Atherosclerotic Peripheral Vascular Disease Symposium II: Nomenclature for Vascular Diseases

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Atherosclerotic Peripheral Vascular Disease Symposium II

Nomenclature for Vascular Diseases

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Peripheral vascular diseases are important components of cardiovascular medicine. The high prevalence of these disorders in the clinical setting mandates effective communication among healthcare providers. The public health significance of these conditions requires clear and consistent terminology for community audiences. Therefore, the goal of this writing group was to suggest definitions, usage, and nomenclature of specific terms commonly used to describe vascular diseases by cardiovascular specialists and primary care communities. The need for clarity is driven by 2 major challenges: (1) the need for use of common keywords for literature searches; and (2) the need for healthcare professionals to use common, reasoned terminology when communicating with each other and with the public. The major structural components of the vascular system are the veins, lymphatic vessels, and arteries. These serve as the basis of the nomenclature system for vascular diseases (Figure).

In this report, the writing group focuses only on nomenclature that applies to non–coronary artery diseases. Venous and lymphatic diseases were outside the scope of this conference. Diseases of arteries are classified further into atherosclerotic occlusive disorders, nonatherosclerotic occlusive disorders, and aneurysms. Atherosclerotic diseases have been subdivided into coronary, cerebral, peripheral, renal, and mesenteric disorders.

Specific terminology for vascular diseases is provided in Table 1. The term "vascular diseases" should refer to all diseases of arteries, veins, and lymphatic vessels. Coronary artery disease was not included in Table 1 because it was outside the scope of this conference. "Atherosclerotic vascular diseases" refers to diseases of arteries caused by atherosclerosis. The term "peripheral artery disease" (PAD) is recommended to describe disease that affects the lower- or upper-extremity arteries. PAD should replace "peripheral vascular disease," which was often used in the past to describe leg artery disease but was too nonspecific, given that it can encompass venous in addition to arterial disorders. Table 1 provides additional definitions for atherosclerotic vascular diseases as they apply to the noncoronary circulations. Definitions are provided for peripheral (lower- and upper-extremity), mesenteric (celiac, superior mesenteric, and inferior mesenteric arteries), and renal and cerebral artery (intracranial and extracranial) disease. These are further subdivided into the major manifestations of each disease. Universal use of the term "disease" is preferred rather than the selective use of the term "stenosis," for example, "renal artery disease" rather than "renal artery stenosis." This is because an artery can have an occlusion or a stenosis with similar clinical manifestations, and the term "disease" is meant to cover both conditions. Some causes of these arterial diseases are provided in Table 1.

In addition to atherosclerosis, a number of nonatherosclerotic arterial occlusive diseases affect peripheral vessels. These include fibromuscular dysplasia, popliteal artery entrapment, popliteal adventitial cyst, thoracic outlet syndrome, vasculitis, radiation injury, and trauma.

Table 2 provides terminology for aneurysms of the aorta and its visceral and limb branches. Although the definitions vary, an artery can be considered aneurysmal when its

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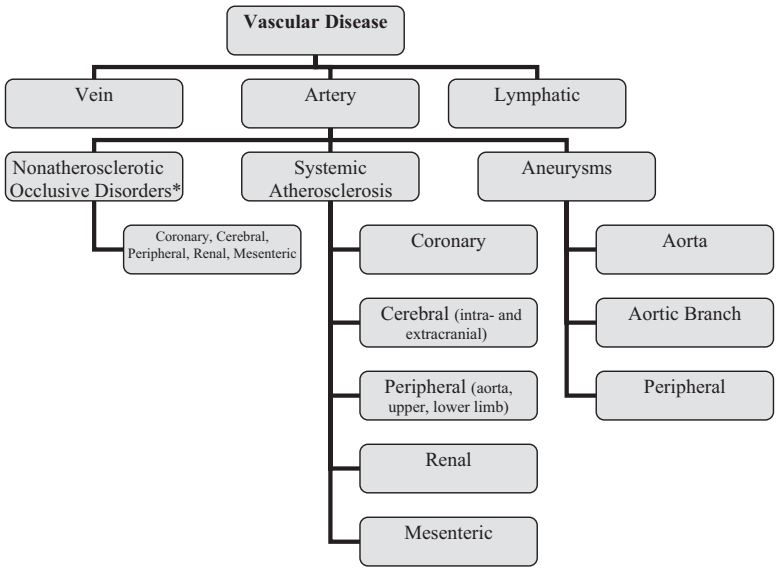

Figure. Major classification of vascular diseases. *Includes inflammatory, artery dysplasias, congenital, traumatic, and infections.

diameter is increased by 50% compared with the normal dimension.

Table 3 defines several terms for the clinical manifestations of PAD. Many patients with PAD are "asymptomatic" on the basis of the absence of exertional leg symptoms. The classic symptom is termed "intermittent claudication," defined as effort-induced (usually walking) discomfort of the calf, thigh, and/or buttock, variably described as

Table 1. Major Vascular Terms

Recommended	Previous Terms	Pathophysiology	Anatomy	Duration and Severity	Comments
Vascular diseases		Diseases of arteries, veins, and lymphatics; includes atherosclerosis and nonatherosclerotic diseases	All vessels without anatomic designation	Acute to chronic; asymptomatic to severe	Broadest term to describe all vascular diseases: coronary, cerebral, peripheral, renal, and mesenteric artery occlusive disease, aneurysms, venous and lymphatic diseases
Peripheral artery disease	Peripheral vascular disease, peripheral arterial disease, peripheral arterial occlusive disease, arteriosclerosis obliterans	Atherosclerosis, thrombosis, noncardiac emboli, inflammatory, etc	Stenosis or occlusion of upper- or lower-extremity arteries	Acute to chronic; may be asymptomatic; symptoms and signs range from asymptomatic with functional limitations to intermittent claudication, rest pain, ulcers, and gangrene	Limited to artery disease; excludes renal, coronary cerebral, mesenteric, and aneurysms
Mesenteric artery disease	Visceral or mesenteric ischemia or angina, intestinal ischemia/angina	Atherosclerosis, thrombosis, emboli, extrinsic compression, vasculitis	Celiac trunk, superior mesenteric artery, inferior mesenteric artery	Acute to chronic; most patients are asymptomatic; symptoms include postprandial pain and weight loss	
Renal artery disease	Renal artery stenosis, renovascular disease	Atherosclerosis, thrombosis, emboli, arterial dysplasia	Main renal arteries and extrarenal branches	Acute to chronic, mild to severe	Associated with hypertension and/or renal insufficiency
Cerebral artery disease	Cerebral vascular disease (confused with cardiovascular disease); extracranial arterial occlusive disease	Atherosclerosis and nonatherosclerotic causes such as dissection, arterial dysplasia	Aortic arch to intracranial vessels	Acute and chronic; symptoms and signs of stroke and transient ischemic attack depend on affected territory	May be asymptomatic
Extracranial cerebral artery disease	Cervical carotid disease, vertebral-basilar insufficiency	Atherosclerosis and nonatherosclerotic causes as above	Aortic arch, carotid, vertebral, and extracranial vessels	As above	Excludes intracranial artery diseases
Intracranial cerebral artery disease		Atherosclerosis and nonatherosclerotic causes	Intracerebral vessels	As above	Excludes extracranial artery diseases (although may coexist)

Table 2. Aneurysm Terminology

Recommended	Pathophysiology	Anatomy	Severity
Aneurysm	Affects all 3 layers of the affected artery; atherosclerosis, connective tissue, congenital, infection (mycotic), traumatic, dissection, inflammation	Affects all major peripheral arteries	Asymptomatic, symptomatic (depending on contiguous structures); ruptured, leaking (contained rupture)
Aorta			
Thoracic aortic aneurysm	As above	Ascending, transverse, arch, descending (DeBakey I or II or Stanford A or B)	As above
Thoracoabdominal aortic aneurysm	As above	Crawford class I to IV	As above
Abdominal aortic aneurysm	As above	Crawford class IV, suprarenal, pararenal, juxtarenal, infrarenal	As above
Aortic branch			
Visceral (celiac, superior mesenteric, inferior mesenteric, hepatic, splenic, renal) artery aneurysm	As above	All visceral branches of the aorta	As above
Peripheral			
Iliac, femoral, popliteal	As above		As above

cramping, aching, tightness, pain, or fatigue. "Atypical claudication" refers to exertional leg pain that does not fulfill all the characteristics of classic claudication.

Many patients have functional limitations characterized by slow walking speed or limited walking endurance but without typical or atypical claudication symptoms. These patients are functionally limited, which, like silent coronary ischemia, implies an underlying cardiovascular disease with important clinical sequelae.

Table 4 defines several terms commonly used in the measurement and treatment of PAD with reference to artery revascularization and repair. Typical noninvasive evaluation is based on hemodynamic measures, such as systolic pressures taken at the ankle or toe. Objective measures of functional limitations in patients with claudication are based on treadmill testing. Treatment includes endovascular and open (surgical) repair of arteries. Terms for these tests and treatments are proposed.

Table 3. Terms for PAD

	Hemodynamics	Limb Symptoms	Function
Asymptomatic PAD	Abnormal ABI at rest or after exercise* or other objective evidence of PAD (duplex ultrasound, computed tomographic angiography, magnetic resonance angiography)	None recognized	Limited data available, but reduced walking endurance and slower walking velocity have been documented; rate of decline in walking performance is at least as great as for patients with intermittent claudication
Atypical claudication	Abnormal ABI at rest or after exercise	Leg pain on exertion that is not consistent with classic "claudication"; may include calf, thigh, or buttock	Limited walking distance and exercise performance due to PAD may be present; symptoms may or may not be reproducible on a daily basis as for classic claudication
Claudication	Abnormal ABI at rest or after exercise	Reproducible lower-extremity muscle fatigue or discomfort on exertion, relieved by rest within 10 minutes	Limited walking distance, exercise performance due to PAD
Critical limb ischemia	Hemodynamic evidence of severe PAD	Distal leg pain at rest, with or without ischemic ulcers or gangrene	Very limited, usually ambulatory only for short distances
Acute limb ischemia	Hemodynamic evidence of severe PAD	Acute limb pain, neurological dysfunction	Very limited as above
Additional terms			
Nonvascular claudication	Normal leg hemodynamics at rest and with exercise	Typical or atypical limb discomfort with effort	May be caused by rheumatologic or neuromuscular disease

ABI indicates ankle–brachial index.

*An abnormal ABI has previously been defined as <0.90, but recent evidence suggests that an ABI <1.00 is indicative of PAD and an increased risk of systemic atherosclerotic events. In the presence of diabetes mellitus, pressure measurements may be unreliable in some patients.

Table 4. Vascular Measurement and Treatment Terms

Recommended	Previous Terms	Mechanism	Comments
ABI	ABPI, AAI	Any artery lesion inducing a pressure drop in an artery supplying the leg	ABPI and AAI not universally accepted; ABI used in all major US, Canadian, and international guidelines; the ABI measurement defines the hemodynamic severity of PAD at rest; ABI does not measure "flow"; previous studies document changes in arterial flow even while the ABI does not change over time
TBI		Any artery lesion inducing a toe-pressure drop in an artery supplying the leg	Used when ABI is elevated (>1.40) or in patients with diabetes to assess for presence of occlusive PAD; abnormal when TBI <0.70
Endovascular revascularization	Peripheral intervention, percutaneous intervention	Catheter-based treatment of artery stenosis, occlusion, or aneurysm	"Intervention" term is overly broad, is nonspecific, and excludes numerous other effective noninvasive therapies and therefore should not be used as a term for revascularization procedures
Open revascularization	Vascular bypass surgery	Open surgical treatment of artery stenosis, occlusion, or aneurysm	Refers to all surgical bypass operations including extra-anatomic bypass
Endovascular aneurysm repair		Catheter-based treatment of aneurysms	
Open aneurysm repair		Surgical treatment of aneurysms	
Peak walking time	Peak walking distance, maximal walking distance, maximal walking time	Integrates all factors limiting peak exercise and is responsive to treatment effect	Patients with PAD cannot reach a true maximal exercise performance, so "peak" is the term referring to the greatest time of exercise achieved; defines a clinically relevant point
Claudication onset time	Initial claudication distance, initial walking time, pain-free walking distance	Defines time of onset of symptoms as measure of disease severity and response to treatment	Defines a clinically relevant point

ABI indicates ankle–brachial index; ABPI, ankle–brachial pressure index; AAI, ankle–arm index; and TBI, toe–brachial index.

Disclosures

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