What Do You Want to Talk About?

A. Sports Participation
B. Immunization
C. Medication
D. Transition of Care
E. Growth & Development
F. Surgical Recovery
G. Treatment for Routine Illness
H. Cardiac "Grab Bag"

Sports Participation

- My patient has _____. Can he/she participate in competitive sports?
- My patient has been told to limit isometric activities. What does that mean?
- Can my patient with a patent foramen ovale (PFO) scuba dive?
- Sports Participation

CHD and Sports

- The 36th Bethesda conference (2005) outlined specific recommendations for most congenital and acquired heart defects
- This is a consensus guideline of many experts, but is largely not based on data
- There is significant variability in interpreting these guidelines
- In general, staying physically active is better for long term heart health than inactivity.

Isometric Activities

- These may be limited in patients with cardiomyopathy, aortic valve disease, other conditions.
- Fixed muscle length with increasing force
- No weight training, football, wrestling, crew, etc.
- "Core" training exercises permitted under certain conditions, must be trained to not increase abdominal pressure.

PFO and Scuba Diving

- Patent foramen ovale is present in 5-10% of healthy adults.
- Increased risk of paradoxical air emboli when scuba diving.
- Scuba diving in contraindicated in patients with known PFO or other intra-cardiac shunting.
- Should be discussed with cardiologist for other complex lesions.

Immunizations

- Should routine child immunization schedules be altered in patients with CHD?
- What are the indications for Palivizumab in congenital heart disease?
- Is the seasonal Flu shot or nasal mist indicated in CHD?
- Are there special concerns with the live virus vaccines (MMR, Varicella)?
**Routine Immunizations**

- In general, all routine immunizations should be given on schedule. When in doubt, immunize!
- For patients undergoing cardiac surgery with cardiopulmonary bypass, immunizations are often held for 2 weeks prior to surgery and 6 weeks after surgery.

**Palivizumab in CHD**

- Children 12 months or younger
- Cyanotic congenital heart disease
- Congestive heart failure on medications
- Cardiomyopathy requiring medications
- Pulmonary hypertension, moderate to severe
- Children <2 years after cardiac transplant
- Patients should be re-dosed after bypass

**Influenza Prophylaxis**

- In general - all children > 6 months with CHD and all household contacts should be immunized annually.
- Intramuscular is preferred for patients with significant CHD. Safety of nasal spray has not been established.
- Nasal mist is contra-indicated in patients with asthma, on aspirin therapy, or immunocompromised

**Live Virus Vaccines**

- Patients who have had intravenous immunoglobulin (IVIG) for Kawasaki disease should not receive live virus vaccines for 1 year from date of last infusion.
- Immunization for patients with DiGeorge syndrome (22q11 deletion) are controversial. Should be discussed on individual basis.

**Medications**

- Is albuterol safe for my patients with CHD and reactive airway disease?
- Are stimulant medications safe in patients with CHD?
- Where do I find information on medications for patients with Long QT syndrome?
- Are oral contraceptives safe in patients with CHD? Other special precautions?

**Albuterol**

- Remember ABC’s! - If any patient is in respiratory distress from reactive airways, albuterol may be given and patient carefully monitored.
- In patients with complex CHD, hypertrophic cardiomyopathy, known tachyarrhythmias, palpitations, premature extrasystoles - levalbuterol may be preferred.
Stimulants

- Patients with repaired CHD are at increased risk for ADHD. Stimulant medications can often be used safely in this population with careful monitoring.
- Patients with CHD and tachyarrhythmias should avoid over-the-counter stimulant medications, including: decongestants, antihistamines, energy drinks, and caffeine.

Long QT

- For patients with known or suspected congenital Long QT syndrome, all new medications should be checked on:

  www.qtdrugs.org

OCP’s; Other Interactions

- Oral contraceptive pills are generally safe in patients with congenital heart disease.
- Caution in patients with known hypercoagulable state, previous thrombus, Fontan or other low flow baffles.
- Other specific drug-drug reactions should be confirmed with online formulary or clinical pharmacist.

Transition of Care

- New patient referrals to Pediatric Cardiologists are usually limited to patients less than 18 years of age. However, every practice is different and it is best to check with the Pediatric Cardiologist.
- At most Pediatric Cardiology centers, children with known congenital heart defects (CHD) who are approaching adult age will be followed by their Pediatric Cardiologist at least through college years since this is a transition period in their lives.
- In early adult life, it is recommended that patients, especially with complex CHD, be referred to an Adult Congenital Heart Disease Program for more comprehensive care including other adult onset medical problems. Common CHD such as minor valve abnormalities like a bicuspid aortic valve and other minor heart abnormalities can be referred to a general adult cardiologist.
- There is now an Adult Congenital Heart Disease specialty certification from the American Board of Internal Medicine.

GROWTH AND DEVELOPMENT

- What to Expect? (short and long term)
  - Non severe Lesions (no intervention or treatment)
  - Cyanotic Lesions (eg. Tetralogy of Fallot)
  - Congestive Heart Failure (eg. VSD)
  - Obstructive Lesions (eg. Aortic Stenosis)
  - Single Ventricle (eg. Hypoplastic Left Heart)
GROWTH AND DEVELOPMENT

- Failure to Thrive
  - Increased caloric need
  - Decreased caloric intake
  - Genetic abnormality
  - Syndromes

- Short Stature
  - Rarely due to pure cardiac cause
  - Caloric mismatch
    - Weight, vs. Height vs. Head
  - Genetic
  - Syndromes

- Developmental Issues
  - Risk Factors:
    - Cyanosis
    - Shock
    - Open Heart surgery
    - Cumulative Risk
    - Associated non cardiac lesions
    - Syndromes

- Early Intervention Therapy
  - Patient Specific
  - Generally require symptoms or specific diagnosis with certainty of delay
  - Higher index of suspicion with risk factors
  - Risk factors are risk factors

- Long Term Monitoring
  - Cardiac Physiology
  - Cardiac Function
  - Valve abnormalities
  - Residual Shunts
  - Arrhythmias
  - Anticoagulation

- Long Term Monitoring
  - Liver Functions (Fontan)
  - Heart Failure
  - Pulmonary Hypertension
**GROWTH AND DEVELOPMENT**

- Acquired Heart disease
  - Hyperlipidemia
  - Increased BMI
  - Hypertension
  - Diabetes

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**Cardiac Surgery Recovery: Guidelines and Precautions**

- Sternal Precautions
  - Sternal healing is at 80% by 6 weeks
  - No lifting more than 10 lbs for 6 weeks
  - No lifting more than 20 lbs for 3 months
  - Do not lift child under the arms
  - No raising arms above head or behind the back
  - Avoid activities that put the chest at risk (biking, wrestling with siblings, monkey bars, etc)

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**Incision Care**

- Shower daily, but avoid direct spray on incision
- Sponge baths daily for infants
- Do not scrub incision, but gently clean and pat dry
- Avoid tight fitting shirts and buttons or snaps in the front
- Avoid creams and ointments unless directed by MD
- Check incision daily for redness, swelling, drainage
- Healing tissue more sensitive to sun damage

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**Diet**

- Infants
  - As much formula/breast milk as wanted
  - May need extra calories for healing, recovery, CHF
  - Limit feeding time to 30 min so child does not become overtired
- Older children
  - Regular diet unless otherwise instructed
  - Encourage balanced diet to promote healing

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**When should parents call?**

- Rapid, heavy breathing
- Excessive sweating
- Extreme lethargy
- Unable to drink bottle for 2 feeds in a row
- Increased puffiness in eyes or face
- Extreme irritability
- Fever above 100°F
Activity

- Excuse from PE for at least 4 weeks
- No contact sports for 3 months
- No swimming or hot tubs for 6 weeks
- Teens-No driving for 4-6 weeks
- Do not return to day care or school before follow-up appointment

TREATMENT OF ROUTINE ILLNESSES

- Asthma
- Influenza
- OTC Medications
- ADHD
- Dental Care
- Non Cardiac Surgery

Cardiac Grab Bag

- Can my patient travel in an airplane?
- What prenatal genetic testing is available for congenital heart disease?
- What are the most recent SBE prophylaxis guidelines from the American Heart Association?

Airplane Travel

- Generally most CHD patients can safely travel in an airplane. However, patients with cyanotic heart defects (functional single ventricles) and baseline low oxygen saturations may require supplemental oxygen during the flight.
- Airplane cabins are pressurized only to an equivalent altitude of ~6000 feet. At this altitude, oxygen tension is low and hypoxemia may be significantly worsened.
- Every patient’s hemodynamics are different and it is important to discuss with the patient’s cardiologist.

Prenatal Testing

- The most common way of prenataly detecting congenital heart disease is by ultrasonography and more specifically by a directed fetal echocardiogram performed by a Fetal or Pediatric Cardiologist. Less than 50% of general obstetrical ultrasounds detect major heart defects whereas a fetal echocardiogram can detect more than 90%.
- If a genetic disorder or syndrome is suspected on a fetal ultrasound, CVS or amniocentesis can be performed. Certain chromosomal disorders are associated with a high incidence of CHD, such as Trisomy 13, 18 or 21. FISH analysis can detect a 22q11 deletion which is also associated with heart defects, especially conotruncal abnormalities. If testing is abnormal, a fetal echo is recommended.
- Maternal blood sampling with NIPT (Noninvasive Prenatal Testing) and more recently cfDNA (cell-free DNA from the fetus) can suggest chromosomal abnormalities but is not specific for CHD.
- On the contrary, if a major CHD is detected by fetal echo then genetic testing (ie CVS or amnio) is recommended.

SBE Prophylaxis

- American Heart Association guidelines for SBE Prophylaxis (2008)
  http://www.heart.org/idc/groups/heart-public/@wcm/@hcm/documents/downloadable/ucm_307684.pdf

PREVENTION OF INFECTIVE (BACTERIAL) ENDOCARDITIS

Wallet Card

This wallet card is to be given to patients or parents by their physician. Healthcare professionals: Please see back of card for reference to the complete statement.

Name: ____________________________
Prescribed by: ______________________
Date: _____________________________
The American Heart Association’s Endocarditis Committee together with national and international experts on IE extensively reviewed published studies in order to determine whether dental, gastrointestinal (GI), or genitourinary (GU) tract procedures are possible causes of IE.

These experts determined that there is no conclusive evidence that links dental, GI, or GU tract procedures with the development of IE.

The current practice of giving patients antibiotics prior to a dental procedure is no longer recommended EXCEPT for patients with the highest risk of adverse outcomes resulting from IE (see below on this card). The Committee cannot exclude the possibility that an exceedingly small number of cases, if any, of IE may be prevented by antibiotic prophylaxis prior to a dental procedure. If such benefit from prophylaxis exists, it should be reserved ONLY for those patients listed below. The Committee recognizes the importance of good oral and dental health and regular visits to the dentist for patients at risk of IE.

- Congenital heart disease only in the following categories:
  - Unrepaired cyanotic congenital heart disease, including those with palliative shunts and conduits
  - Completely repaired congenital heart disease with prosthetic material or device, whether placed by surgery or catheter intervention, during the first six months after the procedure
  - Repaired congenital heart disease with residual defects at the site or adjacent to the site of a prosthetic patch or prosthetic device (which inhibit endocarditisization)
  - Cardiac transplantation recipients with cardiac valvular disease

*Prophylaxis is reasonable because endocarditisization of prosthetic material occurs within six months after the procedure.

Gastrointestinal/Genitourinary Procedures: Antibiotic prophylaxis solely to prevent IE is no longer recommended for patients who undergo a GI or GU tract procedure, including patients with the highest risk of adverse outcomes due to IE.

Other Procedures: Procedures involving the respiratory tract or infected skin, tissues just under the skin, or musculoskeletal tissues for which prophylaxis is reasonable are discussed in the updated document (references below).


Healthcare Professionals—Please refer to these recommendations for more complete information as to which patients and which procedures need prophylaxis.