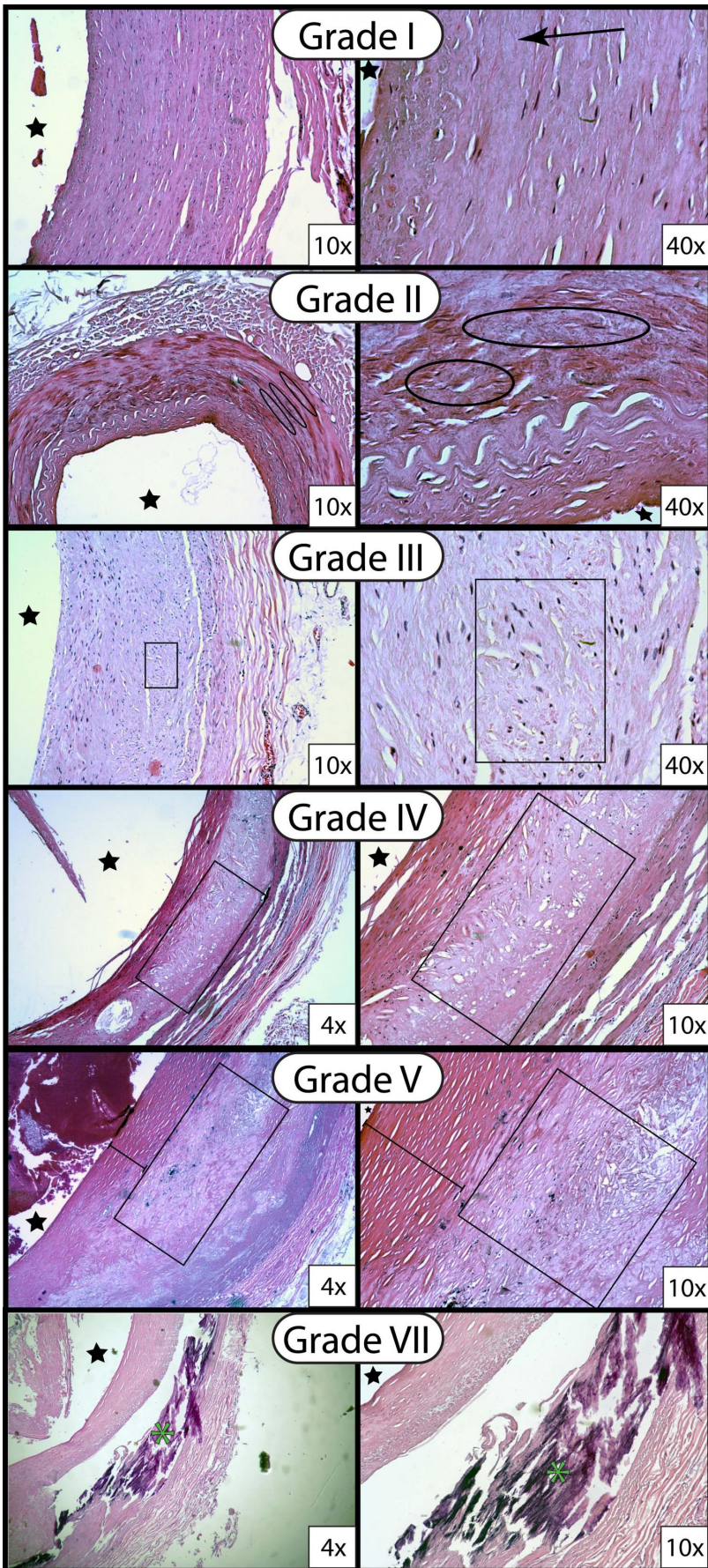


Assessing heart disease risk is within arm's reach

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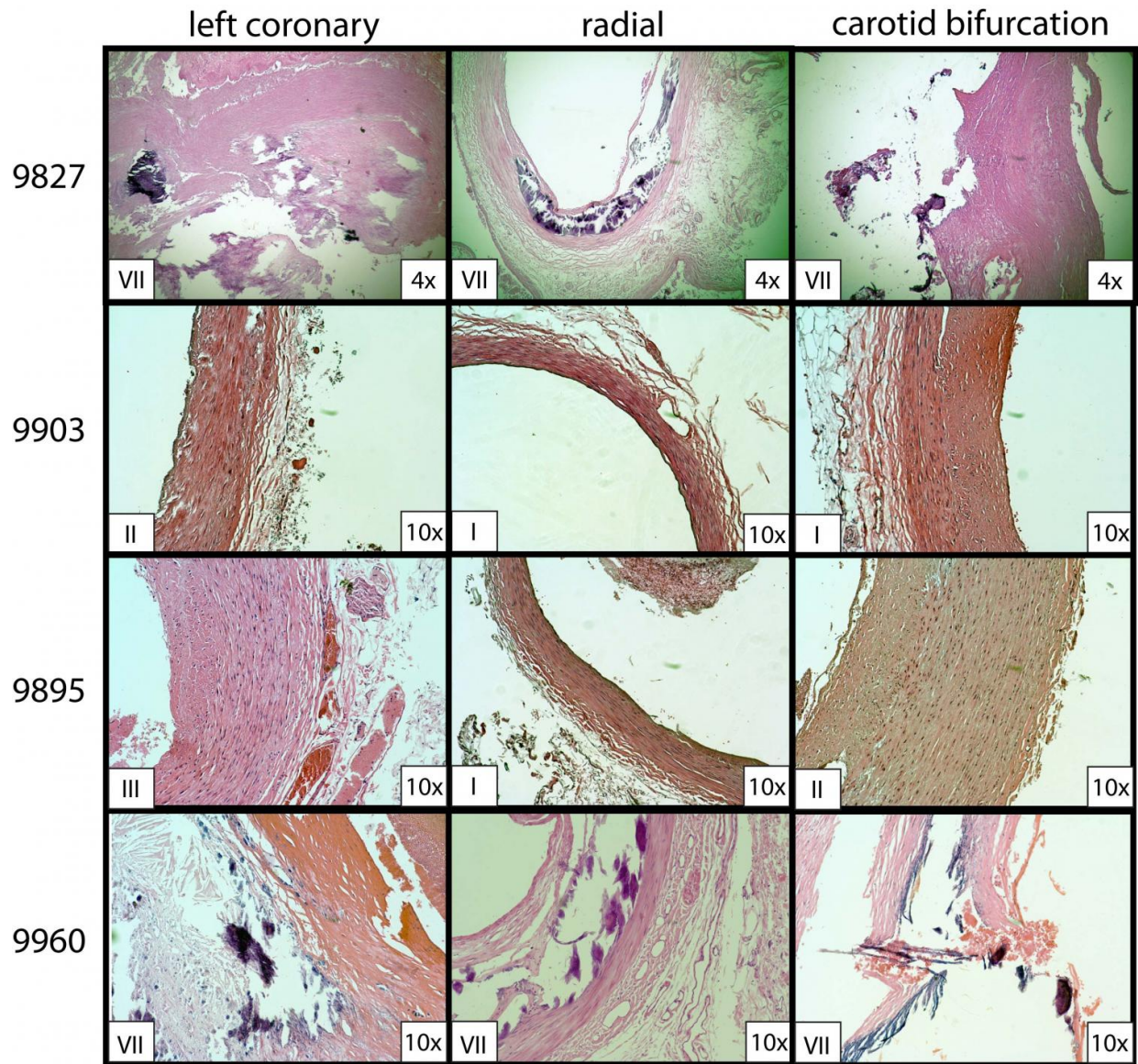
This figure demonstrates the histological grading scale that was used in accordance with the American Heart Association (AHA) to assign grades of atherosclerosis. The purpose of this figure is to give criteria and explain why sections were assigned specific grades. Sections are stained in hematoxylin and eosin. Stars indicate the vessel lumen. Horizontal panels represent each grade observed in the study, I-VII (excluding VI). The vertical columns depict the same sections at different magnifications. Grade I: only isolated macrophage foam cells are present (highlighted by the arrow). This is a section of the external carotid artery. Grade II: macrophage foam cells are apparent here in layers, encircled by the elliptical shapes. This is a section of posterior tibial artery. Grade III: has small pools of extracellular lipids visible, depicted by the rectangle. This is a section of the vertebral artery. Grade IV: exhibits the presence of a large confluent extracellular lipid pool, indicated by the rectangle. This is a section of the femoral artery. Grade V: has apparently thickened fibromuscular tissue layer, appreciated by the line with brackets. An extracellular lipid pool is also present here, indicated by the rectangle. This is a section of the internal carotid artery. Grade VII: calcification predominates the tunica of the vessel wall, indicated by the green asterisk. This is a section of the radial artery. Credit: Christopher Hoehmann, NYIT Medical Student

Atherosclerosis, commonly known as hardening of the arteries, has long been seen as a strong indicator of coronary artery disease, as compared to the traditional risk factors of race, age, gender and metabolic profile. Unlike other diseases that affect many people, atherosclerosis currently has no simple way to diagnose or monitor response to treatment.

Now, a new study published in *The Anatomical Record* finds that peripheral [arteries](#), easily accessible by ultrasound, may be useful for assessing a patient's risk for ischemic cardiovascular disease, thus becoming an important diagnostic tool. While previous research had primarily used ultrasound, a research team at New York Institute of

Technology College of Osteopathic Medicine (NYITCOM) Department of Anatomy performed a study using histopathology to more accurately grade [atherosclerosis](#) development; findings suggest the possibility of introducing a new way to measure systemic atherosclerosis: the radial artery.

"Peripheral Arteries May Be Reliable Indicators of Coronary Vascular Disease," is authored by Brian L. Beatty, Ph.D., and Bennett Futterman, M.D., both associate professors of Anatomy at NYITCOM, and Christopher Hoehmann, a third-year [medical student](#) there. In their research, the authors studied the arteries of 48 cadavers to determine risk factors for atherosclerosis, sampling 13 arterial segments from each of the donated cadavers, including segments of carotid, central and peripheral arteries.



The purpose of this figure is to demonstrate the similar pathology noted in different vessels of the same individual, ultimately suggesting an underlying relationship between them. Each horizontal panel depicts samples collected from a single individual; samples from four individuals are displayed here. The numbers on the left border of the figure represent the assigned cadaver number. The numeral on the bottom left corner of each photo represents the section's assigned grade, while the number on the bottom right corner indicates the magnification. Each vertical column depicts sections of a specific vessel sampled from each cadaver: the radial, carotid bifurcation, and left coronary arteries. The radial artery is a peripheral artery, the bifurcation is a carotid artery, and the left

coronary is a central artery. Credit: Christopher Hoehmann, NYIT Medical Student

"It is very gratifying to combine the work perspectives of an analytical anatomist with those of a physician and a medical student to leverage synergies and discover outcomes that can be applied in a clinical setting", said Beatty.

Specifically, the researchers utilized histopathology to confirm as well as expand the search for correlations among arteries compared to other arteries that may associate with ischemic diseases. To investigate the distribution of atherosclerosis in various arteries throughout the body, they sampled segments from the carotid arteries and from peripheral vessels and compared them to clinically relevant central arteries of the torso.

Importantly, the NYITCOM study demonstrates that the radial artery, a peripheral vessel, exhibited a positive correlation between both the pathologic left coronary and bifurcation of the carotid arteries. As such, they propose investigating the radial artery as a clinically accessible location to monitor with ultrasound when assessing a patient's risk for ischemic cardiovascular [disease](#). Further studies should be carried out evaluating the clinical utility of [radial artery](#) ultrasonography to assess cardiovascular risk.

More information: CHRISTOPHER L. HOEHMANN et al, Peripheral Arteries May Be Reliable Indicators of Coronary Vascular Disease, *The Anatomical Record* (2017). [DOI: 10.1002/ar.23584](https://doi.org/10.1002/ar.23584)

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