

Peripheral Artery Disease Treatment: Systematic Review with SAIMSARA.

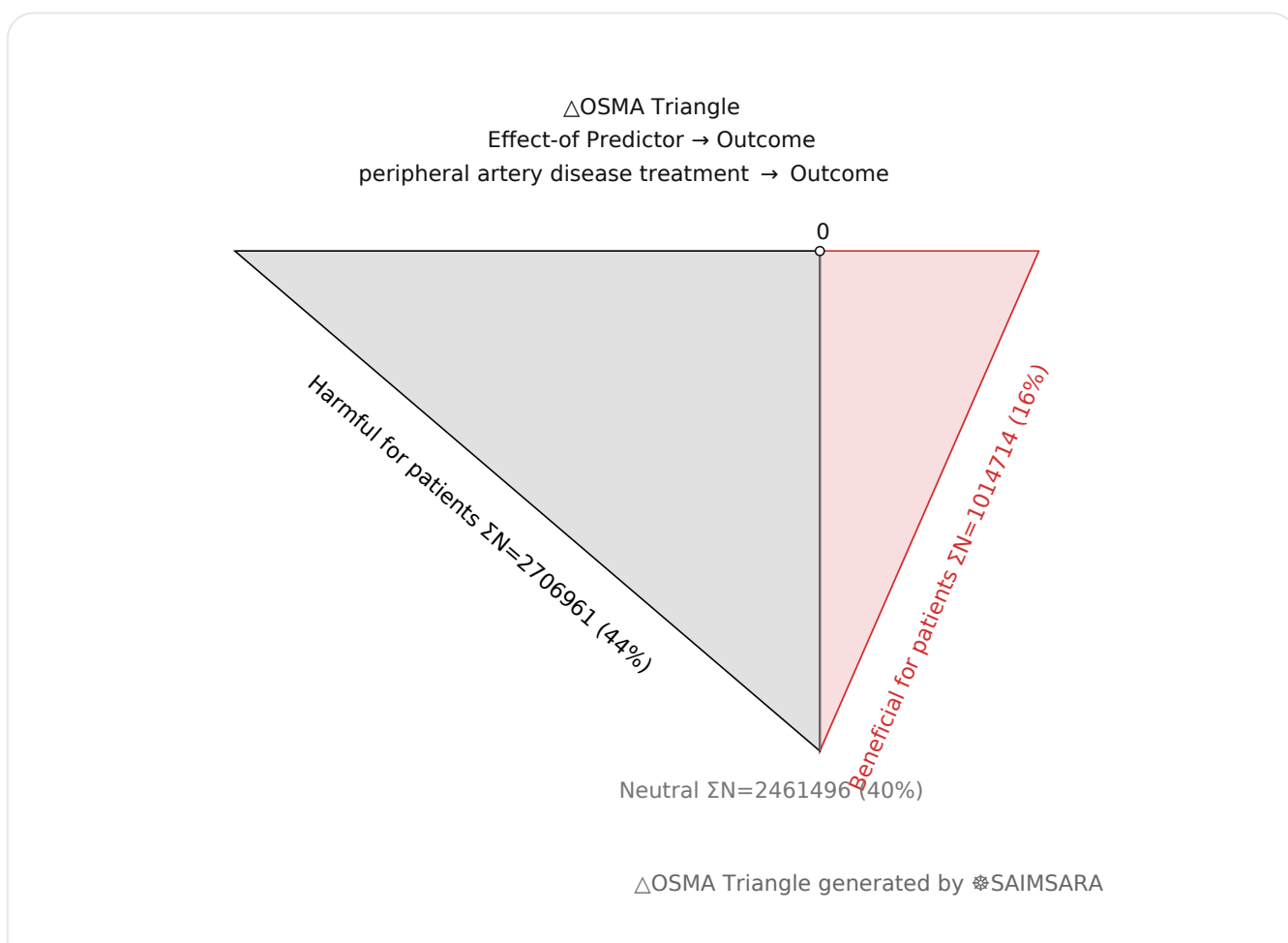
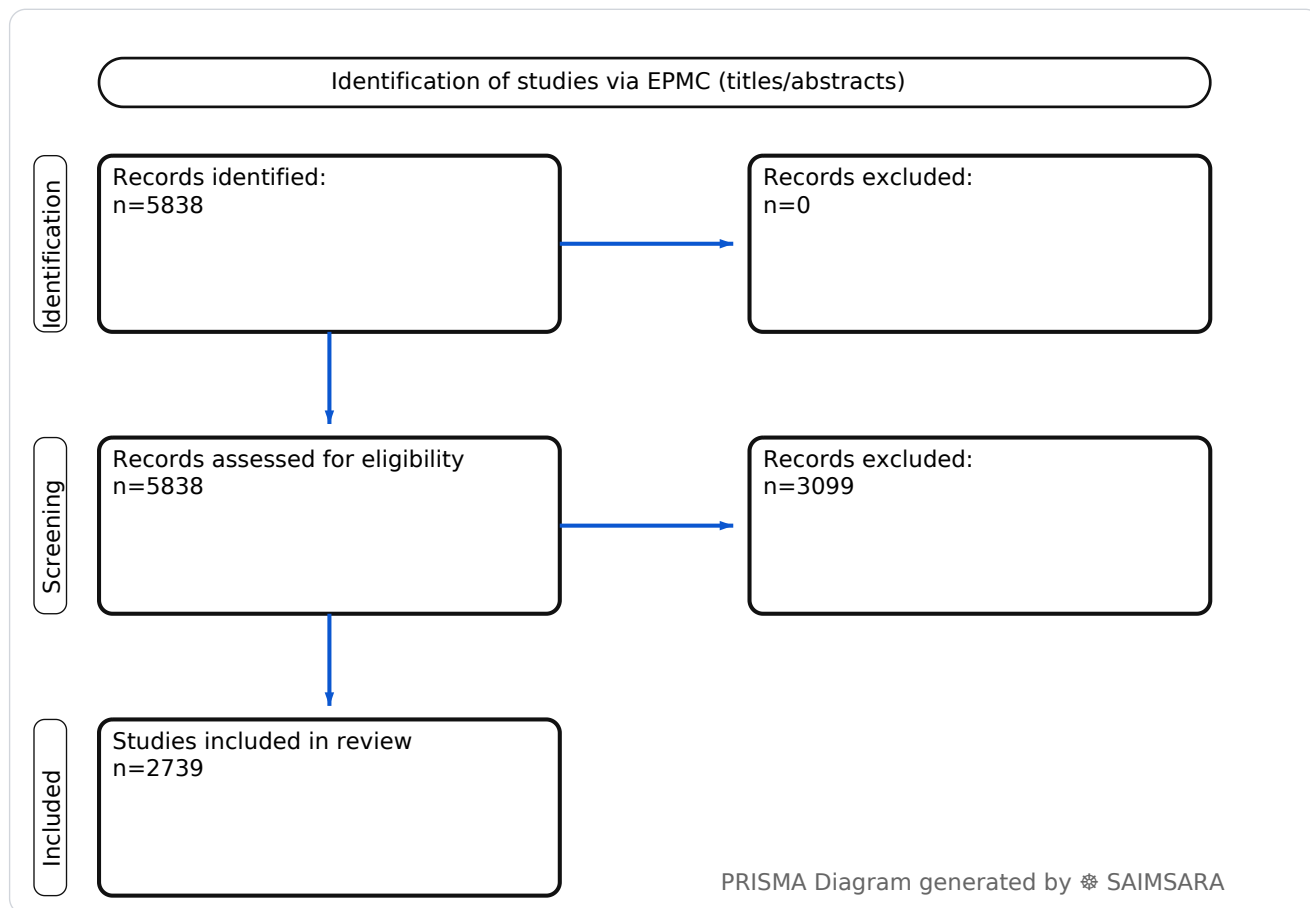
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Abstract: This systematic review aims to synthesize the current evidence on peripheral artery disease treatment, identify key findings regarding intervention efficacy and safety, delineate influential prognostic factors, and highlight significant gaps in research to guide future clinical practice and study design. The review utilises 2739 studies with 6183171 total participants (naïve ΣN). Endovascular interventions for peripheral artery disease demonstrate a high median technical success rate of 97%, with a range from 75% to 100% across various techniques and lesion types. This high procedural success highlights the immediate feasibility of these approaches across diverse patient populations and anatomical challenges. However, the heterogeneous study designs, particularly the mix of observational studies and trials with varying follow-up periods, limit the certainty of long-term comparative effectiveness. A critical next step is to conduct large-scale, pragmatic randomized controlled trials with standardized outcome measures to definitively compare revascularization strategies and optimize long-term patient care.

Keywords: Peripheral Artery Disease; Endovascular Therapy; Surgical Revascularization; Pharmacotherapy; Critical Limb Ischemia; Am

Review Stats

- Generated: 2026-01-30 19:21:42 CET
- Plan: Pro (expanded craft tokens; source: Europe PMC)
- Source: Europe PMC
- Scope: Titles/Abstracts (tiab)
- Keyword Gate: Fuzzy ($\geq 60\%$ of required terms, minimum 2 terms matched in title/abstract)
- Total Abstracts/Papers: 5838
- Downloaded Abstracts/Papers: 5838
- Included original Abstracts/Papers: 2739
- Total study participants (naïve ΣN): 6183171



Outcome-Sentiment Meta-Analysis (OSMA): (LLM-only)

Frame: Effect-of Predictor → Outcome • *Source:* Europe PMC

Outcome: Outcome Typical timepoints: 1-y, 12-mo. Reported metrics: %, CI, p.

Common endpoints: Common endpoints: mortality, complications, patency.

Predictor: peripheral artery disease treatment — exposure/predictor. Doses/units seen: 1.0 mg, 3g, 2.5 mg, 100 mg, 70 mg, 25 l.... Routes seen: oral, intravenous, iv, topical.... Typical comparator: vein bypass, plain old balloon angioplasty, aspirin alone, those with pad on medication.....

- **1) Beneficial for patients** — Outcome with peripheral artery disease treatment — [26], [34], [36], [39], [40], [41], [42], [43], [46], [49], [82], [83], [92], [93], [100], [176], [178], [179], [180], [181], [184], [185], [187], [189], [191], [192], [205], [206], [210], [212], [213], [214], [216], [218], [226], [231], [232], [233], [241], [242], [247], [248], [250], [276], [281], [293], [296], [297], [301], [305], [310], [311], [312], [313], [314], [320], [322], [323], [353], [356], [358], [360], [361], [364], [365], [366], [370], [373], [374], [375], [376], [377], [380], [381], [382], [385], [391], [392], [394], [396], [400], [402], [404], [405], [406], [409], [411], [412], [416], [419], [423], [427], [431], [433], [437], [438], [440], [441], [446], [449], [452], [453], [454], [456], [458], [460], [462], [463], [465], [466], [467], [471], [473], [474], [576], [583], [584], [588], [590], [592], [593], [597], [602], [607], [608], [615], [617], [618], [619], [622], [624], [625], [627], [642], [648], [649], [650], [676], [677], [678], [681], [682], [686], [687], [689], [690], [691], [700], [701], [703], [704], [705], [709], [712], [713], [715], [721], [722], [724], [725], [727], [732], [733], [737], [741], [748], [750], [754], [755], [756], [759], [764], [778], [781], [783], [786], [788], [789], [792], [793], [798], [800], [851], [856], [858], [861], [867], [872], [873], [875], [878], [883], [888], [889], [891], [904], [907], [908], [910], [913], [916], [918], [921], [922], [923], [925], [1002], [1004], [1005], [1007], [1009], [1011], [1012], [1015], [1017], [1018], [1019], [1021], [1022], [1023], [1024], [1025], [1031], [1032], [1035], [1037], [1038], [1042], [1048], [1050], [1103], [1106], [1112], [1113], [1115], [1118], [1119], [1121], [1202], [1205], [1213], [1219], [1221], [1222], [1225], [1228], [1229], [1231], [1233], [1234], [1236], [1238], [1239], [1240], [1241], [1243], [1248], [1249], [1250], [1302], [1303], [1307], [1308], [1309], [1317], [1318], [1320], [1321], [1323], [1327], [1331], [1332], [1337], [1340], [1347], [1349], [1350], [1403], [1410], [1413], [1415], [1420], [1422], [1435], [1441], [1442], [1444], [1447], [1451], [1456], [1459], [1469], [1471], [1472], [1473], [1475], [1576], [1579], [1582], [1584], [1586], [1588], [1590], [1591], [1593], [1596], [1635], [1645], [1647], [1649], [1654], [1662], [1665], [1669], [1677], [1678], [1682], [1683], [1684], [1685], [1688], [1689], [1690], [1691], [1695], [1696], [1699], [1700], [1701], [1702],

[1704], [1706], [1709], [1710], [1711], [1717], [1720], [1722], [1723], [1725], [1851], [1854], [1855], [1856], [1859], [1861], [1865], [1866], [1867], [1868], [1869], [1871], [1882], [1890], [1901], [1905], [1906], [1907], [1909], [1915], [1919], [1921], [1923], [1924], [1925], [1976], [1977], [1979], [1982], [1984], [1985], [1986], [1987], [1988], [1993], [1998], [2000], [2027], [2028], [2029], [2030], [2031], [2034], [2037], [2040], [2041], [2045], [2047], [2048], [2050], [2079], [2080], [2081], [2082], [2084], [2086], [2089], [2090], [2092], [2093], [2095], [2101], [2104], [2105], [2108], [2109], [2113], [2114], [2118], [2120], [2122], [2163], [2167], [2169], [2175], [2177], [2178], [2180], [2184], [2185], [2189], [2192], [2195], [2202], [2203], [2205], [2207], [2209], [2210], [2211], [2213], [2214], [2215], [2217], [2219], [2223], [2224], [2225], [2228], [2229], [2230], [2231], [2232], [2234], [2235], [2237], [2238], [2240], [2241], [2242], [2244], [2248], [2250], [2252], [2257], [2264], [2267], [2272], [2273], [2274], [2275], [2278], [2283], [2284], [2285], [2286], [2291], [2295], [2296], [2297], [2300], [2303], [2309], [2315], [2318], [2319], [2322], [2328], [2330], [2337], [2338], [2340], [2341], [2343], [2344], [2348], [2350], [2354], [2358], [2360], [2365], [2369], [2374], [2375], [2455], [2460], [2461], [2462], [2464], [2467], [2469], [2470], [2472], [2473], [2475], [2479], [2483], [2484], [2486], [2487], [2488], [2489], [2491], [2493], [2494], [2496], [2497], [2500], [2502], [2503], [2504], [2506], [2507], [2510], [2512], [2515], [2519], [2520], [2521], [2526], [2527], [2528], [2534], [2535], [2536], [2537], [2538], [2540], [2541], [2542], [2543], [2545], [2547], [2548], [2549], [2576], [2577], [2579], [2584], [2588], [2589], [2590], [2592], [2596], [2602], [2604], [2607], [2617], [2618], [2619], [2625], [2652], [2654], [2655], [2657], [2661], [2663], [2664], [2665], [2667], [2669], [2670], [2672], [2678], [2681], [2682], [2683], [2684], [2687], [2688], [2689], [2691], [2692], [2696], [2698], [2699], [2702], [2704], [2707], [2709], [2711], [2712], [2713], [2714], [2716], [2719], [2720], [2724], [2725], [2726], [2728], [2730], [2731], [2732], [2734], [2735], [2736], [2738], [2739] — ΣN=1014714

• **2) Harmful for patients** — Outcome with peripheral artery disease treatment —

[27], [37], [50], [76], [84], [94], [177], [182], [186], [188], [195], [196], [197], [198], [200], [203], [204], [208], [219], [220], [221], [222], [225], [235], [236], [239], [240], [243], [245], [246], [249], [280], [284], [291], [292], [298], [299], [302], [304], [306], [315], [316], [317], [318], [319], [325], [354], [355], [363], [369], [371], [372], [379], [384], [387], [390], [395], [399], [407], [408], [414], [426], [430], [434], [447], [450], [451], [457], [459], [461], [470], [475], [577], [578], [579], [580], [581], [585], [586], [589], [591], [595], [596], [598], [599], [600], [601], [636], [637], [639], [640], [647], [679], [683], [697], [698], [702], [711], [714], [717], [718], [743], [757], [760], [762], [765], [766], [767], [770], [775], [785], [787], [852], [854], [857], [859], [868], [871], [874], [879], [880], [882], [885], [886], [887], [892], [897], [899], [900], [906], [911], [924], [1010], [1020], [1040], [1041], [1049], [1102], [1105], [1109], [1111], [1114],

[1116], [1117], [1120], [1124], [1125], [1204], [1206], [1208], [1216], [1220], [1226], [1230], [1237], [1247], [1315], [1322], [1325], [1333], [1334], [1341], [1345], [1346], [1348], [1401], [1402], [1405], [1407], [1409], [1421], [1423], [1426], [1434], [1440], [1445], [1454], [1460], [1465], [1466], [1474], [1581], [1589], [1594], [1595], [1597], [1599], [1600], [1628], [1630], [1637], [1639], [1640], [1646], [1648], [1650], [1655], [1656], [1657], [1664], [1668], [1675], [1679], [1681], [1697], [1698], [1705], [1708], [1712], [1715], [1718], [1719], [1724], [1873], [1874], [1875], [1879], [1885], [1889], [1898], [1900], [1908], [1918], [1978], [1980], [1990], [1991], [1992], [1996], [2026], [2033], [2035], [2036], [2046], [2087], [2094], [2096], [2097], [2098], [2100], [2102], [2103], [2115], [2123], [2155], [2166], [2168], [2179], [2186], [2188], [2199], [2200], [2204], [2206], [2208], [2212], [2216], [2218], [2226], [2227], [2249], [2259], [2260], [2261], [2262], [2269], [2270], [2289], [2290], [2299], [2316], [2320], [2321], [2325], [2332], [2349], [2363], [2364], [2370], [2373], [2452], [2456], [2463], [2466], [2468], [2474], [2490], [2522], [2524], [2525], [2550], [2593], [2594], [2595], [2600], [2610], [2616], [2624], [2656], [2662], [2666], [2671], [2673], [2674], [2675], [2700], [2705], [2706], [2710], [2717], [2721], [2722], [2727] — ΣN=2706961

- **3) No clear effect** — Outcome with peripheral artery disease treatment — [1], [2], [3], [4], [5], [6], [7], [8], [9], [10], [11], [12], [13], [14], [15], [16], [17], [18], [19], [20], [21], [22], [23], [24], [25], [28], [29], [30], [31], [32], [33], [35], [38], [44], [45], [47], [48], [51], [52], [53], [54], [55], [56], [57], [58], [59], [60], [61], [62], [63], [64], [65], [66], [67], [68], [69], [70], [71], [72], [73], [74], [75], [77], [78], [79], [80], [81], [85], [86], [87], [88], [89], [90], [91], [95], [96], [97], [98], [99], [101], [102], [103], [104], [105], [106], [107], [108], [109], [110], [111], [112], [113], [114], [115], [116], [117], [118], [119], [120], [121], [122], [123], [124], [125], [126], [127], [128], [129], [130], [131], [132], [133], [134], [135], [136], [137], [138], [139], [140], [141], [142], [143], [144], [145], [146], [147], [148], [149], [150], [151], [152], [153], [154], [155], [156], [157], [158], [159], [160], [161], [162], [163], [164], [165], [166], [167], [168], [169], [170], [171], [172], [173], [174], [175], [183], [190], [193], [194], [199], [201], [202], [207], [209], [211], [215], [217], [223], [224], [227], [228], [229], [230], [234], [237], [238], [244], [251], [252], [253], [254], [255], [256], [257], [258], [259], [260], [261], [262], [263], [264], [265], [266], [267], [268], [269], [270], [271], [272], [273], [274], [275], [277], [278], [279], [282], [283], [285], [286], [287], [288], [289], [290], [294], [295], [300], [303], [307], [308], [309], [321], [324], [326], [327], [328], [329], [330], [331], [332], [333], [334], [335], [336], [337], [338], [339], [340], [341], [342], [343], [344], [345], [346], [347], [348], [349], [350], [351], [352], [357], [359], [362], [367], [368], [378], [383], [386], [388], [389], [393], [397], [398], [401], [403], [410], [413], [415], [417], [418], [420], [421], [422], [424], [425], [428], [429], [432], [435], [436], [439], [442], [443], [444], [445], [448], [455], [464], [468], [469], [472], [476], [477],

[478], [479], [480], [481], [482], [483], [484], [485], [486], [487], [488], [489], [490], [491], [492], [493], [494], [495], [496], [497], [498], [499], [500], [501], [502], [503], [504], [505], [506], [507], [508], [509], [510], [511], [512], [513], [514], [515], [516], [517], [518], [519], [520], [521], [522], [523], [524], [525], [526], [527], [528], [529], [530], [531], [532], [533], [534], [535], [536], [537], [538], [539], [540], [541], [542], [543], [544], [545], [546], [547], [548], [549], [550], [551], [552], [553], [554], [555], [556], [557], [558], [559], [560], [561], [562], [563], [564], [565], [566], [567], [568], [569], [570], [571], [572], [573], [574], [575], [582], [587], [594], [603], [604], [605], [606], [609], [610], [611], [612], [613], [614], [616], [620], [621], [623], [626], [628], [629], [630], [631], [632], [633], [634], [635], [638], [641], [643], [644], [645], [646], [651], [652], [653], [654], [655], [656], [657], [658], [659], [660], [661], [662], [663], [664], [665], [666], [667], [668], [669], [670], [671], [672], [673], [674], [675], [680], [684], [685], [688], [692], [693], [694], [695], [696], [699], [706], [707], [708], [710], [716], [719], [720], [723], [726], [728], [729], [730], [731], [734], [735], [736], [738], [739], [740], [742], [744], [745], [746], [747], [749], [751], [752], [753], [758], [761], [763], [768], [769], [771], [772], [773], [774], [776], [777], [779], [780], [782], [784], [790], [791], [794], [795], [796], [797], [799], [801], [802], [803], [804], [805], [806], [807], [808], [809], [810], [811], [812], [813], [814], [815], [816], [817], [818], [819], [820], [821], [822], [823], [824], [825], [826], [827], [828], [829], [830], [831], [832], [833], [834], [835], [836], [837], [838], [839], [840], [841], [842], [843], [844], [845], [846], [847], [848], [849], [850], [853], [855], [860], [862], [863], [864], [865], [866], [869], [870], [876], [877], [881], [884], [890], [893], [894], [895], [896], [898], [901], [902], [903], [905], [909], [912], [914], [915], [917], [919], [920], [926], [927], [928], [929], [930], [931], [932], [933], [934], [935], [936], [937], [938], [939], [940], [941], [942], [943], [944], [945], [946], [947], [948], [949], [950], [951], [952], [953], [954], [955], [956], [957], [958], [959], [960], [961], [962], [963], [964], [965], [966], [967], [968], [969], [970], [971], [972], [973], [974], [975], [976], [977], [978], [979], [980], [981], [982], [983], [984], [985], [986], [987], [988], [989], [990], [991], [992], [993], [994], [995], [996], [997], [998], [999], [1000], [1001], [1003], [1006], [1008], [1013], [1014], [1016], [1026], [1027], [1028], [1029], [1030], [1033], [1034], [1036], [1039], [1043], [1044], [1045], [1046], [1047], [1051], [1052], [1053], [1054], [1055], [1056], [1057], [1058], [1059], [1060], [1061], [1062], [1063], [1064], [1065], [1066], [1067], [1068], [1069], [1070], [1071], [1072], [1073], [1074], [1075], [1076], [1077], [1078], [1079], [1080], [1081], [1082], [1083], [1084], [1085], [1086], [1087], [1088], [1089], [1090], [1091], [1092], [1093], [1094], [1095], [1096], [1097], [1098], [1099], [1100], [1101], [1104], [1107], [1108], [1110], [1122], [1123], [1126], [1127], [1128], [1129], [1130], [1131], [1132], [1133], [1134], [1135], [1136], [1137], [1138], [1139], [1140], [1141], [1142], [1143], [1144], [1145], [1146], [1147], [1148], [1149], [1150], [1151],

[1152], [1153], [1154], [1155], [1156], [1157], [1158], [1159], [1160], [1161], [1162], [1163], [1164], [1165], [1166], [1167], [1168], [1169], [1170], [1171], [1172], [1173], [1174], [1175], [1176], [1177], [1178], [1179], [1180], [1181], [1182], [1183], [1184], [1185], [1186], [1187], [1188], [1189], [1190], [1191], [1192], [1193], [1194], [1195], [1196], [1197], [1198], [1199], [1200], [1201], [1203], [1207], [1209], [1210], [1211], [1212], [1214], [1215], [1217], [1218], [1223], [1224], [1227], [1232], [1235], [1242], [1244], [1245], [1246], [1251], [1252], [1253], [1254], [1255], [1256], [1257], [1258], [1259], [1260], [1261], [1262], [1263], [1264], [1265], [1266], [1267], [1268], [1269], [1270], [1271], [1272], [1273], [1274], [1275], [1276], [1277], [1278], [1279], [1280], [1281], [1282], [1283], [1284], [1285], [1286], [1287], [1288], [1289], [1290], [1291], [1292], [1293], [1294], [1295], [1296], [1297], [1298], [1299], [1300], [1301], [1304], [1305], [1306], [1310], [1311], [1312], [1313], [1314], [1316], [1319], [1324], [1326], [1328], [1329], [1330], [1335], [1336], [1338], [1339], [1342], [1343], [1344], [1351], [1352], [1353], [1354], [1355], [1356], [1357], [1358], [1359], [1360], [1361], [1362], [1363], [1364], [1365], [1366], [1367], [1368], [1369], [1370], [1371], [1372], [1373], [1374], [1375], [1376], [1377], [1378], [1379], [1380], [1381], [1382], [1383], [1384], [1385], [1386], [1387], [1388], [1389], [1390], [1391], [1392], [1393], [1394], [1395], [1396], [1397], [1398], [1399], [1400], [1404], [1406], [1408], [1411], [1412], [1414], [1416], [1417], [1418], [1419], [1424], [1425], [1427], [1428], [1429], [1430], [1431], [1432], [1433], [1436], [1437], [1438], [1439], [1443], [1446], [1448], [1449], [1450], [1452], [1453], [1455], [1457], [1458], [1461], [1462], [1463], [1464], [1467], [1468], [1470], [1476], [1477], [1478], [1479], [1480], [1481], [1482], [1483], [1484], [1485], [1486], [1487], [1488], [1489], [1490], [1491], [1492], [1493], [1494], [1495], [1496], [1497], [1498], [1499], [1500], [1501], [1502], [1503], [1504], [1505], [1506], [1507], [1508], [1509], [1510], [1511], [1512], [1513], [1514], [1515], [1516], [1517], [1518], [1519], [1520], [1521], [1522], [1523], [1524], [1525], [1526], [1527], [1528], [1529], [1530], [1531], [1532], [1533], [1534], [1535], [1536], [1537], [1538], [1539], [1540], [1541], [1542], [1543], [1544], [1545], [1546], [1547], [1548], [1549], [1550], [1551], [1552], [1553], [1554], [1555], [1556], [1557], [1558], [1559], [1560], [1561], [1562], [1563], [1564], [1565], [1566], [1567], [1568], [1569], [1570], [1571], [1572], [1573], [1574], [1575], [1577], [1578], [1580], [1583], [1585], [1587], [1592], [1598], [1601], [1602], [1603], [1604], [1605], [1606], [1607], [1608], [1609], [1610], [1611], [1612], [1613], [1614], [1615], [1616], [1617], [1618], [1619], [1620], [1621], [1622], [1623], [1624], [1625], [1626], [1627], [1629], [1631], [1632], [1633], [1634], [1636], [1638], [1641], [1642], [1643], [1644], [1651], [1652], [1653], [1658], [1659], [1660], [1661], [1663], [1666], [1667], [1670], [1671], [1672], [1673], [1674], [1676], [1680], [1686], [1687], [1692], [1693], [1694], [1703], [1707], [1713], [1714], [1716], [1721], [1726], [1727], [1728], [1729], [1730], [1731], [1732], [1733], [1734], [1735], [1736], [1737],

[1738], [1739], [1740], [1741], [1742], [1743], [1744], [1745], [1746], [1747], [1748], [1749], [1750], [1751], [1752], [1753], [1754], [1755], [1756], [1757], [1758], [1759], [1760], [1761], [1762], [1763], [1764], [1765], [1766], [1767], [1768], [1769], [1770], [1771], [1772], [1773], [1774], [1775], [1776], [1777], [1778], [1779], [1780], [1781], [1782], [1783], [1784], [1785], [1786], [1787], [1788], [1789], [1790], [1791], [1792], [1793], [1794], [1795], [1796], [1797], [1798], [1799], [1800], [1801], [1802], [1803], [1804], [1805], [1806], [1807], [1808], [1809], [1810], [1811], [1812], [1813], [1814], [1815], [1816], [1817], [1818], [1819], [1820], [1821], [1822], [1823], [1824], [1825], [1826], [1827], [1828], [1829], [1830], [1831], [1832], [1833], [1834], [1835], [1836], [1837], [1838], [1839], [1840], [1841], [1842], [1843], [1844], [1845], [1846], [1847], [1848], [1849], [1850], [1852], [1853], [1857], [1858], [1860], [1862], [1863], [1864], [1870], [1872], [1876], [1877], [1878], [1880], [1881], [1883], [1884], [1886], [1887], [1888], [1891], [1892], [1893], [1894], [1895], [1896], [1897], [1899], [1902], [1903], [1904], [1910], [1911], [1912], [1913], [1914], [1916], [1917], [1920], [1922], [1926], [1927], [1928], [1929], [1930], [1931], [1932], [1933], [1934], [1935], [1936], [1937], [1938], [1939], [1940], [1941], [1942], [1943], [1944], [1945], [1946], [1947], [1948], [1949], [1950], [1951], [1952], [1953], [1954], [1955], [1956], [1957], [1958], [1959], [1960], [1961], [1962], [1963], [1964], [1965], [1966], [1967], [1968], [1969], [1970], [1971], [1972], [1973], [1974], [1975], [1981], [1983], [1989], [1994], [1995], [1997], [1999], [2001], [2002], [2003], [2004], [2005], [2006], [2007], [2008], [2009], [2010], [2011], [2012], [2013], [2014], [2015], [2016], [2017], [2018], [2019], [2020], [2021], [2022], [2023], [2024], [2025], [2032], [2038], [2039], [2042], [2043], [2044], [2049], [2051], [2052], [2053], [2054], [2055], [2056], [2057], [2058], [2059], [2060], [2061], [2062], [2063], [2064], [2065], [2066], [2067], [2068], [2069], [2070], [2071], [2072], [2073], [2074], [2075], [2076], [2077], [2078], [2083], [2085], [2088], [2091], [2099], [2106], [2107], [2110], [2111], [2112], [2116], [2117], [2119], [2121], [2124], [2125], [2126], [2127], [2128], [2129], [2130], [2131], [2132], [2133], [2134], [2135], [2136], [2137], [2138], [2139], [2140], [2141], [2142], [2143], [2144], [2145], [2146], [2147], [2148], [2149], [2150], [2151], [2152], [2153], [2154], [2156], [2157], [2158], [2159], [2160], [2161], [2162], [2164], [2165], [2170], [2171], [2172], [2173], [2174], [2176], [2181], [2182], [2183], [2187], [2190], [2191], [2193], [2194], [2196], [2197], [2198], [2201], [2220], [2221], [2222], [2233], [2236], [2239], [2243], [2245], [2246], [2247], [2251], [2253], [2254], [2255], [2256], [2258], [2263], [2265], [2266], [2268], [2271], [2276], [2277], [2279], [2280], [2281], [2282], [2287], [2288], [2292], [2293], [2294], [2298], [2301], [2302], [2304], [2305], [2306], [2307], [2308], [2310], [2311], [2312], [2313], [2314], [2317], [2323], [2324], [2326], [2327], [2329], [2331], [2333], [2334], [2335], [2336], [2339], [2342], [2345], [2346], [2347], [2351], [2352], [2353], [2355], [2356], [2357], [2359], [2361], [2362], [2366], [2367], [2368], [2371], [2372], [2376],

[2377], [2378], [2379], [2380], [2381], [2382], [2383], [2384], [2385], [2386], [2387], [2388], [2389], [2390], [2391], [2392], [2393], [2394], [2395], [2396], [2397], [2398], [2399], [2400], [2401], [2402], [2403], [2404], [2405], [2406], [2407], [2408], [2409], [2410], [2411], [2412], [2413], [2414], [2415], [2416], [2417], [2418], [2419], [2420], [2421], [2422], [2423], [2424], [2425], [2426], [2427], [2428], [2429], [2430], [2431], [2432], [2433], [2434], [2435], [2436], [2437], [2438], [2439], [2440], [2441], [2442], [2443], [2444], [2445], [2446], [2447], [2448], [2449], [2450], [2451], [2453], [2454], [2457], [2458], [2459], [2465], [2471], [2476], [2477], [2478], [2480], [2481], [2482], [2485], [2492], [2495], [2498], [2499], [2501], [2505], [2508], [2509], [2511], [2513], [2514], [2516], [2517], [2518], [2523], [2529], [2530], [2531], [2532], [2533], [2539], [2544], [2546], [2551], [2552], [2553], [2554], [2555], [2556], [2557], [2558], [2559], [2560], [2561], [2562], [2563], [2564], [2565], [2566], [2567], [2568], [2569], [2570], [2571], [2572], [2573], [2574], [2575], [2578], [2580], [2581], [2582], [2583], [2585], [2586], [2587], [2591], [2597], [2598], [2599], [2601], [2603], [2605], [2606], [2608], [2609], [2611], [2612], [2613], [2614], [2615], [2620], [2621], [2622], [2623], [2626], [2627], [2628], [2629], [2630], [2631], [2632], [2633], [2634], [2635], [2636], [2637], [2638], [2639], [2640], [2641], [2642], [2643], [2644], [2645], [2646], [2647], [2648], [2649], [2650], [2651], [2653], [2658], [2659], [2660], [2668], [2676], [2677], [2679], [2680], [2685], [2686], [2690], [2693], [2694], [2695], [2697], [2701], [2703], [2708], [2715], [2718], [2723], [2729], [2733], [2737] — ΣN=2461496

1) Introduction

Peripheral artery disease (PAD) is a prevalent atherosclerotic condition affecting millions globally, characterized by reduced blood flow to the limbs, often leading to debilitating symptoms such as claudication or critical limb-threatening ischemia (CLTI) [89, 458, 598]. The management of PAD is complex, encompassing a spectrum of interventions from lifestyle modifications and pharmacological therapies to advanced endovascular and surgical revascularization procedures [75, 89, 287]. Given its association with significant cardiovascular morbidity and mortality, alongside a substantial economic burden [44, 923, 1888], optimizing PAD treatment is a critical area of ongoing research. This paper synthesizes recent findings to provide a comprehensive overview of current treatment strategies, emerging therapies, and critical areas for future investigation.

2) Aim

This systematic review aims to synthesize the current evidence on peripheral artery disease treatment, identify key findings regarding intervention efficacy and safety, delineate influential

prognostic factors, and highlight significant gaps in research to guide future clinical practice and study design.

3) Methods

Systematic review with multilayer AI research agent: keyword normalization, retrieval & structuring, and paper synthesis (see SAIMSARA About section for details).

- **Bias:** Qualitatively inferred from study design fields. The included studies exhibit a high degree of heterogeneity in design, ranging from retrospective and prospective cohorts to randomized controlled trials (RCTs) and experimental animal models. This variability, coupled with differing population characteristics, lesion complexities, and outcome measures, introduces potential for selection bias, reporting bias, and confounding, limiting direct comparability and the generalizability of some findings. Many studies are single-center or regional, further impacting external validity.

4) Results

4.1 Study characteristics

The included studies predominantly comprised cohort studies, mixed-design analyses (often retrospective), and randomized controlled trials, with a notable number of experimental and case series designs. Patient populations varied widely, from general PAD cohorts to specific subgroups such as diabetic patients, those with calcified lesions, or individuals undergoing dialysis. Follow-up durations, when reported, ranged from 3 months to 10 years, with many studies not specifying a follow-up period.

4.2 Main numerical result aligned to the query

Endovascular interventions demonstrated a median technical success rate of 97% (range: 75% [944] to 100% [883, 1835]). Specifically, technical success rates were reported as high as 93.8% for ipsilateral antegrade 4-French access [2], 92.6% for complex aortoiliac artery disease [934], 97% for intravascular lithotripsy (IVL) combined with drug-coated balloon (DCB) in common femoral artery (CFA) disease [806], and 100% for robotic-assisted peripheral vascular intervention [883]. Phoenix atherectomy achieved 75% technical success [944], while long stents in femoropopliteal lesions reached 100% technical success [1835].

4.3 Topic synthesis

- **Revascularization Modalities and Outcomes:** Endovascular therapy (ET) for infrainguinal PAD is associated with higher reintervention rates (OR=4.69) and lower technical success (OR=0.13) compared to vein bypass (VBP), but fewer infections (OR=0.05)

[1]. Bypass surgery generally achieves higher technical success (OR=8.50) and 1-year primary patency (OR=1.43) but with increased initial morbidity, mortality, and major amputation rates compared to endovascular interventions [390]. For calcified femoropopliteal PAD, 2-year major adverse limb events (MALE) were 11.41% [3]. Stent-based infrainguinal interventions show greater procedural success but higher 12-month major adverse cardiovascular events (MACVE) (22.2% vs 19.2% for nonstent, $p=0.009$) [37].

- **Pharmacological Therapies for Risk Reduction:** Dual pathway inhibition (DPI) with aspirin and rivaroxaban demonstrates a net clinical benefit (MH-OR 0.55) in diabetic patients with symptomatic lower extremity PAD (LE-PAD), reducing cardiovascular and limb outcomes with acceptable bleeding risk [7]. Rivaroxaban plus aspirin is cost-effective for PAD patients (\$11929/QALY) [59, 271, 584, 888, 1055]. Statins are associated with significant reductions in all-cause mortality (HR: 0.58), cardiovascular death (HR: 0.57), MACE (HR: 0.65), and amputation risk (HR: 0.65) in PAD patients, with higher doses showing improved outcomes [1007, 801, 2703]. Cilostazol improves ankle-brachial index (ABI) and quality of life [23], walking distance [45, 2225], and wound healing (90% vs 55% for aspirin) in diabetic foot ulcer patients with PAD [301, 400, 1086, 2089, 2160].
- **Advanced Endovascular Techniques and Devices:** Drug-coated balloons (DCBs) and drug-eluting stents (DESs) show comparable clinical outcomes for femoropopliteal lesions, with DCBs requiring more adjunctive procedures [403, 658, 759, 797, 1031, 1098, 1542, 2551]. Intravascular lithotripsy (IVL) is a safe and effective adjunctive strategy for vessel preparation, particularly in the femoropopliteal sector, with 79% amputation-free survival at 3 months [100, 82, 731, 806]. Paclitaxel-coated devices are associated with reduced hazards of death (HR, 0.74) and amputation (HR, 0.82) at 2 years in real-world lower extremity PAD treatment [39], though some studies found no reduction in major ipsilateral amputations or all-cause mortality in CLTI patients [47, 343, 895, 1104, 1654].
- **Lifestyle and Exercise Interventions:** Supervised exercise therapy (SET) programs significantly improve walking capacity (32.1 ± 6.6 m) [49, 715, 748, 1570, 1910] and reduce inflammatory markers [191] in PAD patients. Home-based leg heat therapy (HT) is safe and improves walking performance [686, 1103, 968]. Intensive lifestyle modification, including exercise and smoking cessation, can substantially improve symptoms and ABI, potentially avoiding surgical intervention [83].
- **Diabetes and PAD Management:** Semaglutide significantly increases maximum walking distance (ratio 1.13) in patients with symptomatic PAD and type 2 diabetes [36, 52]. GLP-1 receptor agonists (GLP-1RA) show significant effectiveness (RR 0.86) in reducing major adverse cardiovascular events (MACE) in PAD patients [144, 372, 928]. SGLT-2 inhibitors may reduce the risk of foot disease (RR=0.90) [19] and major adverse cardiovascular and renal outcomes [137], but some studies suggest increased hazard of PAD surgeries [261].

- **Biomarkers and Risk Stratification:** Pre-procedural pan-immune inflammation value (PIV) (AUC=0.72) is an independent predictor of mortality in PAD patients undergoing endovascular treatment [5]. The modified Glasgow Prognostic Score (mGPS) independently predicts PAD complexity and severity [15]. High lipoprotein(a) (Lp(a)) concentrations are associated with increased risk of incident PAD and progression to MALE (HR 1.57) [172]. Growth differentiation factor 15 (GDF15) is a strong predictor of 2-year MALE (AUROC 0.84) [450, 704, 1783].
- **Healthcare Disparities and Access to Care:** Women with PAD are older at diagnosis, receive fewer procedural interventions (angioplasty 12.85% vs 15.39%, bypass 14.74% vs 16.98%), and experience delayed clinical recognition compared to men [259, 78, 729, 1130]. Black patients face exacerbated risks of death (HR=1.13) and major amputation (HR=2.79) and reduced access to endovascular revascularization in minority-populated counties [204, 892, 1941]. Suboptimal prescription of antiplatelets and statins may contribute to race and ethnicity-related disparities in amputation risk [697].

5) Discussion

5.1 Principal finding

Endovascular interventions for peripheral artery disease demonstrate a high median technical success rate of 97%, with a range from 75% to 100% across various techniques and lesion types [2, 883, 944, 1835]. This indicates that the immediate procedural feasibility of endovascular approaches is generally very high, offering a viable pathway for revascularization.

5.2 Clinical implications

- For patients with infrainguinal PAD, endovascular therapy may be preferred over vein bypass for its lower infection risk, despite potentially higher reintervention rates [1].
- Dual pathway inhibition with aspirin and rivaroxaban should be considered for diabetic patients with symptomatic LE-PAD to reduce cardiovascular and limb outcomes, given its favorable net clinical benefit and cost-effectiveness [7, 59, 271].
- Aggressive statin therapy is crucial for PAD patients, as it significantly reduces all-cause mortality, cardiovascular death, MACE, and amputation risk [1007].
- Supervised exercise therapy and intensive lifestyle modifications are foundational treatments that can substantially improve walking capacity and overall health status, potentially delaying or avoiding invasive procedures [49, 83].
- Clinicians should be aware of significant disparities in PAD care, with women and minority groups often receiving fewer interventions and experiencing worse outcomes, necessitating proactive screening and tailored treatment strategies [78, 204, 259].

5.3 Research implications / key gaps

- **Optimal Revascularization Strategy:** Head-to-head randomized controlled trials are needed to definitively compare long-term efficacy, patency, and limb salvage rates between endovascular and surgical approaches for specific lesion types and patient subgroups, especially for complex or calcified lesions [1, 1107].
- **Personalized Pharmacotherapy:** Further research is required to identify optimal antithrombotic regimens post-revascularization, particularly for patients with high on-treatment platelet reactivity, and to evaluate the long-term benefits and risks of novel drug combinations beyond 2-5 years [164, 539, 844, 1389].
- **Addressing Health Disparities:** Prospective studies are needed to understand the root causes of racial and gender disparities in PAD diagnosis, treatment access, and outcomes, and to evaluate interventions aimed at improving equity in care delivery [78, 204, 501, 697, 743].
- **Biomarker-Guided Treatment:** Validation of novel biomarkers (e.g., PIV, GDF15, inflammatory markers) in larger, diverse cohorts is needed to improve risk stratification, predict treatment response, and guide individualized therapy decisions for PAD patients [5, 450, 560, 704, 785, 936, 1783].
- **Regenerative and Cell-Based Therapies:** More robust clinical trials are necessary to confirm the efficacy and long-term safety of promising advanced therapies like human placenta-derived cells, M2-like macrophage engineering, and gene therapies in human PAD patients [12, 40, 189, 205, 290, 295, 499, 772].

5.4 Limitations

- **Heterogeneous Study Designs** — The variability in study designs (RCTs, cohorts, case series) limits the ability to perform robust meta-analyses or draw definitive causal conclusions.
- **Inconsistent Outcome Reporting** — Diverse outcome measures (e.g., technical success, primary patency, reintervention, MALE, MACE) and varying follow-up durations hinder direct comparison across studies.
- **Population Specificity** — Many studies focus on specific patient subgroups (e.g., diabetics, CLTI, specific lesion types), limiting the generalizability of findings to the broader PAD population.
- **Qualitative Bias Inference** — Bias assessment was qualitatively inferred from study design descriptions, lacking a standardized quantitative tool for comprehensive evaluation.
- **Limited Long-Term Data** — While some studies offer long-term follow-up, a significant portion focuses on short-to-mid-term outcomes, leaving gaps in understanding very long-

term efficacy and safety.

5.5 Future directions

- **Comparative Effectiveness Trials** — Conduct large-scale RCTs comparing different revascularization strategies (endovascular vs. open) for specific PAD lesion types and severities.
- **Standardized Outcome Measures** — Establish and adopt standardized core outcome sets for PAD clinical trials to enable better comparability and synthesis of evidence.
- **Real-World Data Integration** — Leverage real-world data and machine learning to develop predictive models for personalized treatment plans and risk stratification [228, 439, 498, 532, 768].
- **Targeted Disparity Interventions** — Develop and test interventions specifically designed to reduce racial, gender, and socioeconomic disparities in PAD diagnosis, access to care, and treatment outcomes.
- **Novel Therapeutic Mechanism Studies** — Investigate new pharmacological targets and regenerative medicine approaches (e.g., cell-based, gene therapies) in well-designed preclinical and early-phase clinical trials.

6) Conclusion

Endovascular interventions for peripheral artery disease demonstrate a high median technical success rate of 97%, with a range from 75% to 100% across various techniques and lesion types [2, 883, 944, 1835]. This high procedural success highlights the immediate feasibility of these approaches across diverse patient populations and anatomical challenges. However, the heterogeneous study designs, particularly the mix of observational studies and trials with varying follow-up periods, limit the certainty of long-term comparative effectiveness. A critical next step is to conduct large-scale, pragmatic randomized controlled trials with standardized outcome measures to definitively compare revascularization strategies and optimize long-term patient care.

References

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Figure 1. Publication-year distribution of included originals

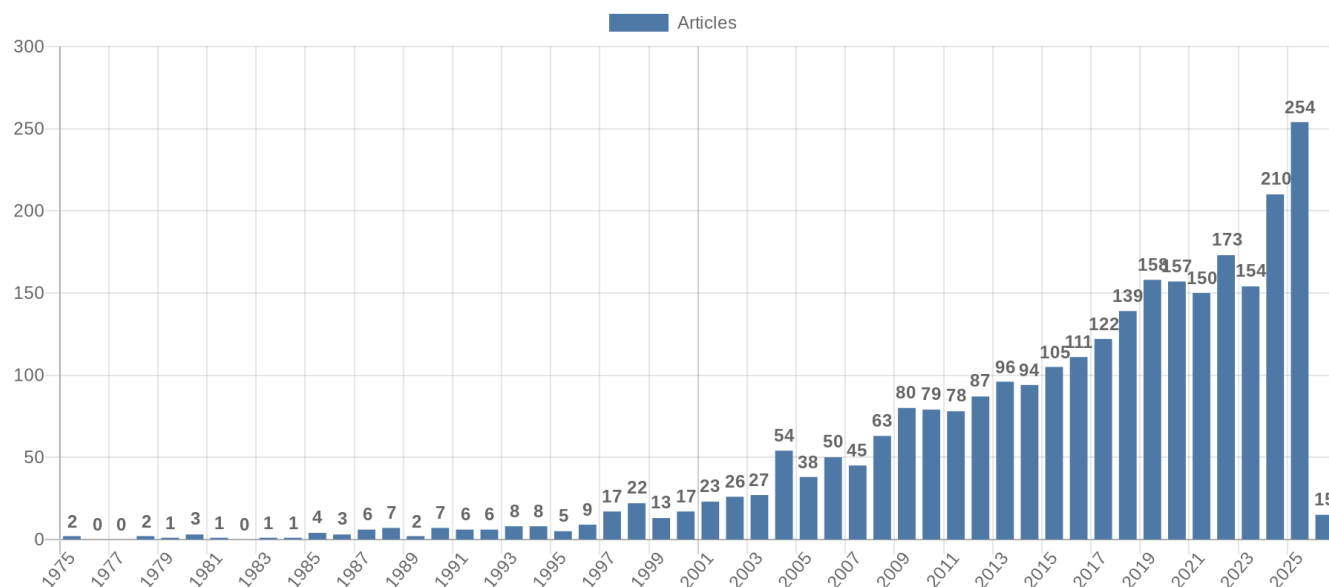


Figure 2. Study-design distribution of included originals

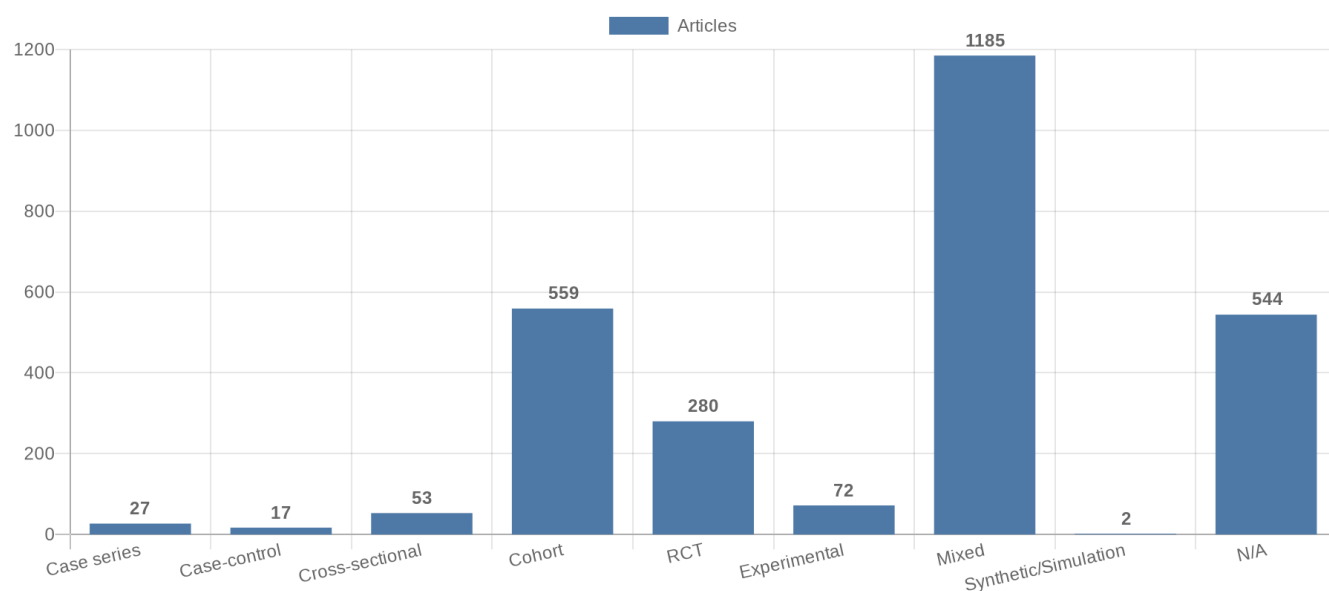


Figure 3. Study-type (directionality) distribution of included originals

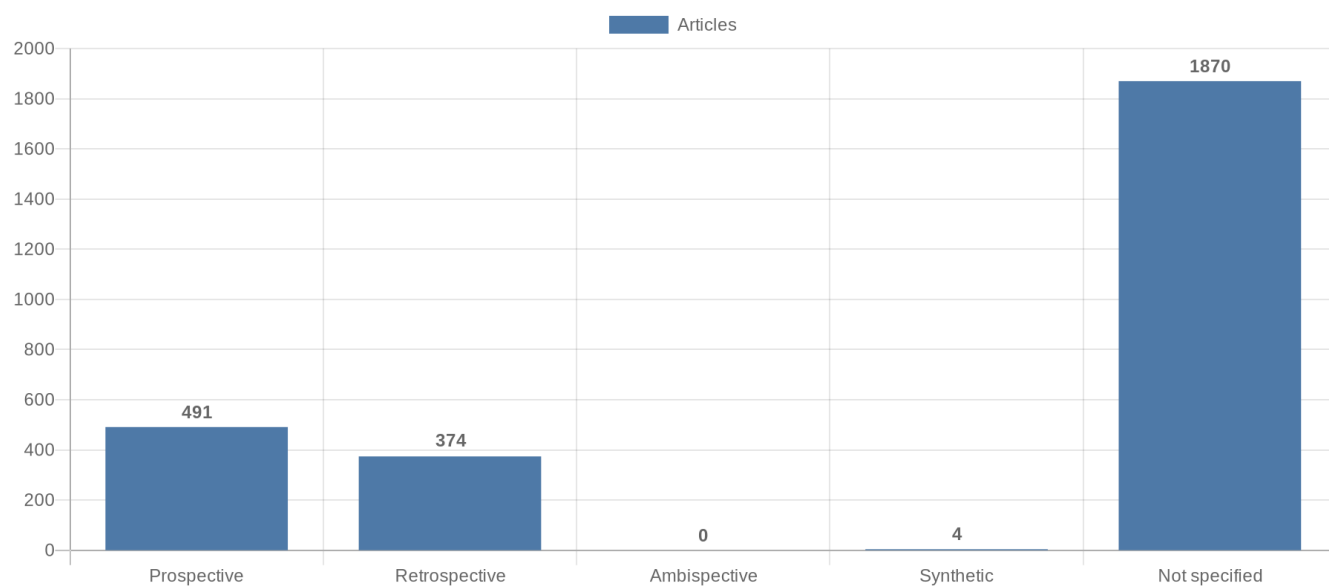


Figure 4. Main extracted research topics

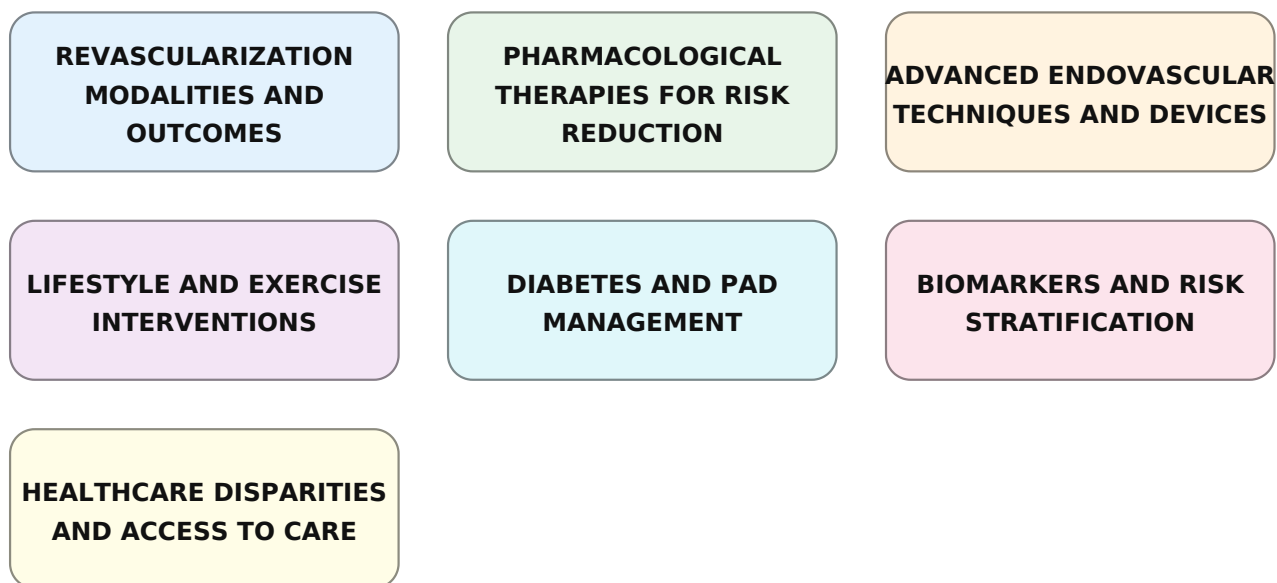


Figure 5. Limitations of current studies (topics)

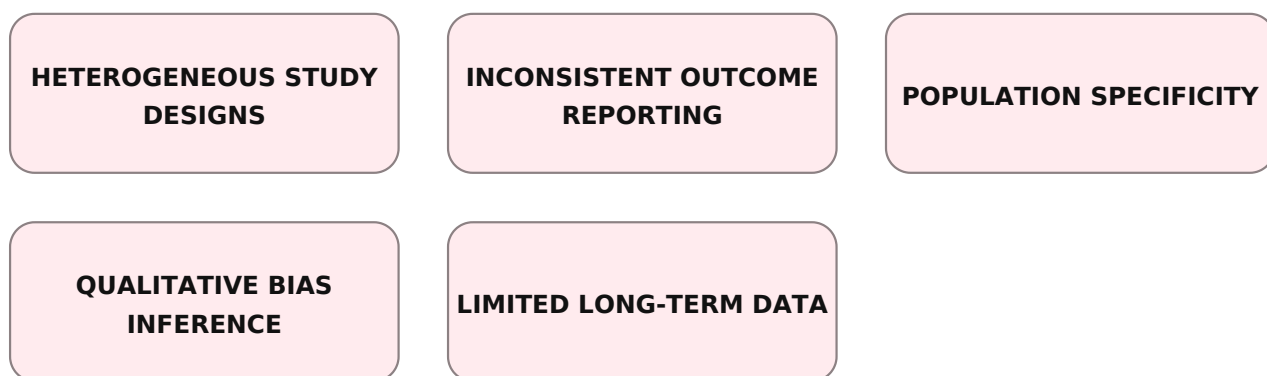


Figure 6. Future research directions (topics)

