

Oral Health Fact Sheet for Dental Professionals

Adults with Congenital Cardiac Disorders

Congenital cardiac disorders are imperfections or malformations of the heart existing at, and usually before, birth regardless of their causation. (ICD9 code 746.9)

Prevalence

- Approximately 1%

Manifestations

Clinical varies with type of congenital defect (e.g. atrial/ventricular septal defects, pulmonary/aortic stenosis, transposition, heart valve abnormalities)

- Pulmonary congestion/labored breathing
- Heart murmur
- Cardiomegaly
- Congestive heart failure
- Hypoxic spells
- Cyanosis
- Poor physical development
- Clubbing of the terminal phalanges of the fingers

Oral

- Infective endocarditis risk from dental treatment
- Post-operative bleeding risk in patients with anti-coagulated status following surgical procedures
- May have oral manifestations caused by co-occurring disorders

Other Potential Disorders/Concerns

- Depression/Anxiety
- Genetic and syndromic conditions (~11%) such as Down, Turner, Marfan and Ehler Danlos syndromes; osteogenesis imperfecta
- Asthma
- Intellectual disabilities
- Esophageal atresia

Management

Medication

The list of medications below are intended to serve only as a guide to facilitate the dental professional's understanding of medications that can be used for Congenital Cardiac Disorders. Medical protocols can vary for individuals with Congenital Cardiac Disorders from few to multiple medications.

MEDICATION TYPE	MEDICATION	SIDE EFFECTS/DRUG INTERACTIONS
ACE inhibitors (angiotension converting enzyme)	<i>Benazepril (Lotensin)</i> <i>Captopril (Capoten)</i> <i>Enalapril (Vasotec)</i> <i>Fosinopril (Monopril)</i> <i>Lisinopril (Prinivil, Zestril)</i> <i>Moexipril (Univasc)</i> <i>Perindopril (Aceon)</i> <i>Quinapril (Accupril)</i> <i>Ramipril (Altace)</i> <i>Trandolapril (Mavik)</i>	Cough, low blood pressure, headache, dizziness, abnormal taste (metallic or salty) angioedema. Aspirin, indomethacin or NSAIDs reduce the effectiveness of ACE inhibitors.

Adults with Congenital Cardiac Disorders continued

MEDICATION TYPE	MEDICATION	SIDE EFFECTS/DRUG INTERACTIONS
Antiarrhythmic	<i>Amiodarone</i> (Cordarone)	Nausea, vomiting, shaking, fatigue, dizziness, fainting, angioedema. Long-term treatment may cause a blue-gray color of the skin. Do not use with macrolide antibiotics (azithromycin, erythromycin, clarithromycin) as QT interval may be prolonged. Inhibits lidocaine metabolism so lidocaine serum levels are increased. Use with fentanyl may cause profound bradycardia, sinus arrest and severe hypotension. Interacts with TCAs to cause serious arrhythmias.
	<i>Sotalol</i> (Betapace)	Prolonged QT interval, allergic reactions, tiredness, slow heartbeat, dizziness, fainting, angioedema (rare). Do not use with macrolide antibiotics (azithromycin, erythromycin, clarithromycin) as they affect the QT interval.
Anticoagulants	<i>Warfarin</i> (Coumadin)	Bleeding and necrosis of the skin. Bleeding around the brain can cause severe headache and paralysis. Bleeding in the joints can cause joint pain and swelling. Aspirin, acetaminophen, and NSAIDs increase the effect of Coumadin. Numerous antibiotics, corticosteroids, and antifungal agents interact with Coumadin – consult a pharmacist or cardiologist. Consult patient's cardiologist prior to extractions or surgical procedures to determine if anti-coagulant therapy should be temporarily paused and get current INR rate.
ARBs (angiotension receptor blockers)	<i>Valsartan</i> (Diovan) <i>Irbesartan</i> (Avapro) <i>Losartan</i> (Cozaar) <i>Candesartan</i> (Atacand)	Low blood pressure, dizziness, headache, drowsiness, abnormal taste (metallic or salty), angioedema. Diflucan /fluconazole reduces the effect of losartan. Aspirin, indomethacin, or NSAIDs reduce the effectiveness of ARBs.
Beta blockers	<i>Propranolol</i> ($\beta_{1,2}$) (Inderal) <i>Metoprolol</i> (β_1) (Toprol XL) <i>Carvedilol</i> ($\alpha + \beta_{1,2}$) (Coreg)	Low blood pressure, low heart rate. Significant risk for acute hypertensive episodes if used with vasopressors in local anesthetics (epinephrine or levonordefrin). Use of NSAIDs, indomethacin, and aspirin may diminish the efficacy of Beta blockers. MAO inhibitors or clonidine increases the effect of carvedilol and may cause significant decrease in blood pressure or heart rate.

Adults with Congenital Cardiac Disorders continued

MEDICATION TYPE	MEDICATION	SIDE EFFECTS/DRUG INTERACTIONS
Calcium channel blockers	<i>Verapamil</i> (Calan) <i>Diltiazem</i> (Cardizem, Dilacor) <i>Nifedipine</i> (Procardia) <i>Nicardipine</i> (Cardene) <i>Isradipine</i> (DynaCirc) <i>Amlodipine</i> (Norvasc)	Low blood pressure, gingival enlargement (except isradipine). Verapamil and diltiazem taken with macrolide antibiotics (azithromycin, erythromycin, clarithromycin) may produce prolonged QT intervals and cardiac toxicity. Verapamil and diltiazem inhibit metabolism of benzodiazepines.
Inotropes/Pressers	<i>Digoxin</i> (Lanoxin)	Nausea, vomiting, headache, dizziness, skin rash, mental changes, angioedema, cardiac arrhythmia. Epinephrine can increase cardiac irritability and arrhythmia. Azole antifungals (itraconazole, ketoconazole), macrolide antibiotics (clarithromycin, erythromycin) and tetracycline affect the removal of digoxin from the body.
Diuretics Loop	<i>Furosemide</i> (Lasix) <i>Bumetanide</i> (Bumex)	Xerostomia, low blood pressure, tinnitus, nausea. Furosemide used with aminoglycoside antibiotics (gentamicin) causes hearing damage. Xerostomia, low blood pressure, tinnitus. Aspirin, indomethacin or NSAIDs may reduce the effectiveness of Loop Diuretics.
Thiazide	<i>Chlorothiazide</i> (Diuril) <i>Hydrochlorothiazide</i> (HydroDIURIL) <i>Metolazone</i> (Mykrox, Zaroxolyn)	Xerostomia, nausea, anaphylaxis, low blood pressure, sensitivity to sun. Corticosteroids may increase the risk for low levels of blood potassium and other electrolytes. Aspirin, indomethacin or NSAIDs may reduce the effectiveness of Thiazides.

Behavioral

- Use of nitrous oxide or conscious sedation may be beneficial in reducing anxiety.

Dental Treatment and Prevention

- Obtain thorough medical and dental history at each visit due to risk of infective endocarditis. Medication changes can affect the appropriate care of the patient from a medical and/or appointment management standpoint.
- Discuss dental treatment with patient's primary physician or cardiologist. Cardiologist will indicate specific antibiotic prophylaxis needed before dental treatment.
- According to the most recent AHA guidelines, many patients who previously required antibiotic prophylaxis no longer require premedication. Before discontinuing prophylactic regimen, consult with cardiologist, as some may still recommend prophylaxis.

General Guidelines: Antibiotic Prophylaxis

- Administer a single dose of antibiotic regimen 30–60 minutes before dental procedure.
- Dosage may also be administered up to two hours after procedure, if not administered before – only in cases when antibiotics are inadvertently not administered.
- Amoxicillin is preferred oral therapy (50 mg/kg). If allergic, consider use of Clindamycin (20 mg/kg), Cephalexin (50 mg/kg), or Azithromycin/Clarithromycin (15 mg/kg).

Antibiotic prophylaxis recommended for following conditions:

- High Risk – includes prosthetic cardiac valves, previous infective endocarditis, and congenital heart disease (unrepaired cyanotic CHD, including shunts and conduits, completely repaired cardiac defect with prosthetic material or device for first 6 months following surgery, repaired CHD with residual defects at the site or adjacent to the site of a prosthetic patch or device), cardiac transplant patients who develop valvulopathy

NOTE: Except for the conditions listed above, antibiotic prophylaxis is no longer recommended for any other form of CHD. If a patient has been previously pre-medicated, consult with their physician.

Antibiotic prophylaxis recommended for following dental procedures:

- Dental extractions, periodontal procedures, endodontic surgery beyond the apex, dental implant placement and reimplantation of avulsed teeth, initial placement of orthodontic bands, local anesthetic injections, including intraligamental injections and prophylactic teeth cleaning where bleeding is anticipated

Antibiotic prophylaxis is NOT recommended for the following dental procedures:

- Routine anesthetic injections through non-infected tissue, taking dental radiographs, placement of removable prosthodontic or orthodontic appliances, adjustment of orthodontic appliances, placement of orthodontic brackets, shedding of retained primary teeth, and bleeding from trauma to the lips or oral mucosa.

As needed for patients with xerostomia:

- Educate on proper oral hygiene (brushing, flossing) and nutrition.
- Recommend brushing teeth with a fluoride containing dentifrice before bedtime. After brushing, apply neutral 1.1% fluoride gel (e.g., Prevident 5000 gel) in trays or by brush for 2 minutes. Instruct patient to spit out excess gel and NOT to rinse with water, eat or drink before going to bed.
- Recommend xylitol mints, lozenges, and/or gum to stimulate saliva production and caries resistance.

Additional information: [Special Needs Fact Sheets for Providers and Caregivers](#)

Adults with Congenital Cardiac Disorders continued

Below are references and resources which, although some are labeled for children, are very helpful for reviewing implications in adults. Congenital cardiac disorders manifest early with lifelong implications impacting the delivery of dental care.

References

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- Becker, D.E., (2007) Cardiovascular Drugs: implications for Dental Practice Part 1 – cardiotonics, diuretics, and vasodilators. *Anesth Prog* 54:178–186.
- [NIH Institute for Congenital Cardiac Disorders](#)

Additional Resources

- [NIH Institute for Congenital Cardiac Disorders](#)
- [Adult Congenital Heart Association](#)
- [Canadian Adult Congenital Heart Network](#)
- [ASTDD-Special Needs](#)
- [Block Oral Disease, MA](#)
- Free of charge CDE course: [NIDCR CDE](#) (2 CDE hours)



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Fact sheets developed by the University of Washington DECOD (Dental Education in the Care of Persons with Disabilities) Program through funding provided to the Washington State Department of Health Oral Health Program by HRSA grant #H47MC08598).



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