The posterior intercostal veins accompany the posterior intercostal arteries, lying above them, in the intercostal spaces. There are eleven pairs and close to the vertebral column each receives a posterior tributary, which drain blood from the prevertebral muscles and skin and the vertebral venous plexuses.

The first posterior intercostal vein ascends anterior to the neck of the first rib, above the pleura to unite with the brachiocephalic or vertebral veins. The remainder of the posterior intercostal veins ultimately drain into the azygos system of veins; on the right the second to fourth veins form the superior intercostal vein, with the remainder draining directly into the azygos vein. On the left the second and third veins form the superior intercostal vein; the fourth to eighth drain into the accessory hemiazygos vein and the ninth to eleventh drain into the hemiazygos vein.