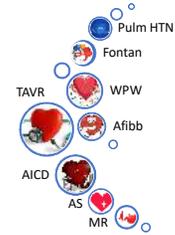


Pre-operative Assessment for Cardiac Conditions

Jesse Aron, MD
Department of Anesthesiology
Overlook Medical Center

1

So many Cardiac Conditions.....So little Time?



2



3

Commonality of Cardiac Workup

- 1. Optimization letter not "Clearance letter"
- 2. We no longer accept Rx pad notes!
- 3. Medications and compliance
- 4. labs esp. INR, Potassium, creatinine
- 5. "True" Exercise Function or stress tolerance



4

Stress Tolerance = METS (Metabolic Equivalent)

- "Grandpa is on the treadmill 3 times a week!"
- "Grandma goes up and down stairs without getting short of breath!"



5

Surgical Stress in Oral Surgery

- Blood loss with extractions?
- Fluid shifts – pre operative NPO status
- Blood Pressure and Heart Rate variations
- Epinephrine mixed with Local Anesthetic
- Reaction to anesthetic medications
- sympathetic/parasympathetic reactions

6

Peripheral oxygen saturation, heart rate, and blood pressure during dental treatment of children with cyanotic congenital heart disease

Rosane Menezes Faria Dutra, I Tamara Lucia Itagiba Neves, II Ricardo Simões Neves, III Edmar Atik, III and Ubiratan de Paula Santos

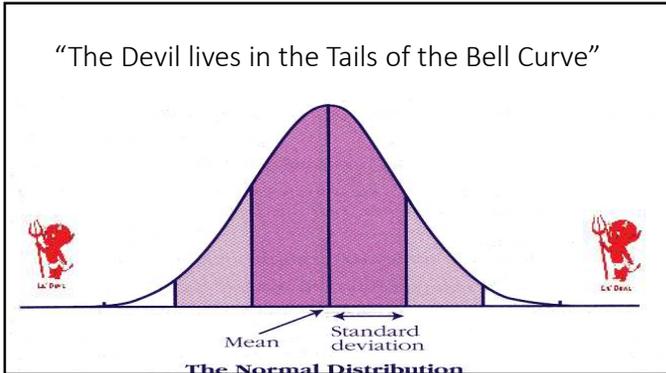
Clinics (Sao Paulo). 2014 May; 69(5): 314–318.

Forty-four patients between the ages of 6 and 12 years who underwent upper primary tooth extraction were included in the study. Of these, 20 patients were in the cyanotic congenital heart disease group and 24 were in the control group.

Peripheral oxygen saturation, heart rate, and systolic blood pressure in the cyanotic congenital heart disease group varied quite significantly during the treatment protocol ($p < 0.05$), with values of 80.5% (± 7.6) to 82.8% (± 7.8), 95.3 beats per minute (bpm) (± 11.3) to 101.3 bpm (± 9.8), and 93.6 mm Hg (± 13.3) to 103.8 mm Hg (± 12.7), respectively. The variations in the control group during the procedure were also significant.

The changes observed during the study protocol, although statistically significant, were mild and lacked clinical relevance. The results indicate that dental treatment of children with cyanotic heart disease using a standardized protocol in decentralized offices without the support of a surgical center is safe.

7



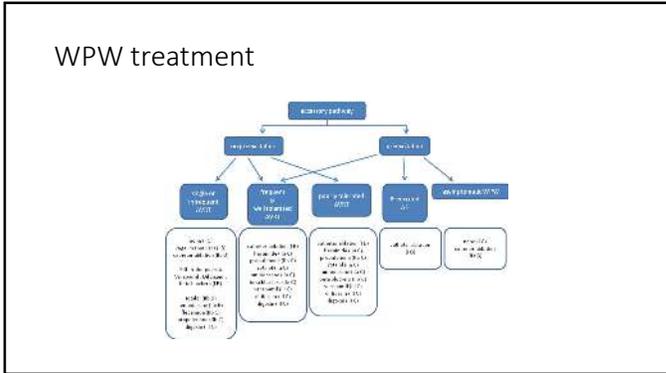
8

Case #1: Wolff–Parkinson-White Syndrome

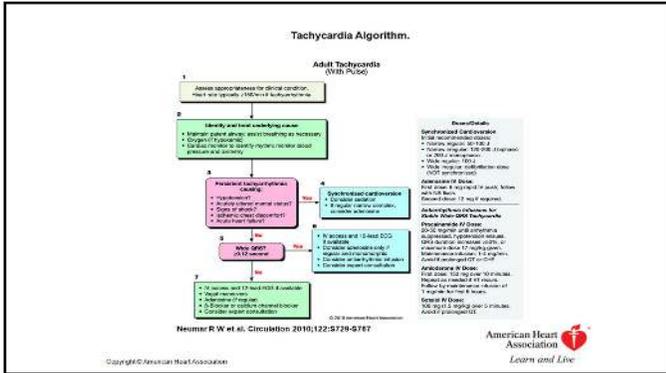
- Inherited disorder in .3 to 9% of general population
- Risk of death is 0.5% in children 0.1% in adults
- Anomalous conduction system in Bundle of Kent
- Supraventricular impulses that bypass AV node and bundle of His leading to pre-excitation paroxysmal SVT and atrial fibrillation
- Symptoms of dizziness, palpitations, chest pain
- Delta Wave on EKG

The ECG strip shows a delta wave, which is a characteristic feature of Wolff-Parkinson-White Syndrome. The leads are labeled V1, V2, V3, V4, V5, and V6.

9



10



11

Anesthesia Considerations

- Potential for perioperative SVT or atrial fibrillation:
 - Consider crash cart, defibrillator pads, invasive arterial access, emergency drugs (procainamide, amiodarone)
 - Avoid AV nodal blockers if atrial fibrillation
- Avoid sympathetic stimulation: pain, anxiety, hypovolemia, ketamine
- Reduce anxiety which may precipitate tachycardia!
- What’s the best route to minimize risk?

12

What we look for in the pre-op assessment

- Recent Symptoms
- Exercise tolerance
- Other co-morbidities ie: asthma, obesity, OSA
- Medications (prescribed and street meds)
- ECHO?
- Previous anesthesia history: intra-op events, airway issues

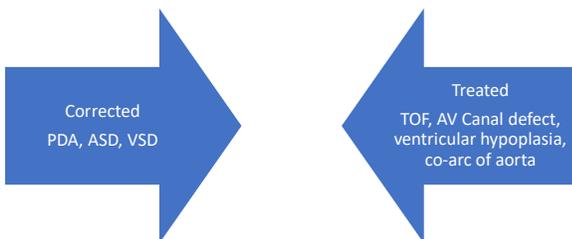
13

Goal for WPW syndrome

- Minimize risk by factoring out as many external risks as possible
- Sedation pre and post op
- Pain control intra op and post op
- "gentle" intubation using lidocaine to blunt sympathetics
- Deep extubation
- Prepared crash cart
- Plan for code situation

14

Scenario #2: Corrected Congenital Cardiac Abnormalities



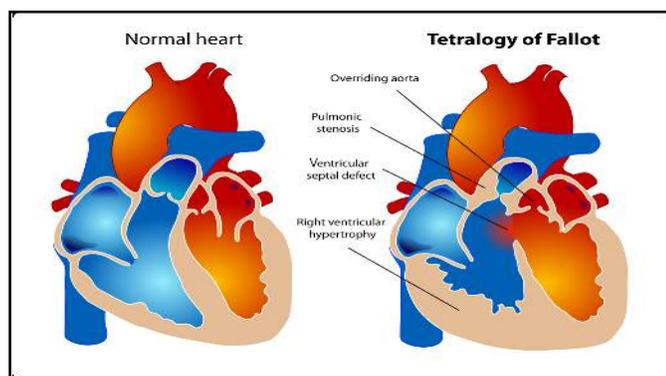
15

Treated Abnormalities

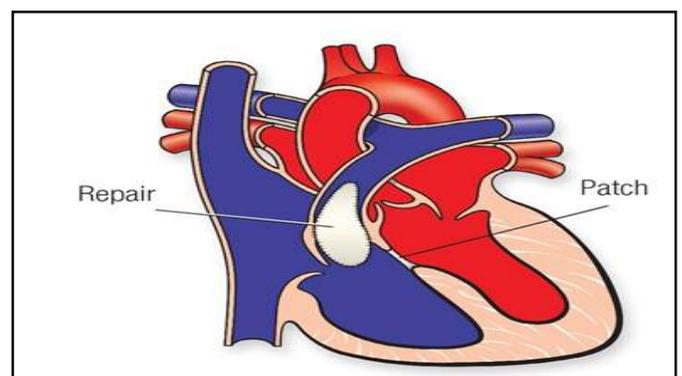
- Improve hypoxemia
- Improve cardiac and peripheral circulation
- Does not totally correct anatomy
- May not completely correct cyanosis
- Corrections left with pulmonary hypertension and septal defects



16



17

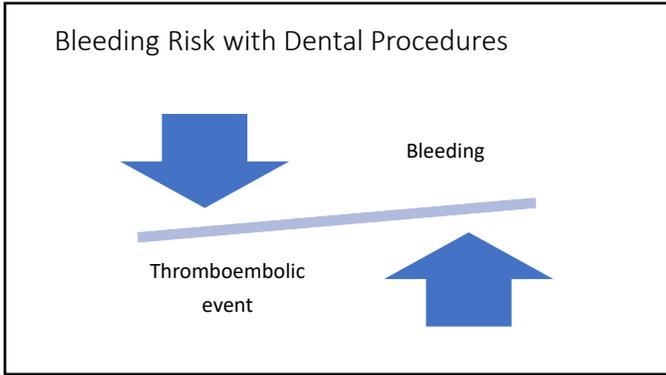


18

Slide 16

AJH1 Aron, Jesse H., 1/4/2019

AJH2 10 days post Fontan procedure
Aron, Jesse H., 1/4/2019



25

The Challenge

- Over 6 million patients on oral anti-coagulation
- 10% of this population requires surgery annually
- Stroke – 20% fatal or permanent neurological deficit in > 50%
- Valve thrombosis : 10 -20% mortality with emergency valve replacement
- Pulmonary embolism or DVT : 5-10% fatality
- Cardiac Stent thrombosis: MI mortality > 50%

26

ADA Consensus

- “There is general agreement that in most cases, treatment regimens with older anticoagulants (e.g., warfarin) and antiplatelet agents (e.g., clopidogrel, ticlopidine, prasugrel, ticagrelor, and/or aspirin) should not be altered before dental procedures. The risks of stopping or reducing these medication regimens (i.e., thromboembolism, stroke, MI) far outweigh the consequences of prolonged bleeding, which can be controlled with local measures”

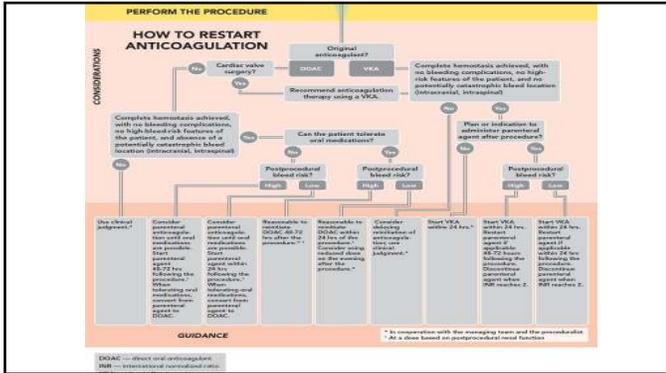
* Hupp WS. Cardiovascular Diseases. In: Patton LL, Glick M, editors. The ADA Practical Guide to Patients with Medical Conditions. 2nd ed. Hoboken, NJ: John Wiley & Sons, Inc.; 2016. p. 25-42.

27

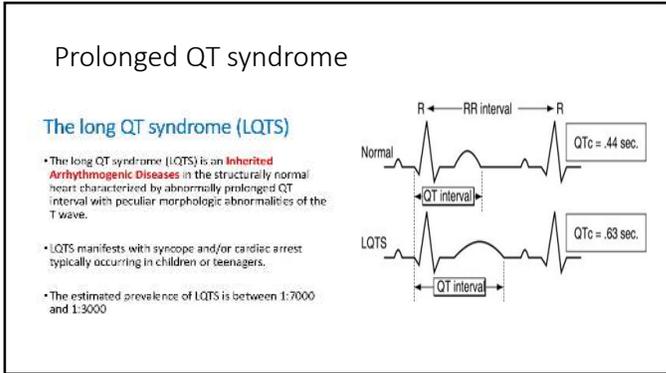
Agents	Route	Site of Action	Plasma Half-life	Duration of Effect	Metabolism	Antidote
Antiplatelet agents						
Aspirin	Oral	COX-1	20 min	7 d	Hepatic	None
Ticlopidine	Oral	P2Y12 receptor	4 d	10 d	Hepatic	None
Clopidogrel	Oral	P2Y12 receptor	7 h	5 d	Hepatic	None
Prasugrel	Oral	P2Y12 receptor	4 h	5-9 d	Hepatic	None
Ticagrelor	Oral	P2Y12 receptor	7 h	12 h	Hepatic	None
Abciximab	IV	Glycoprotein IIb/IIIa	30 min	72 h	Renal	None
Anticoagulant agents						
VKAs	Oral	Vitamin K epoxide reductase	2-4 d	2-4 d	Hepatic	Vitamin K PCCs FFP
UFHs	IW/SC	Antithrombin III	1.5 h	6 h	Hepatic	Protamine
LMWHs	SC	Antithrombin III	4-6 h	12-24 h	Renal	Protamine (partial)
Dabigatran	Oral	Direct thrombin inhibitor	12 h	1-2 d	Renal	None
Apixaban	Oral	Factor Xa antagonist	8-12 h	24 h	Hepatic	None
Rivaroxaban	Oral	Factor Xa antagonist	9-12 h	24 h	Hepatic	None
Fibrinolytic agents						
Recombinant t-PA	IV	Plasminogen	5 min	1 h	Hepatic	None

Adapted from the review of Roberts et al.¹³ Aspirin, ticlopidine, clopidogrel, and prasugrel irreversibly block platelet aggregation. COX = cyclooxygenase. FFP = fresh frozen plasma; IV = intravenous; LMWHs = low-molecular-weight heparins; PCCs = prothrombin complex on concentrates; SC = subcutaneous; t-PA = tissue-type-plasminogen activator; UFHs = Unfractionated heparins; VKAs = vitamin-K antagonists.

28



29



30

Common Medications

- Droperidol
- Zofran (Ondansetron)
- Benadryl



31

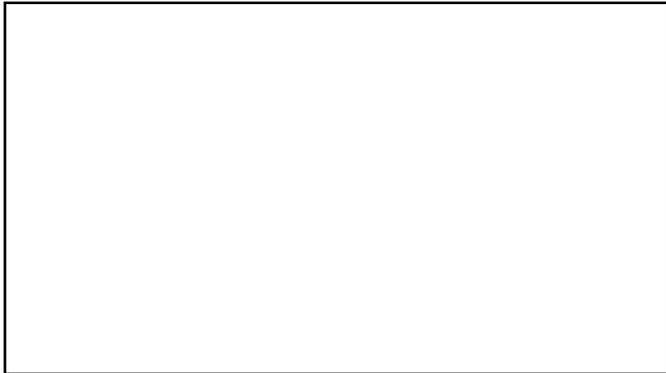
The Effects of Propofol and Sevoflurane on the QT Interval and Transmural Dispersion of Repolarization in Children

Whyte, Simon D. MB, BS, FRCA; Booker, Peter D. MB, BS, MD, FRCA; Buckley, David G. CCSC

Anesthesia & Analgesia: January 2005 - Volume 100 - Issue 1 - p 71-77 doi: 10.1213/01.ANE.0000140781.18391.41 Pediatric Anesthesia: Research Report

Conclusion: This study indicates that although propofol and sevoflurane both prolong the corrected QT interval in healthy children, neither anesthetic increases transmural dispersion of repolarization, implying a small risk of inducing torsades de pointes.

32



33