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Cardiology Fellow
PGY-4

STRESS TESTS Made Ridiculously Simple

Goals:

- Review different types of stress tests for ischemia
  - Capabilities, limitations, contraindications

- Guide to selecting between different stress tests

Will *not* cover:

- Indications
- Interpretation
- Modalities not offered here

Clinical Case

55 yo Hawkins police chief with HTN & fam hx premature CAD noted CP while exercising at the gym.
-Physical exam with systolic murmur
-Baseline ECG: LVH with ST-T wave changes

Which test is most appropriate to detect ischemia?

Variety of options for stress testing

Stressors

- Exercise
  - Treadmill
  - Supine Bike
- Vasodilator
  - Regadenoson
- Dobutamine

Imaging

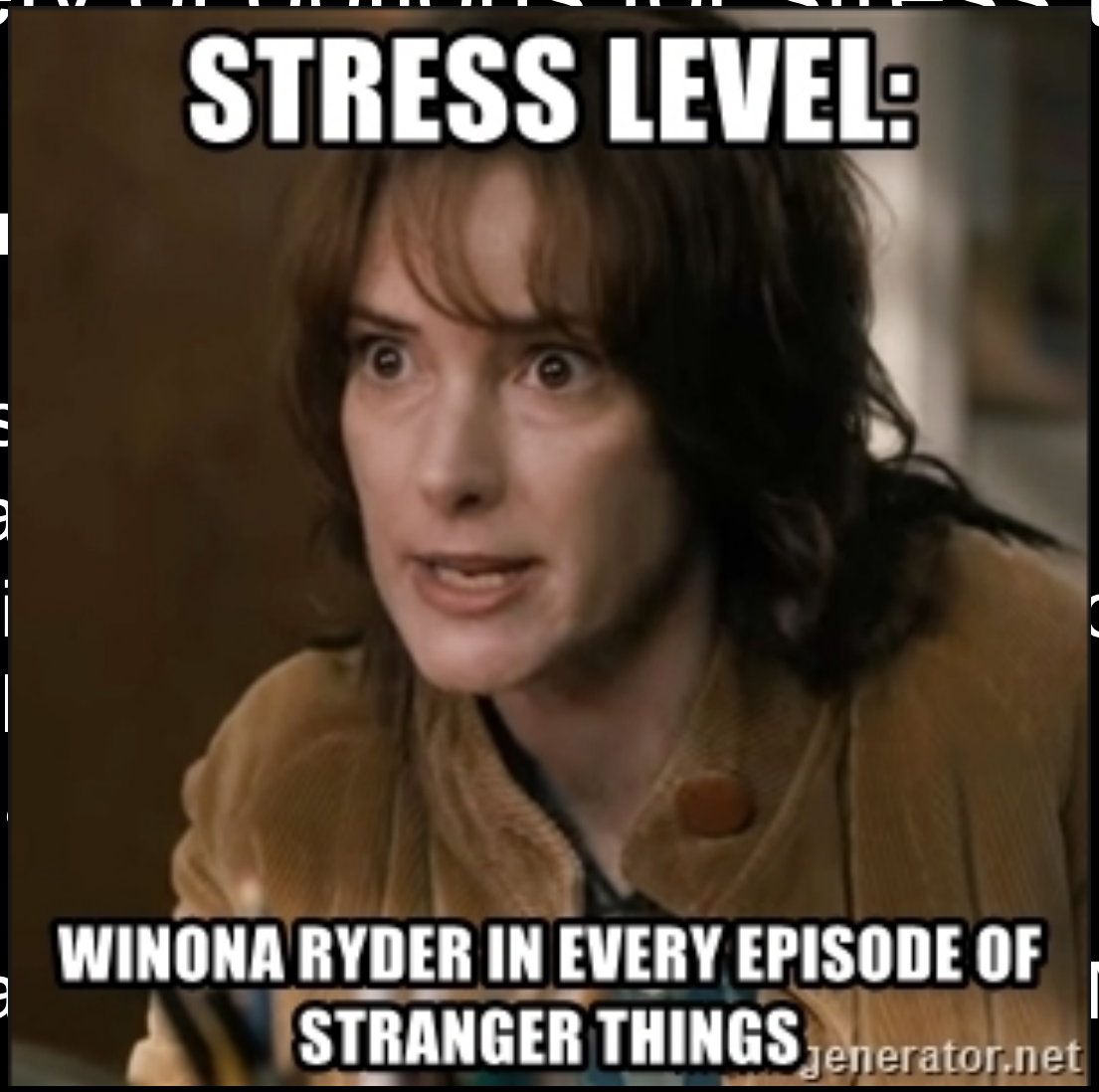
- ECG
- Echocardiography
- SPECT
- Cardiac MRI

Variety of options for stress testing

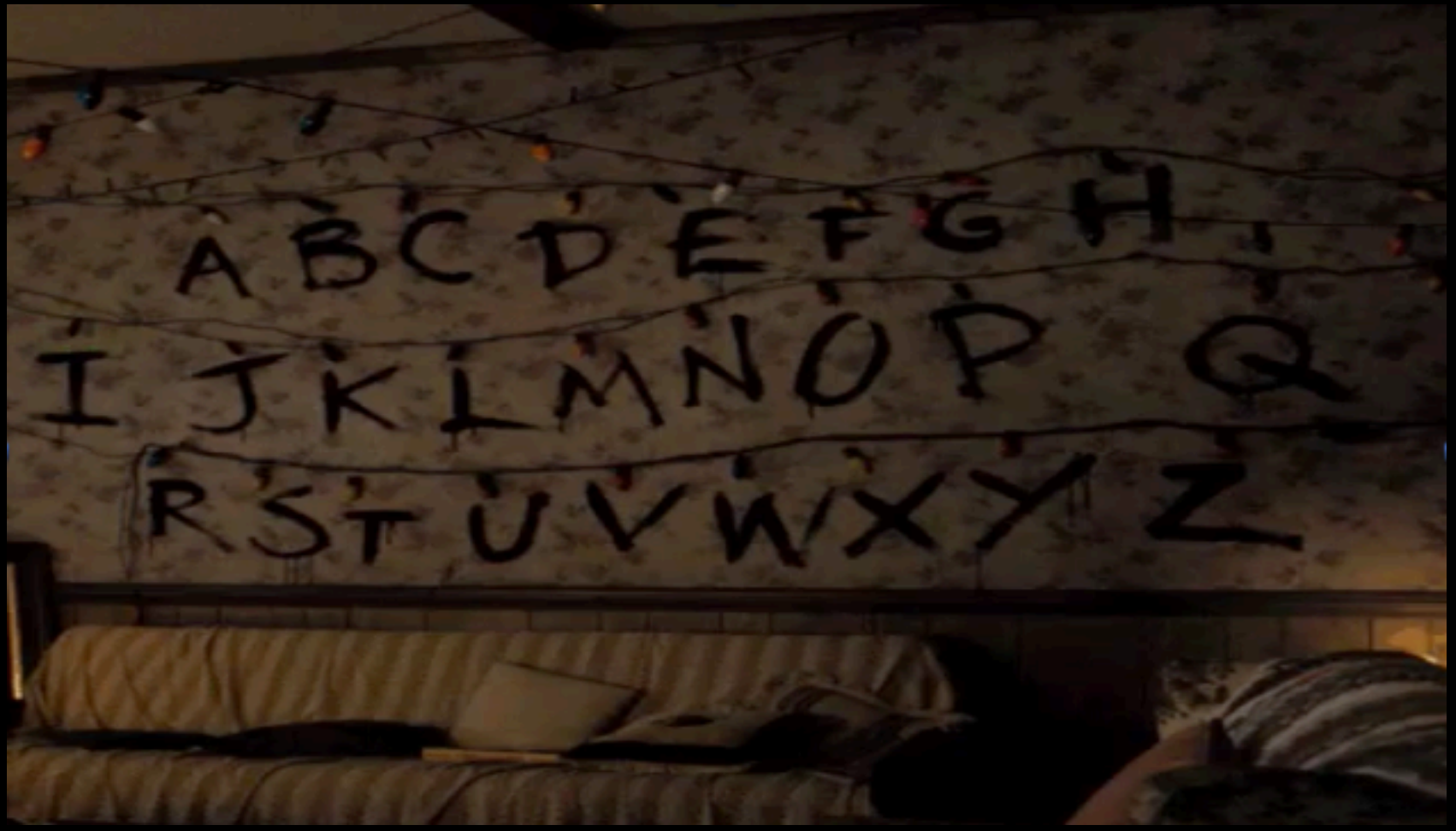
Stressor

- Exercis
  - Trea
  - Supi diography
- Vasodil
  - Reg

- Dobuta MRI



3-step guide to selecting the optimal test



Step 1: Choose stress

Can the patient exercise?

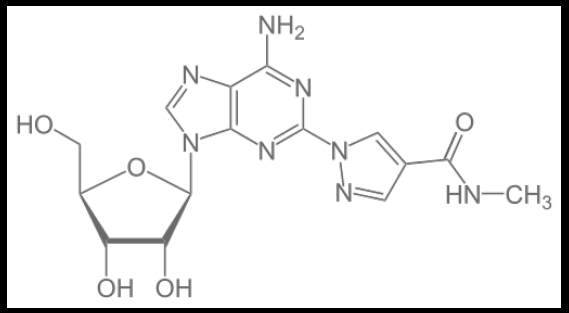
Yes → **Exercise**

No → **Pharmacologic**

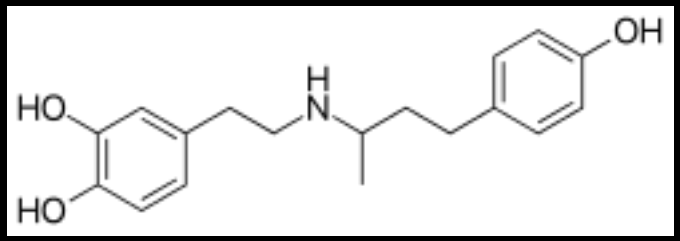
Treadmill

Supine Bike

Vasodilators –*Regadenoson*



Chronotrophic/Inotropic–*Dobutamine*



Clinical Case

55 yo Hawkins Indiana police chief with HTN, fam hx premature CAD noted CP while ***exercising at the gym.*** On physical exam noted to have systolic murmur. Baseline ECG shows LVH with ST-T wave changes.

Which stress test is most appropriate?

A. Treadmill Exercise ECG
B. Exercise Stress ECHO
C. Treadmill + Nuclear
D. ~~Pharmacologic Nuclear~~
E. ~~Dobuatmine Stress Echo~~
F. ~~Stress Cardiac MRI~~
G. ~~Straight to coronary angiography~~

Step 2: Choose imaging or ECG

Is test pharmacologic?

Yes

No

ECG interfere with ischemia interpretation?

Yes

- Ventricular pre-excitation
- V-paced
- LBBB
- ST changes at rest
- LVH with ST-T changes

Imaging

- Radionucleotide Stress Myocardial Perfusion Imaging (SPECT)
- Stress Echo
- Stress Cardiac MRI

No

Consider Exercise ECG

Clinical Case

55 yo Hawkins Indiana police chief with HTN, fam hx premature CAD noted CP while exercising at the gym. On physical exam noted to have systolic murmur. Baseline ***ECG shows LVH with ST-T wave changes***.

Which stress test is most appropriate?

A. ~~Treadmill Exercise ECG~~
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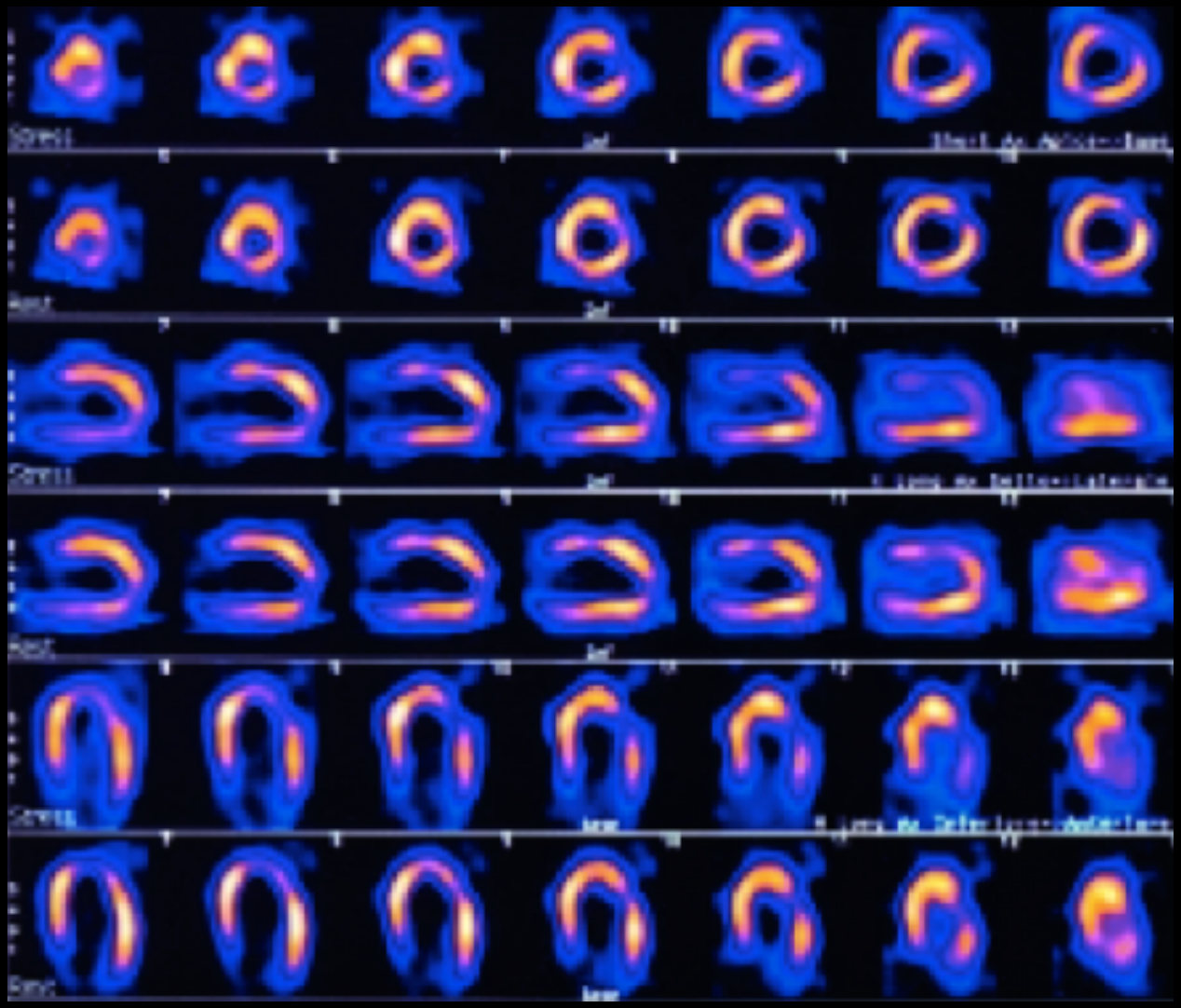
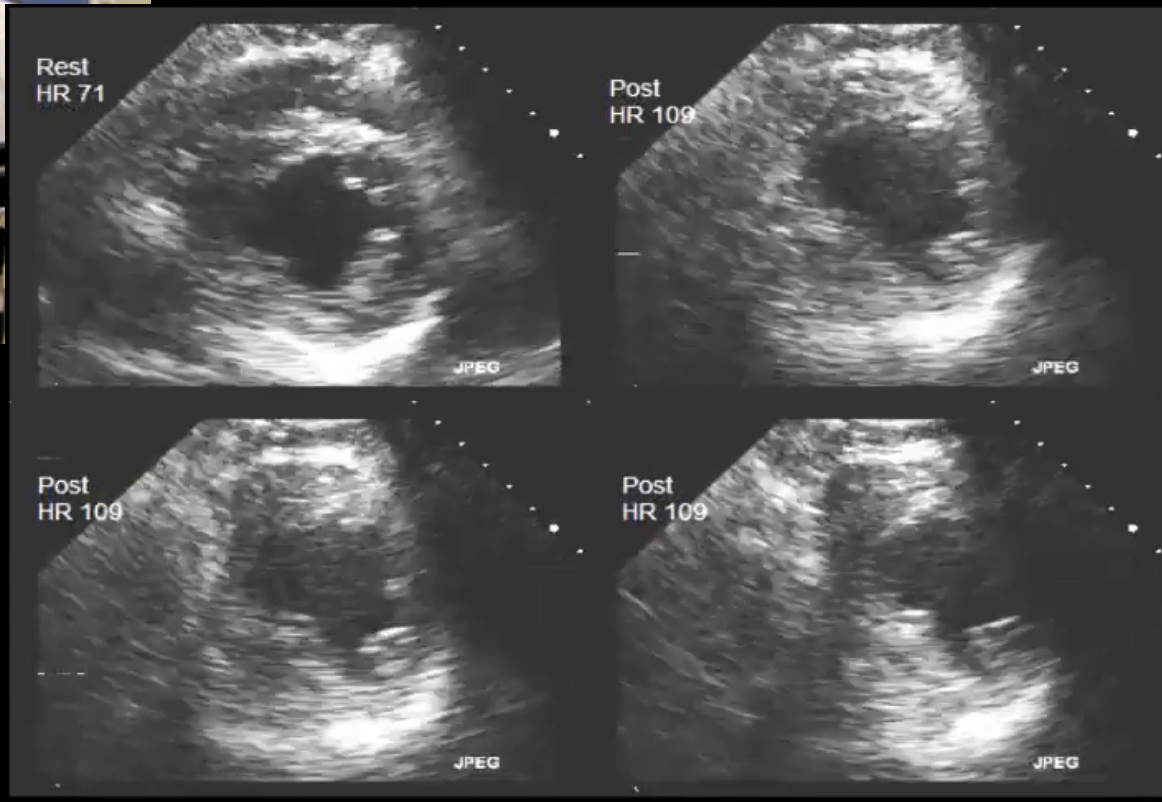
Step 2: Choose imaging modality

SPECT



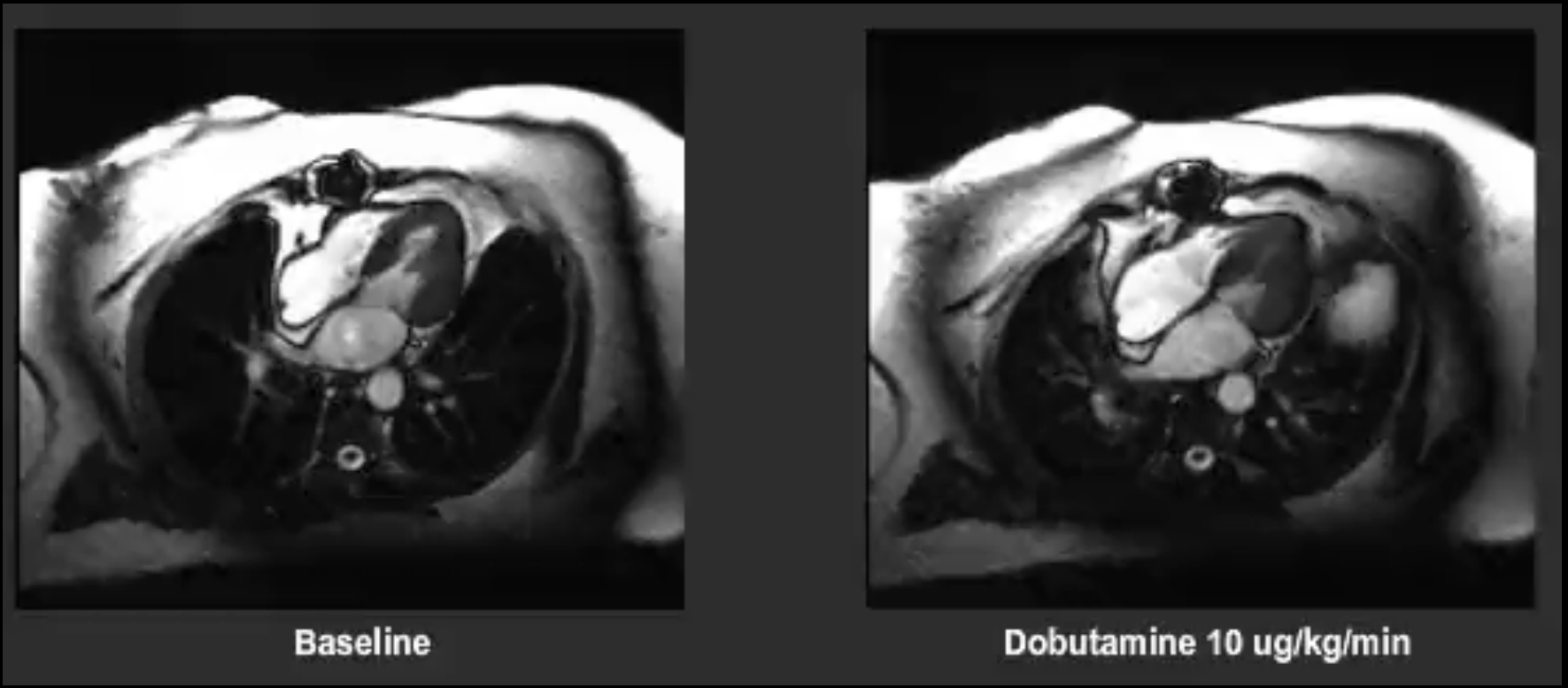
Step 2: Choose imaging modality

Stress Echo



Step 2: Choose imaging modality

Stress Cardiac MRI



Clinical Case

55 yo Hawkins Indiana police chief with HTN, fam hx premature CAD noted CP while exercising at the gym. On physical exam noted to have ***systolic murmur***. Baseline ECG shows LVH with ST-T wave changes.

Which stress test is most appropriate?

A. ~~Treadmill Exercise ECG~~
B. Exercise Stress ECHO
C. Treadmill + Nuclear
D. ~~Pharmacologic Nuclear~~
E. ~~Dobuatmine Stress Echo~~
F. ~~Stress Cardiac MRI~~
G. ~~Straight to coronary angiography~~

Step 3: Consider contraindications

Dobutamine

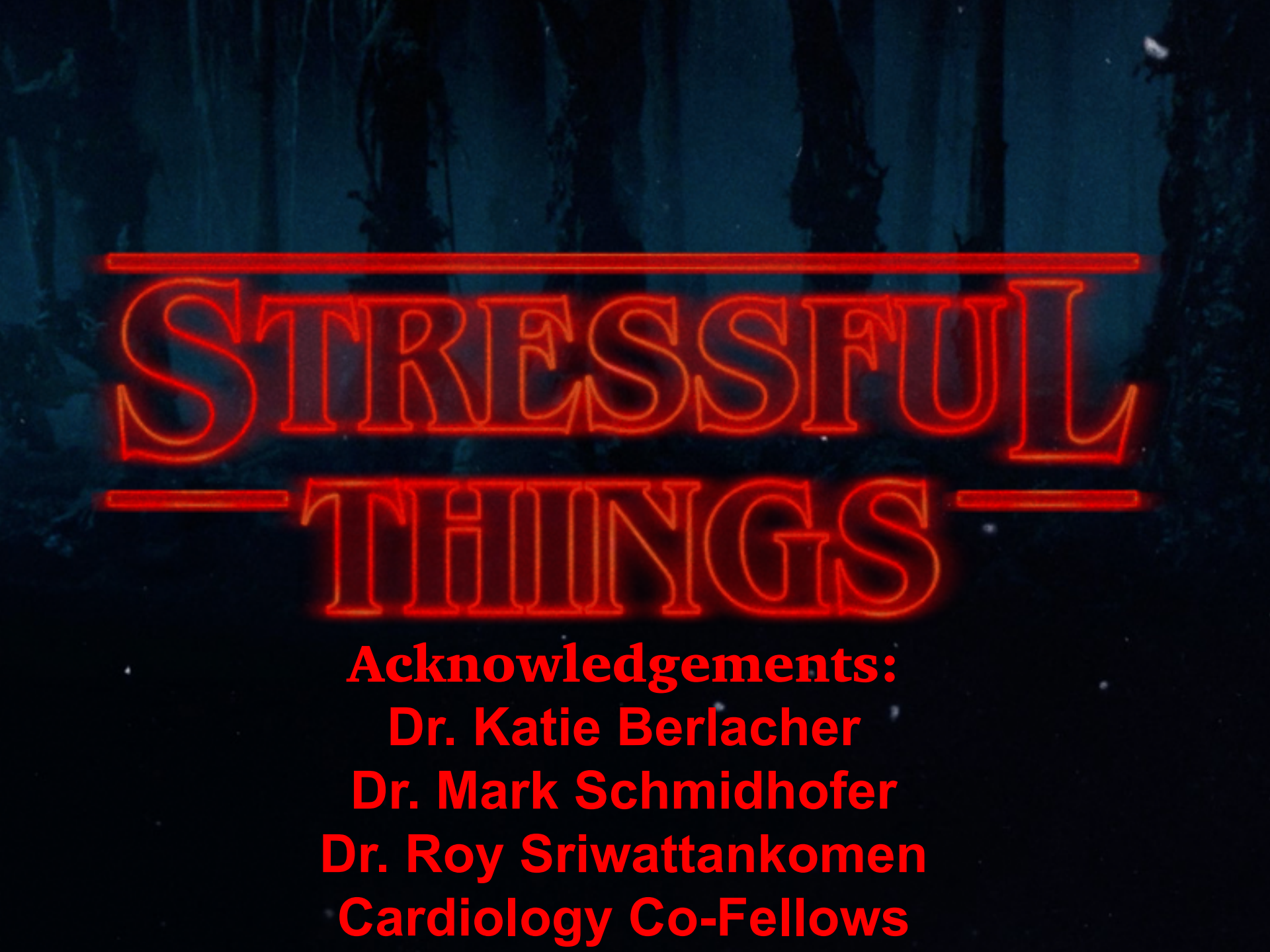
- Ventricular arrhythmia
- AF RVR
- Recent MI
- Unstable Angina
- Significant LVOT
- Severe HTN

Regadenoson

- Active bronchospasm
- Hypotension
- SSS
- High degree AV block

3 steps to selecting optimal stress test

1) Choose stress
2) Choose the imaging or ECG
3) Consider contraindications



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