Wires, Catheters, and More: A Primer for Residents and Fellows Entering Interventional Radiology[1]

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The full digital presentation is available online.

Residents and fellows entering the field of interventional radiology often lack knowledge regarding the appearance, basic properties, and uses of various interventional needles, wires, catheters, and sheaths. They often are unfamiliar with the basic nomenclature surrounding these tools and do not understand the interrelationships of the French, inch, and gauge measurement systems. In addition, they may lack understanding about why one wire, catheter, sheath, or needle should be used rather than another. This knowledge deficit can lead to inefficiency and confusion for the training radiologist during interventional procedures and can potentially compromise patient care. A consolidated resource that contains this information is not widely available in textbooks or other literature.

TEACHING POINTS

- An image-rich chart that lists wires according to diameter, stiffness, and hydrophilic or nonhydrophilic property provides residents and new fellows with information to identify and understand the characteristics of different interventional wires.
- Knowledge of the nomenclature and conversion principles related to wires, catheters, needles, and sheaths aids in problem solving when interventional tools with different units of measure are used.
- Needles are color coded for easy identification, and sheath size correlates with sheath color.
- Practice cases that describe common procedures allow radiology residents and fellows to use the knowledge gained to select the appropriate needle, catheter, wire, or sheath for a particular procedure.

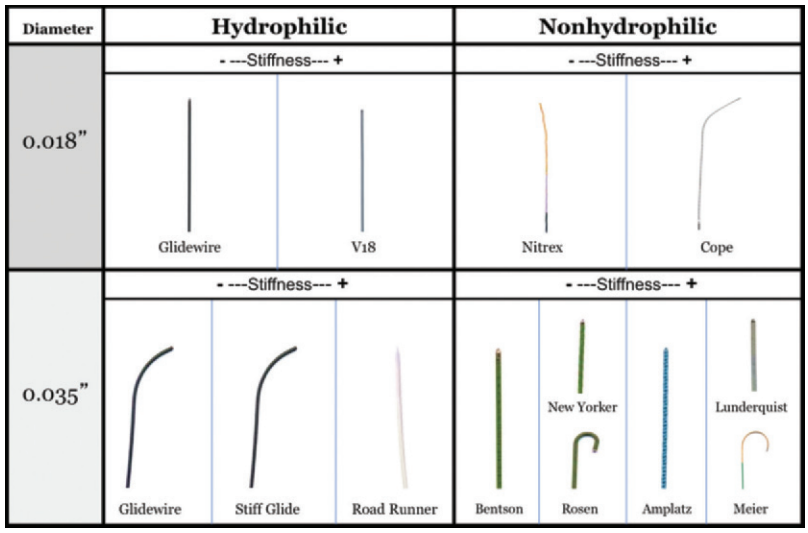

Figure 1. Chart shows commonly used types of interventional wires organized by diameter (in inches), stiffness (low [–] to high [+]), and hydrophilic or nonhydrophilic property. (Glidewire, Stiff Glide: Terumo Medical, Somerset, NJ; V18, Amplatz, Meier: Boston Scientific, Marlborough, Mass; Nitrex: ev3, Plymouth, Minn; Cope, Roadrunner, Bentson, New Yorker, Rosen, Lunderquist: Cook Medical, Bloomington, Ind.)

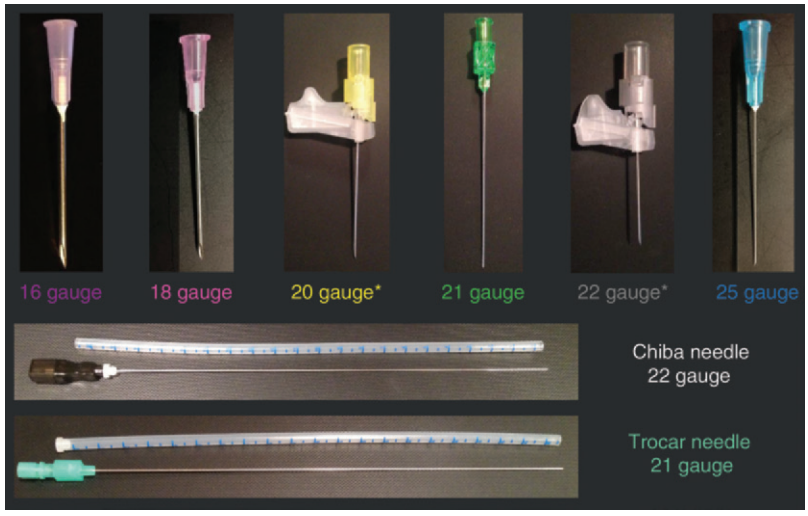

Figure 2. Photograph shows basic needles organized by gauge. The color-coded hub can be used to identify the needle gauge. * = safety lock attached. (All needles shown are produced by Cook Medical.)

The full online presentation provides a pictorial guide that showcases the basic needles, wires, catheters, and sheaths used in interventional radiology (Figs 1, 2) and describes their identifying features and nomenclature. Wires are described according to their diameter, stiffness, and hydrophilic or nonhydrophilic property. Knowledge of the nomenclature and conversion principles related to wires, catheters, needles, and sheaths aids in problem solving when interventional tools with different units of measure are used. Case studies are presented to allow radiology residents and fellows to apply this knowledge to commonly encountered situations in interventional radiology. Increased understanding of these tools will allow radiology residents and fellows to communicate more effectively with other staff members, think critically about equipment utilization, and increase their productivity during interventional procedures.

Suggested Readings

Kadir S. Teaching atlas of interventional radiology: non-vascular interventional procedures. New York, NY: Thieme Medical, 2006.

Kandarpa K, Aruny J. Handbook of interventional radiologic procedures. 3rd ed. Philadelphia, Pa: Lippincott, Williams & Wilkins, 2002.

Mandell J. Core radiology: a visual approach to diagnostic imaging. Cambridge, England: Cambridge University Press, 2013.

Reiser MF, Hricak H, Knauth M. Vascular interventional radiology: current evidence in endovascular surgery. Heidelberg, Germany: Springer, 2012.

Seldinger SI. Catheter replacement of the needle in percutaneous arteriography: a new technique. Acta Radiol 1953:39 (5):368–376.