**Table G-15. Results data for antiplatelet treatment with and without PPI: composite and individual outcomes**

| **Study** | **Study Details** | **Outcome(s)** **Length of Followup** | **Results reported by authors** |
| --- | --- | --- | --- |
| Banerjee, 2011104 | ObservationalTotal N: 23,200Good quality | Primary Composite at 1 yr:Total mortalityNonfatal MIRevascularization | Clopidogrel + PPI | HR (95% CI): 1.19 (1.06-1.33), reference group clopidogrel no PPI |
| Primary Composite at 6 yr:Total mortalityNonfatal MIRevascularization | Clopidogrel + PPI | HR (95% CI): 1.24 (1.11-1.38), reference group clopidogrel no PPI |
| Secondary Composite:Total mortalityNonfatal MI | Clopidogrel + PPI | HR (95% CI): 1.20 (1.02-1.41), reference group clopidogrel no PPI |
| Secondary Composite:Total mortalityNonfatal MI | Clopidogrel + PPI | HR (95% CI): 1.26 (1.08-1.48), reference group clopidogrel no PPI |
| Total mortality at 1 yr | Clopidogrel + PPI | HR (95% CI): 1.16 (0.87-1.55), reference group clopidogrel no PPI |
| Revascularization at 1 yr | Clopidogrel + PPI | HR (95% CI): 1.18 (1.01-1.30), reference group clopidogrel no PPI |
| Total mortality at 6 yr | Clopidogrel + PPI | HR (95% CI): 1.32 (1.00-1.73), reference group clopidogrel no PPI |
| Revascularization at 6 yr | Clopidogrel + PPI | HR (95% CI): 1.22 (1.05-1.42), reference group clopidogrel no PPI |
| Barada, 2008105 | ObservationalTotal N: 1,023Poor quality | UGI bleeding in-hospital | PPI | 0.7% |
| No PPI | 0.6% |
| Bhatt, 2010106COGENT Study | RCTTotal N: 3,761Good quality | Primary Composite at 6 mo:CV mortalityNonfatal MIStrokeRevascularization | Omeprazole | 92/1876 |
| Placebo | 107/1885 |
| Upper GI events at 6 mo | Omeprazole | 21/1876 |
| Placebo | 55/1885 |
| Overt gastroduodenal or upper GI bleeding at 6 mo | Omeprazole | HR (95% CI): 0.13 (0.03-0.56), reference group placebo |
| Nonfatal MI at 6 mo | Omeprazole | 22/1876 |
| Placebo | 28/1885 |
| Revascularization at 6 mo | Omeprazole | 75/1876 |
| Placebo | 87/1885 |
| Stroke at 6 mo | Omeprazole | 4/1876 |
| Placebo | 6/1885 |
| Total mortality at 6 mo | Omeprazole | 8/1876 |
| Placebo | 9/1885 |
| CV mortality at 6 mo | Omeprazole | 8/1876 |
| Placebo | 6/1885 |
| Bhurke, 2012107 | ObservationalTotal N: 5,348Fair quality | Primary Composite at 1 yr:Nonfatal MIStentsNon-stenting revascIntermediate coronary syndrome | Clopidogrel + PPI | 366/2674 |
| Clopidogrel | 337/2674 |
| Nonfatal MI at 1 yr | Clopidogrel + PPI | 172/2674 |
| Clopidogrel | 163/2674 |
| Stents at 1 yr | Clopidogrel + PPI | 97/2674 |
| Clopidogrel | 91/2674 |
| Charlot, 2010108 | ObservationalTotal N: 56,406Good quality | Primary Composite at 1 yr:CV mortalityNonfatal MIStroke | No clopidogrel no PPI | 4244/22815 |
| PPI no clopidogrel | 228/8889 |
| Clopidogrel no PPI | 1508/17949 |
| Clopidogrel + PPI | 1060/6753 |
| Total mortality at 1 yr | No clopidogrel no PPI | 2923/20437 |
| PPI no clopidogrel | 1607/7618 |
| Clopidogrel no PPI | 551/16216 |
| Clopidogrel + PPI | 419/5986 |
| CV mortality at 1 yr | No clopidogrel no PPI | 2391/20437 |
| PPI no clopidogrel | 1234/7618 |
| Clopidogrel no PPI | 470/16216 |
| Clopidogrel + PPI | 329/5986 |
| Nonfatal MI at 1 yr | No clopidogrel no PPI | 1553/19662 |
| PPI no clopidogrel | 832/7170 |
| Clopidogrel no PPI | 861/15663 |
| Clopidogrel + PPI | 582/5596 |
| Stroke at 1 yr | No clopidogrel no PPI | 1506/22815 |
| PPI no clopidogrel | 720/8889 |
| Clopidogrel no PPI | 538/17949 |
| Clopidogrel + PPI | 297/6753 |
| Charlot, 2011109 | ObservationalTotal N: 49,452Good quality | Primary Composite at 1 yr:CV mortalityStrokeRehospitalization | No PPI | 2374/15619 |
| PPI | 986/4306 |
| Total mortality at 1 yr | PPI | 1607/15619 |
| No PPI | 686/4306 |
| CV mortality at 1 yr | PPI | 1328/15619 |
| No PPI | 540/4306 |
| Nonfatal MI at 1 yr | PPI | 1110/15619 |
| No PPI | 497/4306 |
| Stroke at 1 yr | PPI | 1207/15619 |
| No PPI | 338/4306 |
| Chitose, 2011110KICS | ObservationalTotal N: 1,270Good quality | Primary Composite at 18 mo:CV mortalityNonfatal MIStroke | PPI | 6/171 |
| No PPI | 17/450 |
| CV mortality at 18 mo | PPI | 2/171 |
| No PPI | 7/450 |
| Nonfatal MI at 18 mo | PPI | 2/171 |
| No PPI | 1/450 |
| Stroke at 18 mo | PPI | 2/171 |
| No PPI | 9/450 |
| GI event at 18 mo | PPI | 1/171 |
| No PPI | 7/450 |
| Evanchan, 2010111 | ObservationalTotal N: 5,794Good quality | Nonfatal MI at 1 yr | PPI | HR (95% CI): 1.78 (1.55-2.07), reference group no PPI |
| Gao, 2009112 | RCTTotal N: 237Poor quality | Total mortality at 14 days | Omeprazole | 4/114 |
| Placebo | 13/123 |
| Upper GI bleeding at 14 days | Omeprazole | 6/114 |
| Placebo | 18/123 |
| Gaspar, 2010113 | ObservationalTotal N: 876Good quality | Primary Composite at 6 mo:Total mortalityNonfatal MIUA | PPI | 35/274 |
| No PPI | 49/528 |
| Total mortality at 6 mo | PPI | 17/274 |
| No PPI | 21/528 |
| Goodman, 2012114PLATO | ObservationalTotal N: 18,624Good quality | Primary Composite at 1 yr:CV mortalityNonfatal MIStroke | Clopidogrel no PPI | 611/6021 |
| PPI + clopidogrel | 398/3255 |
| Secondary Composite at 1 yr:CV mortalityNonfatal MI | Clopidogrel no PPI | 560/6021 |
| PPI + clopidogrel | 378/3255 |
| Total mortality at 1 yr | Clopidogrel no PPI | 286/6021 |
| PPI + clopidogrel | 213/3255 |
| CV mortality at 1 yr | Clopidogrel no PPI | 256/6021 |
| PPI + clopidogrel | 180/3255 |
| Nonfatal MI at 1 yr | Clopidogrel no PPI | 354/6021 |
| PPI + clopidogrel | 245/3255 |
| Major bleeding at 1 yr | Clopidogrel no PPI | 175/5953 |
| PPI + clopidogrel | 127/3231 |
| Stent thrombosis at 1 yr | Clopidogrel no PPI | 59/3495 |
| PPI + clopidogrel | 46/2154 |
| Gupta, 2010115 | ObservationalTotal N: 315Fair quality | Primary Composite at 4 yr:Total mortalityNonfatal MITVF | Clopidogrel no PPI | 92/243 |
| Clopidogrel + PPI | 40/72 |
| Total mortality at 4 yr | Clopidogrel no PPI | 35/243 |
| Clopidogrel + PPI | 14/72 |
| TLR at 4 yr | Clopidogrel no PPI | 53/243 |
| Clopidogrel + PPI | 21/72 |
| TVF at 4 yr | Clopidogrel no PPI | 70/243 |
| Clopidogrel + PPI | 30/72 |
| Harjai, 2011116 | ObservationalTotal N: 2,653Good quality | Primary Composite at 6 mo:Total mortalityNonfatal MIRevascularizationStent thrombosis | PPI | 48/751 |
| No PPI | 122/1902 |
| Total mortality at 6 mo | PPI | 21/751 |
| No PPI | 48/1902 |
| Nonfatal MI at 6 mo | PPI | 24/751 |
| No PPI | 57/1902 |
| Revascularization at 6 mo | PPI | 16/751 |
| No PPI | 55/1902 |
| Stent thrombosis at 6 mo | PPI | 13/751 |
| No PPI | 29/1902 |
| Major bleeding at 6 mo | PPI | 8/751 |
| No PPI | 29/1902 |
| Ho, 2009117 | ObservationalTotal N: 8,790Good quality | Primary Composite at 18 mo:Total mortalityRehospitalization | Clopidogrel no PPI | 615/2961 |
| Clopidogrel + PPI | 1561/5244 |
| Rehospitalization at 18 mo | Clopidogrel no PPI | 205/2961 |
| Clopidogrel + PPI | 764/5244 |
| Revascularization at 18 mo | Clopidogrel no PPI | 353/2961 |
| Clopidogrel + PPI | 815/5244 |
| Total mortality at 18 mo | Clopidogrel no PPI | 493/2961 |
| Clopidogrel + PPI | 1042/5244 |
| Hsiao, 2011118 | ObservationalTotal N: 9,753Good | Rehospitalization at 6 mo | PPI | 24/622 |
| No PPI | 177/9131 |
| Juurlink, 2009119 | ObservationalTotal N: 2791Good quality | Nonfatal MI at 3 mo | Clopidogrel + nonfatal MI 90 days | 194/734 |
| Clopidogrel | 424/2057 |
| Total mortality at 3 mo | Clopidogrel + nonfatal MI 90 days | 71/323 |
| Clopidogrel | 188/916 |
| Nonfatal MI at 1 yr | Clopidogrel + nonfatal MI 90 days | 240/982 |
| Clopidogrel | 497/2626 |
| Total mortality at 1 yr | Clopidogrel + nonfatal MI 90 days | 116/531 |
| Clopidogrel | 269/1407 |
| Kreutz, 2010120 | ObservationalTotal N: 16,690Good quality | Primary Composite at 1 yr:CV mortalityNonfatal MIStrokeRehospitalization  | Clopidogrel no PPI | 1766/9862 |
| Clopidogrel + PPI | 1710/6828 |
| Stroke at 1 yr | No PPI | 109/9862 |
| PPI | 140/6828 |
| Nonfatal MI at 1 yr | No PPI | 982/9862 |
| PPI | 1121/6828 |
| Revascularization at 1 yr | No PPI | 1312/9862 |
| PPI | 1109/6828 |
| CV mortality at 1 yr | No PPI | 21/9862 |
| PPI | 19/6828 |
| Ng, 2008121 | ObservationalTotal N: 666Good quality | GI bleeding at 7 days | No PPI | 14/290 |
| PPI | 2/336 |
| GI bleeding/occult bleed at 7 days | No PPI | 24/290 |
| PPI | 9/336 |
| Ng, 2011122 | RCTTotal N: 313Good quality | Secondary Composite at 4 mo:CV mortalityNonfatal MIStroke | Esomeprazole | 7/163 |
| Famotidine | 5/148 |
| Secondary Composite at 4 mo:GI events Occult bleeding of unknown origin | Esomeprazole | 1/163 |
| Famotidine | 11/148 |
| GI events at 4 mo | Esomeprazole | 1/163 |
| Famotidine | 9/148 |
| O’Donoghue, 2009123TRITON-TIMI 38 | ObservationalTotal N: 13,608Good quality | Primary Composite:CV mortalityMIStroke | Clopidogrel + PPI | 255/2257 |
| Clopidogrel no PPI | 526/4538 |
| Prasugrel + PPI | 220/2272 |
| Prasugrel no PPI | 423/4541 |
| Secondary Composite:Major bleedingMinor bleeding | Clopidogrel + PPI | 92/2234 |
| Clopidogrel no PPI | 139/4482 |
| Prasugrel + PPI | 98/2253 |
| Prasugrel no PPI | 205/4488 |
| Secondary Composite:MortalityMIStrokeMajor bleeding | Clopidogrel + PPI | 299/2257 |
| Clopidogrel no PPI | 594/4538 |
| Prasugrel + PPI | 268/2272 |
| Prasugrel no PPI | 516/4541 |
| Total mortality | Clopidogrel + PPI | 58/2257 |
| Clopidogrel no PPI | 139/4538 |
| Prasugrel + PPI | 65/2272 |
| Prasugrel no PPI | 123/4541 |
| CV mortality | Clopidogrel + PPI | 44/2257 |
| Clopidogrel no PPI | 106/4538 |
| Prasugrel + PPI | 46/2272 |
| Prasugrel no PPI | 87/4541 |
| MI | Clopidogrel + PPI | 209/2257 |
| Clopidogrel no PPI | 424/4538 |
| Prasugrel + PPI | 166/2272 |
| Prasugrel no PPI | 319/4541 |
| Stent thrombosis | Clopidogrel + PPI | 50/2150 |
| Clopidogrel no PPI | 92/4272 |
| Prasugrel + PPI | 22/2159 |
| Prasugrel no PPI | 46/4263 |
| Major bleeding | Clopidogrel + PPI | 46/2234 |
| Clopidogrel no PPI | 65/4482 |
| Prasugrel + PPI | 51/2253 |
| Prasugrel no PPI | 95/4488 |
| Ortolani, 2011124 | ObservationalTotal N: 3,896Good quality | Secondary Composite at 1 yr:Total mortalityRevascularizationRehospitalization | Clopidogrel + PPI | 892/3519 |
| Clopidogrel no PPI | 50/377 |
| Rehospitalization at 1 yr | Clopidogrel + PPI | 527/3519 |
| Clopidogrel no PPI | 13/377 |
| Revascularization at 1 yr | Clopidogrel + PPI | 573/3519 |
| Clopidogrel no PPI | 28/377 |
| Total mortality at 1 yr | Clopidogrel + PPI | 190/3519 |
| Clopidogrel no PPI | 16/377 |
| Rassen, 2009125 | ObservationalTotal N: 18,565Good quality | Primary Composite at 6 mo:Total mortalityNonfatal MI | PPI | HR (95% CI): 1.22 (0.99-1.51), reference group no PPI |
| Nonfatal MI at 6 mo | PPI | HR (95% CI): 1.22 (0.95-1.57), reference group no PPI |
| Total mortality at 6 mo | PPI | HR (95% CI): 1.20 (0.84-1.70), reference group no PPI |
| Revascularization at 6 mo | PPI | HR (95% CI): 0.97 (0.79-1.21), reference group no PPI |
| Ray, 2010126 | ObservationalTotal N: 20,596Good quality | Primary Composite at 1 yr:Total mortalityCV mortalityNonfatal MIStroke | PPI | HR (95% CI): 0.99 (0.82-1.19), reference group no PPI |
| Secondary Composite at 1 yr:Nonfatal MICV mortality | PPI | HR (95% CI): 0.91 (0.75-1.09), reference group no PPI |
| CV mortality at 1 yr | No PPI | 80/13003 |
| PPI | 64/7593 |
| Stroke at 1 yr | No PPI | 97/13003 |
| PPI | 105/7593 |
| Gastroduodenal bleeding at 1 yr | No PPI | 117/13003 |
| PPI | 63/7593 |
| Other bleeding at 1 yr | No PPI | 108/13003 |
| PPI | 117/7593 |
| Ren, 2011127 | RCTTotal N: 168Poor quality | Slight chest pressure at 30 days | Omeprazole | 3/86 |
| Placebo | 2/86 |
| Occasional angina at 30 days | Omeprazole | 17/86 |
| Placebo | 19/86 |
| TIA at 30 days | Omeprazole | 2/86 |
| Placebo | 1/86 |
| Major bleeding at 30 days | Omeprazole | 0/86 |
| Placebo | 2/86 |
| Rossini, 2011128 | ObservationalTotal N: 1346Good quality | Primary Composite at 1 yr:Total mortalityNonfatal MIStrokeRehospitalization | No PPI | 1/170 |
| PPI | 29/1158 |
| Secondary Composite in-hospital:Total mortalityNonfatal MIStrokeRehospitalization | No PPI | 9/170 |
| PPI | 87/1158 |
| Major bleeding in-hospital | No PPI | 1/170 |
| PPI | 15/1158 |
| Minor bleeding in-hospital | No PPI | 6/170 |
| PPI | 36/1158 |
| Major bleeding at 1 yr | No PPI | 4/170 |
| PPI | 38/1158 |
| Minor bleeding at 1 yr | No PPI | 9/170 |
| PPI | 63/1158 |
| Total mortality at 1 yr | No PPI | 5/170 |
| PPI | 24/1158 |
| Stent thrombosis at 1 yr | No PPI | 2/170 |
| PPI | 25/1158 |
| Sarafoff, 2010129 | ObservationalTotal N: 3408 Good quality | Secondary Composite at 30 days:Nonfatal MIStent thrombosis | PPI | 23/698 |
| No PPI | 32/2640 |
| Stent thrombosis at 30 days | PPI | 8/698 |
| Placebo | 13/2640 |
| Total mortality at 30 days | PPI | 18/698 |
| Placebo | 23/2640 |
| Nonfatal MI at 30 days | PPI | 21/698 |
| Placebo | 53/2640 |
| Major bleeding at 30 days | PPI | 19/698 |
| Placebo | 18/2640 |
| Schmidt, 2012130 | ObservationalTotal N: 13,001Poor quality | Primary Composite at 1 yrCV mortalityNonfatal MIStrokeStent thrombosisTarget lesion revasc | PPI + Clopidogrel | HR (95% CI): 1.51 (1.26-1.81) |
| PPI no Clopidogrel | HR (95% CI): 1.18 (0.96-1.44) |
| Nonfatal MI at 1 yr | PPI + Clopidogrel | HR (95% CI): 0.46 (0.30-0.72) |
| PPI no Clopidogrel | HR (95% CI): 0.33 (0.28-0.41) |
| Target lesion revasc | PPI + Clopidogrel | HR (95% CI): 0.68 (0.44-1.06) |
| PPI no Clopidogrel | HR (95% CI): 0.62 (0.52-0.73) |
| CV mortality | PPI + Clopidogrel | HR (95% CI): 0.35 (0.19-0.64) |
| PPI no Clopidogrel | HR (95% CI): 0.21 (0.15-0.29) |
| Simon, 2011131FAST-MI | ObservationalTotal N: 2744Good quality | Composite at 1 yr:Total mortalityNonfatal MIStroke | Clopidogrel no PPI | 100/711 |
| PPI + clopidogrel | 125/1052 |
| No PPI no clopidogrel | 64/180 |
| PPI no clopidogrel | 41/111 |
| Total mortality in-hospital | Clopidogrel no PPI | 32/900 |
| PPI + clopidogrel | 49/1453 |
| No PPI no clopidogrel | 32/233 |
| PPI no clopidogrel | 20/158 |
| Nonfatal MI in-hospital | Clopidogrel no PPI | 13/900 |
| PPI + clopidogrel | 24/1453 |
| No PPI no clopidogrel | 8/233 |
| PPI no clopidogrel | 4/158 |
| Stroke in-hospital | Clopidogrel no PPI | 11/900 |
| PPI + clopidogrel | 7/1453 |
| No PPI no clopidogrel | 3/233 |
| PPI no clopidogrel | 2/158 |
| Major bleeding in-hospital | Clopidogrel no PPI | 16/900 |
| PPI + clopidogrel | 23/1453 |
| No PPI no clopidogrel | 3/233 |
| PPI no clopidogrel | 5/158 |
| Total mortality at 1 yr | Clopidogrel no PPI | 77/900 |
| PPI + clopidogrel | 94/1453 |
| No PPI no clopidogrel | 57/233 |
| PPI no clopidogrel | 38/158 |
| Stockl, 2010132 | ObservationalTotal N: 2066Good quality | Rehospitalization for MI at 1 yr | Clopidogrel + PPI | 36/1041 |
| Clopidogrel no PPI | 22/6008 |
| Rehospitalization for MI or coronary stent implantation at 1 yr | Clopidogrel + PPI | 97/1041 |
| Clopidogrel no PPI | 72/6008 |
| Tentzeris, 2010133 | ObservationalTotal N: 1210Good quality | Composite at 1 yr:Total mortalityRehospitalizationStent thrombosis | Clopidogrel + PPI | HR (95% CI): 1.084 (0.529-2.222), reference group clopidogrel no PPI |
| Total mortality at 1 yr | PPI | 15/691 |
| No PPI | 11/519 |
| CV mortality at 1 yr | PPI | 8/691 |
| No PPI | 10/519 |
| Rehospitalization at 1 yr | PPI | 6/691 |
| No PPI | 3/519 |
| Stent thrombosis at 1 yr | PPI | 6/691 |
| No PPI | 2/519 |
| Tsai, 2011134 | ObservationalTotal N: 3580Good quality | Primary Composite at 1 yr:Nonfatal MIStrokeRehospitalization | Clopidogrel + PPI | 121/1052 |
| Clopidogrel no PPI | 62/1325 |
| GI events at 1 yr | Clopidogrel + PPI | 91/1052 |
| Clopidogrel no PPI | 34/1352 |
| Valkhoff, 2011135 | ObservationalTotal N: 23,655 Poor quality | Nonfatal MI at 1 yr | PPI | OR (95% CI): 1.62 (1.15-2.27), reference group no PPI |
| Van Boxel, 2010136 | ObservationalTotal N: 18,139Fair quality | Primary Composite at 30 days:Total mortalityNonfatal MIStrokeUnstable angina | Clopidogrel + PPI | 754/5734 |
| Clopidogrel no PPI | 830/12405 |
| Nonfatal MI at 1 yr | Clopidogrel + PPI | 84/5734 |
| Clopidogrel no PPI | 78/12405 |
| UA at 1 yr | Clopidogrel + PPI | 458/5734 |
| Clopidogrel no PPI | 538/12405 |
| Stroke at 1 yr | Clopidogrel + PPI | 46/5734 |
| Clopidogrel no PPI | 78/12405 |
| Total mortality at 1 yr | Clopidogrel + PPI | 189/5734 |
| Clopidogrel no PPI | 164/12405 |
| Peptic ulcer disease at 1 yr | Clopidogrel + PPI | 38/5734 |
| Clopidogrel no PPI | 27/12405 |
| Wu, 2010137 | ObservationalTotal N: 6,300Good quality | Primary Composite at 3 mo:Total mortalityRehospitalization  | Clopidogrel + PPI | 103/311 |
| Clopidogrel no PPI | 644/5551 |
| Rehospitalization at 3 mo | Clopidogrel + PPI | 77/311 |
| Clopidogrel no PPI | 561/5551 |
| Revascularization at 3 mo | Clopidogrel + PPI | 35/311 |
| Clopidogrel no PPI | 222/5551 |
| Total mortality at 3 mo | Clopidogrel + PPI | 35/311 |
| Clopidogrel no PPI | 94/5551 |
| Zairis, 2010138 | ObservationalTotal N: 588Good quality | Primary Composite at 1 yr:CV mortalityRehospitalization | Omeprazole | 34/340 |
| No PPI | 24/248 |
| CV mortality at 1 yr | Omeprazole | 12/340 |
| No PPI | 8/248 |
| Rehospitalization at 1 yr | Omeprazole | 22/340 |
| No PPI | 16/248 |
| Stent thrombosis at 1 yr | Omeprazole | 30/340 |
| No PPI | 21/248 |
| Revascularization at 1 yr | Omeprazole | 32/340 |
| No PPI | 22/248 |

Abbreviations: CI=confidence interval; CV=cardiovascular; GI=gastrointestinal; HR=hazard ratio; MI=myocardial infarction; mo=month/months; N=number of patients; OR=odds ratio; PPI=proton pump inhibitor; RCT=randomized controlled trial; TIA=transient ischemic attack; UA=unstable angina; UGI=upper gastrointestinal; yr=year/years