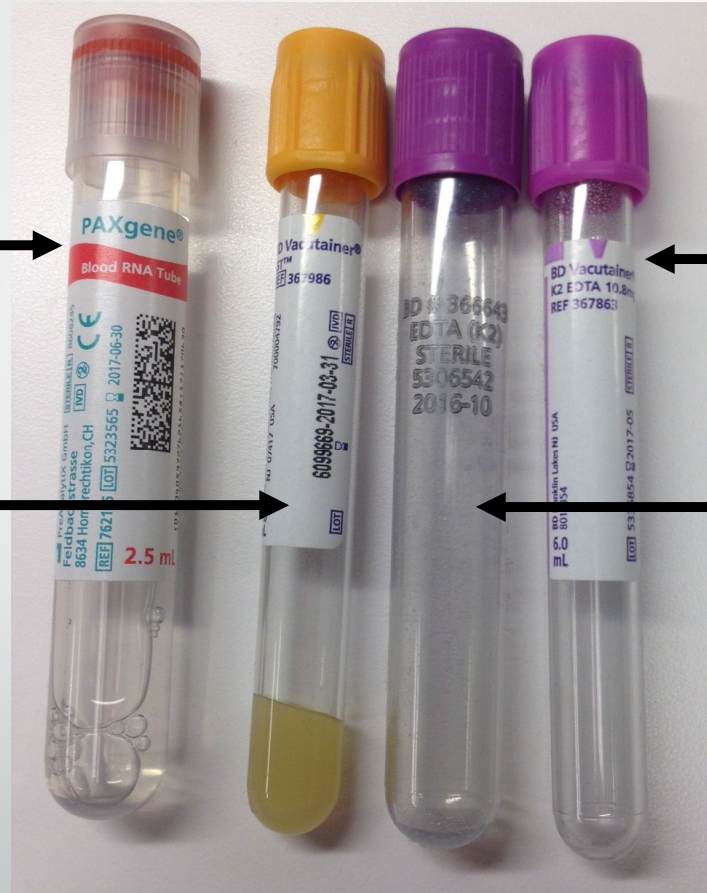
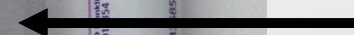
5mL SST



4mL EDTA



10mL EDTA



# Blood Transfer Device



- Needs to have a **female Luer adapter!**
- Luer adapters and holders are also sold separately



# Blood Draw: Venous

## Venous “omics” Blood Draw

- Participant has to be resting for 15 minutes before drawing the blood.
- After the introducer has been placed, but before any other procedures or measurements are performed, draw the venous blood sample from the SVC through the side port of the sheath.
- Draw back 3mL of blood using a sterile syringe and discard the sample. Then, using a second sterile syringe, draw 27.5mL of blood for “omics” analysis.
- Team member or coordinator will then fill the tubes using a sterile transfer device.

# Blood Draw: Venous & Optional Arterial

1. Participant must rest for 15 min before blood collection

Side port of introducer

Arterial access

## 2. VENOUS blood collection

Discard 3ml

OMICS blood: 27.5ml\*

1. 2.5ml **Red** PAX gene (RT)
2. 10ml **Lavender** (ice)
3. 10ml **Lavender** (ice)
4. 5ml **Gold** (ice)

## OPTIONAL

### 2a. SYSTEMIC Arterial blood collection

Discard 3ml

Blood gas: 1ml §

OMICS blood: 6.5ml\*

- 1.4ml **Lavender** (ice)
- 2.2.5ml **Red** PAX gene (RT)

3. Resting RHC hemodynamic measurements

□ Order of RHC  
□ Order of OMICS Blood Collection 2

\* non-heparinized syringe RT = room temperature  
§ heparinized syringe ice = place on wet ice

## Blood Draw: Pulmonary Capillary (Wedge)

- Blood draw must be done after all pressure measurements have been completed.
- Draw back 3mL of blood using a sterile syringe and discard the sample.
- Then use a second sterile syringe to draw 6.5mL of blood for “omics” analysis.
- Transfer the blood from the sterile syringe to the appropriate blood collection tubes using a blood transfer device.

# Blood Draw: Pulmonary Capillary (Wedge)

## 4. Measure PCW pressure



Distal port

## 5. Pulmonary Capillary (Wedge) blood collection

Discard 3ml

OMICS blood: 6.5ml\*

1. 4ml **Lavender** (ice)
2. 2.5ml **Red** PAX gene (RT)

  Order of RHC  
  Order of OMICS Blood Collection 2

\* non-heparinized syringe RT = room temperature  
§ heparinized syringe ice = place on wet ice

## Blood Draw: Pulmonary Artery (Mix)

- Blood draw must be done after all pressure measurements have been completed.
- Draw back 3mL of blood using a sterile syringe and discard the sample.
- Then use a second sterile syringe to draw 6.5mL of blood for “omics” analysis.
- Transfer the blood from the sterile syringe to the appropriate blood collection tubes using a blood transfer device.

# Blood Draw: Pulmonary Artery (Mix)

6. Measure PA pressure

↓ Distal port

## 7. Pulmonary Arterial (Mix) blood collection

Discard 3ml

OMICS blood: 6.5ml\*

1.4ml **Lavender** (ice)

2.2.5ml **Red** PAX gene (RT)

Continue with the rest of the RHC  
procedure and challenges

□ Order of RHC  
□ Order of OMICS Blood Collection 2

\* non-heparinized syringe RT = room temperature  
§ heparinized syringe ice = place on wet ice

# Recording Data: Pressure Tracings

- You should receive paper printouts of pressure tracings.
  - Total of 24 printouts
    - There should be 2 printouts per location (RA, RV, PWCP, PA) for each condition (resting, oxygen challenge, nitric oxide challenge and fluid challenge/iCPET)
- All pressure tracings need to have an ECG tracing on then
- Digitized or computer generated “mean line” should be recorded with all tracings.

Condition should be noted

1. Rest: Pressure Calculations 01:04:54 PM+1 s

AXIOM Sensis XP VC11D

ECG tracing



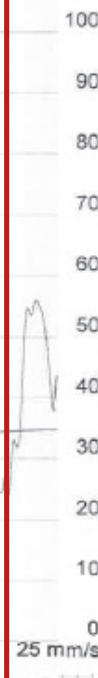
PA 100 mmHg B

Measurement location must be noted somewhere



Mean Line

Summary: 65HR: PA 55/24/34



Pressure scale and Speed

Study: Coronary\*Heart Fail...

# RHC Transmission to the CPC

1. Label and De-identify the RHC printout (if necessary)
  - a) Verify that each waveform printout has the participant's 6 digit ID #, participant's alphacode and the date of RHC test indicated on it somewhere
  - b) If one of the 3 elements mentioned above is missing, hand write the missing element on the RHC printout
  - c) Verify that no identifying information exists on the RHC printout
  - d) Cross off or obscure any identifying information that does exist on the printout (e.g. name, date of birth, SSN, MRN, initials)

# RHC Transmission to the CPC

2. Scan the de-identified RHC printout into a secure computer and save it as a PDF file.
3. Name the PDF file according to the following convention:

RHC\_#####\_ac\_mmddyyyy.pdf

↑                    ↑                    ↑                    ↑                    ↑  
Type of Test                    PVDOMICS ID#                    Alphacode                    Date of Test                    File Type

# RHC Transmission to the CPC

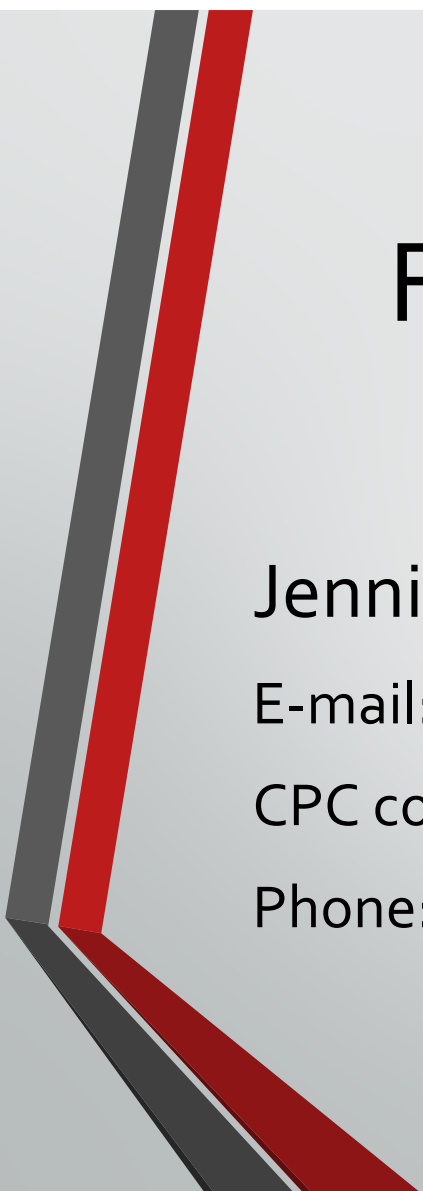
## 4. Submit RHC to DCC.

- Log in to SSH with your assigned account name and password
- Drag and drop the PDF file into SSH home directory for PVDOMICS on DCC server
- DCC will then move the file out of the home directory for processing

## 5. Document the date you uploaded the RHC on Form 280

## 40.9 RHC Transmission to the CPC

6. Complete Form 280 (paper) and enter it into the PVDOMICS Study database.
7. Keep the paper copy of Form 280 and the original waveform printouts in the participant's study file maintained at your site.



# For Questions Please Contact

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