

NEUROPROTECTION

History

Repression and Denial

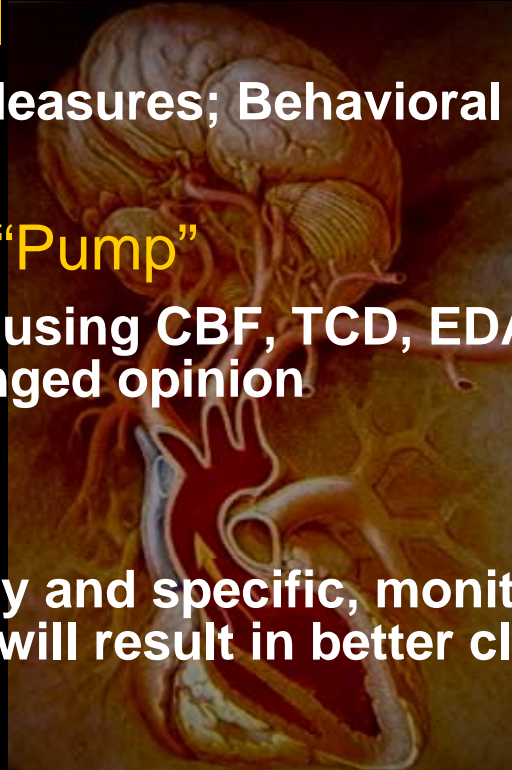
Better Outcome Measures; Behavioral and Radiological

It is all because of the “Pump”

Acute Monitoring using CBF, TCD, EDAC, Temp and better clinical trials changed opinion

Now What?

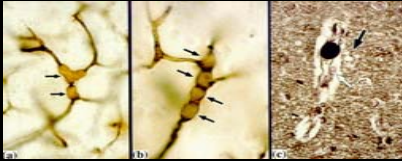
Better, more timely and specific, monitoring of surrogate markers of injury will result in better clinical trial design.



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Triad of CardioNeuroProtection

The Best Neuroprotection is Prevention



- **Blood Management**

Minimize return of shed blood

Filter Purge to venous reservoir



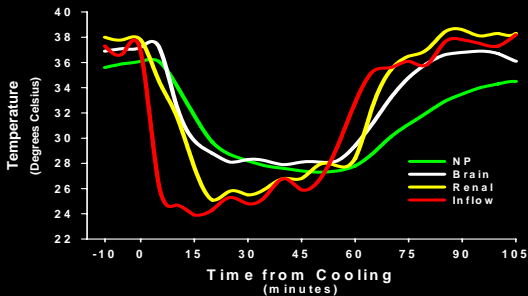
- **Temperature Management**

Never allow arterial inflow
temperature to exceed 37 C



- **Minimize manipulation of the aorta**

Use epi-aortic /TEE scanning



Anything that damages the brain during cardiac surgery,
be it hyperthermic blood or embolic debris,
must pass through the arteries



The variability of the brain's response to embolic insult
(BBBB) is partially related to endothelial function



**A marker of “endothelial health” may allow us to better prepare
the patient for the trauma associated with CPB**

Neurologic Biomarkers have been a disappointment

S100b and Neuron Specific Enolase (NSE)

Damage must be extensive

Results are delayed and not clinically relevant

Not specific to the brain

**Cellular Microparticles as Biomarkers of
Inflammatory Brain Lesions and Endothelial Injury
have yielded promising results**

The cardiothoracic team has optimized the “external” environment, meaning the methods and apparatus used during surgery.

Further work is needed to optimize the “internal” environment to better resist the trauma of cardiopulmonary bypass

New monitoring methods are needed to provide timely information about the status of the “conduit” which best predicts the patient’s response to surgery

Neuroprotection = Prevention + Endothelial Health