

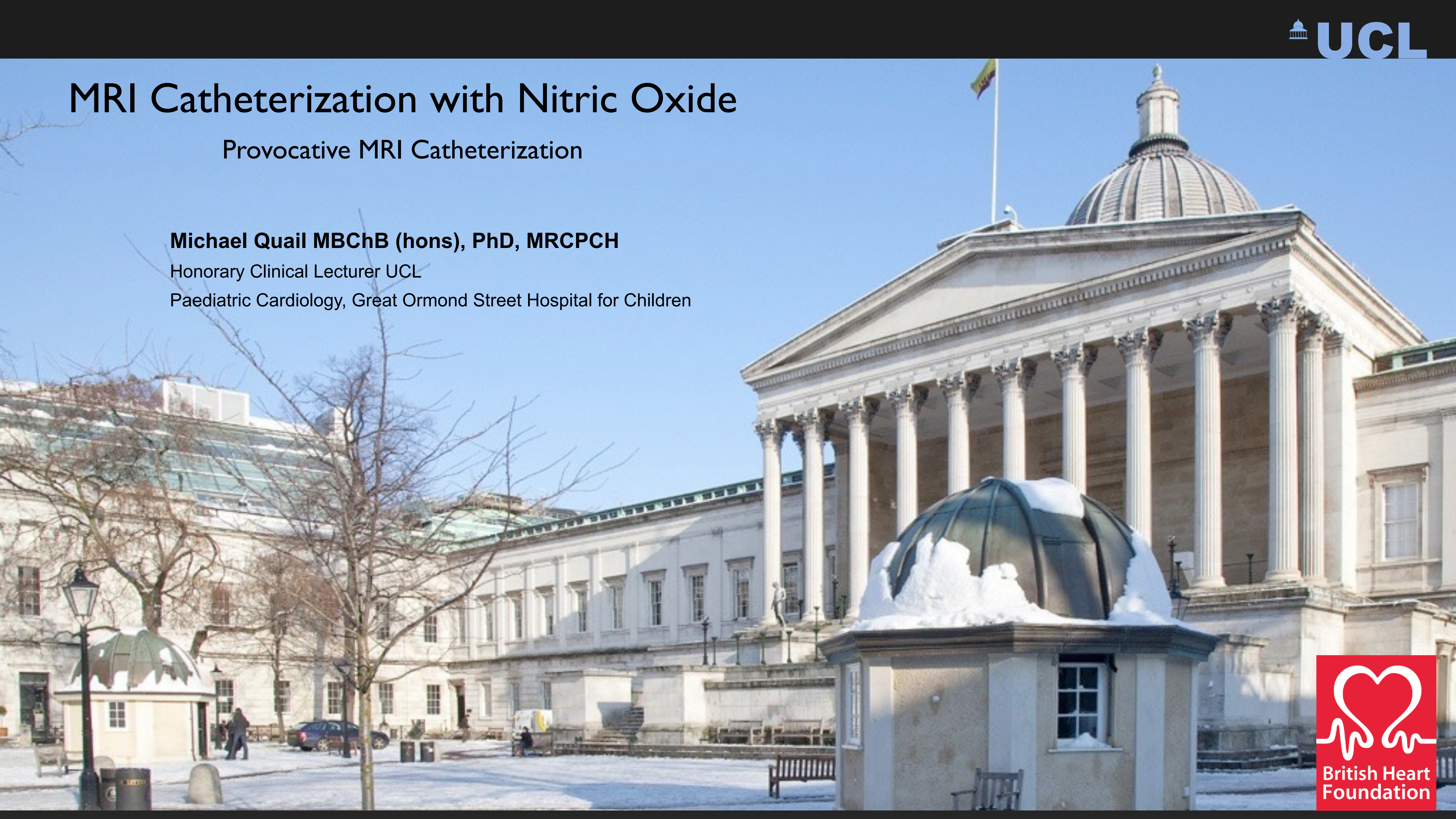
MRI Catheterization with Nitric Oxide

Provocative MRI Catheterization

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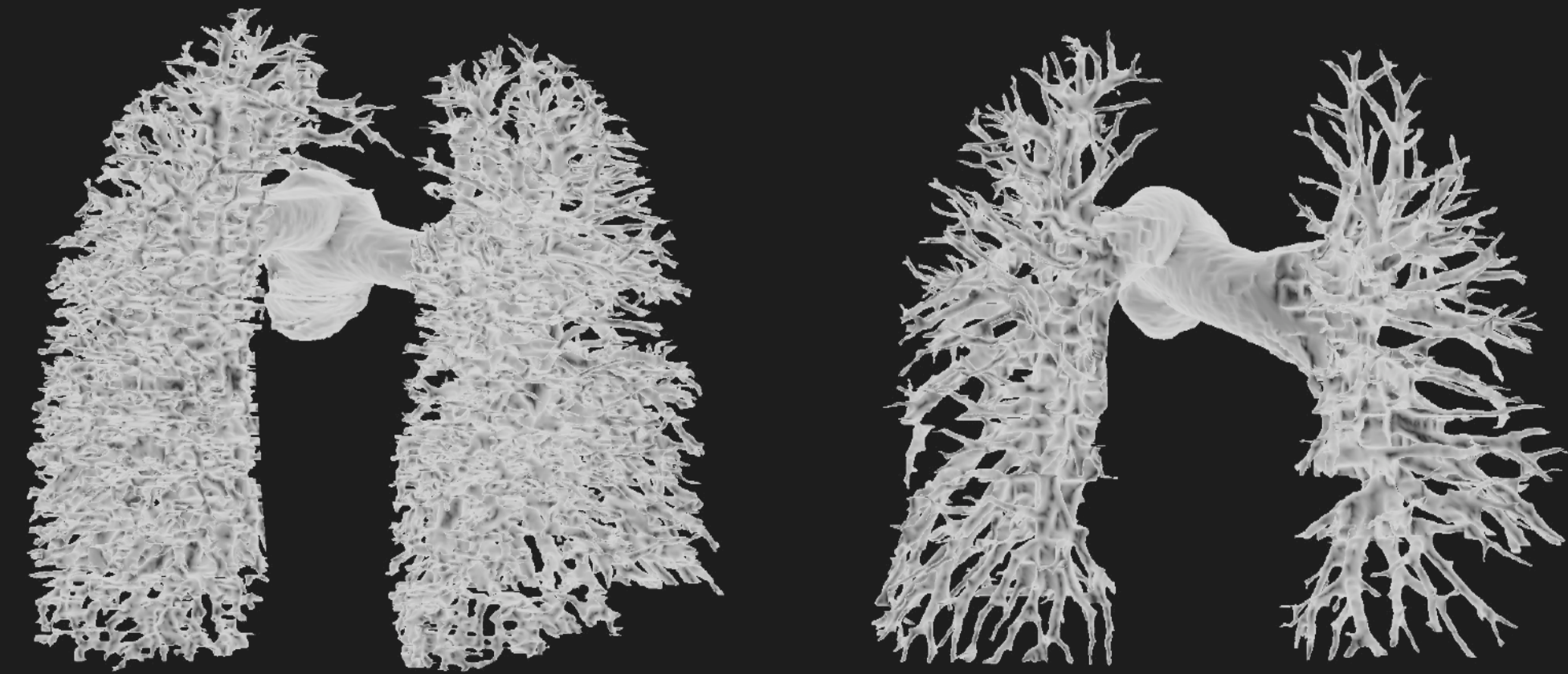
- No Disclosures

Nitric Oxide

- Potent Pulmonary Vasodilator
- Smooth Muscle Relaxation
- cGMP - myosin phosphorylation

Why AVT?

1. Selecting IPAH/FPAH-patients for CCB therapy;
2. Assessing long-term prognosis;
3. Assessing operability in patients with congenital heart disease associated with PAH



PVR

=

mPAP - PCW

Qp from PCMR

- How do we do it?
- Is it safe?
- What do the data mean?

All Children under GA



Courtesy of Dr K. Dimopoulos PH @ RBHT

Catheter placement under X-ray

- Pressure and Flow Data In MRI

20ppm NO (FiO_2 1.0)



Repeat physiology assessment



Risk of NO administration:

Nitrogen Dioxide O=N=O

Bronchospasm & Pulmonary Oedema

CDC

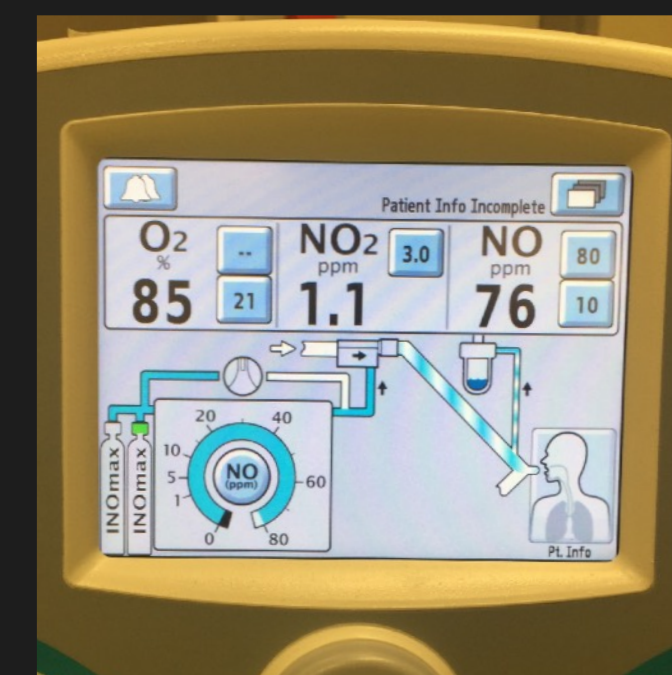
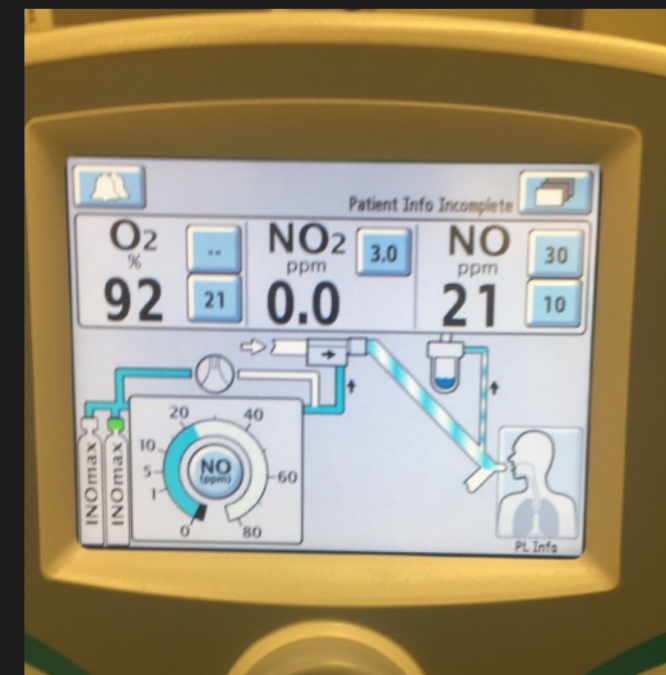
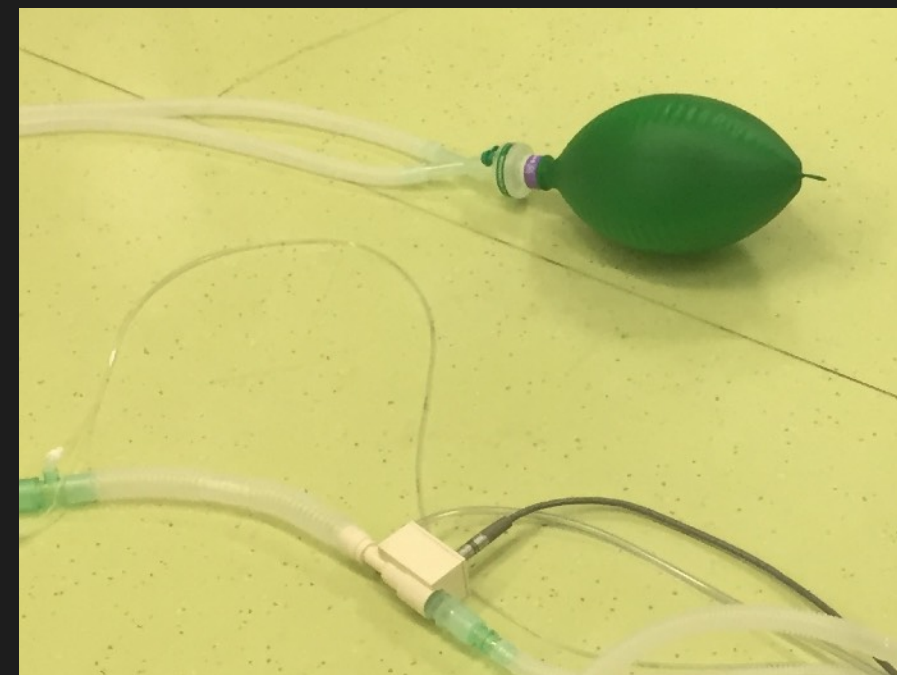
Should never exceed = 5ppm

Immediately Dangerous to Life or Health = 13ppm

NO 20ppm (+O₂)

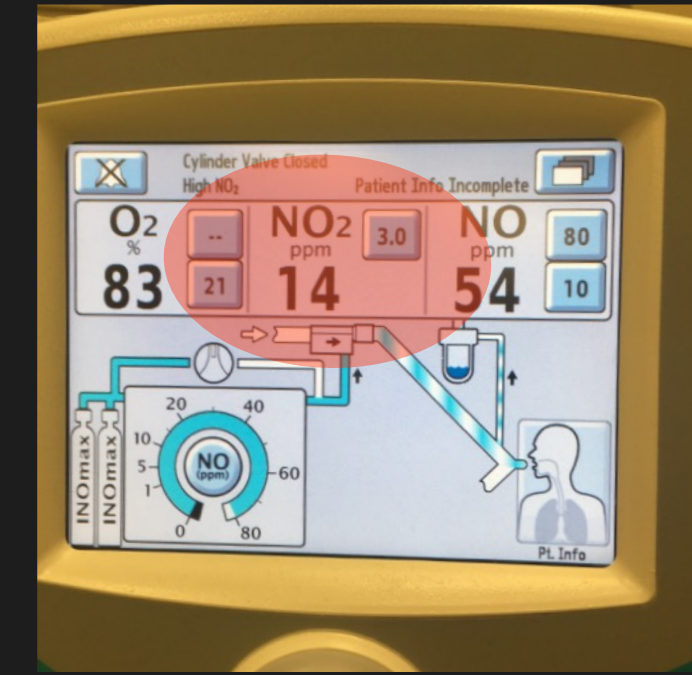
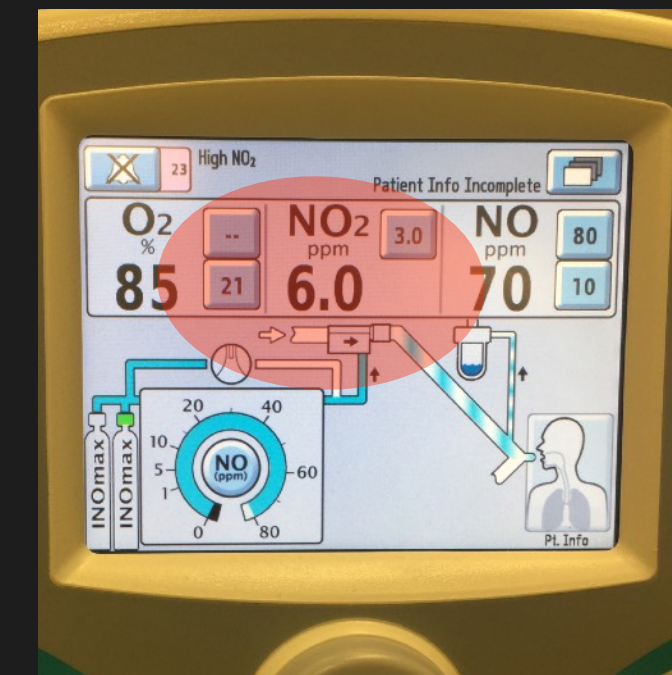
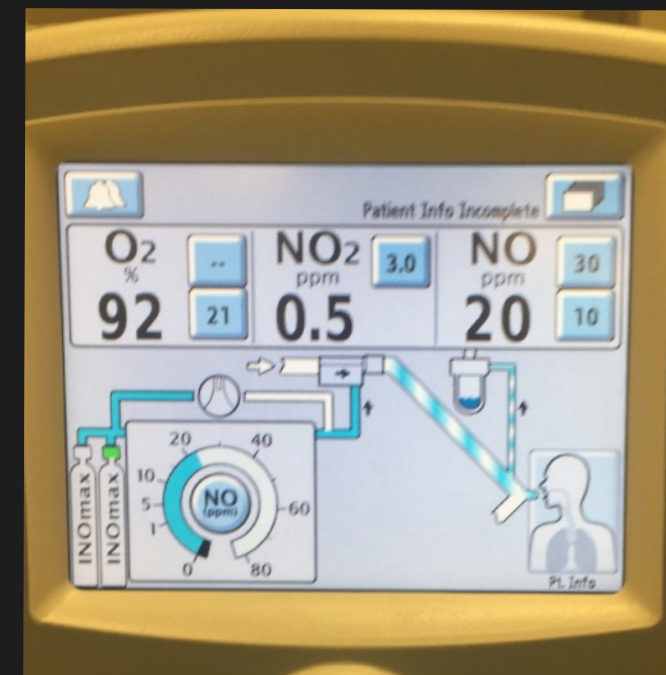
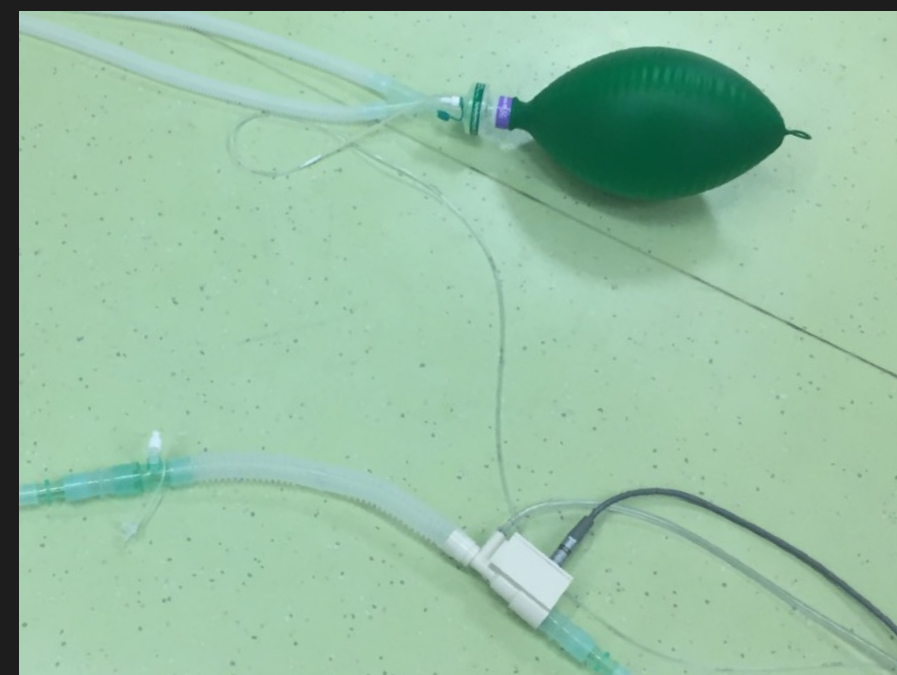
NO 80ppm (+O₂)

Sampling Line Control Room



No flow for 1min!

Sampling Line at ETT (True)



REVEAL-pediatric criteria by Barst et al.

- A decrease in mPAP of $\geq 20\%$
- And an unchanged, increased, or less than 10% decreased cardiac index
- And a decreased or unchanged pulmonary-to-systemic vascular resistance ratio

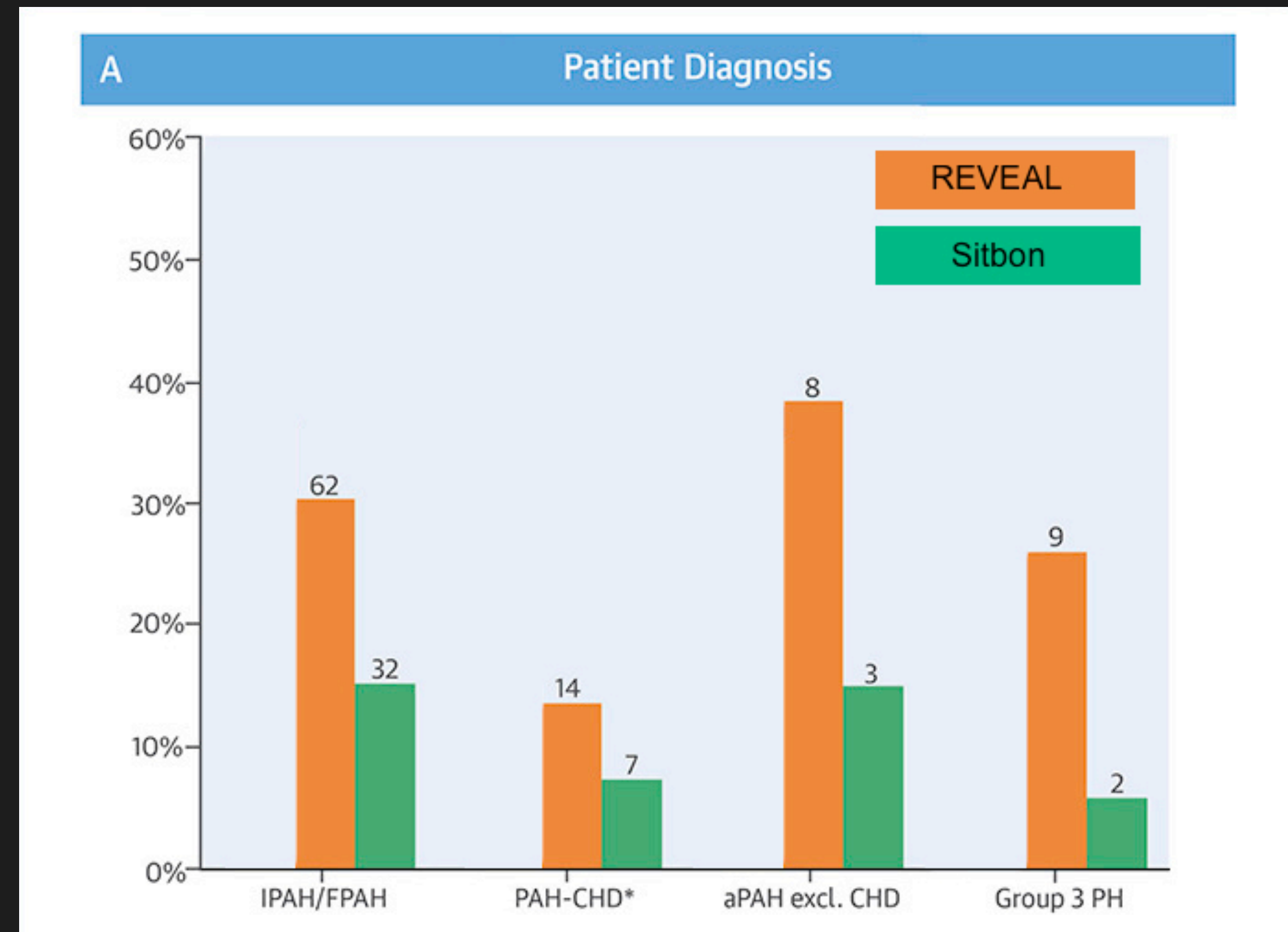
Adult Consensus criteria by Sitbon et al.

- Reduction of mPAP of ≥ 10 mm Hg
- To reach an absolute value of mPAP ≤ 40 mm Hg
- And an increased or unchanged cardiac output

mPAP 70mmHg to AVT 50mmHg

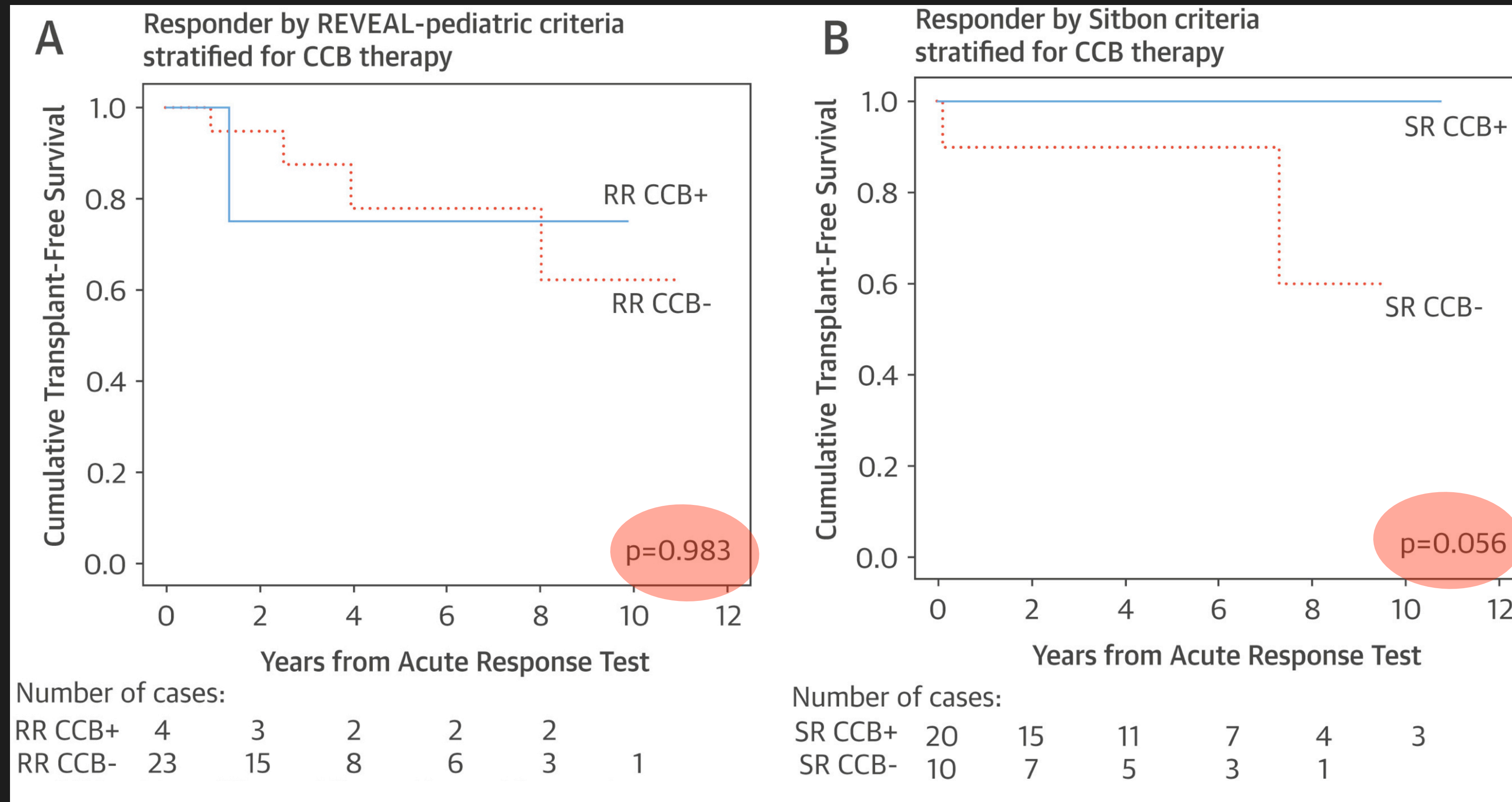
- REVEAL Positive ($>20\%$)
- Sitbon Negative (Not less than 40mmHg)

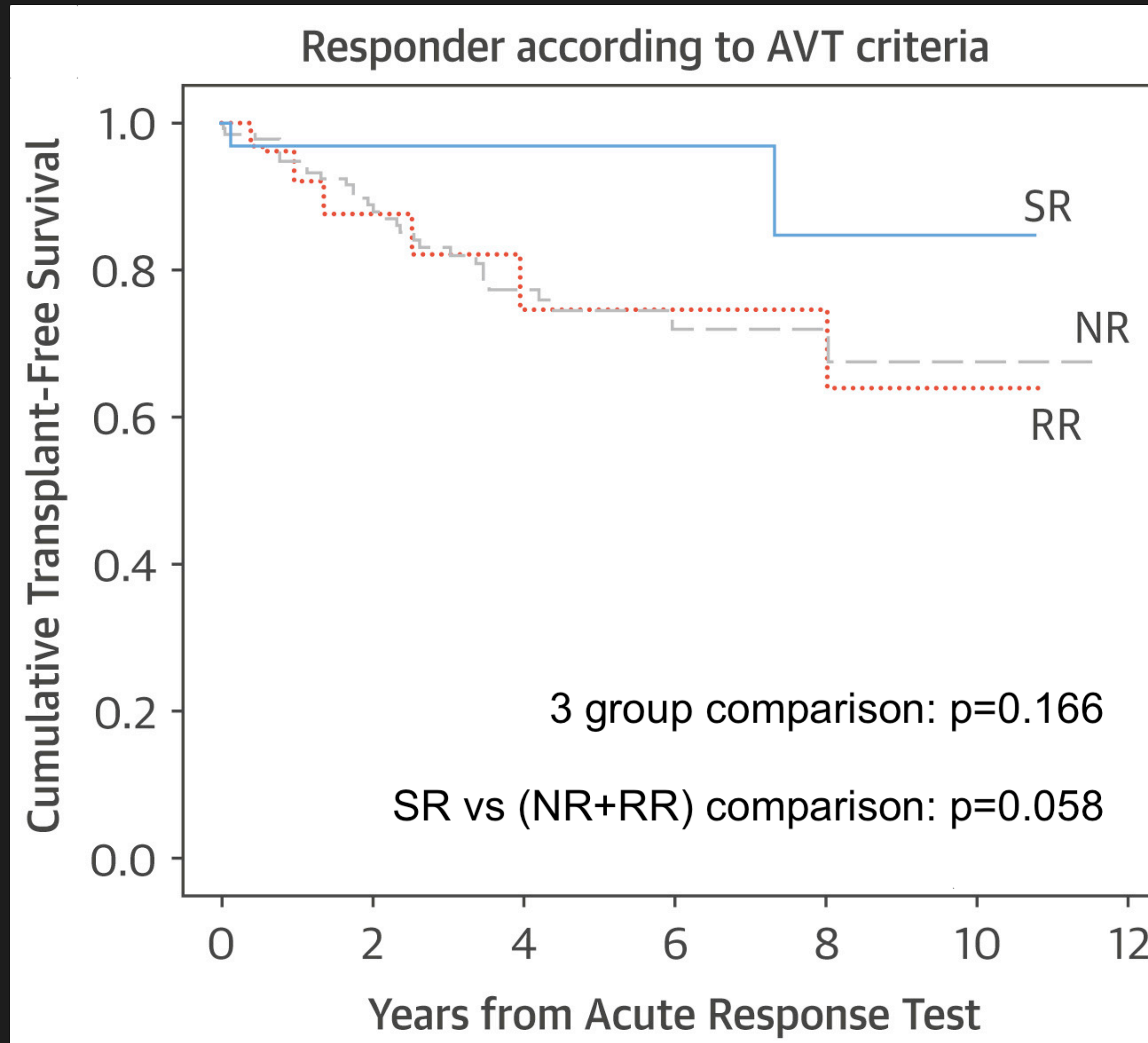
382 patients from TOPPS registry - Douwes et al JACC 2016

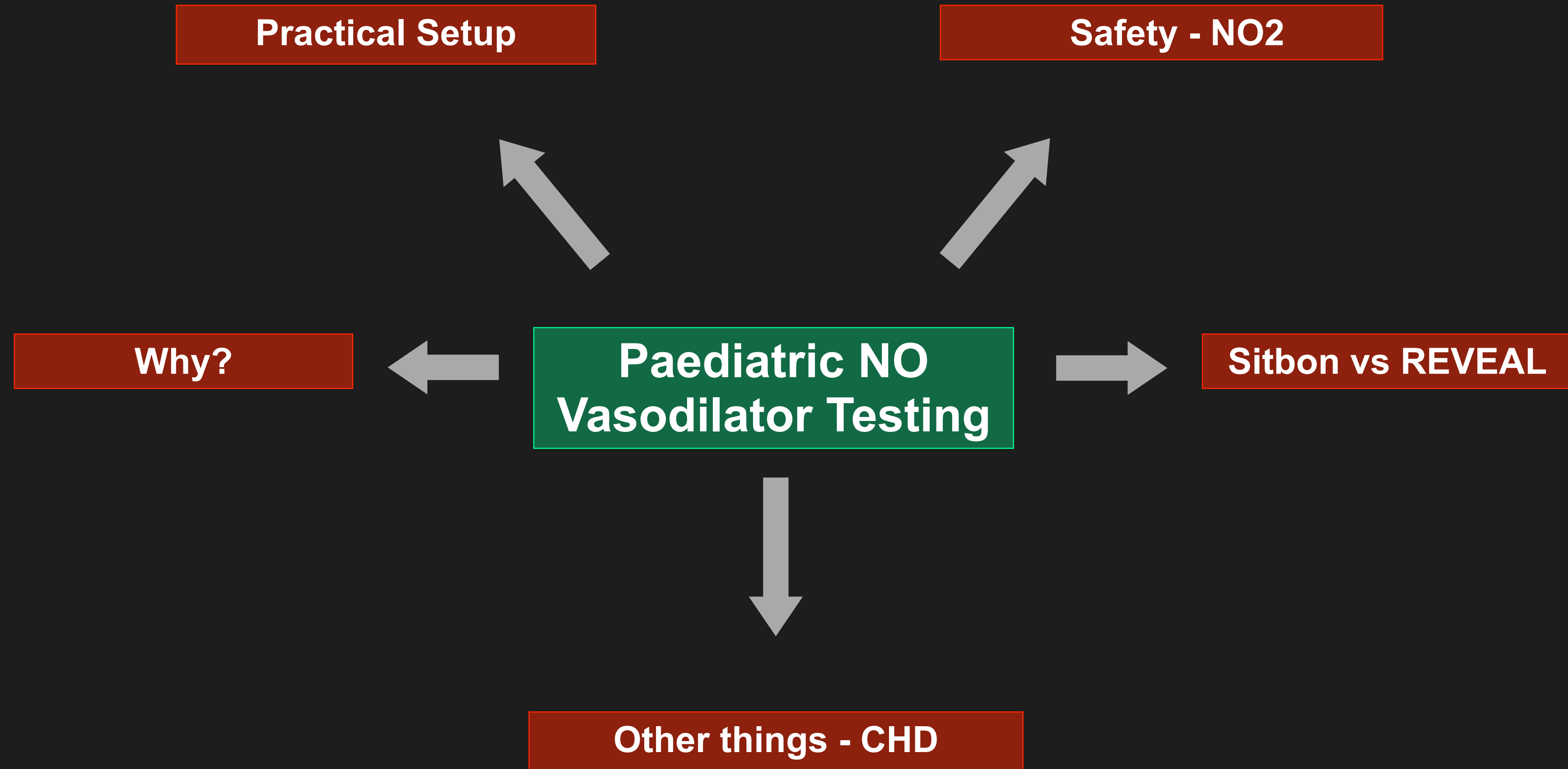


Which Criteria?

Statistical Relationship to Outcome







Dr Vivek Muthurangu (MRI)

Dr Graham Derrick (Interventional Cardiology)

Dr Shahin Moledina (Pulmonary Hypertension)

Dr Mike Sury (Anesthesiology)

Clinical collaborators

Dr Dan Knight (Royal Free - Adult PH)

Dr Bejal Pandya (Barts - ACHD & PH)

