

ABBREVIATIONS

ACRIN	American College of Radiology Imaging Network	FHS	Framingham Heart Study
ACS	acute coronary syndrome; American Cancer Society	FIT	fecal immunochemical test
AEC	automatic exposure control	FOBT	fecal occult blood test
ALA	American Lung Association	FOV	field of view
BG	blood glucose	HDL	high-density lipoprotein
BMI	body mass index	HU	Hounsfield unit
BPM	beats per minute	IR	iterative reconstruction
CABG	coronary artery bypass graft	IV	intravenous
CAC	coronary artery calcium	keV	kiloelectron volts
CAD	coronary artery disease	kV	kilovolt
CCTA	coronary CT angiogram	kVp	peak kilovolt / kilovoltage
CHD	coronary heart disease	LAD	left anterior descending coronary artery
CIRC	circumflex coronary artery	LCX	left circumflex artery
CMS	Centers for Medicare & Medicaid Services	LDCT	low-dose CT/low dose chest CT
CO₂	carbon dioxide	LDL	low-density lipoprotein
CT	computed tomography; also called CAT scan, computed axial tomography	LMA	left main coronary artery
CTA	CT angiogram	mA	milliamperes
CTDI	CT dose index	mAs	milliamperes-second
DECTA	dual-energy coronary artery angiogram	MDCT	multi-detector computed tomography
DEXA	dual-energy X-ray absorptiometry	MESA	Multi-Ethnic Study of Atherosclerosis
DRE	digital rectal exam	mGy	milligray
DSCT	dual source CT	MI	myocardial infarction
EBCT	electron-beam computed tomography	MIP	maximum intensity projection
ECF	extra-cardiac finding	MPI	myocardial perfusion imaging
ECG	electrocardiogram; also EKG	MPR	multiplanar reconstruction/reformatting
EPA	Environmental Protection Agency	MRI	magnetic resonance imaging
ER	emergency room	NLST	National Lung Screening Trial
EF	ejection fraction	NPI	National Provider Identifier
FAP	familial adenomatous syndrome polyposis	NPV	negative predictive value
		PPV	positive predictive value
		RCA	right coronary artery
		ROI	region of interest
		US	ultrasound
		VC	virtual colonoscopy

GLOSSARY

acute coronary syndrome (ACS)

any group of clinical symptoms compatible with acute myocardial infarction

adenomatous/adenoma

a benign lesion originating in a secretory gland and are a precursor to cancer

Agatston score

also known as a calcium score, a quantification of the amount of calcium in the coronary arteries; named for noted cardiologist Arthur Agatston

angina

chest pain caused by reduced blood flow to the heart muscle; angina is a symptom of coronary heart disease and is usually described as squeezing, pressure, heaviness, tightness, or pain in the chest

angiogram, angiography

in coronary CT angiography, an X-ray that visualizes blood vessels and flowing blood by administration of an iodinated contrast agent

arrhythmia/arrhythmic

a heart rhythm problem that may feel like a fluttering or racing heartbeat; may or may not be harmless depending on the type

artifact

an appearance on a radiographic image that is unrelated to the anatomical subject; includes aliasing, beam hardening, blooming artifact, edge-gradient effects, metal, and motion artifacts

atherosclerosis

a disease in which plaque builds in the arteries, can lead to heart attack, stroke, or death; also known as “hardening of the arteries”

atrioventricular (AV) block

a partial or complete interruption of electrical impulse transmission from the atria to the ventricles; also called heart block

attenuation/attenuate

the reduction in the intensity of an X-ray beam as it passes through tissue caused by the absorption and scattering of photons; the amount of attenuation is dependent on both the intensity of the original X-ray beam and the physical properties of the tissue the beam passes through

beam hardening

an artifact produced when the mean energy of the X-ray increases as it passes through the patient; it occurs most often when a poly-energetic beam is used, and the lower energy photons in the beam attenuate first, leaving the higher energy photons to pass through the patient and strike the detectors; also called *cupping* because the beam hardening is most pronounced at the center and less at the periphery, resembling a cup

beta blocker

a type of medication that reduces blood pressure and therefore the heart rate; beta blockers can also help open blood vessels to increase blood flow

blood glucose

the blood sugar concentration in the blood, which results from food consumption

blooming artifact

in coronary CT angiography, an artifact that causes calcified plaque to appear larger than it actually is; can result in overestimation of the degree of stenosis

cardiac gating

the use of an electronic signal from the cardiac cycle to time the cycle and control image sampling; also known as electrocardiographic or ECG gating

cholesterol

a waxy, fat-like substance that is found in all cells of the body that travel through the blood stream. Cholesterol is required to make hormones, vitamin D, and substances that aid in digestion. A high LDL level can lead to a build-up of cholesterol in the arteries; HDL cholesterol is carried to the liver and removed.

concordance

agreement with; high concordance means high agreement between two conditions; a low level of agreement is called *discordance*

cytology

the branch of pathology that deals with making diagnoses of diseases and conditions from examination of the cells of tissue samples from the body

detector

one of hundreds or thousands of identical receptor units that measure attenuated X-rays after they have passed through the patient

diastolic

the bottom and lower number of a blood pressure reading, which measures the pressure in the arteries between heartbeats, ie, when the heart is resting between beats and refilling with blood

dual source CT

CT unit utilizing two tubes and two detectors that rotate in the same plane and are at 90° angles from one other; allows for ultra-fast, motion-free imaging

ectopic heartbeat

small changes in a heartbeat that is otherwise normal that can lead to extra or skipped beats; the cause is often unknown and the condition is usually harmless

effective dose

the estimate of the radiation dose to the patient during an ionizing radiation exam or procedure; measures the total energy entering into the body, taking into account the sensitivity of the organs that are being irradiated.

ejection fraction (EF)

a measure of the percentage of blood leaving the heart each time it contracts; typically measured in the left ventricle; an LV EF of ≥55% is considered normal

false positive/negative finding

a false positive finding indicates that a given disease or condition is present when it is not; a false negative finding indicates no disease or condition is present when the patient actually does have it

Hounsfield unit (HU)

the information contained in a single pixel and assigned a value that corresponds to a gray scale value; also called CT number. HUs characterize radiation attenuation in different tissues, which help define what a given finding may represent. Named for Sir Godfrey Hounsfield (1919-2004).

hyperplastic

abnormal multiplication of cells or enlargement due in part to an increase in the number of cells

insufflation

in medicine, the act of blowing a powder, vapor, or gas into a body cavity

ischemia

a reduction in blood flow to the heart muscle usually caused by narrowing of one or more coronary arteries; *silent* ischemia occurs when there is reduced blood flow to the heart but absence of symptoms. Silent ischemia is typically diagnosed by exercise stress testing or 24-hour monitoring of heart rate and rhythm (Holter monitoring).

iterative reconstruction (IR)

the process of passing images through numerous software filters and noise-reducing calculations to reduce radiation dose while maintaining diagnostic image quality

kilovolt (kV)

unit of electromotive force equal to 1000 volts

kilovoltage peak (kVp)

the peak voltage applied to the X-ray tube

lumen, luminal

the channel or space within a tube or cavity; in cardiac CTA, the space inside blood vessels

maximum intensity projection (MIP)

a volume rendering method for 3D data; consists of projecting the voxel with the highest attenuation value on every view throughout the volume onto a 2D image

milliamperage (mA)

the tube current that flows down the X-ray tube from the cathode filament to the anode

milliamperage-second (mAs)

tube current (mA) multiplied by scan time

milligray (mGy)

one-thousandth of a gray, which is the absorption of one joule of radiation energy per one kilogram of matter

multiplanar reconstruction/reformatting (MPR)

MPR reconstructs images from the original axial plane in coronal, sagittal, and oblique planes. Curved MPR is a subcategory of MPR and displays all voxels contained in a user-selected curved surface as a single bidimensional image, allowing the user to follow winding structures, like blood vessels, in their entirety. The technique allows the winding structure to be shown as a straight line, which aids in detection of stenosis

myocardial perfusion imaging (MPI)

a nuclear stress test that shows how well blood flows (perfuses) through the heart and how well the heart is pumping

myocardium

the middle and thickest layer of the heart wall, composed of cardiac muscle

necrosis/necrotic

dying or dead tissue

negative predictive value

the probability that subjects with a negative screening test truly do not have the disease

neoplasm

an abnormal growth of tissue caused by rapid cell division; can be benign or malignant

occlude/occlusion

the blockage or closing of a blood vessel

pack-year

as relates to tobacco smoking history, one pack-year = smoking one pack of 20 cigarettes per day for one year

partial volume averaging

a type of artifact that yields a CT number (HU) representative of the average attenuation of the materials within a voxel

plaque

a composite of fat, cholesterol, calcium, and other substances found in the blood; over time, plaque can harden and narrow the arteries, especially in the heart. *Hard* plaque is usually calcified and causes narrowing of the artery; *soft* or *vulnerable* plaque may be buried in the wall of the artery and is typically caused by inflammation; does not typically cause narrowing of the artery

polychromatic beam

in CT, a beam that produces photons of varying energies; a monochromatic beam produces photons having the same energy; also poly-energetic and mono-energetic

polyp

a projecting growth from a flat mucous surface

polypoid

resembling a polyp; nonpolypoid lesions are flat, indented, or depressed

positive predictive value

the probability that subjects with a positive screening test truly do have the disease

prospective triggering

a cardiac CT scanning technique that lowers radiation dose by scanning the heart axially in a step-and-shoot format

R to R interval

the time between one heart beat and the next

radon

a tasteless, odorless, and colorless gas that occurs naturally in the ground as a result of uranium decay

region of interest (ROI)

keyboard-controlled identification of a particular area of an image for numerical analysis, as well as the area of anatomy being scanned that is of importance to the image

retrospective triggering

a cardiac CT scanning technique using helical scanning for patients who have rapid heartbeats or arrhythmias. Employing electrocardiographic gating dose modulation helps lower radiation dose, which runs higher for retrospective than for prospective triggering.

second-hand smoke

smoke from burning tobacco products that is inhaled involuntarily

sinus bradycardia

a sinus rhythm with a resting heart rate of ≤ 60 bpm; normal heart rhythm set by the heart's natural pacemaker; the sinus node.

Symptoms typically do not occur until the heart rate drops < 50 bpm.

spatial resolution

defines how much detail is captured in an image and is dependent on the matrix size acquired

statin therapy

a course of medication to lower cholesterol levels if diet and exercise are ineffective

subcutaneous

under the skin; a subcutaneous injection is the insertion of the needle just under the skin

systolic

the top and higher number of a blood pressure reading that measures the pressure in the arteries when the heart is beating/contracting

temporal resolution

in cardiac CTA, the duration of time for the acquisition of a single frame of multiple frame captures

third-hand smoke

residual nicotine and other chemicals left on indoor surfaces by tobacco smoke

triage

the process of classifying patients based on their need for immediate medical attention

viscera

internal organs of the body located within the chest and abdomen. In a figurative sense, something "visceral" is felt "deep down," having a "gut feeling."

volume rendering

a set of postprocessing techniques used to display a 2D projection of a 3D dataset