American College of Cardiology APPROPRIATE USE CRITERIA

# Appropriate Use Criteria for Multimodality Imaging During the Follow-Up Care of Patients with Congenital Heart Disease

# **GUIDELINE MAPPING AND REFERENCES**

#### Note to Rating Panelists:

Within each table are abbreviated titles for guidelines, expert consensus statements, society recommendations, and cohort studies, with a citation afterwards and full reference listed at the end of this document. Included below each table are additional references such as review articles and device recommendations for further background information.

#### Table 1: Patent Foramen Ovale (PFO), Atrial Septal Defects (ASD), and Partial Anomalous Pulmonary Venous Connection (PAPVC)

Pate	nt Foramen Ovale	Level of Evidence	TTE	TTE + Saline	TEE	MRI	СТ	
1.	Routine surveillance of an asymptomatic patient with a PFO				None			
		A	trial Septal Defe	cts				
Unre	paired	Level of Evidence	TTE	TTE + Saline	TEE	MRI	СТ	
2.	Routine surveillance (1-2 years) in an asymptomatic patient with a small ASD or PAPVC involving a single pulmonary vein				None			
3.	Routine surveillance (3-5 years) in an asymptomatic patient with a small ASD or PAPVC involving a single pulmonary vein		None					
4.	Routine surveillance (1-2 years) in an asymptomatic patient with ≥ moderate ASD or PAPVC involving more than one pulmonary vein		None					
5.	Evaluation due to change in clinical status and/or new concerning signs or symptoms		ACC/AHA ACHD Guidelines (2018): 4.1.1 Stout, et al. (1) AEPC/EACVI Expert Consensus Paper: Indications for CMR in Children with					
			ESC Recommendations for CMR in Adults with CHD (2010) Kilner, et al. (3)					
			ASE Indications	and Guidelines fo Acquired or (	or Performance o CHD (2005) Ay	f TEE in the Patie res, et al. (4)	nt with Pediatric	

			CCS Consens	CCS Consensus Conference on Management of Adults with CHD: Shunt Lesions (2009) Silversides, et al. (5)				
			ACCF/SCC	ACCF/SCCT/ACR/AHA/ASE/ASNC/NASCI/SCAI/SCMR AUC for Cardiac CT (2010): Table 7 Taylor, et al. (6)				
6.	Evaluation to determine the method of closure of isolated secundum ASD				See above			
7.	Evaluation prior to planned repair of sinus venosus defect and/or PAPVC				See above			
Post	-procedural: Surgical or Catheter-based	Level of Evidence	TTE	TTE + Saline	TEE	MRI	СТ	
8.	Routine post-procedural evaluation (within 30 days)	С	ACC/AI	HA ACHD Guidelir	nes (2008): Sectio	on 2.6 Warnes,	, et al. (7)	
9.	Evaluation due to change in clinical status and/or new concerning signs or symptoms		ACC/AHA ACHD Guidelines (2018): 4.1.1 Stout, et al. (1) ASE Indications and Guidelines for Performance of TEE in the Patient with Pediatric Acquired or CHD (2005) Ayres, et al. (4)					
			CCS Consensus Conference on Management of Adults with CHD: Shunt Lesions (2009) Silversides, et al. (5)					
			ACCF/SCC	//ACR/AHA/ASE/ (2010): <sup>-</sup>	ASNC/NASCI/SC Fable 7 Taylor,	AI/SCMR AUC fo et al. (6)	or Cardiac CT	
10.	Routine surveillance within 1 week following device closure of ASD in an asymptomatic patient with no or mild sequelae	С	ACC/AHA ACHD Guidelines (2008): Section 2.6 Warnes, et al. (7)				, et al. (7)	
11.	Routine surveillance at 1 month following device closure of ASD in an asymptomatic patient with no or mild sequelae				See above			
12.	Routine surveillance at 3-6 months following device closure of ASD in an asymptomatic patient with no or mild sequelae				See above			
13.	Routine surveillance at 1 year following device closure of ASD in an asymptomatic patient with no or mild sequelae				See above			

14.	Routine surveillance (2-5 years) after the first year following device closure of ASD in an asymptomatic patient with no or mild sequelae	ACC/AHA ACHD Guidelines (2018): 4.1.1 Stout, et al. (1)
15.	Routine surveillance within a year following surgical ASD closure or PAPVC repair in an asymptomatic patient with no or mild sequelae	None
16.	Routine surveillance (annually) after the first year following surgical ASD closure or PAPVC repair in an asymptomatic patient with no or mild sequelae	None
17.	Routine surveillance (2-5 years) after the first year following surgical ASD closure or PAPVC repair in an asymptomatic patient with no or mild sequelae	ACC/AHA ACHD Guidelines (2018): 4.1.1 Stout, et al. (1)
18.	Routine surveillance (3 to 12 months) following surgical or device closure of ASD in a patient with significant residual shunt, valvular or ventricular dysfunction, arrhythmias, and/or pulmonary hypertension	See above
19.	Routine surveillance (3 to 12 months) following repair of PAPVC in a patient with systemic or pulmonary venous obstruction, valvular or ventricular dysfunction, arrhythmias, and/or pulmonary hypertension	See above

# Table 1 Additional Resources:

Amplatzer Multifenestrated Septal Occluder - "Cribriform": Instructions for Use. Available at: <u>https://manuals.sjm.com/Search-Form?re=North-America&cc=US&In=EN&gry=Amplatzer%20Cribriform&ipp=10</u>. Accessed: July 17, 2018.

Amplatzer PFO Occluder: Instructions for Use. Available at: <u>https://manuals.sjm.com/Search-Form?re=North-America&cc=US&In=EN&gry=Amplatzer%20PFO%20Occluder&ipp=10</u>. Accessed: July 17, 2018.

- Amplatzer Septal Occluder and Delivery System: Instructions for Use. Available at: <u>https://manuals.sjm.com/Search-Form?re=North-America&cc=US&In=EN&gry=Amplatzer+Septal+Occluder&ipp=10&Page=1</u>. Accessed: July 17, 2018.
- Fratz S, Chung T, Greil GF, et al. Guidelines and protocols for cardiovascular magnetic resonance in children and adults with congenital heart disease: SCMR expert consensus group on congenital heart disease. J Cardiovasc Magn Reson. 2013; 15:51.
- Gore Cardioform Septal Occluder: Instructions for Use. Available at: <u>https://www.goremedical.com/products/cardioform---ifu/instructions</u>. Accessed: July 17, 2018.
- Silvestry FE, Cohen MS, Armsby LB, et al. Guidelines for the Echocardiographic Assessment of Atrial Septal Defect and Patent Foramen Ovale: From the American Society of Echocardiography and Society for Cardiac Angiography and Interventions. J Am Soc Echocardiogr. 2015; 28:910-58.

Unre	epaired	Level of Evidence	TTE	TEE	MRI	СТ
20.	Routine surveillance (annually) in an asymptomatic child with a small muscular VSD			No	ne	
21.	Routine surveillance (2-5 years) in an asymptomatic child with a small muscular VSD			Nc	ne	
22.	Routine surveillance (2-5 years) in an asymptomatic adult with a small muscular VSD			Nc	ne	
23.	Routine surveillance (1-2 years) in an asymptomatic patient with a small VSD in a location other than muscular septum			Nc	ne	
24.	Routine surveillance (3-5 year(s)) in an asymptomatic adult with a small VSD in a location other than muscular septum			Nc	ne	
25.	Routine surveillance (1-3 months) in an infant with ≥ moderate VSD on medical management			Nc	ne	

# Table 2: Ventricular Septal Defects (VSD)

26.	Evaluation due to change in clinical status		ACC/AHA A	CHD Guidelines (201	8): Section 4.1.3 St	out, et al. (1)			
	and/or new concerning signs or symptoms		AEPC/EACVI Ex	pert Consensus Pape	er: Indications for CMF	R in Children with			
			Congenital and Acquired Heart Disease (2015) Valsangiacomo Buechel, et al. (2)						
			ESC Recomment	ESC Recommendations for CMR in Adults with CHD (2010) Kilner, et al. (3)					
			ASE Indications Pedi	and Guidelines for Po iatric Acquired or CHE	erformance of TEE in ) (2005) Ayres, et a	the Patient with I. (4)			
			SCCT CT Imaging i	n Patients with CHD F	Part 1 (2015): Section	2.5 Han, et al. (8)			
			CCS Consensus Conference on Management of Adults with CHD: Shunt Lesions (2009) Silversides, et al. (5)						
			ACCF/SCCT/AC	R/AHA/ASE/ASNC/N/ (2010): Table 7	ASCI/SCAI/SCMR AU - Taylor, et al. (6)	IC for Cardiac CT			
27.	Evaluation prior to planned repair			See a	above				
Pos	-procedural: Surgical or Catheter-based	Level of Evidence	TTE	TEE	MRI	СТ			
28.	Routine post-procedural evaluation (within 30 days)			No	ne				
29.	Evaluation due to change in clinical status		ACC/AHA A	CHD Guidelines (201	8): Section 4.1.3 St	out, et al. (1)			
	and/or new concerning signs or symptoms		ASE Indications Pedi	and Guidelines for Po iatric Acquired or CHE	erformance of TEE in ) (2005) Ayres, et a	the Patient with I. (4)			
			SCCT CT Imaging i	n Patients with CHD F	Part 1 (2015): Section	2.5 Han, et al. (8)			
			CCS Consensus C	onference on Manage (2009) Silver	ement of Adults with C sides, et al. (5)	CHD: Shunt Lesions			
			ACCF/SCCT/AC	R/AHA/ASE/ASNC/NA (2010): Table 7	ASCI/SCAI/SCMR AL - Taylor, et al. (6)	IC for Cardiac CT			

30.	Routine surveillance within a year following surgical or device VSD closure in an	С	ACC/AHA ACHD Guidelines (2008): Section 3.6 Warnes, et al. (7)
	asymptomatic patient with no or mild sequelae		CCS Consensus Conference on Management of Adults with CHD: Shunt Lesions (2009) Silversides, et al. (5)
31.	Routine surveillance (2-3 years) after the first year following device closure of VSD in an asymptomatic patient with no or mild sequelae		ACC/AHA ACHD Guidelines (2018): Section 4.1.3 Stout, et al. (1)
32.	Routine surveillance (annually) after the first year following surgical VSD closure in an asymptomatic patient with no or mild sequelae		None
33.	Routine surveillance (2-3 years) after the first year following surgical VSD closure in an asymptomatic patient with no or mild sequelae		ACC/AHA ACHD Guidelines (2018): Section 4.1.3 Stout, et al. (1)
34.	Routine surveillance (2-3 years) following surgical or device closure in a patient with small residual shunt, ≤ mild valvular dysfunction, no ventricular dysfunction, arrhythmias or pulmonary hypertension		See above
35.	Routine surveillance (3 to 12 months) following surgical or device closure in a patient with significant residual shunt, valvular or ventricular dysfunction, arrhythmias, and/or pulmonary hypertension		See above

#### Table 2 Additional Resources:

American College of Cardiology Foundation Task Force on Expert Consensus D, Hundley WG, Bluemke DA, et al. ACCF/ACR/AHA/NASCI/SCMR 2010 expert consensus document on cardiovascular magnetic resonance: a report of the American College of Cardiology Foundation Task Force on Expert Consensus Documents. J Am Coll Cardiol. 2010; 55:2614-62.

# Table 3: Atrioventricular Septal Defects (AVSD)

Unr	epaired: Partial/Transitional	Level of Evidence	TTE	TEE	MRI	СТ	
36	Routine surveillance (3-6 months) in an asymptomatic infant	Lindende		No	ne		
37	Routine surveillance (1-2 years) in an asymptomatic child			No	ne		
Unr	epaired: Complete	Level of Evidence	TTE	TEE	MRI	СТ	
38	Routine surveillance (1-3 months) in an infant			No	ne		
Unr	epaired: All Types	Level of Evidence	TTE	TEE	MRI	СТ	
39	Evaluation due to change in clinical status and/or new concerning signs or symptoms		ACC/AHA ACHD Guidelines (2018): Section 4.1.4 Stout, et al. (1) AEPC/EACVI Expert Consensus Paper: Indications for CMR in Children with Congenital and Acquired Heart Disease (2015) Valsangiacomo Buechel, et al. (2) ESC Recommendations for CMR in Adults with CHD (2010) Kilner, et al. (3) ASE Indications and Guidelines for Performance of TEE in the Patient with Pediatric Acquired or CHD (2005) Ayres, et al. (4) SCCT CT Imaging in Patients with CHD Part 1 (2015): Section 2.5 Han, et al. (8) CCS Consensus Conference on Management of Adults with CHD: Shunt Lesions (2009) Silversides, et al. (5) ACCF/SCCT/ACR/AHA/ASE/ASNC/NASCI/SCAI/SCMR AUC for Cardiac CT (2010): Table 7 Taylor, et al. (6)				
40	Evaluation prior to planned repair			See a	above		
Pos	t-operative	Level of Evidence	TTE	TEE	MRI	СТ	

41	Routine post-procedural evaluation (within 30 days)	None
42	Evaluation due to change in clinical status and/or new concerning signs or symptoms	<ul> <li>ACC/AHA ACHD Guidelines (2018): Section 4.1.4 Stout, et al. (1)</li> <li>AEPC/EACVI Expert Consensus Paper: Indications for CMR in Children with Congenital and Acquired Heart Disease (2015) Valsangiacomo Buechel, et al. (2)</li> <li>ESC Recommendations for CMR in Adults with CHD (2010) Kilner, et al. (3)</li> <li>ASE Indications and Guidelines for Performance of TEE in the Patient with Pediatric Acquired or CHD (2005) Ayres, et al. (4)</li> <li>SCCT CT Imaging in Patients with CHD Part 1 (2015): Section 2.5 Han, et al. (8)</li> <li>CCS Consensus Conference on Management of Adults with CHD: Shunt Lesions (2009) Silversides, et al. (5)</li> <li>PACES/HRS Expert Consensus Statement on the Recognition and Management of Arrhythmias in ACHD (2014): Section 5.3.3 Khairy, et al. (9)</li> </ul>
43	Routine surveillance within a year after AVSD repair in an asymptomatic patient with no or mild sequelae	None
44	Routine surveillance (1-3 year(s)) after the first year following repair in an asymptomatic patient with no or mild sequelae	ACC/AHA ACHD Guidelines (2018): Section 4.1.4 Stout, et al. (1)
45	Routine surveillance (3-12 months) in a patient with significant residual shunt, valvular or ventricular dysfunction, LVOT obstruction, arrhythmias, and/or pulmonary hypertension	See above
46	Routine surveillance (3-12 months) in a patient with heart failure symptoms	ACCF/AHA Guideline for the Management of Heart Failure (2013) Yancy, et al. (10)

Table 3 Additional Resources:

Dillman JR, Hernandez RJ. Role of CT in the evaluation of congenital cardiovascular disease in children. AJR Am J Roentgenol. 2009; 192:1219-31.

Fratz S, Chung T, Greil GF, et al. Guidelines and protocols for cardiovascular magnetic resonance in children and adults with congenital heart disease: SCMR expert consensus group on congenital heart disease. J Cardiovasc Magn Reson. 2013; 15:51.

#### Table 4: Patent Ductus Arteriosus (PDA)

Unrepa	ired	Level of Evidence	TTE	MRI	СТ		
47.	Routine surveillance (3-5 years) in an asymptomatic patient with a trivial, silent PDA			None			
48.	Routine surveillance (3-6 months) in an infant with ≥ moderate PDA			None			
49.	Routine surveillance (3-6 months) in an infant or child with a small, audible PDA until closure		None				
50.	Routine surveillance (1-2 years) in an infant or child with a small, audible PDA until closure		None				
51.	Routine surveillance (3-5 years) in an adult with a small PDA		ACC/AHA ACHD G	Guidelines (2018): Section 4.1	.5 Stout, et al. (1)		
52.	Evaluation due to change in clinical status and/or new concerning signs or symptoms		SCCT CT Imaging in Pa AEPC/EACVI Expert Co Congenital and Acquired H ESC Recommendations	See above + atients with Congenital Heart Han, et al. (8) onsensus Paper: Indications f eart Disease (2015) Valsar for CMR in Adults with CHD	Disease Part 1 (2015) – for CMR in Children with ngiacomo Buechel, et al. (2) (2010) Kilner, et al. (3)		

		CCS Consensus Conference on Management of Adults with CHD: Shunt Lesions (2009) Silversides, et al. (5)
53.	Evaluation prior to planned repair	See above

Post-j	procedural: Surgery or Catheter-based	Level of Evidence	TTE	TEE	MRI	СТ	Lung Scan	
54.	Routine post-procedural evaluation (within 30 days)				None		-	
55.	Evaluation due to change in clinical status and/or new concerning signs or symptoms		ACC/AHA ACHD Guidelines (2018): Section 4.1.5 Stout, et al. (1) SCCT CT Imaging in Patients with Congenital Heart Disease Part 1 (2015) – Han, et al. (8) AEPC/EACVI Expert Consensus Paper: Indications for CMR in Children with Congenital and Acquired Heart Disease (2015) Valsangiacomo Buechel, et al. (2) ESC Recommendations for CMR in Adults with CHD (2010) Kilner, et al. (3) CCS Consensus Conference on Management of Adults with CHD: Shunt Lesions (2009) Silversides, et al. (5)					
56.	Routine surveillance (annually) within 2 years following PDA closure in an asymptomatic patient with no or mild sequelae			(	None			
57.	Routine surveillance (5 years) after the first 2 years following surgical closure in an asymptomatic patient with no or mild sequelae		ACC/AF CCS Consens	IA ACHD Guidelir us Conference or (2009)	nes (2008): Section Management of ) Silversides, et	on 5.6 Warnes, Adults with CHD: al. (5)	et al. (7) Shunt Lesions	
58.	Routine surveillance (5 years) after the first 2 years following device closure in an asymptomatic patient with no or mild sequelae				See above	. , , , , , , , , , , , , , , , , , , ,		

59.	Routine surveillance (1-2 years) in a patient with post-procedural left pulmonary artery stenosis	None	
60.	Routine surveillance (1-2 years) in a	None	
	patient with post-procedural aortic		
	obstruction		

#### Table 4 Additional Resources:

Amplatzer Duct Occluder and Delivery System: Instructions for Use.

Available at: <u>https://manuals.sjm.com/Search-Form?re=North-America&cc=US&In=EN&fam=49a84173-ce9d-44d9-82ab-3e293c2cbadc&cat=71260c89-7cb8-475d-950b-0262191e7526&seg=dd28d64f-7d0b-4660-aa2c-da987bb7894c&gry=Amplatzer%20Duct%20Occluder&ipp=10. Accessed: July 17, 2018.</u>

# Table 5: Total Anomalous Pulmonary Venous Connection (TAPVC)

Unrep	aired	Level of Evidence	TTE	СТ				
61.	Evaluation due to change in clinical status and/or new concerning signs or symptoms		SCCT CT Imaging in Patients with CHD Part 1 (2015) Han, et al. (8) AEPC/EACVI Expert Consensus Paper: Indications for CMR in Children with Congenital and Acquired Heart Disease (2015) Valsangiacomo Buechel, et al. (2) ESC Recommendations for CMR in Adults with CHD (2010) Kilner, et al. (3) ASE Indications and Guidelines for Performance of TEE in the Patient with Pediatric Acquired or CHD (2005) Avres, et al. (4)					
62.	Evaluation prior to planned repair		SCCT CT Im AEPC/EACVI Ex Congenital and Acq ESC Recommen	aging in Patients with opert Consensus Pape uired Heart Disease (2 dations for CMR in Ad	CHD Part 1 (2015) er: Indications for CMF 2015) Valsangiacon lults with CHD (2010)	Han, et al. (8) R in Children with no Buechel, et al. (2) Kilner, et al. (3)		

Post	-operative	Level of Evidence	TTE	TEE	MRI	СТ	Stress Imaging	Lung Scan		
63.	Routine post-procedural evaluation (within 30 days)		None							
64.	Evaluation due to change in clinical status and/or new concerning signs or symptoms		SCCT AEPC/EA Congenital a ASE Indicatio ACCF/SC	CT Imaging ir ACVI Expert Co Ind Acquired H Dons and Guide Acquir CCT/ACR/AHA (2	n Patients with onsensus Pape leart Disease (: lines for Perfor red or CHD (20 /ASE/ASNC/N 010): Table 7 -	CHD Part 1 (2 er: Indications f 2015) Valsar mance of TEE 05) Ayres, e ASCI/SCAI/SC - Taylor, et al.	015) Han, et for CMR in Chi ngiacomo Bued in the Patient t al. (4) MR AUC for C (6)	al. (8) Idren with chel, et al. (2) with Pediatric cardiac CT		
65.	Routine surveillance (3-6 months) in an asymptomatic infant with no or mild sequelae		None							
66.	Routine surveillance (1-2 years) in an asymptomatic child with no or mild sequelae		None							
67.	Routine surveillance (3-5 years) in an asymptomatic adult with no or mild sequelae				Nc	one				

# Table 5 Additional Resources:

# Table 6: Eisenmenger Syndrome and Pulmonary Hypertension Associated with CHD

Eisenmenger Syndrome (ES)	Level of	TTE	MRI	СТ	Stress Imaging
	Evidence				

68.	Initial evaluation with suspicion of ES	C	ACC/AHA ACHD Guidelines (2018): Section 4.4.6 Stout, et al. (1)
		В	AHA/ATS Pediatric Pulmonary Hypertension Guidelines (2015): Section 3 Abman, et al. (11)
			ACCF/AHA Expert Consensus Document on Pulmonary Hypertension (2009): Figure 3, Section 6 McLaughlin, et al. (12)
		С	ESC/ERS Guidelines for the Diagnosis and Treatment of Pulmonary Hypertension (2016): Table 12 and 16 Galie, et al. (13)
			CCS Consensus Conference on Management of Adults with CHD: Complex CHD (2009) Silversides, et al. (14)
			ACCF/SCCT/ACR/AHA/ASE/ASNC/NASCI/SCAI/SCMR AUC for Cardiac CT (2010): Table 7 Taylor, et al. (6)
69.	Evaluation due to change in clinical status	С	ACC/AHA ACHD Guidelines (2018): Section 4.4.6 Stout, et al. (1)
	symptoms in a patient with ES	В	AHA/ATS Pediatric Pulmonary Hypertension Guidelines (2015): Section 3 Abman, et al. (11)
			ACCF/AHA Expert Consensus Document on Pulmonary Hypertension (2009): Table 8 McLaughlin, et al. (12)
		С	ESC/ERS Guidelines for the Diagnosis and Treatment of Pulmonary Hypertension (2016): Table 16 Galie, et al. (13)
			CCS Consensus Conference on Management of Adults with CHD: Complex CHD (2009) Silversides, et al. (14)
70.	Evaluation due to change in PAH- targeted therapy in a patient with ES		See above
71.	Routine surveillance (3 months) in a stable child with ES		AHA/ATS Pediatric Pulmonary Hypertension Guidelines (2015): Section 3 Abman, et al. (11)

72.	Routine surveillance (6-12 months) in a stable child with ES			See a	above			
73.	Routine surveillance (3 months) in a stable adult with ES	С	ACC/AHA ACHD Guidelines (2018): Section 4.4.6 Stout, et al. (1) ACCF/AHA Expert Consensus Document on Pulmonary Hypertension (2009): Table 8 McLaughlin, et al. (12)					
		С	ESC/ERS Guidelines for the Diagnosis and Treatment of Pulmonary Hypertension (2016): Table 16 Galie, et al. (13)					
			CCS Consensus Conference on Management of Adults with CHD: Complex CHD (2009) Silversides, et al. (14)					
74.	Routine surveillance (6-12 months) in a stable adult with ES			See a	above			
Pulmo	onary hypertension associated with CHD	Level of Evidence	TTE MRI CT Stress Imagi					
75.	Initial evaluation with suspicion of	С	ACC/AHA A	CHD Guidelines (201	8): Section 4.4.6 S	tout, et al. (1)		
	surgery	В	AHA/ATS Pedia	tric Pulmonary Hyperl Abman, e	tension Guidelines (2 et al. (11)	015): Section 3		
			ACCF/AHA Expe	rt Consensus Docum Figure 3, Section 6	ent on Pulmonary Hy McLaughlin, et al. (12	pertension (2009): 2)		
		С	ESC/ERS Guidelin	es for the Diagnosis a (2016): Table 12 an	nd Treatment of Puln 16 Galie, et al. (13)	nonary Hypertension		
			CCS Consensus Conference on Management of Adults with CHD: Complex CHE (2009) Silversides, et al. (14)					
			ACCF/SCCT/ACR/AHA/ASE/ASNC/NASCI/SCAI/SCMR AUC for Cardiac CT (2010): Table 7 Taylor, et al. (6)					
76.	Evaluation due to change in clinical status	С	ACC/AHA A	CHD Guidelines (201	8): Section 4.4.6 S	tout, et al. (1)		
		В						

	symptoms in a patient with post-operative PH		AHA/ATS Pediatric Pulmonary Hypertension Guidelines (2015): Section 3 Abman, et al. (11)
		C	ACCF/AHA Expert Consensus Document on Pulmonary Hypertension (2009): Table 8 McLaughlin, et al. (12)
		0	ESC/ERS Guidelines for the Diagnosis and Treatment of Pulmonary Hypertension (2016): Table 16 Galie, et al. (13)
			CCS Consensus Conference on Management of Adults with CHD: Complex CHD (2009) Silversides, et al. (14)
77.	Evaluation due to change in PAH- targeted therapy in a patient with post- operative PH		See above
78.	Routine surveillance (3 months) in a stable child with post-operative PH		AHA/ATS Pediatric Pulmonary Hypertension Guidelines (2015): Section 3 Abman, et al. (11)
79.	Routine surveillance (6-12 months) in a stable child with post-operative PH		See above
80.	Routine surveillance (3 months) in a stable adult with post-operative PH		ACCF/AHA Expert Consensus Document on Pulmonary Hypertension (2009): Table 8 McLaughlin, et al. (12)
		С	ESC/ERS Guidelines for the Diagnosis and Treatment of Pulmonary Hypertension (2016): Table 16 Galie, et al. (13)
			CCS Consensus Conference on Management of Adults with CHD: Complex CHD (2009) Silversides, et al. (14)
81.	Routine surveillance (6-12 months) in a stable adult post-operative PH		See above

Table 6 Additional Resources:

Unrep	aired	Level of	TTE	TTE TTE + TEE MRI CT Stres					
		Evidence		Saline				Imaging	
82.	Routine surveillance (1-2 years) in an asymptomatic infant or child with mild TR				No	ne			
83.	Routine surveillance (3-5 years) in an asymptomatic adult with mild TR		ACC/AHA AHCD Guidelines (2018): Section 4.3.4-1 Stout, et al. (1)						
84.	Routine surveillance (3-6 months) in an asymptomatic infant with ≥ moderate TR without hypoxemia				No	ne			
85.	Routine surveillance (6-12 months) in an asymptomatic patient with ≥ moderate TR and previously stable RV size and/or function without hypoxemia		None						
86.	Evaluation due to change in clinical status and/or new concerning signs and symptoms		ASE/CMR Recommendations for Noninvasive Evaluation of Native Valvular Regurgitation (2017) Zoghbi, et al. (15)						
			EAE/A	ASE Echocardi	ographic Asse Baumgartne	ssment of Valv er, et al. (16)	ve Stenosis (2	009)	
			ASE Ind Pediatri	ications and G c Acquired or (	uidelines for Po Congenital Hea	erformance of art Disease (20	TEE in the Pa )05) Ayres,	itient with et al. (4)	
			CCS Consensus Conference on Management of Adults with CHD: Eb Anomaly (2009) Silversides, et al. (17)					): Ebstein	
		В	PACES/HRS Expert Consensus Statement on the Recognition and Mana Arrhythmias in ACHD (2014) Khairy, et al. (9)						
87.	Evaluation of an ASD for device closure in a patient with mild or moderate TR. RV				See A	Above			
	enlargement and no hypoxemia	С	ACC/A	HA AHCD Gui	idelines (2018)	: Sections 4.3	4-1 Stout, e	et al. (1)	

# Table 7: Ebstein Anomaly and Tricuspid Valve Dysplasia

			AEPC/EACVI Expert Consensus Paper: Indications for CMR in Children with Congenital and Acquired Heart Disease (2015) Valsangiacomo Buechel, et al. (2)						
			ESC Reco	mmendations	for CMR in Ad	lults with CHD	(2010) Kilne	er, et al. (3)	
88.	Evaluation prior to planned repair				See A	Above +	· · · ·		
		С	AHA/ACC Guideline for the Management of Patients with Valvular Heart Disease (2014): Section 8 Nishimura, et al. (18)						
			ACCF/SCT/ACR/ASE/ASNC/SCAI/SCMR AUC for Cardiac CT (2010): Table 7 Taylor, et al. (6)						
Post-o	perative	Level of Evidence	TTE	TTE + Saline	TEE	MRI	СТ	Stress Imaging	
89.	Routine post-procedural evaluation (within 30 days)				Nc	one	J		
90.	Evaluation due to change in clinical status and/or new concerning signs or symptoms		ASE/CM	R Recommenc Regur	dations for Non rgitation (2017)	invasive Evalı Zoghbi, et :	uation of Nativ al. (15)	e Valvular	
			EAE/A	ASE Echocardi	iographic Asse Baumgartne	essment of Val er, et al. (16)	ve Stenosis (2	009)	
			ASE Indi Pediatri	cations and G c Acquired or	uidelines for P Congenital He	erformance of art Disease (2	TEE in the Pa 005) Ayres,	atient with et al. (4)	
			CCS Consensus Conference on Management of Adults with CHD: Ebstein Anomaly (2009) Silversides, et al. (17)						
		В	PACES/HRS	Expert Conse Arrhythm	ensus Stateme ias in ACHD (2	nt on the Reco 2014) Khairy	ognition and M v, et al. (9)	anagement of	
91.	Routine surveillance (1-2 years) in an asymptomatic patient with no or mild sequelae		CCS Co	nsensus Confe Anom	erence on Man naly (2009) S	agement of A ilversides, et a	dults with CHE al. (17)	): Ebstein	

92.	Routine surveillance (3-5 years) in an asymptomatic patient with no or mild		See Above
	sequelae	С	ACC/AHA AHCD Guidelines (2018): Section 4.3.4-1 Stout, et al. (1)
93.	Routine surveillance (6-12 months) in an asymptomatic child with valvular or ventricular dysfunction or arrhythmia		None
94.	Routine surveillance (1-2 years) in an asymptomatic adult with valvular or ventricular dysfunction or arrhythmias		ASE/CMR Recommendations for Noninvasive Evaluation of Native Valvular Regurgitation (2017) Zoghbi, et al. (15)
			EAE/ASE Echocardiographic Assessment of Valve Stenosis (2009) Baumgartner, et al. (16)
			ASE Indications and Guidelines for Performance of TEE in the Patient with Pediatric Acquired or Congenital Heart Disease (2005) Ayres, et al. (4)
			CCS Consensus Conference on Management of Adults with CHD: Ebstein Anomaly (2009) Silversides, et al. (17)
		В	PACES/HRS Expert Consensus Statement on the Recognition and Management of Arrhythmias in ACHD (2014) Khairy, et al. (9)
		С	ACC/AHA AHCD Guidelines (2018): Section 4.3.4 Stout, et al. (1)
			AHA/ACC Guideline for the Management of Patients with Valvular Heart Disease (2014): Section 8 Nishimura, et al. (18)
95.	Routine surveillance (3-12 months) in a patient with symptoms of heart failure	С	ACC/AHA AHCD Guidelines (2018): Section 4.3.4 Stout, et al. (1)
	and/or atrial arrhythmias		ACCF/AHA Guideline for the Management of Heart Failure (2013):
			Section 5 and 6 Yancy, et al. (10)

# Table 7 Additional Resources:

American College of Cardiology Foundation Task Force on Expert Consensus D, Hundley WG, Bluemke DA, et al. ACCF/ACR/AHA/NASCI/SCMR 2010

expert consensus document on cardiovascular magnetic resonance: a report of the American College of Cardiology Foundation Task Force on Expert Consensus Documents. J Am Coll Cardiol. 2010; 55:2614-62.

- Fratz S, Chung T, Greil GF, et al. Guidelines and protocols for cardiovascular magnetic resonance in children and adults with congenital heart disease: SCMR expert consensus group on congenital heart disease. J Cardiovasc Magn Reson. 2013; 15:51.
- Kirk R, Dipchand AI, Rosenthal DN, et al. The International Society for Heart and Lung Transplantation Guidelines for the management of pediatric heart failure: Executive summary. [Corrected]. J Heart Lung Transplant. 2014; 33:888-909. (see Chapter 5)
- Silvestry FE, Cohen MS, Armsby LB, et al. Guidelines for the Echocardiographic Assessment of Atrial Septal Defect and Patent Foramen Ovale: From the American Society of Echocardiography and Society for Cardiac Angiography and Interventions. J Am Soc Echocardiogr. 2015; 28:910-58.

Unrepa	ired	Level of Evidence	TTE	TEE	MRI	CT	Stress Imaging	
96.	Routine surveillance (1-4 weeks) in an asymptomatic infant with PS				None			
97.	Routine surveillance (3-6 months) in an asymptomatic infant with mild PS				None			
98.	Routine surveillance (1-2 years) in an asymptomatic child with mild PS		None					
99.	Routine surveillance (3-5 years) in an asymptomatic adult with mild PS	С	ACC/AHA ACHD Guidelines (2008): Section 7.5 Warnes, et al. (7)					
			CCS Consensus Conference on Management of Adults with CHD: Outflow Tract Obstruction (2009) Silversides, et al. (17)					
100.	Routine surveillance (3-6 months) in an asymptomatic infant with $\geq$ moderate PS		None					
101.	Routine surveillance (1-2 years) in an asymptomatic child or adult with ≥ moderate PS				None			

#### Table 8: Pulmonary Stenosis (PS)

102.	Routine surveillance (3-5 years) in an asymptomatic adult with PS and pulmonary artery dilation		None
103.	Evaluation due to change in clinical status and/or new concerning signs or symptoms	С	<ul> <li>ACC/AHA ACHD Guidelines (2008): Section 7.5 Warnes, et al. (7)</li> <li>AEPC/EACVI Expert Consensus Paper: Indications for CMR in Children with Congenital and Acquired Heart Disease (2015) Valsangiacomo Buechel, et al. (2)</li> <li>ESC Recommendations for CMR in Adults with CHD (2010) Kilner, et al. (3)</li> <li>ASE Indications and Guidelines for Performance of TEE in the Patient with Pediatric Acquired or CHD (2005) Ayres, et al. (4)</li> <li>SCCT CT Imaging in Patients with CHD Part 1 (2015): Section 2.11 – Han, et al. (8)</li> <li>CCS Consensus Conference on Management of Adults with CHD: Outflow Tract Obstruction (2009) Silversides, et al. (17)</li> <li>ISHLT Guidelines for the Management of Pediatric Heart Failure (2014): Section 5.3 Kirk, et al. (19)</li> <li>ACCF/AHA Guideline for the Management of Heart Failure (2013): Section 6.4</li> </ul>
104.	Evaluation prior to planned repair		See above

Post-pr	ocedural: Surgical or Catheter-based	Level of Evidence	TTE TEE MRI CT Stress Imaging				Stress Imaging	
105.	Routine post-procedural evaluation (within 30 days)		None					
106.	Evaluation due to change in clinical status and/or new concerning signs or symptoms	С	ACC/AHA	ACHD Guideline	s (2018): Section Stout, et al. (1)	4.3.1.1 Table 23,	Figure 3 –	

			ASE/SCMR Recommendations for Noninvasive Evaluation of Native Valvular Regurgitation (2017) Zoghbi, et al. (15) AEPC/EACVI Expert Consensus Paper: Indications for CMR in Children with Congenital and Acquired Heart Disease (2015) Valsangiacomo Buechel, et al. (2) ESC Recommendations for CMR in Adults with CHD (2010) Kilner, et al. (3) ASE Indications and Guidelines for Performance of TEE in the Patient with Pediatric Acquired or CHD (2005) Ayres, et al. (4)
407		B, C B, C	SCCT CT Imaging in Patients with CHD Part 1 (2015) Han, et al. (8) ISHLT Guidelines for the Management of Pediatric Heart Failure (2014): Section 5.3 Kirk, et al. (19) ACCF/AHA Guideline for the Management of Heart Failure (2013): Section 6.4 Yancy, et al. (10) CCS Consensus Conference on Management of Adults with CHD: Outflow Tract Obstruction (2009) Silversides, et al. (17)
107.	Routine surveillance (1-2 years) in an asymptomatic child with no or mild sequelae		None
108.	Routine surveillance (3-5 years) in an asymptomatic adult with no or mild sequelae	С	ACC/AHA ACHD Guidelines (2018): Section 4.3.1.1 Table 23, Figure 3 – Stout, et al. (1) CCS Consensus Conference on Management of Adults with CHD: Outflow Tract Obstruction (2009) Silversides, et al. (17)
109.	Routine surveillance (6-12 months) in an asymptomatic child with moderate or severe sequelae		None
110.	Routine surveillance (1-3 years) in an asymptomatic adult with moderate or severe sequelae	С	ACC/AHA ACHD Guidelines (2018): Section 4.3.1.1. Table 23, Figure 3 – Stout, et al. (1)

		CCS Consensus Conference on Management of Adults with CHD: Outflow Tract Obstruction (2009) Silversides, et al. (17)
111.	Routine surveillance (3-12 months) in a patient with heart failure symptoms	ACCF/AHA Guideline for the Management of Heart Failure (2013): Section 6.4 Yancy, et al. (10)

# Table 8 Additional Resources:

Fratz S, Chung T, Greil GF, et al. Guidelines and protocols for cardiovascular magnetic resonance in children and adults with congenital heart disease: SCMR expert consensus group on congenital heart disease. J Cardiovasc Magn Reson. 2013; 15:51.

# Table 9: Pulmonary Atresia with Intact Ventricular Septum (PA/IVS)

Unrepaired		Level of Evidence	TTE	TEE	MRI	СТ	Stress Imaging	Lung scan
112.	Evaluation prior to planned repair				Nc	one		
Post-pr	ocedural: Palliation	Level of Evidence	TTE	TEE	MRI	СТ	Stress Imaging	Lung scan
113.	Routine post-procedural evaluation (within 30 days)		None					
114.	Routine surveillance (1-3 months) in an asymptomatic patient		None					
115.	Evaluation due to change in clinical status and/or new concerning signs or symptoms		SCCT CT Imaging in Patients with CHD Part 1 (2015) Han, et al. (8) AEPC/EACVI Expert Consensus Paper: Indications for CMR in Children with Congenital and Acquired Heart Disease (2015) Valsangiacomo Buechel, et al. (2) ESC Recommendations for CMR in Adults with CHD (2010) Kilner, et al. (3)					
116.	Evaluation prior to planned repair				No	one		

Post-p	rocedural: Complete Repair	Level of Evidence	TTE	TEE	MRI	СТ	Stress Imaging	Lung scan		
117.	Routine post-procedural evaluation (within 30 days)		None							
118.	Evaluation due to a change in clinical status and/or new concerning signs or symptoms			None						
119.	Routine surveillance (3-6 months) in an asymptomatic infant				No	one				
120.	Routine surveillance (1-2 years) in an asymptomatic child with no or mild sequelae		None							
121.	Routine surveillance (2-3 years) in an asymptomatic adult with no or mild sequelae				Nc	one				
122.	Routine surveillance (6-12 months) in an asymptomatic child with $\geq$ moderate sequelae		None							
123.	Routine surveillance (1-3 years) in an asymptomatic adult with $\geq$ moderate sequelae		None							
124.	Routine surveillance (3-12 months) in a patient with heart failure symptoms		ACCF/AHA	Guideline for	the Manageme Yancy, e	ent of Heart Fa et al. (10)	ilure (2013): S	ection 6.4		

# Table 9 Additional Resources:

# Table 10: Mitral Valve Disease

Unrepaired: Congenital Mitral Stenosis (MS)	Level of	TTE	TEE	MRI	СТ	Stress
	Evidence					Imaging

125.	Routine surveillance (1-4 weeks) in an infant with mild MS		None
126.	Routine surveillance (3-6 months) in an infant with mild MS		None
127.	Routine surveillance (1-3 months) in an infant with ≥ moderate MS		None
128.	Routine surveillance (1-2 years) in an asymptomatic child with mild MS		None
129.	Routine surveillance (3-12 months) in an asymptomatic child with ≥moderate MS		None
130.	Evaluation due to change in clinical status and/or new concerning signs or symptoms	B, C	<ul> <li>AHA/ACC Guideline for the Management of Patients with Valvular Heart Disease (2014): Section 6 Nishimura, et al. (18)</li> <li>ACCF/ACR/AHA/NASCI/SCMR Expert Consensus Document on CMR (2010) American College of Cardiology Foundation Task Force on Expert Consensus, et al. (20)</li> <li>ASE/EACVI Clinical Use of Stress Echocardiography in Non-Ischaemic Heart Disease (2017) Lancellotti, et al. (21)</li> <li>SCCT CT Imaging in Patients with Congenital Heart Disease Part 1 (2015) – Han, et al. (8)</li> <li>ASE Indications and Guidelines for Performance of TEE in the Patient with Pediatric Acquired or Congenital Heart Disease (2005) Ayres, et al. (4)</li> <li>ACC/AHA Guideline for the Management of Heart Failure (2013): Section 6 Yancy, et al. (10)</li> </ul>
131.	Evaluation prior to planned repair		See above

Unrepaired: Congenital Mitral Regurgitation	Level of	TTE	TEE	MRI	СТ	Stress
(MR) including Mitral Valve Prolapse (MVP)	Evidence					Imaging

132.	Routine surveillance (6-12 months) in an asymptomatic infant with mild MR		None
133.	Routine surveillance (1-3 months) in an asymptomatic infant with ≥moderate MR		None
134.	Routine surveillance (2-5 years) in a child with mild MR, normal LV size and systolic function		None
135.	Routine surveillance (6-12 months) in a child with ≥ moderate MR		None
136.	Routine surveillance (annually) in an asymptomatic child with MVP and mild MR		None
137.	Routine surveillance (2-5 years) in an asymptomatic child with MVP and mild MR		None
138.	Evaluation due to change in clinical status and/or new concerning signs or symptoms	B, C	<ul> <li>AHA/ACC Guideline for the Management of Patients with Valvular Heart Disease (2014): Section 7 Nishimura, et al. (18)</li> <li>ACCF/ACR/AHA/NASCI/SCMR Expert Consensus Document on CMR (2010) American College of Cardiology Foundation Task Force on Expert Consensus, et al. (20)</li> <li>ASE/EACVI Clinical Use of Stress Echocardiography in Non-Ischaemic Heart Disease (2017) Lancellotti, et al. (21)</li> <li>SCCT CT Imaging in Patients with Congenital Heart Disease Part 1 (2015) - Han, et al. (8)</li> <li>ASE Indications and Guidelines for Performance of TEE in the Patient with Pediatric Acquired or Congenital Heart Disease (2005) Ayres, et al. (4)</li> <li>ACCF/AHA Guideline for the Management of Heart Failure (2013): Section 6 Yancy, et al. (10)</li> </ul>

139.	Evaluation prior to planned repair	See above

Post-	procedural: Surgical or Catheter-based	Level of	TTE TEE MRI CT Stress Fluoro							
		Evidence								
140.	Routine post-procedural evaluation (within 30 days)		None							
141.	Evaluation in an infant or child due to change in clinical status and/or new concerning signs or symptoms		<ul> <li>ASE/SCMR Recommendations for Noninvasive Evaluation of Native Valvular Regurgitation (2017) Zoghbi, et al. (15)</li> <li>ACCF/ACR/AHA/NASCI/SCMR Expert Consensus Document on CMR (2010) American College of Cardiology Foundation Task Force on Expert Consensus, et al. (20)</li> <li>ASE Indications and Guidelines for Performance of TEE in the Patient with Pediatric Acquired or Congenital Heart Disease (2005) Ayres, et al. (4)</li> <li>ASE Recommendations for Evaluation of Prosthetic Valves with Echocardiography and December Ultransural (2000) Zoghbi, et al. (22)</li> </ul>							
			and Doppler Ultrasound (2009) Zoghbi, et al. (22) SCCT CT Imaging in Patients with Congenital Heart Disease Part 1 (201: Hap. et al. (8)							
142.	Routine surveillance (3-6 months) in an infant with mild MS or MR and no LV dysfunction				No	ne				
143.	Routine surveillance (1-3 months) in an infant with ≥ moderate MS or MR, dilated LV, and no LV dysfunction		None							
144.	Routine surveillance (1-2 years) in a child with mild MS or MR and no LV dysfunction		None							
145.	Routine surveillance (3-12 months) in a child with $\geq$ moderate MS or MR, dilated LV, and no LV dysfunction				No	ne				

146.	Routine surveillance (annually) in a child with normal prosthetic mitral valve function and no LV dysfunction	None
147.	Routine surveillance (3-12 months) in a child with prosthetic mitral valve or ventricular dysfunction, and/or arrhythmia	None

# Table 10 Additional Resources:

# Table 11: Left Ventricular Outflow Tract (LVOT) Lesions

Unre	oaired: Subvalvular Aortic Stenosis	Level of Evidence	TTE	TEE	MRI	СТ	Stress Imaging			
148.	Routine surveillance (1-3 months) in an infant with any degree of subvalvular AS and ≤ mild AR			None						
149.	Routine surveillance (1-2 years) in a child or adult with mild subvalvular AS and no AR		ACC/AH CCS Consens	ACC/AHA ACHD Guidelines (2018): Section 4.2.3 Stout, et al. (1) CCS Consensus Conference on Management of Adults with CHD: Outflow Tract Obstruction (2009) Silversides, et al. (17)						
150.	Routine surveillance (6-12 months) in a child or adult with ≥ moderate subvalvular AS and/or ≤ mild AR			See above						
151.	Routine surveillance (3-5 years) in an asymptomatic adult with ≥ moderate subvalvular AS			None						
152.	Evaluation due to change in clinical status and/or new concerning signs or symptoms		ACC/AH AEPC/EAC Congenital and ESC Recom	HA ACHD Guideli /I Expert Consen Acquired Heart D	nes (2018): Sectionsus Paper: Indica Disease (2015) N MR in Adults with	on 4.2.3 Stout, ( tions for CMR in ( Valsangiacomo Bi CHD (2010) Kii	et al. (1) Children with Jechel, et al. (2) ner. et al. (3)			

153.	Evaluation prior to planned repair		ASE Indications SCCT C CCS Consens	and Guidelines fo Acquired or ( T Imaging in Patie sus Conference or Obstruction (2	or Performance o CHD (2005) Ay nts with CHD Pa n Management of <u>2009) Silversid</u> See above	of TEE in the Pat rres, et al. (4) rt 1 (2015) Ha f Adults with CHI les, et al. (17)	tient with Pediatric n, et al. (8) D: Outflow Tract
Post-	operative	Level of Evidence	TTE	TEE	MRI	СТ	Stress Imaging
154.	Routine post-operative evaluation (within 30 days)				None		
155.	Evaluation due to change in clinical status and/or new concerning signs or symptoms		ACC/AI AEPC/EAC Congenital and ESC Recom ASE Indications SCCT C CCS Consens	HA ACHD Guidelir VI Expert Consens Acquired Heart D mendations for CM and Guidelines for Acquired or ( T Imaging in Patie sus Conference or Obstruction (2)	nes (2018): Sections sus Paper: Indica isease (2015) MR in Adults with or Performance of CHD (2005) Ay nts with CHD Pa of Management of 2009) Silversid	on 4.2.3 Stout tions for CMR in Valsangiacomo CHD (2010) H of TEE in the Pat rres, et al. (4) rt 1 (2015) Ha f Adults with CHI les, et al. (17)	t, et al. (1) n Children with Buechel, et al. (2) Kilner, et al. (3) tient with Pediatric In, et al. (8) D: Outflow Tract
156.	Routine surveillance (3-6 months) in an infant with ≤ mild stenosis and/or AR				None		
157.	Routine surveillance (1-3 months) in an infant with ≥ moderate stenosis and/or AR				None		

158.	Routine surveillance (1-2 years) in a child or adult with ≤ mild stenosis and/or AR	ACC/AHA ACHD Guidelines (2018): Section 4.2.3 Stout, et al. (1)
159.	Routine surveillance (6-12 months) in a child or adult with ≥ moderate stenosis and/or AR	See above
160.	Routine surveillance (3-12 months) in an adult with heart failure symptoms or ≥ moderate stenosis and/or AR	See above

*Unre	paired: Aortic Valve Stenosis and/or	Level of	TTE	TEE	MRI	СТ	Stress
Regu	rgitation	Evidence					Imaging
161.	Routine surveillance (1-4 weeks) in an infant (<3 months old) with any degree of AS and/or AR not requiring neonatal surgery				None		
162.	Routine surveillance (3-6 months) in an infant (3-12 months old) with mild AS and/or mild AR				None		
163.	Routine surveillance (1-3 months) in an infant (3-12 months old) with ≥ moderate AS and/or ≥ moderate AR				None		
164.	Routine surveillance (6 months) in an asymptomatic child with mild AS and/or mild AR				None		
165.	Routine surveillance (1-2 years) in an asymptomatic child with mild AS and/or mild AR				None		
166.	Routine surveillance (6-12 months) in an asymptomatic child with $\geq$ moderate AS and/or $\geq$ moderate AR				None		
167.	Routine surveillance (3-5 years) in a child with a bicuspid aortic valve with trivial or mild valvular dysfunction with				None		

	no aortic sinus and/or ascending aortic dilation	
168.	Routine surveillance (2-3 years) in a child with aortic sinus and/or ascending aortic dilation with stable z-scores	None
169.	Routine surveillance (6-12 months) in a child with aortic sinus and/or ascending aortic dilation with increasing z-scores	None
170.	Evaluation due to change in clinical status and/or new concerning signs or symptoms	<ul> <li>AHA/ACC Guideline for the Management of Patients With Valvular Heart Disease (2014): Sections 3.2, 4.2 Nishimura, et al. (18)</li> <li>AEPC/EACVI Expert Consensus Paper: Indications for CMR in Children with Congenital and Acquired Heart Disease (2015) Valsangiacomo Buechel, et al. (2)</li> <li>ESC Recommendations for CMR in Adults with CHD (2010) Kilner, et al. (3)</li> <li>ASE Indications and Guidelines for Performance of TEE in the Patient with Pediatric Acquired or CHD (2005) Ayres, et al. (4)</li> </ul>
		SCCT CT Imaging in Patients with CHD Part 1 (2015) Han, et al. (8)
171.	Evaluation prior to planned repair	See above

\*This part of the table does not include indications for adults.

*Post	procedural: Surgical or Catheter-	Level of	TTE TEE MRI CT Stres		Stress	Fluoro		
Dased		Evidence					Imaging	
172.	Routine post-procedural evaluation (within 30 days)		None					
173.	Evaluation due to change in clinical status and/or new concerning signs or symptoms		AHA/ACC Guideline for the Management of Patients With Valvular Heart Disease (2014): Sections 3.2, 4.2 Nishimura, et al. (18)         AEPC/EACVI Expert Consensus Paper: Indications for CMR in Children with Congenital and Acquired Heart Disease (2015) Valsangiacomo Buechel, et al. (2)				eart Disease Idren with chel, et al. (2)	
			ESC Reco	ommendations	for CMR in Ad	ults with CHD	(2010) Kilner	r, et al. (3)

		ASE Indications and Guidelines for Performance of TEE in the Patient with Pediatric Acquired or CHD (2005) Ayres, et al. (4) SCCT CT Imaging in Patients with CHD Part 1 (2015): Section 2.11 – Han. et al. (8)
		ASE Recommendations for Evaluation of Prosthetic Valves With Echocardiography and Doppler Ultrasound (2009) Zoghbi, et al. (22) CCS Consensus Conference on Management of Adults with CHD: Outflow
		Tract Obstruction (2009) Silversides, et al. (17)
174.	Routine surveillance (3-6 months) in an infant following neonatal intervention with ≤ mild AS and/or AR and no LV dysfunction	None
175.	Routine surveillance (1-3 months) in an infant following neonatal intervention with ≥ moderate AS and/or regurgitation, and/or LV dysfunction	None
176.	Routine surveillance (1-2 years) in a child with ≤ mild AS and/or AR following repair or normal prosthetic valve function	None
177.	Routine surveillance (6-12 months) in a child with ≥ moderate AS or AR	None
178.	Routine surveillance (3-12 months) in a child with heart failure symptoms and/or ventricular dysfunction	None

\*This part of the table does not include indications for adults.

Unrepaired: Supravalvular Aortic Stenosis	Level of	TTE	TEE	MRI	СТ	Stress
	Evidence					Imaging

179.	Routine surveillance (3-6 months) in an infant with any degree of supravalvular AS	None
180.	Routine surveillance (1-2 years) in an asymptomatic child or adult with mild supravalvular AS	ACC/AHA ACHD Guidelines (2018): Section 4.2.5 Stout, et al. (1)
181.	Routine surveillance (6-12 months) in an asymptomatic child or adult with moderate supravalvular AS	See above
182.	Routine surveillance (2-5 years) in an asymptomatic adult with moderate supravalvular AS	See above
183.	Evaluation due to change in clinical status and/or new concerning signs or symptoms	See above +
		ASE/EACVI Clinical Use of Stress Echocardiography in Non-Ischaemic Heart Disease (2017) Lancellotti, et al. (21)
		AEPC/EACVI Expert Consensus Paper: Indications for CMR in Children with Congenital and Acquired Heart Disease (2015) Valsangiacomo Buechel, et al. (2)
		ESC Recommendations for CMR in Adults with CHD (2010) Kilner, et al. (3)
		ASE Indications and Guidelines for Performance of TEE in the Patient with Pediatric Acquired or CHD (2005) Ayres, et al. (4)
		SCCT CT Imaging in Patients with CHD Part 1 (2015): Sections 2.2, 2.11 – Han, et al. (8)
		CCS Consensus Conference on Management of Adults with CHD: Outflow Tract Obstruction (2009) Silversides, et al. (17)
184.	Evaluation prior to planned repair	See Above
		SCCT Guidelines for the Performance and Acquisition of Coronary CT Angiography (2016) Abbara, et al. (23)

Post-	operative	Level of	TTE	TEE	MRI	СТ	Stress		
		Evidence					Imaging		
185.	Routine post-operative evaluation (within 30 days)		None						
186.	Evaluation due to change in clinical status and/or new concerning signs or symptoms		ACC/A	HA ACHD Guidelin Clinical Use of St	nes (2018): Sections (2018): Sections (2018): ress Echocardions	on 4.2.5 Stout, e rraphy in Non-Isch	et al. (1) paemic Heart		
				Disease (2	017) Lancellott	i, et al. (21)			
			AEPC/EAC Congenital and	VI Expert Consens Acquired Heart D	sus Paper: Indica isease (2015) \	tions for CMR in 0 √alsangiacomo Bi	Children with uechel, et al. (2)		
		ESC Recommendations for CMR in Adults with CHD (				CHD (2010) Ki	(2010) Kilner, et al. (3)		
		ASE Indications and Guidelines for Performance of TEE in the Patie Acquired or CHD (2005) Ayres, et al. (4)							
			SCCT CT I	maging in Patient	s with CHD Part ´ Han, et al. (8)	(2015): Sections	: 2.2, 2.11 –		
CCS Consensus Conference on Management of Adults Obstruction (2009) Silversides, et a						Adults with CHD: es, et al. (17)	Outflow Tract		
187.	Routine surveillance (2-5 years) in a patient with no or mild supravalvular AS		ACC/AHA ACHD Guidelines (2018): Section 4.2.5 Stout, et al. (1)						
188.	Routine surveillance (6-12 months) in a patient with ≥ moderate supravalvular AS				See above				

# Table 11 Additional Resources:

- Fratz S, Chung T, Greil GF, et al. Guidelines and protocols for cardiovascular magnetic resonance in children and adults with congenital heart disease: SCMR expert consensus group on congenital heart disease. J Cardiovasc Magn Reson. 2013; 15:51.
- Kirk R, Dipchand AI, Rosenthal DN, et al. The International Society for Heart and Lung Transplantation Guidelines for the management of pediatric heart failure: Executive summary. [Corrected]. J Heart Lung Transplant. 2014; 33:888-909.

# Table 12: Aortic Coarctation/ Interrupted Aortic Arch

Unrepa	lired	Level of Evidence	TTE	TEE	MRI	СТ	Stress Imaging
189.	Routine surveillance (3-6 months) in an infant with mild aortic coarctation in the absence of a PDA				None		
190.	Routine surveillance (1-2 years) in a child or adult with mild aortic coarctation		ACC/AHA A	CHD Guidelines (	2018): Section 4.2	2.6, Table 21 Si	tout, et al. (1)
191.	Routine surveillance (3-5 years) in a child or adult with mild aortic coarctation		See above				
192.	Evaluation due to change in clinical status and/or new concerning signs or symptoms		See above +				
			AEPC/EAC Congenital and	VI Expert Consen Acquired Heart D	sus Paper: Indica Disease (2015) \	tions for CMR in ( /alsangiacomo B	Children with uechel, et al. (2)
			ESC Recom	mendations for C	MR in Adults with	CHD (2010) Ki	lner, et al. (3)
			ASE Indications	and Guidelines f Acquired or	or Performance o CHD (2005) Ay	f TEE in the Patie res, et al. (4)	nt with Pediatric
			SCCT C	T Imaging in Patie	ents with CHD Par	rt 1 (2015) Han	, et al. (8)
			ASE/EACVI	Clinical Use of St Disease (2	ress Echocardiog 2017) Lancellotti	raphy in Non-Isch i, et al. (21)	naemic Heart
			ASE/EACVI MU	ıltimodality Imagir G	ng of Diseases of Soldstein, et al. (24	Thoracic Aorta in 4)	Adults (2015)

			CCS Consensu	s Conference on N	Management of A	dults with CHD: (	Coarctation of the	
193.	Evaluation prior to planned repair		See above					
					+			
		В	ACC/AHA A	CHD Guidelines (	2018): Section 4.2	2.6, Table 21 S	Stout, et al. (1)	
			ACCF/SCC	T/ACR/AHA/ASE/ (2010):	ASNC/NASCI/SC Table 7 Taylor,	AI/SCMR AUC fo et al. (6)	or Cardiac CT	
Post-p	rocedural: Surgical or Catheter-based	Level of Evidence	TTE	TEE	MRI	ĆT	Fluoro	
194.	Routine post-procedural evaluation (within 30 days)			1	None	l		
195.	Evaluation due to change in clinical		ACC/AH	IA ACHD Guidelin	nes (2008): Sectio	n 6.14 Warnes	s, et al. (7)	
	status and/or new concerning signs or symptoms		AEPC/EAC	VI Expert Consen	sus Paper: Indica	tions for CMR in	Children with	
			Congenital and	Acquired Heart D	)isease (2015) V	Valsangiacomo E	Buechel, et al. (2)	
			ESC Recom	mendations for Cl	MR in Adults with	CHD (2010) K	(ilner, et al. (3)	
			ASE Indications	s and Guidelines f Acquired or	or Performance o CHD (2005) Ay	of TEE in the Pati rres, et al. (4)	ent with Pediatric	
			SCCT C	T Imaging in Patie	ents with CHD Pa	rt 1 (2015) Har	n, et al. (8)	
			ASE/EACVI Clinical Use of Stress Echocardiography in Non-Ischaemic Hea Disease (2017) Lancellotti, et al. (21)					
			ASE/EACVI Mu	ultimodality Imagir G	ng of Diseases of Goldstein, et al. (24	Thoracic Aorta ir 4)	n Adults (2015)	
			CCS Consensu	s Conference on I Aorta (20	Management of A 09) Silversides,	dults with CHD: ( et al. (17)	Coarctation of the	

			ACCF/SCCT/ACR/AHA/ASE/ASNC/NASCI/SCAI/SCMR AUC for Cardiac CT (2010) <sup>-</sup> Table 7 Taylor et al. (6)
196.	Routine surveillance (3-6 months) within the first year following surgical		ACC/AHA ACHD Guidelines (2008): Section 6.14 Warnes, et al. (7)
	or catheter-based intervention in an asymptomatic patient with no or mild sequelae		CCS Consensus Conference on Management of Adults with CHD: Coarctation of the Aorta (2009) Silversides, et al. (17)
197.	Routine surveillance (6 months) after the first year following surgical or catheter-based intervention in an asymptomatic patient with no or mild sequelae		See above
198.	Routine surveillance (1-2 years) after the first year following surgical or catheter-based intervention in an asymptomatic patient with no or mild sequelae		See above
199.	Routine surveillance (3-5 years) in an asymptomatic patient to evaluate for aortic arch aneurysms, in-stent stenosis, stent fracture, or endoleak		See above + ACC/AHA ACHD Guidelines (2018): Section 4.2.6, Table 21 Stout, et al. (1)
200.	Routine Surveillance (3-12 months) in a patient with heart failure symptoms	C	ACCF/AHA Guideline for the Management of Heart Failure (2013): Section 6.4 Yancy, et al. (10)

#### Table 12 Additional Resources:

Fratz S, Chung T, Greil GF, et al. Guidelines and protocols for cardiovascular magnetic resonance in children and adults with congenital heart disease: SCMR expert consensus group on congenital heart disease. J Cardiovasc Magn Reson. 2013; 15:51.

#### Table 13: Coronary Anomalies

Unrepaired	Level of Evidence	TTE	MRI	СТ	Stress Imaging
	LVIGENCE				

201.	Routine surveillance (annually) in an asymptomatic patient with anomalous right coronary artery from the left aortic sinus	С	AATS Expert Consensus Guidelines: Anomalous Coronary Artery (2017): Tables 3 and 4 Brothers, et al. (25)
202.	Routine surveillance (2-5 years) in an asymptomatic patient with anomalous right coronary artery from the left aortic sinus		See above
203.	Routine surveillance (annually) in an asymptomatic patient with small coronary fistula		None
204.	Routine surveillance (2-5 years) in an asymptomatic patient with small coronary fistula	С	ACC/AHA ACHD Guidelines (2008): Section 8.8 Warnes, et al. (7)
205.	Routine surveillance (1-2 years) in an asymptomatic patient with moderate or large coronary fistula		See above
206.	Evaluation due to change in clinical status and/or new concerning signs or	С	ACC/AHA ACHD Guidelines (2018): Section 4.4.7 Stout, et al. (1)
	symptoms	В	AATS Expert Consensus Guidelines: Anomalous Coronary Artery (2017): Section 2 Brothers, et al. (25)
			ACCF/SCCT/ACR/AHA/ASE/ASNC/NASCI/SCAI/SCMR AUC for Cardiac CT (2010): Table 7 Taylor, et al. (6)
207.	Evaluation prior to planned repair		See above
			ACCF/ACR/AHA/NASCI/SCMR Expert Consensus Document on CMR (2010) American College of Cardiology Foundation Task Force on Expert Consensus, et al. (20)
		В	Eligibility and Disqualification Recommendations for Competitive Athletes with Cardiovascular Abnormalities: Task Force 4: Congenital Heart Disease (2015) Van Hare, et al. (26)

Post-pr	ocedural: Surgical and Catheter-	Level of Evidence	TTE MRI CT Stress Ir					
Dasca		Lvidence						
208.	Routine post-procedural evaluation (within 30 days)	С	AATS Expert Consensus Guidelines: Anomalous Coronary Artery (2017): Tab Brothers, et al. (25)					
		С	Eligibility and Dis Cardiovascular At	equalification Recomm phormalities: Task Fore Van Hare,	endations for Compet ce 4: Congenital Hear et al. (26)	itive Athletes with t Disease (2015)		
209.	Evaluation due to change in clinical status and/or new concerning signs or symptoms	С	AATS Expert Conse	ensus Guidelines: Ano Brothers	s Guidelines: Anomalous Coronary Artery (2017): Section 4 Brothers, et al. (25)			
			ACCF/ACR/AHA/ American College o	NASCI/SCMR Expert ( f Cardiology Foundatio (2	Consensus Document on Task Force on Exp 0)	: on CMR (2010) ert Consensus, et al.		
			ACCF/SCCT/AC	R/AHA/ASE/ASNC/N/ (2010): Table 7	ASCI/SCAI/SCMR AU - Taylor, et al. (6)	C for Cardiac CT		
210.	Evaluation within 1 year after surgery or catheter-based intervention with no or mild sequelae	С	AATS Expert Consensus Guidelines: Anomalous Coronary Artery (2017): Table 2 - Brothers, et al. (25)					
211.	Routine surveillance (1-3 months) within the first year following repair			See a	ibove			
212.	Routine surveillance (3-6 months) in an infant with or without ventricular or valvular dysfunction		See above					
213.	Routine surveillance (3-6 months) in a child or adult with ventricular or valvular dysfunction		See above					
214.	Routine surveillance (annually) with no or mild sequelae			See a	above			
215.	Routine surveillance (2-5 years) with no or mild sequelae			See a	ibove			

 Table 13 Additional Resources:

# Table 14: Tetralogy of Fallot (TOF)

Unrepai	ired	Level of Evidence	TTE	TEE	MRI	СТ
216.	Routine surveillance (1-3 months) in an infant before complete repair			No	one	
217.	Routine surveillance (1-3 months) in an infant following valvuloplasty, PDA and/or RVOT stenting, or shunt placement before complete repair			No	one	
218.	Evaluation due to change in clinical status and/or new concerning signs or symptoms		AEPC/EACVI Expert Consensus Paper: Indications for CMR in Children Congenital and Acquired Heart Disease (2015) Valsangiacomo Buechel, ESC Recommendations for CMR in Adults with CHD (2010) Kilner, et a ASE Indications and Guidelines for Performance of TEE in the Patient with Acquired or CHD (2005) Ayres, et al. (4)			
219.	Evaluation prior to planned repair			See	above	

Post-	operative: Initial Repair	Level of Evidence	TTE	TEE	MRI	СТ	Stress Imaging	Lung Scan
220.	Routine post-operative evaluation (within 30 days)				Nc	ne		

221.	Evaluation due to change in clinical	ACC/AHA ACHD Guidelines (2008): Sections 10.4, 10.5 Warnes, et al. (7)
	symptoms	ASE Multimodality Imaging Guidelines for Patients with Repaired Tetralogy of Fallot (2014) Valente, et al. (27)
		AEPC/EACVI Expert Consensus Paper: Indications for CMR in Children with Congenital and Acquired Heart Disease (2015) Valsangiacomo Buechel, et al. (2)
		ESC Recommendations for CMR in Adults with CHD (2010) Kilner, et al. (3)
		ASE Indications and Guidelines for Performance of TEE in the Patient with Pediatric Acquired or CHD (2005) Ayres, et al. (4)
		SCCT CT Imaging in Patients with CHD Part 1 (2015): Section 2.6 Han, et al. (8)
		CCS Consensus Conference on Management of Adults with CHD: Tetralogy of Fallot (2009) Silversides, et al. (17)
		ACCF/SCCT/ACR/AHA/ASE/ASNC/NASCI/SCAI/SCMR AUC for Cardiac CT (2010): Table 7 Taylor, et al. (6)
222.	Routine surveillance (annually) in an asymptomatic patient with no or mild sequelae or pulmonary regurgitation of	ACC/AHA ACHD Guidelines (2018): Section 4.3.5, Table 27, Figure 4 – Stout, et al. (1)
	any severity	CCS Consensus Conference on Management of Adults with CHD: Tetralogy of Fallot (2009) Silversides, et al. (17)
223.	Routine surveillance (6-12 months) in a patient with valvular dysfunction other than pulmonary valve, RVOT obstruction, branch pulmonary artery stenosis, arrhythmia or presence of a RV-to-PA conduit	See above
224.	Routine surveillance (2-3 years) in a patient with pulmonary regurgitation and preserved ventricular function	See above

225.	Routine surveillance (3-12 months) in a patient with heart failure symptoms		ACC/AHA ACHD Guidelines (2018): Section 4.3.5, Table 27 Stout, et al. (1) ACCF/AHA Guideline for the Management of Heart Failure (2013): Section 6.4 Yancy, et al. (10)
226.	Evaluation prior to planned pulmonary valve replacement (percutaneous or surgical) including evaluation of the proximal courses of the coronary arteries	В	See above + ACC/AHA ACHD Guidelines (2018): Section 4.3.5, Table 27, Figure 4 – Stout, et al. (1) SCCT Guidelines for the Performance and Acquisition of Coronary CT Angiography (2016) Abbara, et al. (23)

Post- pulm	procedural: Surgical or Catheter-based onary valve replacement	Level of Evidence	TTE	TEE	MRI	СТ	Stress Imaging	Fluoro	Lung scan
227.	Routine post-procedural evaluation (within 30 days)			1		None			
228.	Evaluation due to change in clinical status and/or new concerning signs or symptoms		ACC/A ASE Multi AEPC/ Congenita ESC Ro ASE Indica SCCT CT CCS Co	HA ACHD Gi modality Ima EACVI Expe I and Acquire ecommendat ations and Gi Ad Imaging in F	uidelines (20 ging Guidelir (2014) - ert Consensus ed Heart Dise tions for CMF uidelines for cquired or CH Patients with nference on	18): Section nes for Patie Valente, e s Paper: Indi ease (2015) R in Adults w Performance ID (2005) CHD Part 1 Managemen	4.3.5, Table nts with Repa t al. (27) ications for C Valsangiad ith CHD (201 e of TEE in th Ayres, et al. (2015): Secti t of Adults wi	27 Stout, e aired Tetralog MR in Childr como Bueche 0) Kilner, e ne Patient wit (4) ion 2.6 Har ith CHD: Tetr	<ul> <li>t al. (1)</li> <li>gy of Fallot</li> <li>en with</li> <li>et al. (2)</li> <li>at al. (3)</li> <li>th Pediatric</li> <li>n, et al. (8)</li> <li>ralogy of</li> </ul>

229.	Evaluation at 1 year following	C	ACCF/SCCT/ACR/AHA/ASE/ASNC/NASCI/SCAI/SCMR AUC for Cardiac CT (2010): Table 7 Taylor, et al. (6) ACC/AHA ACHD Guidelines (2008): Sections 10.4, 10.5 Warnes, et al. (7)
	transcatheter or surgical pulmonary valve replacement		One-Year Follow-Up of the Melody Transcatheter Pulmonary Valve Multicenter Post- Approval Study (2014) Armstrong, et al. (28)
			ASE Multimodality Imaging Guidelines for Patients with Repaired Tetralogy of Fallot (2014): Table 6 Valente, et al. (27)
230.	Routine surveillance at 1 and 6 months in an asymptomatic patient following transcatheter pulmonary valve replacement		One-Year Follow-Up of the Melody Transcatheter Pulmonary Valve Multicenter Post- Approval Study (2014) Armstrong, et al. (28)
231.	Routine surveillance (annually) in an asymptomatic patient following transcatheter pulmonary valve replacement		See above
232.	Routine surveillance (annually) in an asymptomatic patient with no or mild		ACC/AHA ACHD Guidelines (2018): Section 4.3.5, Table 27 Stout, et al. (1)
	sequelae		CCS Consensus Conference on Management of Adults with CHD: Tetralogy of Fallot (2009) Silversides, et al. (17)
233.	Routine surveillance (6-12 months) in a patient with RV-PA conduit dysfunction, valvular or ventricular dysfunction, branch pulmonary artery stenosis, or arrhythmia	С	ACC/AHA ACHD Guidelines (2008): Sections 10.4, 10.5 Warnes, et al. (7)
234.	Routine surveillance (2-3 years) in an asymptomatic patient with no or mild	В	ACC/AHA ACHD Guidelines (2018): Section 4.3.5, Table 27 Stout, et al. (1)
	sequelae		CCS Consensus Conference on Management of Adults with CHD: Tetralogy of Fallot (2009) Silversides, et al. (17)
			ASE Multimodality Imaging Guidelines for Patients with Repaired Tetralogy of Fallot (2014): Table 6 Valente, et al. (27)

235.	Routine surveillance (2-3 years) in a patient with valvular or ventricular dysfunction, RVOT obstruction, branch pulmonary artery stenosis, or presence of a RV-to-PA conduit	ASE Multimodality Imaging Guidelines for Patients with Repaired Tetralogy of Fa (2014): Table 6 Valente, et al. (27)	allot
236.	Routine surveillance (3-12 months) in a patient with heart failure symptoms	ACC/AHA ACHD Guidelines (2018): Section 4.3.5, Table 27 Stout, et al. (1	)
		Yancy, et al. (10)	

#### Table 14 Additional Resources:

Fratz S, Chung T, Greil GF, et al. Guidelines and protocols for cardiovascular magnetic resonance in children and adults with congenital heart disease: SCMR expert consensus group on congenital heart disease. J Cardiovasc Magn Reson. 2013; 15:51.

#### Table 15: Double Outlet Right Ventricle (DORV)

Unrepai	red	Level of Evidence	TTE	TEE	MRI	СТ	
237.	Routine surveillance (1-3 months) in an infant with balanced systemic and pulmonary circulation			Nc	ne		
238.	Routine surveillance (3-6 months) in a child with balanced systemic and pulmonary circulation		None				
239.	Evaluation due to change in clinical status and/or new concerning signs or symptoms	AEPC/EACVI Expert Consensus Paper: Indications for C Congenital and Acquired Heart Disease (2015) Valsangiad ESC Recommendations for CMR in Adults with CHD (201				t in Children with to Buechel, et al. (2) Kilner, et al. (3)	
			ASE Indications an	d Guidelines for Perfor Acquired or CHD (20	mance of TEE in the F 05) Ayres, et al. (4)	Patient with Pediatric	

240.	Evaluation prior to planned repair	See above

Post-o	perative	Level of	TTE	TEE	MRI	СТ	Stress	Lung Scan			
		Evidence					Imaging				
241.	Routine post-procedural evaluation (within 30 days)		None								
242.	Evaluation due to change in clinical status and/or new concerning signs or symptoms	C	ACC/AHA AEPC/E Congenital a ESC Rec ASE Indicati SCC <sup>-</sup> ASE Multim ASE/SCMR	ACHD Guidelii ACVI Expert Co and Acquired H commendations ons and Guide Acquir T CT Imaging ir odality Imaging	nes (2018): See onsensus Pape leart Disease (2 for CMR in Ad lines for Perfor red or CHD (20 n Patients with g Guidelines for (2014) Vale odality Imaging Cohen, e E/ASNC/NASC Table 7 Ta	ction 4.4.5, 4.3 er: Indications fo 2015) Valsan lults with CHD ( mance of TEE 05) Ayres, et CHD Part 1 (20 Patients with F nte, et al. (27) Guidelines of F et al. (29)	.5, 4.3.6 Stou or CMR in Child giacomo Buecl (2010) Kilner in the Patient w : al. (4) D15) Han, et a Repaired Tetral Patients with T( AUC for Cardia	it, et al. (1) dren with hel, et al. (2) , et al. (3) vith Pediatric al. (8) ogy of Fallot GA (2016) ac CT (2010):			
243.	Routine surveillance (6 months) within a year following repair in an asymptomatic infant or child with no or mild sequelae		None								
244.	Routine surveillance (1-2 years) in an asymptomatic patient with no or mild sequelae	С	ACC/AHA	ACHD Guidelii	nes (2018): See	ction 4.4.5, 4.3	.5, 4.3.6 Stou	it, et al. (1)			

245.	Routine surveillance (6-12 months) in a patient with valvular or ventricular dysfunction, right or left ventricular outflow tract obstruction, branch pulmonary artery stenosis, arrhythmia, or presence of a RV-to-PA conduit	See above
246.	Routine surveillance (2-3 years) in an asymptomatic patient with no or mild sequelae	See above
247.	Routine surveillance (3-12 months) in a patient with heart failure symptoms	ACCF/AHA Guideline for the Management of Heart Failure (2013) – Yancy, et al. (10)

#### Table 15 Additional Resources:

- Fratz S, Chung T, Greil GF, et al. Guidelines and protocols for cardiovascular magnetic resonance in children and adults with congenital heart disease: SCMR expert consensus group on congenital heart disease. J Cardiovasc Magn Reson. 2013; 15:51.
- Kirk R, Dipchand AI, Rosenthal DN, et al. The International Society for Heart and Lung Transplantation Guidelines for the management of pediatric heart failure: Executive summary. [Corrected]. J Heart Lung Transplant. 2014; 33:888-909.

#### Table 16: D-Loop Transposition of the Great Arteries (TGA)

Unre	paired	Level of Evidence	TTE MRI CT		СТ
248.	Evaluation due to change in clinical status and/or new concerning signs or symptoms		ASE/SCMR/SCCT Multime AEPC/EACVI Expert C Congenital and Acquired H ESC Recommendations	odality Imaging Guidelines of F Cohen, et al. (29) onsensus Paper: Indications fo leart Disease (2015) Valsan s for CMR in Adults with CHD (	Patients with TGA (2016) or CMR in Children with giacomo Buechel, et al. (2) (2010) Kilner, et al. (3)

		ASE Indications and Guidelines for Performance of TEE in the Patient with Pediatric Acquired or CHD (2005) Ayres, et al. (4)	
		SCCT CT Imaging in Patients with CHD Part 1 (2015) Han, et al. (8)	
249.	Evaluation prior to planned repair	See above	Evaluation prior to planned repair

Post-	operative: Arterial Switch Operation	Level of Evidence	TTE	TEE	MRI	СТ	Stress Imaging	Lung Scan		
250.	Routine post-operative evaluation (within 30 days)		None							
251.	Evaluation due to change in clinical status and/or new concerning signs or symptoms	B, C	ACC/AHA ACHD Guidelines (2018): Section 4.4.1.2 Stout, et al. (1) ASE/SCMR/SCCT Multimodality Imaging Guidelines of Patients with TGA (2016) Cohen, et al. (29) AEPC/EACVI Expert Consensus Paper: Indications for CMR in Children with							
			Congenital and Acquired Heart Disease (2015) Valsangiacomo Buechel, et al. (2) ESC Recommendations for CMR in Adults with CHD (2010) Kilner, et al. (3)							
			CCS Cons	ensus Confere (	nce on Manage (2009) Silvers	ement of Adults sides, et al. (14	with CHD: Cor )	nplex CHD		
			ACCF/SCCT/ACR/AHA/ASE/ASNC/NASCI/SCAI/SCMR AUC for Cardiac CT (2010): Table 7 Taylor, et al. (6) ASE Indications and Guidelines for Performance of TEE in the Patient with Pediatric Acquired or CHD (2005) Ayres, et al. (4)							
252.	Evaluation for coronary imaging in an asymptomatic patient				See a	above				

253.	Routine surveillance (1-3 months) in an asymptomatic infant with moderate sequelae		None						
254.	Routine surveillance (3-6 months) in an asymptomatic infant with no or mild sequelae				No	one			
255.	Routine surveillance (6-12 months) in an asymptomatic child or adult with moderate sequelae	С	ACC CCS Cons	AHA ACHD G	Guidelines (2018 ence on Manage (2009) Silver	B): Section 4.4. Ement of Adult sides, et al. (14	.1.2 Stout, et s s with CHD: Co 4)	al. (1) mplex CHD	
256.	Routine surveillance (1-2 years) in an asymptomatic child or adult with no or mild sequelae				Seea	above			
257.	Routine surveillance (3-5 years) in an asymptomatic patient				Seea	above			
258.	Routine surveillance (1-2 years) in a patient with dilated neo-aortic root with increasing Z scores, or neo-aortic regurgitation		See above						
259.	Routine surveillance (3-12 months) in a patient with heart failure symptoms				Seea	above			
Post-	operative: Rastelli	Level of Evidence	TTE	TEE	MRI	СТ	Stress Imaging	Lung Scan	
260.	Routine post-operative evaluation (within 30 days)				No	one	·		
261.	Evaluation due to change in clinical status and/or new concerning signs or	B, C			delines (2018): S	Section 4.3.6, 4	4.4.1.3 Stout,	et al. (1)	
	symptoms		Cohen, et al. (29)						
			AEPC/E Congenital	ACVI Expert C and Acquired I	Consensus Pape Heart Disease (	er: Indications 2015) Valsa	for CMR in Chil ngiacomo Buec	dren with hel, et al. (2)	
			ESC Red	commendation	s for CMR in Ac	ults with CHD	(2010) Kilner	, et al. (3)	

			ASE Indications and Guidelines for Performance of TEE in the Patient with Pediatric Acquired or CHD (2005) Ayres, et al. (4)						
			SCCT CT Imaging in Patients with CHD Part 1 (2015): Section 2.7 Han, et al. (8)						
			CCS Cons	ensus Confere	nce on Manage (2009) Silver	ement of Adults sides, et al. (14	with CHD: Cor )	nplex CHD	
			ACCF/SCC1	[/ACR/AHA/AS	E/ASNC/NASC Table 7 Ta	N/SCAI/SCMR . ylor, et al. (6)	AUC for Cardia	ic CT (2010):	
262.	Routine surveillance (3-6 months) within the first year following repair				No	one			
263.	Routine surveillance (6 months) after the first year following repair in an asymptomatic patient with no or mild sequelae		None						
264.	Routine surveillance (1-2 years) in an asymptomatic patient with no or mild sequelae	B, C	ACC CCS Cons	C/AHA ACHD (	Guidelines (201 nce on Manage (2009) Silver:	8): 4.3.6, 4.4.1. ement of Adults sides, et al. (14	3 Stout, et al with CHD: Cor	. (1) nplex CHD	
265.	Routine surveillance (3-5 years) in an asymptomatic patient				See a	above	1		
266.	Routine surveillance (3-12 months) in a patient with valvular dysfunction, LVOT obstruction, presence of a RV to PA conduit, branch pulmonary artery stenosis, or arrhythmia		See above						
267.	Routine surveillance (3-12 months) in a patient with heart failure symptoms				Seea	above			
Post-	operative: Atrial Switch Operation	Level of Evidence	TTE TTE + TEE MRI CT Stress Imaging					Stress Imaging	

268.	Evaluation due to concerning signs or	B, C	ACC/AHA ACHD Guidelines (2018): Section 4.4.1.1 Stout, et al. (1)
	symptoms and/or change in clinical status		ASE/SCMR/SCCT Multimodality Imaging Guidelines of Patients with TGA (2016) Cohen, et al. (29)
			AEPC/EACVI Expert Consensus Paper: Indications for CMR in Children with Congenital and Acquired Heart Disease (2015) Valsangiacomo Buechel, et al. (2)
			ESC Recommendations for CMR in Adults with CHD (2010) Kilner, et al. (3)
			ASE Indications and Guidelines for Performance of TEE in the Patient with Pediatric Acquired or CHD (2005) Ayres, et al. (4)
			SCCT CT Imaging in Patients with CHD Part 1 (2015): Section 2.7 Han, et al. (8)
			CCS Consensus Conference on Management of Adults with CHD: Complex CHD (2009) Silversides, et al. (14)
			ACCF/SCCT/ACR/AHA/ASE/ASNC/NASCI/SCAI/SCMR AUC for Cardiac CT (2010): Table 7 Taylor, et al. (6)
269.	Routine surveillance (6 months) in an asymptomatic patient with no or mild sequelae	С	ACC/AHA ACHD Guidelines (2018): Section 4.4.1.1 Stout, et al. (1)
270.	Routine surveillance (1-2 years) in an asymptomatic patient with no or mild sequelae		See above
271.	Routine surveillance (6-12 months) in an asymptomatic patient with ≥moderate sequelae		See above
272.	Routine surveillance (3-5 years) in an asymptomatic patient		See above
273.	Routine surveillance (3-12 months) in a patient with ≥moderate systemic AV valve regurgitation, systemic RV		See above

	dysfunction, LVOT obstruction, or arrhythmia	
274.	Routine surveillance (3-12 months) in a patient with heart failure symptoms	See above

#### Table 16 Additional Resources:

Fratz S, Chung T, Greil GF, et al. Guidelines and protocols for cardiovascular magnetic resonance in children and adults with congenital heart disease: SCMR expert consensus group on congenital heart disease. J Cardiovasc Magn Reson. 2013; 15:51.

# Table 17: Congenitally Corrected Transposition of the Great Arteries (ccTGA)

Unrepair	red	Level of Evidence	TTE	TEE	MRI	СТ	Stress Imaging		
275.	Evaluation due to change in clinical status and/or new concerning signs or symptoms	C	ACC/AI AEPC/EAC Congenital and ESC Recon ASE Indication SCCT CT Ima CCS Consen	HA ACHD Guidelir VI Expert Consen d Acquired Heart E nmendations for C is and Guidelines f Acquired or iging in Patients wi sus Conference or (2009) CR/AHA/ASE/ASN Tab	hes (2018): Section sus Paper: Indica Disease (2015) N MR in Adults with for Performance o CHD (2005) Ay ith CHD Part 1 (20 MAnagement of Silversides, et NC/NASCI/SCAI/S le 7 Taylor, et a	h 4.4.1.4 Stout, e tions for CMR in C /alsangiacomo Bu CHD (2010) Kilr f TEE in the Patier res, et al. (4) 015): Section 2.7 Adults with CHD: ( al. (14) CMR AUC for Car I. (6)	et al. (1) hildren with echel, et al. (2) ner, et al. (3) nt with Pediatric Han, et al. (8) Complex CHD diac CT (2010):		
276.	Routine surveillance (3-6 months) in an asymptomatic infant		None						

277.	Routine surveillance (1-2 years) in a patient with <moderate systemic<br="">AV valve regurgitation</moderate>	С	ACC/AHA ACHD Guidelines (2018): Section 4.4.1.4 Stout, et al. (1)
278.	Routine surveillance (6-12 months) in a patient with ≥moderate systemic AV valve regurgitation		See above
279.	Routine surveillance (3-5 years) in an asymptomatic patient		See above
280.	Routine surveillance (3-12 months) in a patient with heart failure symptoms		See above
281.	Évaluation prior to planned repair	С	ACC/AHA ACHD Guidelines (2018): Section 4.4.1.4 Stout, et al. (1) AEPC/EACVI Expert Consensus Paper: Indications for CMR in Children with Congenital and Acquired Heart Disease (2015) Valsangiacomo Buechel, et al. (2) ESC Recommendations for CMR in Adults with CHD (2010) Kilner, et al. (3) ASE Indications and Guidelines for Performance of TEE in the Patient with Pediatric Acquired or CHD (2005) Ayres, et al. (4) SCCT CT Imaging in Patients with CHD Part 1 (2015): Section 2.7 Han, et al. (8) CCS Consensus Conference on Management of Adults with CHD: Complex CHD (2009) Silversides, et al. (14) ACCF/SCCT/ACR/AHA/ASE/ASNC/NASCI/SCAI/SCMR AUC for Cardiac CT (2010): Table 7 Taylor, et al. (6)

Post-operative: Anatomic Repair		Level of Evidence	TTE	TTE + Saline	TEE	MRI	СТ	Stress Imaging
282.	Routine post-operative evaluation (within 30 days)				Nc	ne		

283.	Evaluation due to change in clinical status and/or new concerning signs or symptoms	B, C	<ul> <li>ACC/AHA ACHD Guidelines (2018): Section 4.4.1.4, 4.4.1.2, 4.3.6 Stout, et al. (1)</li> <li>ASE/SCMR/SCCT Multimodality Imaging Guidelines of Patients with TGA (2016) Cohen, et al. (29)</li> <li>AEPC/EACVI Expert Consensus Paper: Indications for CMR in Children with Congenital and Acquired Heart Disease (2015) Valsangiacomo Buechel, et al. (2)</li> <li>ESC Recommendations for CMR in Adults with CHD (2010) Kilner, et al. (3)</li> <li>ASE Indications and Guidelines for Performance of TEE in the Patient with Pediatric Acquired or CHD (2005) Ayres, et al. (4)</li> <li>SCCT CT Imaging in Patients with CHD Part 1 (2015): Section 2.7 Han, et al. (8)</li> <li>CCS Consensus Conference on Management of Adults with CHD: Complex CHD (2009) Silversides, et al. (14)</li> </ul>
			ACCF/SCCT/ACR/AHA/ASE/ASNC/NASCI/SCAI/SCMR AUC for Cardiac CT (2010): Table 7 Taylor, et al. (6)
284.	Routine surveillance (3-6 months) within a year following repair in an asymptomatic patient with no or mild sequelae	B, C	ACC/AHA ACHD Guidelines (2018): Section 4.4.1.4, 4.4.1.2, 4.3.6 Stout, et al. (1)
285.	Routine surveillance (1-2 years) after the first year following repair in an asymptomatic patient with no or mild sequelae		See above
286.	Routine surveillance (6-12 months) in a patient with valvular or ventricular dysfunction, right or left ventricular outflow tract obstruction, or presence of a RV-to-PA conduit		See above

287.	Routine surveillance (2-3 years) in a patient with valvular or ventricular dysfunction, right or left ventricular outflow tract obstruction, or presence of a RV-to-PA conduit	See above
288.	Routine surveillance (3-12 months) in a patient with heart failure symptoms	See above

Post-ope VSD clos	erative: Physiologic Repair with sure and/or LV to PA conduit	Level of Evidence	TTE	TTE TEE		СТ	Stress Imaging			
289.	Routine post-operative evaluation (within 30 days)		None							
290.	Evaluation due to change in clinical status and/or new concerning signs or symptoms	С	ACC/AI AEPC/EAC Congenital and ESC Recon ASE Indication SCCT CT Ima CCS Consen	HA ACHD Guidelir VI Expert Consen d Acquired Heart I nmendations for C s and Guidelines f Acquired or ging in Patients w sus Conference or (2009) CR/AHA/ASE/ASI	nes (2018): Section sus Paper: Indicat Disease (2015) \ MR in Adults with for Performance of CHD (2005) Ay ith CHD Part 1 (20 m Management of the CHD Part 1 (20 m Management of the CHD Part 1 (20 m M M M M M M M M M M M M M M M M M M M	n 4.4.1.4 Stout, o ions for CMR in C /alsangiacomo Bu CHD (2010) Kilr f TEE in the Patier res, et al. (4) 015): Section 2.7 Adults with CHD: ( al. (14) CMR AUC for Car I. (6)	et al. (1) hildren with echel, et al. (2) ner, et al. (3) nt with Pediatric · Han, et al. (8) Complex CHD rdiac CT (2010):			
291.	Routine surveillance (3-6 months) within a year following repair in an asymptomatic patient with no or mild sequelae	С	ACC/AHA ACHD Guidelines (2018): Section 4.4.1.4 Stout, o CCS Consensus Conference on Management of Adults with CHD: ( (2009) Silversides, et al. (14)							

292.	Routine surveillance (1-2 years) in an asymptomatic patient with no or mild sequelae	See above
293.	Routine surveillance (3-5 years) in an asymptomatic patient with no or mild sequelae	See above
294.	Routine surveillance (3-12 months) in a patient with ≥ moderate systemic AV valve regurgitation, systemic RV dysfunction, and/or LV-to-PA conduit dysfunction	See above
295.	Routine surveillance (3-12 months) in a patient with heart failure symptoms	ACCF/AHA Guideline for the Management of Heart Failure (2013) – Yancy, et al. (10)

#### Table 17 Additional Resources:

- Fratz S, Chung T, Greil GF, et al. Guidelines and protocols for cardiovascular magnetic resonance in children and adults with congenital heart disease: SCMR expert consensus group on congenital heart disease. J Cardiovasc Magn Reson. 2013; 15:51.
- Kirk R, Dipchand AI, Rosenthal DN, et al. The International Society for Heart and Lung Transplantation Guidelines for the management of pediatric heart failure: Executive summary. [Corrected]. J Heart Lung Transplant. 2014; 33:888-909.

#### Table 18: Truncus Arteriosus (TA)

Unrepaired		Level of Evidence	TTE	MRI	СТ		
296.	Evaluation due to change in clinical status and/or new concerning signs or symptoms		AEPC/EACVI Expert Consensus Paper: Indications for CMR in Childr Congenital and Acquired Heart Disease (2015) Valsangiacomo Bueche				
			ESC Recommendations SCCT CT Imaging i	(2010) Kilner, et al. (3) 015) Han, et al. (8)			

297.	Evaluation prior to planned repair	None

Post-pr based	ocedural: Surgery or Catheter-	Level of Evidence	TTE	TEE	MRI	СТ	Stress Imaging	Lung Scan	
298.	Routine post-procedural evaluation (within 30 days)		None						
299.	Evaluation due to change in clinical status and/or new concerning signs or symptoms		ASE Indications and Guidelines for Performance of TEE in the Patient with Pedi Acquired or Congenital Heart Disease (2005) Ayres, et al. (4) SCCT CT Imaging in Patients with Congenital Heart Disease Part 1 (2015) - Han, et al. (8) ASE/EACVI Clinical Use of Stress Echocardiography in Non-Ischaemic Heart Dis (2017) Lancellotti, et al. (21)						
			ASE/EACVI	Assessment of al. (30)	f Aortic Valve				
B AHA/ACC Guideline for the Management of Patients v (2014): Sections 3, 4 Nishimura, e						nt of Patients wi Nishimura, et	with Valvular Heart Disease et al. (18)		
			AEPC/E Congenital	AEPC/EACVI Expert Consensus Paper: Indications for CMR in Children with Congenital and Acquired Heart Disease (2015) Valsangiacomo Buechel, et al. (2)			Iren with nel, et al. (2)		
			ESC Recommendations for CMR in Adults with CHD (2010) Kilner, et al. (3)						
			ACCF/SCT/ACR/ASE/ASNC/SCAI/SCMR AUC for Cardiac CT (2010): Table 7 Taylor. et al. (6)						
300.	Routine surveillance (1-3 months) within the first year following repair in an asymptomatic patient		None						
301.	Routine surveillance (6-12 months) after the first year following repair in				No	one			

	an asymptomatic child or adult with no or mild sequelae	
302.	Routine surveillance (2-3 year(s)) in an asymptomatic child or adult with no or mild sequelae	None
303.	Routine surveillance (3-6 months) in an asymptomatic child or adult with ≥ moderate truncal stenosis and/or regurgitation	None
304.	Routine surveillance (1-2 years) in an asymptomatic child or adult with ≥ moderate truncal stenosis and/or regurgitation	None
305.	Routine surveillance (3-12 months) in a patient with known residual VSD, presence of a RV-to-PA	ASE Indications and Guidelines for Performance of TEE in the Patient with Pediatric Acquired or Congenital Heart Disease (2005) Ayres, et al. (4)
	conduit, or branch PA obstruction	SCCT CT Imaging in Patients with Congenital Heart Disease Part 1 (2015) – Han, et al. (8)
		ASE/EACVI Clinical Use of Stress Echocardiography in Non-Ischaemic Heart Disease (2017) Lancellotti, et al. (21)
		ASE/EACVI Recommendations on the Echocardiographic Assessment of Aortic Valve Stenosis (2017) Baumgartner, et al. (30)
		AHA/ACC Guideline for the Management of Patients with Valvular Heart Disease (2014): Sections 3, 4 Nishimura, et al. (18)
		AEPC/EACVI Expert Consensus Paper: Indications for CMR in Children with Congenital and Acquired Heart Disease (2015) Valsangiacomo Buechel, et al. (2)
		ESC Recommendations for CMR in Adults with CHD (2010) Kilner, et al. (3)
		ACCF/SCT/ACR/ASE/ASNC/SCAI/SCMR AUC for Cardiac CT (2010): Table 7 Taylor, et al. (6)

306.	Routine surveillance (3-12 months)	
	in a patient with heart failure	ACCF/AHA Guideline for the Management of Heart Failure (2013): Section 5 –
	symptoms	Yancy, et al. (10)

# Table 18 Additional Resources:

Fratz S, Chung T, Greil GF, et al. Guidelines and protocols for cardiovascular magnetic resonance in children and adults with congenital heart disease: SCMR expert consensus group on congenital heart disease. J Cardiovasc Magn Reson. 2013; 15:51.

Nguyen T, John JB, Nardell K, et al. Echocardiography of common arterial trunk. Cardiol Young. 2012; 22:655-63.

Unrepair	red	Level of Evidence	TTE	TEE MRI CT L		Lung Scan		
307.	Routine surveillance (1-4 week(s)) in a patient with balanced systemic and pulmonary circulation not requiring neonatal surgery		None					
308.	Evaluation due to change in clinical status and/or new concerning signs or symptoms		AEPC/EACVI Expert Consensus Paper: Indications for CMR in Children with Congenital and Acquired Heart Disease (2015) Valsangiacomo Buechel, et al. (2) ESC Recommendations for CMR in Adults with CHD (2010) Kilner, et al. (3) ASE Indications and Guidelines for Performance of TEE in the Patient with Pediatric Acquired or CHD (2005) Ayres, et al. (4)					
309.	Evaluation prior to planned surgical palliation				See above			
Post-pro based (S	ocedural: Surgery and/or Catheter- Stage 1 Palliation)	Level of Evidence	TTE	TEE	MRI	СТ	Lung Scan	
310.	Routine post-procedural evaluation (within 30 days)		None					

# Table 19: Single Ventricle Heart Disease

311.	Evaluation due to change in clinical status and/or new concerning signs	ACC/AHA ACHD Guidelines (2018): Section 14.3 Stout, et al. (1)
	or symptoms	AEPC/EACVI Expert Consensus Paper: Indications for CMR in Children with
		Congenital and Acquired Heart Disease (2015) Valsangiacomo Buechel, et al. (2)
		ESC Recommendations for CMR in Adults with CHD (2010) Kilner, et al. (3)
		ASE Indications and Guidelines for Performance of TEE in the Patient with Pediatric Acquired or CHD (2005) Ayres, et al. (4)
		SCCT CT Imaging in Patients with CHD Part 1 (2015): Section 2.8 – Han, et al. (8)
312.	Routine surveillance (1-4 weeks) in an asymptomatic infant	None
313.	Evaluation prior to planned stage 2 palliation	AEPC/EACVI Expert Consensus Paper: Indications for CMR in Children with Congenital and Acquired Heart Disease (2015) Valsangiacomo Buechel, et al. (2)
		ESC Recommendations for CMR in Adults with CHD (2010) Kilner, et al. (3)
		ASE Indications and Guidelines for Performance of TEE in the Patient with Pediatric Acquired or CHD (2005) Ayres, et al. (4)
		SCCT CT Imaging in Patients with CHD Part 1 (2015): Section 2.8 – Han, et al. (8)

Post-c	perative: Stage 2 Palliation	Level of         TTE         TTE +         TEE         MRI           Evidence         Saline				СТ	Lung Scan	
314.	Routine post-operative evaluation (within 30 days)		None					
315.	Evaluation due to change in clinical status and/or new concerning signs or symptoms		AC AEPC/E Congenital ESC Ree	C/AHA ACHD	Guidelines (201 consensus Pape leart Disease (: s for CMR in Ac	8): Section 14. er: Indications fo 2015) Valsan lults with CHD (	3 Stout, et al or CMR in Chil giacomo Buec (2010) Kilner	. (1) dren with hel, et al. (2) <sup>.</sup> , et al. (3)

		ASE Indications and Guidelines for Performance of TEE in the Patient with Pediatric Acquired or CHD (2005) Ayres, et al. (4)
		SCCT CT Imaging in Patients with CHD Part 1 (2015): Section 2.8 Han, et al. (8)
		ACCF/SCCT/ACR/AHA/ASE/ASNC/NASCI/SCAI/SCMR AUC for Cardiac CT (2010): Table 7 Taylor, et al. (6)
		CCS Consensus Conference on Management of Adults with CHD: Complex CHD (2010) Silversides, et al. (14)
316.	Routine surveillance (1-6 months) in an asymptomatic infant or child	None
317.	Routine surveillance (1-2 years) in an asymptomatic child or adult	ACC/AHA ACHD Guidelines (2018): Section 14.3 Stout, et al. (1)
318.	Evaluation prior to planned stage 3 palliation	See above +
		AEPC/EACVI Expert Consensus Paper: Indications for CMR in Children with Congenital and Acquired Heart Disease (2015) Valsangiacomo Buechel, et al. (2)
		ESC Recommendations for CMR in Adults with CHD (2010) Kilner, et al. (3)
		ASE Indications and Guidelines for Performance of TEE in the Patient with Pediatric Acquired or CHD (2005) Ayres, et al. (4)
		SCCT CT Imaging in Patients with CHD Part 1 (2015): Section 2.8 Han, et al. (8)
		ACCF/SCCT/ACR/AHA/ASE/ASNC/NASCI/SCAI/SCMR AUC for Cardiac CT (2010): Table 7 Taylor, et al. (6)
		CCS Consensus Conference on Management of Adults with CHD: Complex CHD (2010) Silversides, et al. (14)

Post-operative: Stage 3 Palliation	Level of	TTE	TTE +	TEE	MRI	СТ	Stress
	Evidence		Saline				Imaging

319.	Routine post-operative evaluation (within 30 days)	None
320.	Evaluation due to change in clinical status and/or new concerning signs or symptoms	ACC/AHA ACHD Guidelines (2018): Section 4.4.2 Stout, et al. (1) AEPC/EACVI Expert Consensus Paper: Indications for CMR in Children with Congenital and Acquired Heart Disease (2015) Valsangiacomo Buechel, et al. (2) ESC Recommendations for CMR in Adults with CHD (2010) Kilner, et al. (3) ASE Indications and Guidelines for Performance of TEE in the Patient with Pediatric Acquired or CHD (2005) Ayres, et al. (4) SCCT CT Imaging in Patients with CHD Part 1 (2015): Section 2.7 Han, et al. (8) ACCF/SCCT/ACR/AHA/ASE/ASNC/NASCI/SCAI/SCMR AUC for Cardiac CT (2010): Table 7 Taylor, et al. (6)
		(2010) Silversides, et al. (14)
321.	Routine surveillance (3-6 months) within a year following stage 3 palliation in an asymptomatic patient	None
322.	Routine surveillance (6-12 months) after the first year following stage 3 palliation in an asymptomatic patient	ACC/AHA ACHD Guidelines (2018): Section 4.4.2 Stout, et al. (1)
323.	Routine surveillance (3-5 years) in an asymptomatic patient	See above
324.	Routine surveillance (3-12 months) in a patient with valvular or ventricular dysfunction, arrhythmias, or other cardiac complications	See above
325.	Routine surveillance (3-12 months) in a patient with heart failure symptoms	ACCF/AHA Guideline for the Management of Heart Failure (2013) – Yancy, et al. (10)

#### Table 19 Additional Resources:

- Brown DW, Gauvreau K, Powell AJ, et al. Cardiac magnetic resonance versus routine cardiac catheterization before bidirectional Glenn anastomosis in infants with functional single ventricle: a prospective randomized trial. Circulation. 2007; 116:2718-25.
- Brown DW, Gauvreau K, Powell AJ, et al. Cardiac magnetic resonance versus routine cardiac catheterization before bidirectional Glenn anastomosis: long-term follow-up of a prospective randomized trial. J Thorac Cardiovasc Surg. 2013; 146:1172-8.
- Fratz S, Chung T, Greil GF, et al. Guidelines and protocols for cardiovascular magnetic resonance in children and adults with congenital heart disease: SCMR expert consensus group on congenital heart disease. J Cardiovasc Magn Reson. 2013; 15:51.
- Han BK, Huntley M, Overman D, et al. Cardiovascular CT for evaluation of single-ventricle heart disease: risks and accuracy compared with interventional findings. Cardiol Young. 2018; 28:9-20.
- Han BK, Vezmar M, Lesser JR, et al. Selective use of cardiac computed tomography angiography: an alternative diagnostic modality before second-stage single ventricle palliation. J Thorac Cardiovasc Surg. 2014; 148:1548-54.
- Margossian R, Schwartz ML, Prakash A, et al. Comparison of echocardiographic and cardiac magnetic resonance imaging measurements of functional single ventricular volumes, mass, and ejection fraction (from the Pediatric Heart Network Fontan Cross-Sectional Study). Am J Cardiol. 2009; 104:419-28.
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- 3. Kilner PJ, Geva T, Kaemmerer H, et al. Recommendations for cardiovascular magnetic resonance in adults with congenital heart disease from the respective working groups of the European Society of Cardiology. Eur Heart J. 2010;31:794-805.
- 4. Ayres NA, Miller-Hance W, Fyfe DA, et al. Indications and guidelines for performance of transesophageal echocardiography in the patient with pediatric acquired or congenital heart disease: report from the task force of the Pediatric Council of the American Society of Echocardiography. J Am Soc Echocardiogr. 2005;18:91-8.
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- 9. Khairy P, Van Hare GF, Balaji S, et al. PACES/HRS Expert Consensus Statement on the Recognition and Management of Arrhythmias in Adult Congenital Heart Disease: developed in partnership between the Pediatric and Congenital Electrophysiology Society (PACES) and the Heart Rhythm Society (HRS). Endorsed by the governing bodies of PACES, HRS, the American College of Cardiology (ACC), the American Heart Association (AHA), the European Heart Rhythm Association (EHRA), the Canadian Heart Rhythm Society (CHRS), and the International Society for Adult Congenital Heart Disease (ISACHD). Heart Rhythm. 2014;11:e102-65.
- 10. Yancy CW, Jessup M, Bozkurt B, et al. 2013 ACCF/AHA guideline for the management of heart failure: a report of the American College of Cardiology Foundation/American Heart Association Task Force on Practice Guidelines. J Am Coll Cardiol. 2013;62:e147-239.
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- 13. Galie N, Humbert M, Vachiery JL, et al. 2015 ESC/ERS Guidelines for the diagnosis and treatment of pulmonary hypertension: The Joint Task Force for the Diagnosis and Treatment of Pulmonary Hypertension of the European Society of Cardiology (ESC) and the European Respiratory Society (ERS): Endorsed by: Association for European Paediatric and Congenital Cardiology (AEPC), International Society for Heart and Lung Transplantation (ISHLT). Eur Heart J. 2016;37:67-119.
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