Highlights of New Revascularization Guideline

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APPROPRIATE USE CRITERIA

ACC/AATS/AHA/ASE/ASNC/SCAI/SCCT/STS 2017 Appropriate Use Criteria for Coronary Revascularization in Patients With Stable Ischemic Heart Disease

TABLE A Revascularization to Improve Survival Compared With Medical Therapy

Anatomic Setting	COR	LOE	References
UPLM or complex CAD			
CABG and PCI	I—Heart Team approach recommended	C	(950-952)
CABG and PCI	IIa—Calculation of STS and SYNTAX scores	B	(949,950,953-957)
UPLM*			
CABG	I	B	(73,381,412,959-962)

TABLE A Continued

Anatomic Setting	COR	LOE	References
PCI	IIa—For SIHD when *both* of the following are present: ■ Anatomic conditions associated with a low risk of PCI procedural complications and a high likelihood of good long-term outcome (e.g., a low SYNTAX score of ≤22, ostial or trunk left main CAD) ■ Clinical characteristics that predict a significantly increased risk of adverse surgical outcomes (e.g., STS-predicted risk of operative mortality ≥5%)	B	(949,953,955,958,963-980)
	IIa—For UA/NSTEMI if not a CABG candidate	B	(949,968-971,976-979,981)
	IIa—For STEMI when distal coronary flow is TIMI flow grade <3 and PCI can be performed more rapidly and safely than CABG	C	(965,982,983)
	IIb—For SIHD when *both* of the following are present: ■ Anatomic conditions associated with a low to intermediate risk of PCI procedural complications and an intermediate to high likelihood of good long-term outcome (e.g., low-intermediate SYNTAX score of <33, bifurcation left main CAD) ■ Clinical characteristics that predict an increased risk of adverse surgical outcomes (e.g., moderate—severe COPD, disability from prior stroke, or prior cardiac surgery; STS-predicted operative mortality >2%)	B	(949,953,955,958,963-980,984)
	III: Harm—For SIHD in patients (versus performing CABG) with unfavorable anatomy for PCI and who are good candidates for CABG	B	(73,381,412,949,953,955,959-964)

3-vessel disease with or without proximal LAD artery disease*

CABG	I	B	(353,412,959,985-987)
	IIa—It is reasonable to choose CABG over PCI in patients with complex 3-vessel CAD (e.g., SYNTAX score >22) who are good candidates for CABG.	B	(964,980,987-989)
PCI	IIb—Of uncertain benefit	B	(366,959,980,985,987)

2-vessel disease with proximal LAD artery disease*			
CABG	I	B	(353,412,959,985-987)
PCI	IIb—Of uncertain benefit	B	(366,959,985,987)

2-vessel disease without proximal LAD artery disease*			
CABG	IIa—With extensive ischemia	B	(327,990-992)
	IIb—Of uncertain benefit without extensive ischemia	C	(987)
PCI	IIb—Of uncertain benefit	B	(366,959,985,987)

1-vessel proximal LAD artery disease			
CABG	IIa—With LIMA for long-term benefit	B	(412 987,993,994)
PCI	IIb—Of uncertain benefit	B	(366,959,985,987)

1-vessel disease without proximal LAD artery involvement			
CABG	III: Harm	B	(306,327,412,985,990,995-998)
PCI	III: Harm	B	(306,327,412,985,990,995-998)

LV dysfunction			
CABG	IIa—EF 35% to 50%	B	(365,412,999-1002)
CABG	IIb—EF <35% without significant left main CAD	B	(355,365,410,412,999-1002)
PCI	Insufficient data		N/A

No anatomic or physiological criteria for revascularization			
CABG	III: Harm	B	(306,327,412,985,990,995-998)
PCI	III: Harm	B	(306,327,412,985,990,995-998)

The Role of Patient Preference in the AUC

Patients often make decisions about medical treatments without a complete understanding of their options. Patient participation or shared decision making (SDM) describes a collaborative approach whereby patients are provided with evidence-based information on treatment choices and encouraged to use the information in an informed dialogue with their provider to make decisions that not only use the scientific evidence, but also align with their values, preferences, and lifestyle (26–28). The alternative decision paradigm, often referred to as medical paternalism, places decision authority with physicians and assigns the patient a more passive role (29). SDM respects both the provider's knowledge and the patient's right to be fully informed of all care options with their associated risks and benefits. SDM often uses decision aids such as written materials, online modules, or videos to present information about treatment options that help the patient evaluate the risks and benefits of a particular treatment. The most effective decision aids to help patients make truly informed decisions provide relevant facts and videos of real patient perspectives regarding the particular treatment (30). Many professional organizations now endorse SDM in practice (31,32).

More than 1 treatment option often exists with no clear evidence identifying the best option. This is compounded when there is variation in experts' recommendations about the best treatment under different circumstances (33). A challenging situation exists when scientific data suggest 1 treatment is likely to have better outcomes, yet the patient prefers an alternative treatment. Within the context of the AUC, this would be manifest as the patient requesting a therapy with a lower AUC rating (e.g., wanting a therapy rated as *rarely appropriate* when a therapy rated *appropriate* exists). Informed consent is fundamental to SDM (34). Without understanding the pros

TABLE 1.1 One-Vessel Disease

Appropriate Use Score (1-9)

One-Vessel Disease

		Asymptomatic				Ischemic Symptoms			
		Not on AA Therapy or With AA Therapy		Not on AA Therapy		On 1 AA Drug (BB Preferred)		On ≥2 AA Drugs	
	Indication	**PCI**	**CABG**	**PCI**	**CABG**	**PCI**	**CABG**	**PCI**	**CABG**
No Proximal LAD or Proximal Left Dominant LCX Involvement									
1.	■ Low-risk findings on noninvasive testing	R (2)	R (1)	R (3)	R (2)	M (4)	R (3)	A (7)	M (5)
2.	■ Intermediate- or high-risk findings on noninvasive testing	M (4)	R (3)	M (5)	M (4)	M (6)	M (4)	A (8)	M (6)
3.	■ No stress test performed or, if performed, results are indeterminate ■ FFR ≤0.80*	M (4)	R (2)	M (5)	R (3)	M (6)	M (4)	A (8)	M (6)
Proximal LAD or Proximal Left Dominant LCX Involvement Present									
4.	■ Low-risk findings on noninvasive testing	M (4)	R (3)	M (4)	M (4)	M (5)	M (5)	A (7)	A (7)
5.	■ Intermediate- or high-risk findings on noninvasive testing	M (5)	M (5)	M (6)	M (6)	A (7)	A (7)	A (8)	A (8)
6.	■ No stress test performed or, if performed, results are indeterminate ■ FFR ≤0.80	M (5)	M (5)	M (6)	M (6)	M (6)	M (6)	A (8)	A (7)

The number in parentheses next to the rating reflects the median score for that indication. *Substitution of a newer coronary pressure ratio that does not require hyperemia for FFR may be considered provided the appropriate reference values are used.

A indicates appropriate; AA, antianginal; BB, beta blockers; CABG, coronary artery bypass graft; FFR, fractional flow reserve; LAD, left anterior descending coronary artery; LCX, left circumflex artery; M, may be appropriate; PCI, percutaneous coronary intervention; and R, rarely appropriate.

TABLE 1.2 Two-Vessel Disease

Appropriate Use Score (1-9)									
Two-Vessel Disease									
		Asymptomatic				**Ischemic Symptoms**			
		Not on AA Therapy or With AA Therapy		**Not on AA Therapy**		**On 1 AA Drug (BB Preferred)**		**On ≥2 AA Drugs**	
Indication		**PCI**	**CABG**	**PCI**	**CABG**	**PCI**	**CABG**	**PCI**	**CABG**
No Proximal LAD Involvement									
7.	■ Low-risk findings on noninvasive testing	R (3)	R (2)	M (4)	R (3)	M (5)	M (4)	A (7)	M (6)
8.	■ Intermediate- or high-risk findings on noninvasive testing	M (5)	M (4)	M (6)	M (5)	A (7)	M (6)	A (8)	A (7)
9.	■ No stress test performed or, if performed, results are indeterminate ■ FFR ≤0.80* in both vessels	M (5)	M (4)	M (6)	M (4)	A (7)	M (5)	A (8)	A (7)
Proximal LAD Involvement and No Diabetes Present									
10.	■ Low-risk findings on noninvasive testing	M (4)	M (4)	M (5)	M (5)	M (6)	M (6)	A (7)	A (7)
11.	■ Intermediate- or high-risk findings on noninvasive testing	M (6)	M (6)	A (7)	A (7)	A (7)	A (7)	A (8)	A (8)
12.	■ No stress test performed or, if performed, results are indeterminate ■ FFR ≤0.80 in both vessels	M (6)	M (6)	M (6)	M (6)	A (7)	A (7)	A (8)	A (8)
Proximal LAD Involvement With Diabetes Present									
13.	■ Low-risk findings on noninvasive testing	M (4)	M (5)	M (4)	M (6)	M (6)	A (7)	A (7)	A (8)
14.	■ Intermediate- or high-risk findings on noninvasive testing	M (5)	A (7)	M (6)	A (7)	A (7)	A (8)	A (8)	A (9)
15.	■ No stress test performed or, if performed, results are indeterminate ■ FFR ≤0.80 in both vessels*	M (5)	M (6)	M (6)	A (7)	A (7)	A (8)	A (7)	A (8)

TABLE 1.3 Three-Vessel Disease

Appropriate Use Score (1-9)

Three-Vessel Disease

		Asymptomatic				Ischemic Symptoms			
		Not on AA Therapy or With AA Therapy		Not on AA Therapy		On 1 AA Drug (BB Preferred)		On ≥2 AA Drugs	
	Indication	**PCI**	**CABG**	**PCI**	**CABG**	**PCI**	**CABG**	**PCI**	**CABG**
Low Disease Complexity (e.g., Focal Stenoses, SYNTAX ≤22)									
16.	■ Low-risk findings on noninvasive testing ■ No diabetes	M (4)	M (5)	M (5)	M (5)	M (6)	M (6)	A (7)	A (7)
17.	■ Intermediate- or high-risk findings on noninvasive testing ■ No diabetes	M (6)	A (7)	A (7)	A (7)	A (7)	A (8)	A (8)	A (8)
18.	■ Low-risk findings on noninvasive testing ■ Diabetes present	M (4)	M (6)	M (5)	M (6)	M (6)	A (7)	A (7)	A (8)
19.	■ Intermediate- or high-risk findings on noninvasive testing ■ Diabetes present	M (6)	A (7)	M (6)	A (8)	A (7)	A (8)	A (7)	A (9)
Intermediate or High Disease Complexity (e.g. Multiple Features of Complexity as Noted Previously, SYNTAX >22)									
20.	■ Low-risk findings on noninvasive testing ■ No diabetes	M (4)	M (6)	M (4)	A (7)	M (5)	A (7)	M (6)	A (8)
21.	■ Intermediate- or high-risk findings on noninvasive testing ■ No diabetes	M (5)	A (7)	M (6)	A (7)	M (6)	A (8)	M (6)	A (9)
22.	■ Low-risk findings on noninvasive testing ■ Diabetes present	M (4)	A (7)	M (4)	A (7)	M (5)	A (8)	M (6)	A (9)
23.	■ Intermediate- or high-risk findings on noninvasive testing ■ Diabetes present	M (4)	A (8)	M (5)	A (8)	M (5)	A (8)	M (6)	A (9)

TABLE 1.4 Left Main Coronary Artery Stenosis

Appropriate Use Score (1-9)

Left Main Disease

Indication		Asymptomatic		Ischemic Symptoms					
		Not on AA Therapy or With AA Therapy		Not on AA Therapy		On 1 AA Drug (BB Preferred)		On ≥2 AA Drugs	
		PCI	CABG	PCI	CABG	PCI	CABG	PCI	CABG
24.	■ Isolated LMCA disease ■ Ostial or midshaft stenosis	M (6)	A (8)	A (7)	A (8)	A (7)	A (9)	A (7)	A (9)
25.	■ Isolated LMCA disease ■ Bifurcation involvement	M (5)	A (8)	M (5)	A (8)	M (5)	A (9)	M (6)	A (9)
26.	■ LMCA disease ■ Ostial or midshaft stenosis ■ Concurrent multivessel disease ■ Low disease burden (e.g., 1–2 additional focal stenoses, SYNTAX score ≤22)	M (6)	A (8)	M (6)	A (9)	A (7)	A (9)	A (7)	A (9)
27.	■ Ostial or midshaft stenosis ■ Concurrent multivessel disease ■ Intermediate or high disease burden (e.g., 1–2 additional bifurcation stenosis, long stenoses, SYNTAX score >22)	M (4)	A (9)	M (4)	A (9)	M (4)	A (9)	M (4)	A (9)
28.	■ LMCA disease ■ Bifurcation involvement ■ Low disease burden in other vessels (e.g., 1–2 additional focal stenosis, SYNTAX score ≤22)	M (4)	A (8)	M (5)	A (8)	M (5)	A (9)	M (6)	A (9)
29.	■ LMCA disease ■ Bifurcation involvement ■ Intermediate or high disease burden in other vessels (e.g., 1–2 additional bifurcation stenosis, long stenoses, SYNTAX score >22)	R (3)	A (8)	R (3)	A (9)	R (3)	A (9)	R (3)	A (9)

TABLE 2.1 IMA to LAD Patent and Without Significant Stenoses

Appropriate Use Score (1-9)

		Asymptomatic				Ischemic Symptoms			
		Not on AA Therapy or With AA Therapy		Not on AA Therapy		On 1 AA Drug (BB Preferred)		On ≥2 AA Drugs	
Indication		PCI	CABG	PCI	CABG	PCI	CABG	PCI	CABG
Stenosis Supplying 1 Territory Disease (Bypass Graft or Native Artery) to Territory Other Than Anterior									
30.	■ Low-risk findings on noninvasive testing	R (3)	R (1)	R (3)	R (2)	M (6)	R (3)	A (7)	M (4)
31.	■ Intermediate- or high-risk findings on noninvasive testing	M (5)	R (3)	M (5)	R (3)	A (7)	M (4)	A (8)	M (5)
32.	■ No stress test performed or, if performed, the results are indeterminate ■ FFR of stenosis ≤0.80*	M (4)	R (3)	M (4)	R (3)	M (6)	M (4)	A (8)	M (5)
Stenoses Supplying 2 Territories (Bypass Graft or Native Artery, Either 2 Separate Vessels or Sequential Graft Supplying 2 Territories) Not Including Anterior Territory									
33.	■ Low-risk findings on noninvasive testing	R (3)	R (2)	M (4)	R (3)	M (6)	R (3)	A (7)	M (5)
34.	■ Intermediate- or high-risk findings on noninvasive testing	M (5)	R (3)	M (5)	M (4)	A (7)	M (5)	A (8)	M (6)

TABLE 2.2 IMA to LAD Not Patent

Appropriate Use Score (1-9)

		Asymptomatic				Ischemic Symptoms			
		Not on AA Therapy or With AA Therapy		Not on AA Therapy		On 1 AA Drug (BB Preferred)		On ≥2 AA Drugs	
Indication		PCI	CABG	PCI	CABG	PCI	CABG	PCI	CABG
Stenosis Supplying 1-Territory Disease (Bypass Graft or Native Artery)-Anterior (LAD) Territory									
35.	■ Low-risk findings on noninvasive testing	M (4)	R (3)	M (5)	R (3)	M (6)	M (4)	A (7)	M (5)
36.	■ Intermediate- or high-risk findings on noninvasive testing	M (6)	M (4)	M (6)	M (4)	A (7)	M (5)	A (8)	M (6)
37.	■ No stress test performed or, if performed, the results are indeterminate ■ FFR of stenosis ≤0.80*	M (5)	M (4)	M (6)	M (4)	A (7)	M (5)	A (8)	M (6)
Stenoses Supplying 2 Territories (Bypass Graft or Native Artery, Either 2 Separate Vessels or Sequential Graft Supplying 2 Territories) LAD Plus Other Territory									
38.	■ Low-risk findings on noninvasive testing	M (5)	M (4)	M (6)	M (4)	A (7)	M (5)	A (7)	M (6)
39.	■ Intermediate- or high-risk findings on noninvasive testing	M (6)	M (5)	A (7)	M (6)	A (7)	A (7)	A (8)	A (8)
Stenoses Supplying 3 Territories (Bypass Graft or Native Arteries, Separate Vessels, Sequential Grafts, or Combination Thereof) LAD Plus 2 Other Territories									
40.	■ Low-risk findings on noninvasive testing	M (5)	M (5)	M (6)	M (5)	M (6)	M (6)	A (7)	A (7)
41.	■ Intermediate- or high-risk findings on noninvasive testing	A (7)	A (7)	A (7)	A (7)	A (7)	A (7)	A (8)	A (8)

TABLE 3.1 Stable Ischemic Heart Disease Undergoing Procedures for Which Coronary Revascularization May Be Considered

Appropriate Use Score (1-9)

		Asymptomatic				Ischemic Symptoms			
		Not on AA Therapy or With AA Therapy		Not on AA Therapy		On 1 AA Drug (BB Preferred)		On ≥2 AA Drugs	
	Indication	PCI	CABG	PCI	CABG	PCI	CABG	PCI	CABG
	Patients Undergoing Renal Transplantation, No Diabetes								
42.	■ One- or two-vessel CAD, no proximal LAD involvement, with low-risk noninvasive findings	R (3)	R (2)	M (4)	R (3)	M (6)	M (4)	A (7)	M (5)
43.	■ One- or two-vessel CAD, no proximal LAD involvement, with intermediate- or high-risk noninvasive findings	M (5)	M (4)	M (6)	M (4)	A (7)	M (5)	A (8)	M (6)
44.	■ One- or two-vessel CAD, including proximal LAD, with low-risk noninvasive findings	M (5)	M (4)	M (6)	M (5)	M (6)	M (6)	A (8)	A (7)
45.	■ One- or two-vessel CAD, including proximal LAD, with intermediate- or high-risk noninvasive findings	M (6)	M (6)	A (7)	A (7)	A (7)	A (7)	A (8)	A (8)
46.	■ Left main and/or three-vessel disease, with intermediate- or high-risk noninvasive findings (e.g., SYNTAX ≤22)	M (6)	A (7)	A (7)	A (7)	A (7)	A (7)	A (8)	A (8)
47.	■ Left main and/or three-vessel disease, with intermediate- or high-risk noninvasive findings (e.g., SYNTAX >22)	M (5)	A (7)	M (6)	A (8)	M (6)	A (8)	M (6)	A (9)
	Patients Undergoing Renal Transplantation, Diabetes Present								
48.	■ One- or two-vessel CAD, no proximal LAD involvement, with low-risk noninvasive findings	R (3)	R (3)	M (4)	R (3)	M (5)	M (4)	A (7)	M (6)
49.	■ One- or two-vessel CAD, no proximal LAD involvement, with intermediate- or high-risk noninvasive findings	M (5)	M (4)	M (5)	M (4)	M (6)	M (5)	A (7)	A (7)
50.	■ One- or two-vessel CAD, including proximal LAD, with low-risk noninvasive findings	M (5)	M (5)	M (5)	M (6)	M (5)	A (7)	A (7)	A (7)
51.	■ One- or two-vessel CAD, including proximal LAD, with intermediate- or high-risk noninvasive findings	M (6)	M (6)	M (6)	A (7)	M (6)	A (7)	A (7)	A (8)
52.	■ Left main and/or three-vessel disease, with intermediate- or high-risk noninvasive findings (e.g., SYNTAX ≤22)	M (6)	A (8)	M (6)	A (8)	M (6)	A (8)	A (7)	A (9)
53.	■ Left main and/or three-vessel disease, with intermediate- or high-risk noninvasive findings (e.g., SYNTAX >22)	M (5)	A (8)	M (5)	A (8)	M (5)	A (9)	M (5)	A (9)
	Patient Who Will Undergo a Percutaneous Valve Procedure (TAVR, MitraClip, Others)								
54.	■ One- or two-vessel CAD, no proximal LAD involvement, with low-risk noninvasive findings	M (4)		M (4)		M (6)		A (8)	
55.	■ One- or two-vessel CAD, no proximal LAD involvement, with intermediate- or high-risk noninvasive findings	A (7)		A (7)		A (7)		A (8)	
56.	■ One- or two-vessel CAD, including proximal LAD, with low-risk noninvasive findings	M (6)		M (6)		A (7)		A (8)	
57.	■ One- or two-vessel CAD, including proximal LAD, with intermediate- or high-risk noninvasive findings	A (7)		A (7)		A (8)		A (9)	
58.	■ Left main and/or three-vessel disease, with intermediate- or high-risk noninvasive findings (e.g., SYNTAX ≤22)	A (8)		A (8)		A (8)		A (9)	
59.	■ Left main and/or three-vessel disease, with intermediate- or high-risk noninvasive findings (e.g., SYNTAX >22)	A (7)		A (7)		A (8)		A (8)	