Am Heart J (2004);147:815-22
# Impact of coronary artery stents on mortality and nonfatal myocardial infarction: meta-analysis of randomized trials comparing a strategy of routine stenting with that of balloon angioplasty
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BACKGROUND: A strategy of routine stenting has been shown to reduce the need for target-vessel revascularization compared with a strategy of balloon angioplasty alone; however, the impact on mortality and frequency of nonfatal myocardial infarction is unclear. The aim of this study was to provide a quantitative comparison of the impact of coronary stenting on the rates of mortality and myocardial infarction with that of balloon angioplasty with provisional stenting. METHODS: We performed a meta-analysis of randomized trials comparing routine coronary stenting to percutaneous transluminal coronary angioplasty (PTCA), including only those trials that used combination antiplatelet therapy (aspirin and a thienopyridine) as an adjuvant to stenting. Such trials included: the Belegian Netherlands Stent Study (BENESTENT) II, Optimal Coronary Balloon Angioplasty With Provisional Stenting Versus Primary Stent (OCBAS), Balloon Optimization vs Stent Study (BOSS), Evaluation of Platelet IIb/IIIa Inhibitor for Stenting (EPISTENT), Optimum Percutaneous Transluminal Coronary Angioplasty Compared With Routine Stent Strategy (OPUS-1), French Optimal Stenting Trial (FROST), Angioplasty or Stent (AS), and Doppler Endpoint Stenting International Investigation (DESTINI) trials for de novo coronary artery lesions; the Stent vs Percutaneous Angioplasty in Chronic Total Occlusion (SPACTO), Total Occlusion Study of Canada (TOSCA), Stent or Angioplasty after Recanalization of Chronic Coronary Occlusions (SARECCO), and Mayo-Japan Investigation for Chronic Total Occlusion (MAJIC) trials for coronary occlusions; the Primary Angioplasty Versus Stent Implantation in Acute Myocardial Infarction (PASTA), Gianturco-Roubin in Acute Myocardial Infarction (GRAMI), Florence Randomized Elective Stenting in Acute Coronary Occlusions (FRESCO), Immediate Coronary Angioplasty with Elective Wiktor Stent Implantation Compared with Conventional Balloon Angioplasty in Acute Myocardial Infarction (STENTUIM-2), Stent Primary Angioplasty in MI (Stent-PAMI), Zwolle, and Controlled Abciximab and Device Investigation to Lower Late Angioplasty Complications (CADILLAC) trials for acute ST-segment elevation myocardial infarction; and the Intracoronary Stenting or Angioplasty for Restenosis Reduction in Small Arteries (ISAR-SMART), Park, Stenting in Small Arteries (SISA), and Bestent in Small Arteries (BESMART) trials for small vessels. RESULTS: The 23 trials enrolled 10,347 patients, with 5130 patients randomized to receive stent and 5217 patients randomized to receive balloon angioplasty. A total of 902 (17 %) of patients crossed over from a strategy of balloon angioplasty to stent placement because of the inability to achieve a satisfactory result with a balloon. No significant difference was observed between the stent group and PTCA group in the rates of death or myocardial infarction, despite a significant reduction in the frequency of major adverse cardiac events (odds ratio, 0.59; 95% CI, 0.50-0.70; P <.001), which was driven entirely by a reduction in target vessel revascularization. CONCLUSIONS: An initial strategy of stent placement versus balloon angioplasty with provisional stenting is associated with a similar mortality rate and

frequency of nonfatal myocardial infarction after a mean follow-up period of 12.8 months. Patients who underwent stent placement had a significantly lower risk of major adverse cardiac events only when target revascularization is included as an end point.
http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=PubMed&dopt=Citation&list_uids=15131536

J Am Coll Cardiol (2004);43:943-9
Cutting balloon versus conventional balloon angioplasty for the treatment of in-stent restenosis: results of the restenosis cutting balloon evaluation trial (RESCUT)
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OBJECTIVES: The aim of this trial was to compare cutting balloon angioplasty (CBA) with conventional balloon angioplasty (i.e., percutaneous transluminal coronary angioplasty [PTCA]) for the treatment of patients with coronary in-stent restenosis (ISR). BACKGROUND: Retrospective studies suggest CBA might be superior to conventional PTCA in the treatment of ISR. METHODS: The Restenosis Cutting Balloon Evaluation Trial (RESCUT) is a multicenter, randomized, prospective European trial including 428 patients with all types of ISR (e.g., focal, multifocal, diffuse, proliferative). RESULTS: In both groups, the majority of ISR lesions were shorter than 20 mm. The length of restenotic stents was similar (CBA: 18.6 +/- 9.7 mm; PTCA: 18.3 +/- 8.7 mm). The number of balloons used to treat ISR was lower in the CBA group: only one balloon was used in 82.3% of CBA cases, compared with 75% of PTCA procedures ($p = 0.03$). Balloon slippage was less frequent in the CBA group (CBA 6.5%, PTCA 25%; $p < 0.01$). There was a trend toward a lower need for additional stenting in the CBA group (CBA 3.9%, PTCA 8.0%; $p = 0.07$). At seven-month angiographic follow-up, the binary restenosis rate was not different between the groups (CBA 29.8%, PTCA 31.4%; $p = 0.82$), with a similar pattern of recurrent restenosis. Clinical events at seven months were also similar. CONCLUSIONS: Cutting balloon angioplasty did not reduce recurrent ISR and major adverse cardiac events, as compared with conventional PTCA. However, CBA was associated with some procedural advantages, such as use of fewer balloons, less requirement for additional stenting, and a lower incidence of balloon slippage.
http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=PubMed&dopt=Citation&list_uids=15028348

J Am Coll Cardiol (2004);43:936-42
Meta-analysis of randomized trials of percutaneous transluminal coronary angioplasty versus atherectomy, cutting balloon atherotomy, or laser angioplasty
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controlled experience with atherectomy, laser, or atherotomy versus balloon angioplasty with or without coronary stenting. Each trial tested the hypothesis that ablative therapy would result in better clinical or angiographic results than balloon dilation alone. RESULTS: Short-term death rates (<31 days) were not improved by the use of ablative procedures (0.3% vs. 0.4%, odds ratio [OR] 0.94 [95% confidence interval 0.46 to 1.92]), but periprocedural myocardial infarctions (4.4% vs. 2.5%, OR 1.83 [95% CI 1.43 to 2.34]) and major adverse cardiac events (5.1% vs. 3.3%, OR 1.54 [95% CI 1.25 to 1.89]) were increased. Angiographic restenosis rates (6,958 patients) were not improved with the ablative devices (38.9% vs. 37.4%, OR 1.06 [95% CI 0.97 to 1.17]). No reduction in revascularization rates (25.2% vs. 24.5%, OR 1.04 [95% CI 0.94 to 1.14]) or cumulative adverse cardiac events rates up to one year after treatment were seen with ablative devices (27.8% vs. 26.1%, OR 1.09 [95% CI 0.99 to 1.20]). CONCLUSIONS: The combined experience from randomized trials suggests that ablative devices failed to achieve predefined clinical and angiographic outcomes. This meta-analysis does not support the hypothesis that routine ablation or sectioning of atheromatous tissue is beneficial during percutaneous coronary interventions.
http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=PubMed&dopt=Citation&list_uids=15028347

J Am Coll Cardiol (2004);43:8-14
Optimal glycemic control is associated with a lower rate of target vessel revascularization in treated type II diabetic patients undergoing elective percutaneous coronary intervention
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OBJECTIVES: We examined the association between glycemic control determined by preprocedural hemoglobin A1c (A1c) and the incidence of target vessel revascularization (TVR) in diabetic patients undergoing elective percutaneous coronary intervention (PCI). BACKGROUND: Patients with diabetes mellitus (DM) have increased rates of restenosis and a worse clinical outcome after PCI than patients

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Am J Cardiol (2004);94:1429-32
Stent implantation in very small coronary arteries: the Tsunami SV International Registry
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The aim of this multicenter registry was to examine the in-hospital and long-term clinical outcomes of patients who underwent Tsunami SV stent implantation for the treatment of lesions involving coronary arteries with a reference diameter of <2.5 mm. The angiographic success rate was 97.5%. No in-hospital or 30-day major adverse cardiac events occurred. During the 6-month follow-up, there was 1 cardiac death (1%), and 5 subjects (4.8%) underwent repeat target lesion revascularization.
http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=PubMed&dopt=Citation&list_uids=15566919

Am Heart J (2004);147:E16
Facilitated percutaneous coronary intervention versus primary percutaneous coronary intervention: design and rationale of the Facilitated Intervention with Enhanced Reperfusion Speed to Stop Events (FINESSE) trial
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BACKGROUND: Percutaneous coronary intervention (PCI) has emerged as the strategy of choice in reestablishing effective flow in occluded infarct-related arteries in patients with acute myocardial infarction (MI) if it can be administered in a timely fashion. Patients who enter the catheterization laboratory with Thrombolysis In Myocardial Infarction (TIMI) grade 3 blood flow in the infarct-related vessel have better clinical outcomes than patients presenting with impaired flow. We hypothesize that a strategy of early pharmacologic reperfusion therapy with abciximab alone or in conjunction with reduced-dose reteplase, followed by PCI will improve the outcome of patients eligible for primary PCI. STUDY DESIGN: The Facilitated Intervention with Enhanced Reperfusion Speed to Stop Events (FINESSE) study is a 3000-patient, prospective, multicenter, randomized, double-blind, placebo-controlled trial. The study is designed to

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J Am Coll Cardiol (2004);43:1755-62
Hospital percutaneous coronary intervention volume and patient mortality, 1998 to 2000: does the evidence support current procedure volume minimums?
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OBJECTIVES: The aim of this study was to evaluate current American College of Cardiology/American Heart Association (ACC/AHA) hospital percutaneous coronary intervention (PCI) volume minimum recommendations. BACKGROUND: In order to reduce procedure-associated mortality, ACC/AHA guidelines recommend that hospitals offering PCIs perform at least 400 PCIs annually. It is unclear whether this volume standard applies to current practice. METHODS: We conducted a retrospective analysis of the Agency for Healthcare Research and Quality's Nationwide In-patient Sample hospital discharge database to evaluate in-hospital mortality among patients (n = 362748) who underwent PCI between 1998 and 2000 at low (5 to 199 cases/year), medium (200 to 399 cases/year), high (400 to 999 cases/year), and very high (1000 cases or more/year) PCI volume hospitals. RESULTS: Crude in-hospital mortality rates were 2.56% in low-volume hospitals, 1.83% in medium-volume hospitals, 1.64% in high-volume hospitals, and 1.36% in very high-volume hospitals ($p < 0.001$ for trend). Compared with patients treated in high-volume hospitals (odds ratio [OR] 1.00, referent), patients treated in low-volume hospitals remained at increased risk for mortality after adjustment for patient characteristics (OR 1.21, 95% confidence interval [CI] 1.06 to 1.28). However, patients treated in medium-volume hospitals (OR 1.02, 95% CI 0.92 to 1.14) and patients treated in very high-volume hospitals (OR 0.94, 95% CI 0.85 to 1.03) had a comparable risk of mortality. Findings were similar when high- and very

consecutive patients undergoing PCI at multiple centers in 1997 to 1998 and 1999. Of 3747 PCI patients, 216 (5.8%) required additional nontarget lesion PCI for clinical plaque progression at 1 year. Fifty-nine percent presented with new unstable angina, and 9.3% presented with nonfatal myocardial infarction. Patients with multivessel coronary artery disease during original PCI were more likely to require nontarget lesion PCI during follow-up (adjusted odds ratio, 1.72 [95% CI, 1.18 to 2.52] for 2 vessels; adjusted odds ratio, 3.37 [95% CI, 2.32 to 4.89] for 3 vessels). Angiographic review showed that the majority (86.9%) of lesions requiring subsequent PCI were </=60% in severity during original PCI, with the mean lesion stenosis 41.8+/-20.8% at the time of the initial PCI and 83.9+/-13.9% during the recurrent event. CONCLUSIONS: Approximately 6% of PCI patients will have clinical plaque progression requiring nontarget lesion PCI by 1 year. Greater coronary artery disease burden confers a significantly higher risk for clinical plaque progression.
http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=PubMed&dopt=Citation&list_uids=15623544

Am Heart J (2004);147:442-8
Certificate of need, volume, and percutaneous transluminal coronary angioplasty outcomes
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BACKGROUND: Florida seeks high hospital volumes for percutaneous transluminal coronary angioplasty (PTCA) by enforcing certificate of need (CON) laws, whereas California has no such laws. This study compares the volume-outcome relation for PTCA in Florida and California. METHODS: The relation between the number of PTCA procedures performed at hospitals and the rate of inhospital bypass graft surgery and death for 292,457 patients in Florida and 390,880 patients in California between 1988 and 1998 was examined with descriptive statistics and logistic regressions. RESULTS: In 1988, the mean hospital PTCA volumes in Florida (237) and California (218) were not significantly different (P =.44). By 1998, Florida hospital volumes were significantly

# Randomized comparison of direct stenting with predilatation followed by stenting on vessel trauma and restenosis

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BACKGROUND: Direct stenting may reduce trauma to the vessel wall, thereby having a positive impact on acute and long-term results. This study evaluated acute vessel trauma and acute and follow-up angiographic and intravascular ultrasound (IVUS) results after direct stenting in comparison to conventional stenting. METHODS: Two hundred forty-nine patients were randomly assigned to direct stenting (n = 124) or stenting after predilatation (n = 125) and were followed up by angiography at 6 +/- 2 months. Intracoronary serum endothelin (ET-1) levels were determined distal to the lesion before and after coronary intervention to define vessel trauma, and IVUS was performed before and after intervention and at follow-up to determine induced changes in vessel morphology and intimal hyperplasia in a subgroup of 40 patients. RESULTS: Feasibility of direct stenting was 91%, with 9% requiring crossover to predilatation. There were no differences between the 2 groups in immediate clinical, angiographic, and intravascular ultrasound results. Intracoronary ET-1 levels increased significantly after intervention, without differences between the 2 groups (increase in ET-1 level, 0.79 +/- 1.06 vs 0.96 +/- 1.22 fmol/L, P =.206). At 6-month follow-up, angiographic late loss (0.76 +/- 0.86 vs 0.69 +/- 1.09 mm, P =.788) and restenosis rate (21% vs 20%, P = 1.000) were similar for direct stenting versus conventional stenting, respectively. IVUS demonstrated comparable intimal hyperplasia areas for direct versus conventional stenting (2.0 +/- 1.5 mm(2) vs 2.2 +/- 1.6 mm(2), respectively, P =.243).

men, with a predominance of diabetes and hypercholesterolemia, and were at higher risk of developing vascular and ischemic complications after percutaneous coronary intervention, warranting aggressive risk factor modification and vigilance in this population.
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Am J Cardiol (2004);93:747-50
Predictors of troponin elevation after percutaneous coronary intervention
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The predictors of troponin release after percutaneous coronary intervention were prospectively assessed in 405 consecutive patients. Troponin release occurred frequently (27%) and was associated with complications during the procedure, including sapheneous vein graft interventions, multistent use, glycoprotein IIb/IIIa use, and a history of hypercholesterolemia.
http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=PubMed&dopt=Citation&list_uids=15019883

Am J Cardiol (2004);94:583-7
Comparison of outcomes of percutaneous coronary intervention of ostial versus nonostial narrowing of the major epicardial coronary arteries
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Outcomes of percutaneous coronary intervention (PCI) of the ostia of the major epicardial coronary arteries in the modern era of stenting have not been clearly defined. We evaluated data from all PCIs performed from 1998 to 2001 in the proximal segments of the major epicardial coronary arteries entered into a large cardiac database and compared ostial with nonostial PCI outcomes. Of 2,484 patients who underwent PCI of a proximal coronary artery (left anterior descending, left circumflex, or right coronary),

N Engl J Med (2004);351:2795-804
Coronary-artery revascularization before elective major vascular surgery
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BACKGROUND: The benefit of coronary-artery revascularization before elective major vascular surgery is unclear. METHODS: We randomly assigned patients at increased risk for perioperative cardiac complications and clinically significant coronary artery disease to undergo either revascularization or no revascularization before elective major vascular surgery. The primary end point was long-term mortality. RESULTS: Of 5859 patients scheduled for vascular operations at 18 Veterans Affairs medical centers, 510 (9 percent) were eligible for the study and were randomly assigned to either coronary-artery revascularization before surgery or no revascularization before surgery. The indications for a vascular operation were an expanding abdominal aortic aneurysm (33 percent) or arterial occlusive disease of the legs (67 percent). Among the patients assigned to preoperative coronary-artery revascularization, percutaneous coronary intervention was performed in 59 percent, and bypass surgery was performed in 41 percent. The median time from randomization to vascular surgery was 54 days in the revascularization group and 18 days in the group not undergoing revascularization (P<0.001). At 2.7 years after randomization, mortality in the revascularization group was 22 percent and in the no-revascularization group 23 percent (relative risk, 0.98; 95 percent confidence interval, 0.70 to 1.37; P=0.92). Within 30 days after the vascular operation, a postoperative myocardial infarction, defined by elevated troponin levels, occurred in 12 percent of the revascularization group and 14 percent of the no-revascularization group (P=0.37). CONCLUSIONS: Coronary-artery revascularization before elective vascular surgery does not significantly alter the

groups. Compared with healthy weight patients, patient with class I or II obesity had lower in-hospital mortality and major adverse cardiac events (MACE) (combined death, myocardial infarction, and emergency surgery), whereas patients at the extremes of BMI (underweight and class III obese patients) had significantly higher mortality and MACE rates. Adjusted hazards ratios for in-hospital mortality according to BMI were: underweight (2.69), healthy weight (1.0), overweight (0.90), class I obese (0.74), class II obese (0.67), and class III obese (1.63). Patients at the extremes of BMI (<18.5 and >40 kg/m(2)) were at increased risk of MACEs, including mortality after PCI, whereas patients who were moderately to severely obese (BMIs 30 to 40 kg/m(2)) were at lower risk than healthy weight patients.
http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=PubMed&dopt=Citation&list_uids=15135694

J Am Coll Cardiol (2004);43:1964-72
Coronary stenting versus balloon angioplasty in small vessels: a meta-analysis from 11 randomized studies
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OBJECTIVES: A meta-analysis of 11 randomized trials was done to compare stenting versus balloon angioplasty (BA) in small coronary vessels. BACKGROUND: Randomized studies on coronary stenting (CS) in small vessels have yielded controversial results. METHODS: Eleven randomized trials on CS versus BA in small vessels, including angiographic re-evaluation at six months, were analyzed. RESULTS: The BeStent (Medtronic Instent, Minneapolis, Minnesota) was used in four studies, the Multi-Link (Guidant, Advanced Cardiovascular Systems Inc., Santa Clara, California) in three trials, and the NIR (Boston Scientific Corp., Boston, Massachusetts), JoStent (Jomed International AB, Helsingborg, Sweden), Tenax (Biotronik, Berlin, Germany), and BioDivysio (Abbott Vascular Devices, Redwood City, California) in the remaining four trials. Overall, 3,541 patients were included (1,672 allocated to BA and 1,869 to stent). The rate of cross-over from balloon to stent in the pooled population was 19%, and unsuccessful stent deployment occurred in 2% of the patients allocated to stent. The pooled rates of restenosis were 25.8% and 34.2% in patients allocated to stent and balloon, respectively (p = 0.003) (risk ratio [RR] 0.77; 95% confidence interval [CI] 0.65 to 0.92). A smaller reference vessel diameter at baseline was associated with a higher risk reduction in the restenosis rate (y = -3.551 + 1.826 [x]; p = 0.012). Patients allocated to stent had lower rates of major adverse cardiac events (15.0% vs. 21.8%, p = 0.002; RR 0.70; 95% CI 0.57 to 0.87) and new target vessel revascularizations (12.5% vs. 17.0%, p = 0.004; RR 0.75, 95% CI 0.61 to 0.91). CONCLUSIONS: Elective stenting is superior to provisional stenting in small coronary arteries. This benefit is more evident in smaller coronary arteries.
http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=PubMed&dopt=Citation&list_uids=15172399

Am J Cardiol (2004);94:1058-60
Effectiveness of percutaneous coronar sa7dpud9eod92td9e/.p eod.1(%2o6(onal 1)Mct%fscrw.7(fi5(61

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Data on percutaneous coronary intervention (PCI) in nonagenarians are very scarce. The investigators present a series of 26 nonagenarians who underwent PCI (29 lesions, 1.1 +/- 0.3 per patient). Most (96%) had acute coronary syndrome at presentation, 27% underwent primary PCI for acute myocardial infarctions, and 54% had multivessel disease. Angiographically successful results were obtained in 24 patients (92%), and coronary stents were used in 81%. Five patients (19%) died during hospitalization. In-hospital mortality was significantly greater in patients with Killip class III or IV at presentation (100% vs 9%, p = 0.001), in those in whom the procedure was a primary PCI for acute myocardial infarction (57% vs 5%, p = 0.010), and in the presence of angiographic failure (100% vs 13%, p = 0.031). In-hospital mortality was 0% after excluding patients in cardiogenic shock and those with primary PCI. Thus, most nonagenarians who undergo PCI have a high-risk profile. However, PCI achieves a successful angiographic result in most patients. Mortality is high but concentrated in patients in cardiogenic shock and with primary angioplasty as PCI.
http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=PubMed&dopt=Citation&list_uids=15476626

Am J Cardiol (2004);93:750-3
Incidence, predictors, and clinical significance of troponin-I elevation without creatine kinase elevation following percutaneous coronary interventions
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The objectives of this study were to investigate the incidence, predictors, and clinical significance of isolated postprocedural troponin-I elevations in a consecutive series of patients who underwent percutaneous coronary intervention. We observed, in a series of 1,128 patients, that isolated troponin-I elevations without concomitant creatine kinase elevations occurred in 17% of patients after percutaneous coronary intervention, and that even troponin-I elevations 5 times above the upper limit of normal did not predict events after hospital discharge.
http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=PubMed&dopt=Citation&list_uids=15019884

Eur Heart J (2004);25:69-80
Clinical outcomes of stents versus balloon angioplasty in non-acute coronary artery disease. A meta-analysis of randomized controlled trials
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AIMS: To evaluate whether stents as compared to balloon angioplasty reduce mortality in patients with non-acute coronary artery disease. METHODS AND RESULTS: We identified randomized controlled trials comparing0ompad ediswh3(hat )n of( )3(ry)9els.

total of 8004 patients, fulfilled our inclusion criteria. For 1000 patients treated with stents rather than balloon angioplasty, 3 (95% CI 0-6), 5 (95% CI 0-9), and 6 (95% CI -1-12) additional lives were saved at 30 days, 6 and 12 months. At 12 months, for 1000 patients treated with stents rather than balloon angioplasty 46 (95% CI 25-66) additional target vessel revascularizations were avoided, but 25 (95% CI 15-34) additional bleeding complications with need for blood transfusion or surgical intervention occurred. In sensitivity analysis 11 (95% CI 2-20) and 2 (95% CI -4-7) deaths were avoided per 1000 patients treated with stents rather than PTCA in trials that routinely used compared to trials that did not use glycoprotein IIb/IIIa inhibitors. CONCLUSION: In non-acute coronary disease stents may reduce overall mortality, but this benefit seems to be limited to stents used in conjunction with glycoprotein IIb/IIIa inhibitors. Stents compared to PTCA reduce target vessel revascularizations, but increase the risk of bleeding complications.
http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=PubMed&dopt=Citation&list_uids=14683745

J Am Coll Cardiol (2004);43:1335-42
Routine intravascular ultrasound guidance of percutaneous coronary intervention: a critical reappraisal
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Intravascular ultrasound (IVUS) has played an integral role in the evolution of interventional cardiology. However, routine IVUS guidance of coronary stent implantation is not supported by a critical reappraisal of the available evidence. Although there is a trend toward a benefit with respect to target lumen revascularization favoring IVUS-guided coronary stent implantation, it is likely that this effect is driven by improved outcomes in small vessels, long coronary stenoses, and possibly saphenous vein graft interventions. No consistent trend in the incidence of death or myocardial infarction is apparent. Furthermore, the safety, efficacy, and effectiveness of IVUS should be taken into account when considering the goals, risks, benefits, and alternatives to such a treatment strategy.
http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=PubMed&dopt=Citation&list_uids=15093863

Am J Cardiol (2005);95:502-5
Effect of dexamethasone-eluting stents on systemic inflammatory response in patients with unstable angina pectoris or recent myocardial infarction undergoing percutaneous coronary intervention
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The effect of treatment with steroid-eluting stents on systemic inflammatory response was investigated in patients with unstable angina pectoris or recent myocardial infarction who underwent percutaneous intervention. Compared with controls, dexamethasone-eluting stents significantly reduced C-reactive protein peak levels 48 hours after the procedure; this effect persisted for 7 days and was particularly evident in

patients with elevated (>/=3 mg/L) preprocedural C-reactive protein values. Patients receiving a dexamethasone-eluting stent had lower adverse events during follow-up.
http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=PubMed&dopt=Citation&list_uids=15695139

Am J Cardiol (2004);93:477-80
Impact of strut thickness on late luminal loss after coronary artery stent placement
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To determine the influence of coronary artery stent strut thickness on angiographic late luminal loss, 663 patients were included in a single-center observational cohort after receiving an ACS Multilink stent in a native coronary vessel. At 6- to 10-month follow-up, 287 patients treated with a thin-strut stent (50 microm) had significantly less late luminal loss than 376 patients treated with a thick-strut stent (> or =90 microm) (mean 0.92 +/- 0.59 vs 1.06 +/- 0.71 mm, p = 0.011); on multivariate regression analysis, strut thickness was found to be an independent predictor for late luminal loss.
http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=PubMed&dopt=Citation&list_uids=14969629

Eur Heart J (2004);25:190-8
Percutaneous coronary intervention in diabetic patients with non-ST-segment elevation acute coronary syndromes
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Key pathophysiologic mechanisms of diabetes-related coronary disease include inflammation and a prothrombotic state. In the setting of non-ST-segment elevation acute coronary syndromes diabetic patients are at high risk for subsequent cardiovascular events. At the same time, they derive greater benefit than non-diabetic counterparts from aggressive antithrombotic therapy, early coronary angiography, and

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sensitive tool to detect restenosis. Thus, FU angio protocols have been a pivotal part of trials on long-term efficacy of stents. However, it is unclear if such protocols supply data relevant for the prognosis of individual patients. The purpose of this study was to assess the impact of angiographic restenosis detected by FU angio on late mortality after coronary stent placement. METHODS AND RESULTS: We analyzed 2272 consecutive patients with successful stent placement performed from May 1992 through December 1996. All patients were scheduled for 6-month FU angio and contacted again after 4 years. FU angio was performed in 1958 patients. Of those, 557 patients (28.4%) had restenosis. After 4 years, 8.8% of patients with restenosis died, compared to 6.0% without (P =.02). There were several significant differences in clinical and angiographic characteristics between the 2 groups. In a multivariate analysis including those characteristics plus restenosis, only older age and restenosis were independent risk factors for late mortality. In patients with severe restenosis (>75% of lumen diameter; n = 231), late mortality was 7.6% in those with target vascular revascularization, compared to 14.9% without (P = not significant). CONCLUSIONS: In this analysis, mortality 4 years after stent placement was higher in patients with angiographic restenosis. Restenosis was an independent risk factor for late mortality, with a potential benefit after target vessel revascularization in severe restenoses. These data suggest that routine FU angio after stenting provides data relevant for long-term prognosis of patients.
http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=PubMed&dopt=Citation&list_uids=14760331

Circulation (2004);110:3789-94
Predictors of quality-of-life benefit after percutaneous coronary intervention
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BACKGROUND: Improving patients' quality of life is a primary indication for percutaneous coronary intervention (PCI), yet little is known about patient characteristics associated with greater quality-of-life improvement from the procedure. This study was conducted to identify patient characteristics associated with quality-of-life benefit after PCI. METHODS AND RESULTS: A consecutive series of 1518 patients undergoing PCI in nonacute myocardial infarction settings were prospectively enrolled into an observational study documenting their postprocedural health status. We examined univariate and multivariable associations between baseline patient characteristics and quality of life 1 year after the procedure using the disease-specific Seattle Angina Questionnaire (SAQ) to quantify the impact of patients' coronary disease on their quality of life. Baseline angina frequency and physical function were the strongest predictors of quality-of-life improvement 1 year after PCI. In comparing patients without angina to those experiencing monthly, weekly, and daily angina, the quality-of-life improvements (mean+/-SEM) were 21.4+/-2.1, 30.7+/-2.2, and 34.6+/-2.6 points greater (P<0.001). Patients with mild, moderate, and severe physical limitation improved 13.8+/-1.9, 20.0+/-2.1, and 13.5+/-3.5 points more than those with minimal baseline physical limitation (P<0.001). These findings were maintained in multivariable models correcting for baseline differences in demographic, clinical, disease-severity, and health-status variables. CONCLUSIONS: Pr

frequency is the most important prognostic indicator of quality-of-life improvement after PCI. Although substantial quality-of-life benefits are attained in most patients with preprocedural angina, more careful consideration of the potential benefits and risks of the procedure are needed in asymptomatic patients.
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Myocardial perfusion grade and survival after percutaneous transluminal coronary angioplasty in patients with cardiogenic shock
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We sought to evaluate myocardial reperfusion and its prognostic value after percutaneous transluminal coronary angioplasty (PTCA) in patients admitted for cardiogenic shock. Lack of myocardial reperfusion despite restored coronary flow affects the survival of patients with acute myocardial infarction (AMI). Myocardial blush grade (MBG) is an angiographic measure of myocardial perfusion. We assessed MBG in 41 consecutive patients admitted to our department within 12 hours from the onset of AMI and in cardiogenic shock. PTCA was successful in 83% of patients. Thrombolysis In Mycardial Infarction (TIMI) grade 3 flow was demonstrated in 22 patients (53%). MBG 2/3 was found in 14 patients (34%); among them, 12 had TIMI 3 flow. Compared with patients with MBG 2/3, those with MBG 0/1 were older (71 +/- 11 vs 57 +/- 13 years, p = 0.001), had a higher prevalence of diabetes (48% vs 14%, p = 0.04) and hypertension (63% vs 29%, p = 0.04), showed a trend toward longer ischemic time (6.1 +/- 2.4 vs 4.9 +/- 1.1), and had larger enzymatic infarct size (peak creatine kinase 7,690 +/- 3,516 vs 5,500 +/- 2,977 IU/L). Mortality was higher in patients with MBG 0/1 both in the hospital (81% vs 14%, p <0.001) and at follow-up (81% vs 29%, p = 0.001). After adjustment by multivariate analysis, MBG 0/1 (odds ratio 16, p = 0.01) and age (odds ratio 3.8/10 years, p = 0.04) were correlated with in-hospital mortality. MBG 2/3 was achieved in a few patients in cardiogenic shock after AMI who were treated with PTCA; this was a strong predictor of in-hospital survival. Also, risk stratification after mechanical revascularization should include assessment of restoration of myocardial reperfusion.
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Promising efficacy of primary gradual and prolonged balloon angioplasty in small coronary arteries: a randomized comparison with cutting balloon angioplasty and conventional balloon angioplasty
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BACKGROUND: Small vessel size represents a critical risk factor for an adverse outcome after both conventional balloon angioplasty (POBA) and stenting. Gradual and prolonged balloon angioplasty (GPBA) has been shown to cause less arterial trauma, which results in higher procedural success rates and fewer in-hospital complications than POBA. The aim of this study was to assess the clinical and angiographic benefits

of primary GPBA with a perfusion balloon in small coronary arteries, as compared with cutting balloon angioplasty (CBA) and POBA. METHODS: A total of 263 patients with symptoms and reference diameters <3.0 mm were randomly assigned to undergo GPBA (n = 85), CBA (n = 88), or POBA (n = 90). The cumulative inflation time must be >10 minutes in GPBA. Crossover to stent was allowed for inadequate results. Follow-up angiography was performed after 6 months. The primary end point was angiographic restenosis at follow-up. RESULTS: Compared with POBA, GPBA resulted in a lower final residual diameter stenosis (27.3% vs 34.2%, P =.01) and decreased the need for stent placement (8.0% vs 22.2%, P =.031). At follow-up, the restenosis rates were lower with GPBA (31.3%, P =.034) and CBA (32.9%, P =.059) than POBA (50.6%). Target lesion revascularization was less frequently needed with GPBA (20.5%, P =.043) and CBA (20.0%, P =.033) than POBA (37.6%). Additionally, the event-free survival rate was higher with GPBA (77.1%, P =.033) and CBA (76.4%, P =.047) than POBA (58.8%). CONCLUSIONS: In small coronary arteries, both GPBA and CBA resulted in favorable angiographic and clinical outcomes. With a lower restenosis rate and target lesion revascularization rate, GPBA may be a superior strategy for small vessels compared with POBA.
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Circulation (2004) Influence of Percutaneous Coronary Intervention on Coronary Microvascular Resistance Index
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BACKGROUND: Coronary microvascular resistance during maximal hyperemia is generally assumed to be unaffected by percutaneous coronary interventions (PCIs). We assessed a velocity-based index of hyperemic microvascular resistance (h-MRv) by using prototypes of a novel, dual-sensor (Doppler velocity and pressure)-equipped guidewire before and after PCI to test this hypothesis. METHODS AND RESULTS: Aortic pressure, flow velocity (h-v), and pressure (h-Pd) distal to 24 coronary lesions were measured simultaneously during maximal hyperemia induced by intracoronary adenosine. Measurements were obtained in the reference vessel before PCI and in the target vessel before and after PCI, stenting, and ultrasound-guided, upsized stenting. h-Pd increased from 57.9+/-17.0 to 85.5+/-15.6 mm Hg, and h-MRv (ie, h-Pd/h-v) decreased from 2.74+/-1.40 to 1.58+/-0.61 mm Hg. cm(-1). s after stenting (both P<0.001). The reduction in h-MRv accounted for 34% of the decrease in total coronary resistance achieved by PCI. h-MRv of the target vessel after PCI was lower than that of the corresponding reference vessel despite a higher h-Pd in the reference vessel (P<0.01). Post-PCI baseline MRv was correlated with baseline Pd before PCI (P<0.01).

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A comparison of coronary artery stenting with angioplasty for isolated stenosis of the proximal left anterior descending coronary artery: five year clinical follow up
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BACKGROUND: Stent implantation for isolated stenosis of the proximal left anterior descending coronary artery (LAD) with preserved left ventricular function has been found to have a better clinical and angiographic outcome at one year than balloon angioplasty (PTCA). OBJECTIVE: To establish whether those results are maintained at five year follow up. METHODS: Patients were followed at least every six months. For those who died during follow up, data were obtained from medical records. MAIN OUTCOME MEASURES: Freedom from death, non-fatal myocardial infarction, cerebrovascular accident, and repeated target lesion revascularisation. Secondary end points were revascularisation in a remote region and freedom from angina. RESULTS: Follow up was complete in all patients. At five years, the primary end point was reached more often by patients randomised to stent implantation than to PTCA (80% v 53%; odds ratio (OR) 0.29 (95% confidence interval (CI) 0.13 to 0.69); p = 0.0034). In the PTCA group, 35% of patients underwent target lesion revascularisation v 15% in the stent group (OR 0.33, 95% CI 0.13 to 0.80; p = 0.014). There was a trend towards increased mortality in the PTCA group than in the stent group (17% v 7%; OR 0.36, 95% CI 0.10 to 1.21; p = 0.098). No significant differences were found between PTCA and stent groups for non-fatal myocardial infarction (8% v 5%; OR 0.58, 95% CI 0.13 to 2.54; p = 0.46) or cerebrovascular accident (2% v 0%). CONCLUSIONS: In patients with isolated stenosis of the proximal LAD, a five year clinical follow up confirmed a better outcome in those treated with stenting than with PTCA.
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