A multiple lumen vascular access introducer sheath having a main lumen for introduction of another device such as a catheter therethrough and into the vascular system and a secondary lumen having a cross-sectional area significantly less than that of the main lumen for infusion of small doses of medication therethrough at a controlled rate and directly into the vascular system. The introducer sheath comprises a tubular member of an inelastic, semi-rigid plastic material such as fluorinated ethylene propylene or nylon. The main lumen extends longitudinally through the tubular member and opens at the distal and proximal ends thereof. The secondary lumen is positioned adjacent to and separated from the main lumen with a cross-sectional area approximately fifteen percent of that of the main lumen. The distal end of the tubular member is tapered with the distal end of the secondary lumen closed. The secondary lumen has a side port near the tapered distal end. The sheath also includes a hub with main and secondary passages communicating with the main and secondary lumens of the tubular member. The longitudinal axes of the main passages are substantially parallel to one another. The secondary passage extends laterally from the secondary lumen of the tubular member which is recessed from the proximal end thereof. The hub also includes a third passage communicating with and extending laterally from the main lumen of the tubular member.