A single-stent retriever is a medical device used in neurointerventional procedures, particularly in the treatment of acute ischemic stroke, to remove blood clots from the arteries in the brain. It is typically deployed via a catheter inserted into the femoral artery and navigated to the site of the clot within the cerebral vasculature.

Key Features of Single-Stent Retrievers: Design and Mechanism:

The device consists of a single stent, usually made from a flexible, biocompatible material such as nitinol (a nickel-titanium alloy). The stent has a mesh-like structure that expands upon deployment. Once the device reaches the site of the clot, the stent is deployed and expands to engage the clot, trapping it within the stent's structure. After the clot is captured, the retriever is retracted, pulling the clot out of the vessel and restoring blood flow to the brain. Indications:

Single-stent retrievers are primarily used in endovascular thrombectomy procedures for patients with acute ischemic stroke caused by large vessel occlusion. They are especially effective in cases where a single clot is blocking blood flow in a major artery, such as the internal carotid artery or middle cerebral artery. Size and Fit:

Stent retrievers come in various sizes to accommodate different artery diameters and clot types. The appropriate size is chosen based on the size of the occluded artery and the characteristics of the clot. Deployment and Retrieval:

Deployment: The retriever is advanced through a catheter to the site of the clot. Upon reaching the occlusion, the stent is deployed. Retrieval: The stent is then retracted, and the clot is pulled back through the catheter, typically via a combination of mechanical force and aspiration. Advantages:

High Clot Capture Efficiency: Single-stent retrievers are highly effective in capturing and retrieving large clots. Faster Procedure: They simplify the clot retrieval process, as a single stent can capture and remove the clot quickly. Minimally Invasive: The procedure is less invasive than surgical approaches, as it is done endovascularly (through blood vessels). Common Devices:

Solitaire™ by Medtronic and Trevo™ by Stryker are two well-known examples of single-stent retrievers used for acute ischemic stroke thrombectomy procedures. Clinical Use:

The single-stent retriever is most effective when used within the first 6 to 24 hours of an ischemic stroke, depending on the patient's condition, to restore blood flow and reduce the risk of permanent brain damage. Conclusion: The single-stent retriever is a critical tool in modern stroke management, allowing for faster, safer, and more effective clot retrieval. It has revolutionized the treatment of ischemic stroke, providing patients with the potential for better recovery and reduced disability when performed in a timely manner.