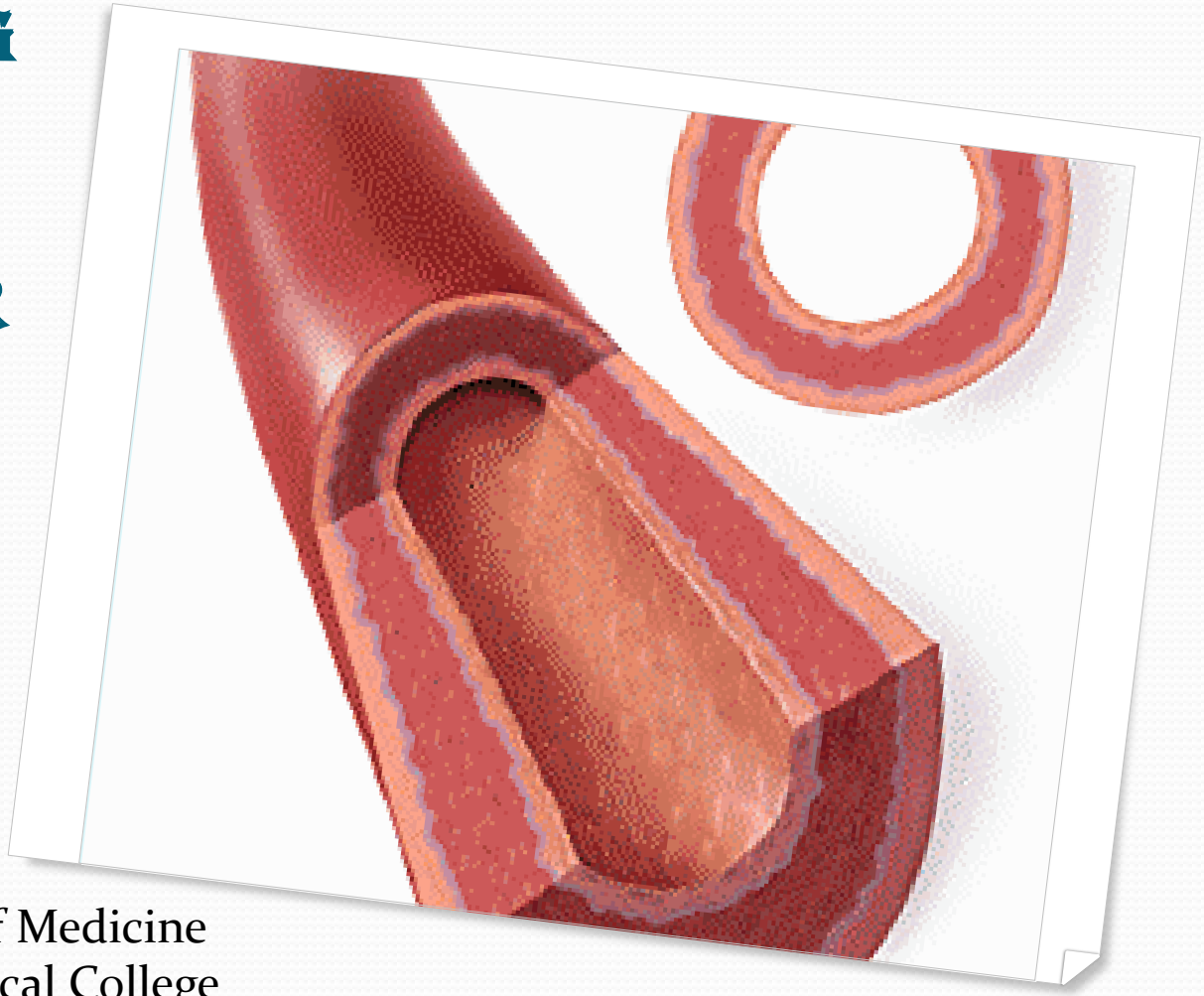
DRUG ELUTING OR BARE METAL STENTING FOR CORONARY ARTERY DISEASE



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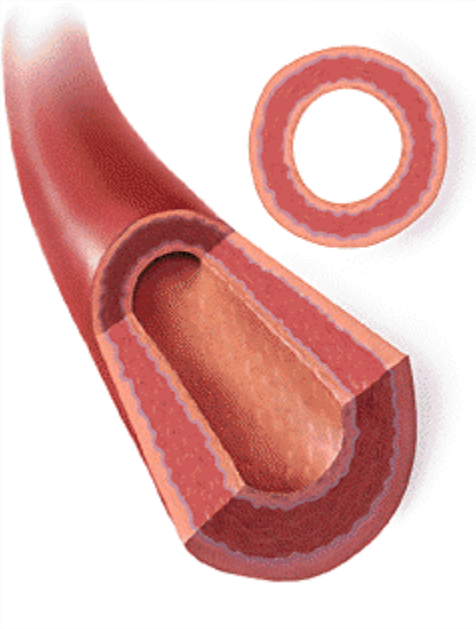
Coronary Artery Disease



- Occurs when the arteries that supply blood to the heart muscle (coronary arteries) become hardened and narrowed due to the build-up of cholesterol and other material, called plaque, on the inner walls of the arteries

- Less blood may flow through the arteries consequently leading to the lack of oxygen in the heart muscle, causing chest pain (angina) and ultimately acute coronary syndrome (heart attack)

Percutaneous coronary intervention

- Percutaneous coronary intervention is the most prevalent method for coronary artery revascularization.

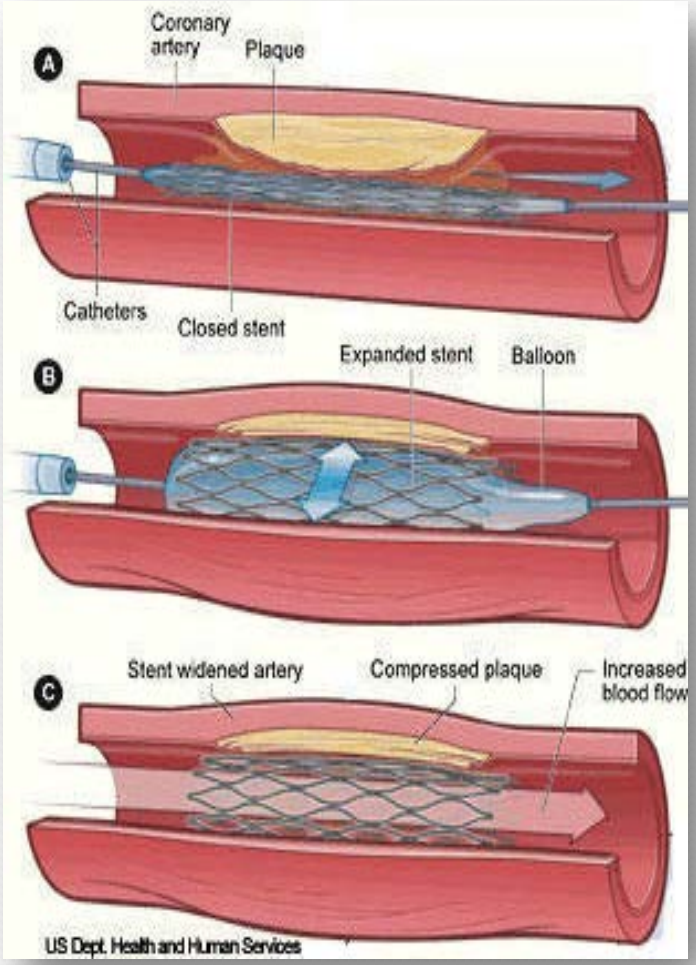
- Initial interventions using balloon angioplasty had limited efficacy because coronary dissections, arterial recoil, and neointimal formation led to high rates of abrupt vessel closure and clinical restenosis.

Percutaneous coronary intervention

- With the introduction of coronary stents, vascular dissections were stabilized and arterial recoil was eliminated, but neointimal accumulation remained problematic, resulting in the development of in-stent restenosis (ISR) in 20%-30% of cases.

- Drug-eluting stents (DESs) were developed to release antiproliferative agents at the site of arterial injury to attenuate neointimal formation

Intracoronary Stenting (IS)



- Stents have a tubular, lattice structure.
- Assembled from metals, such as nitinol, stainless steel, cobalt and chromium
- It is left in the artery permanently to help maintain the artery unblocked and decrease the chance of another blockage

Two main types of stents currently in use

Bare-Metal(BMS)

- Made of stainless steel
- Procedure involves lower costs than with DES

Drug-Eluting(DES)

- Coated with a drug that fights the proliferation of cells that can block the artery
- Significantly reduce the need of repeated procedures

[6] American Heart Association. Drug-eluting stents beat bare metal stents in diabetics

Drug-Eluting Stent(DES)

DESs are composed of a metallic stent, a polymer-based drug delivery platform, and a pharmacologic agent (typically an immunosuppressant and/or antiproliferative compound).

The goal of DES technology is to minimize PCI-related vascular inflammation and cellular proliferation thus reducing ISR

Drug-Eluting Stent(DES)

First-generation DES

comprised of a metallic stent platform coated with a polymer that elutes antiproliferative and antiinflammatory therapeutic agents (ie, sirolimus or paclitaxel).

Second-generation DES

decreased strut thickness, improved flexibility and deliverability, enhanced polymer biocompatibility/ drug elution profiles, and superior reendothelialization.

DES COMPARED TO BMS

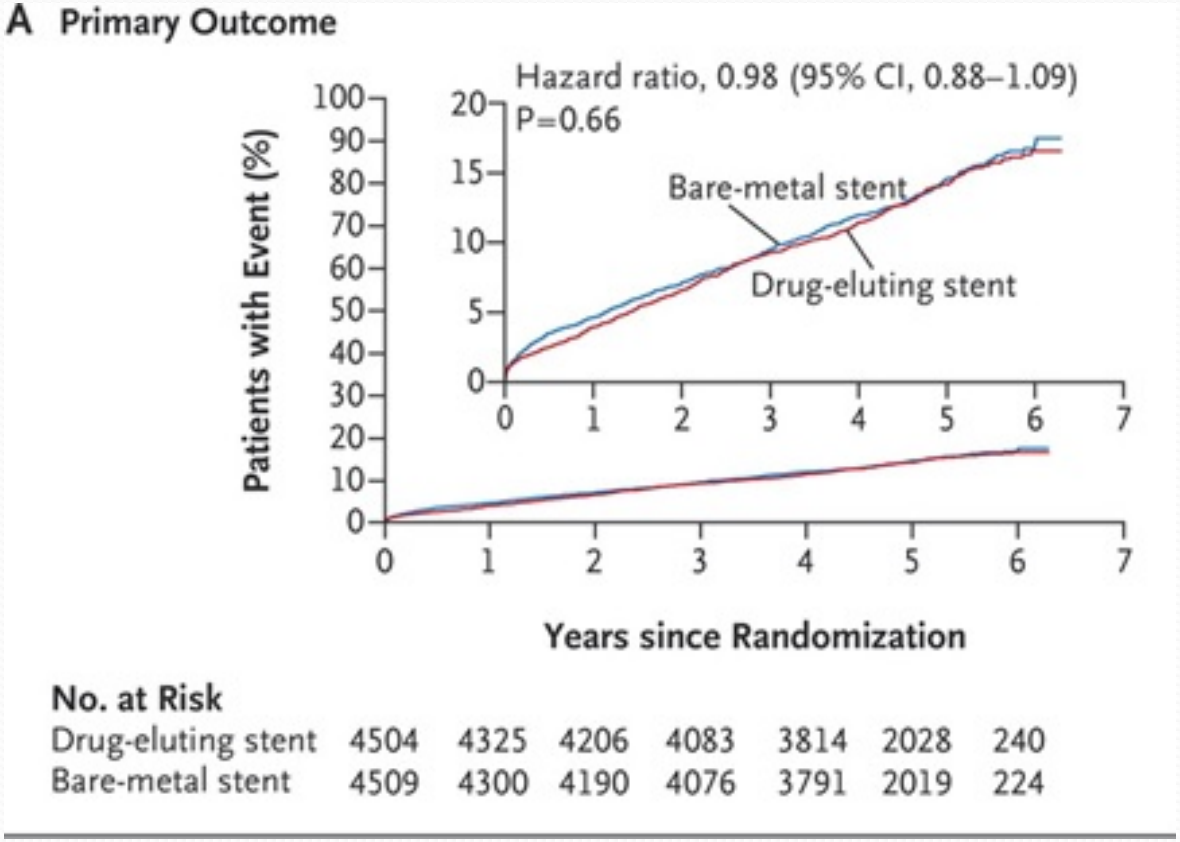
- In most of the studies efficacy or safety of DES (sirolimus / paclitaxel) compared to BMS was observed

- There are few studies comparing 2nd generation DES (everolimus-eluting or zotarolimus-eluting stents) to BMS.

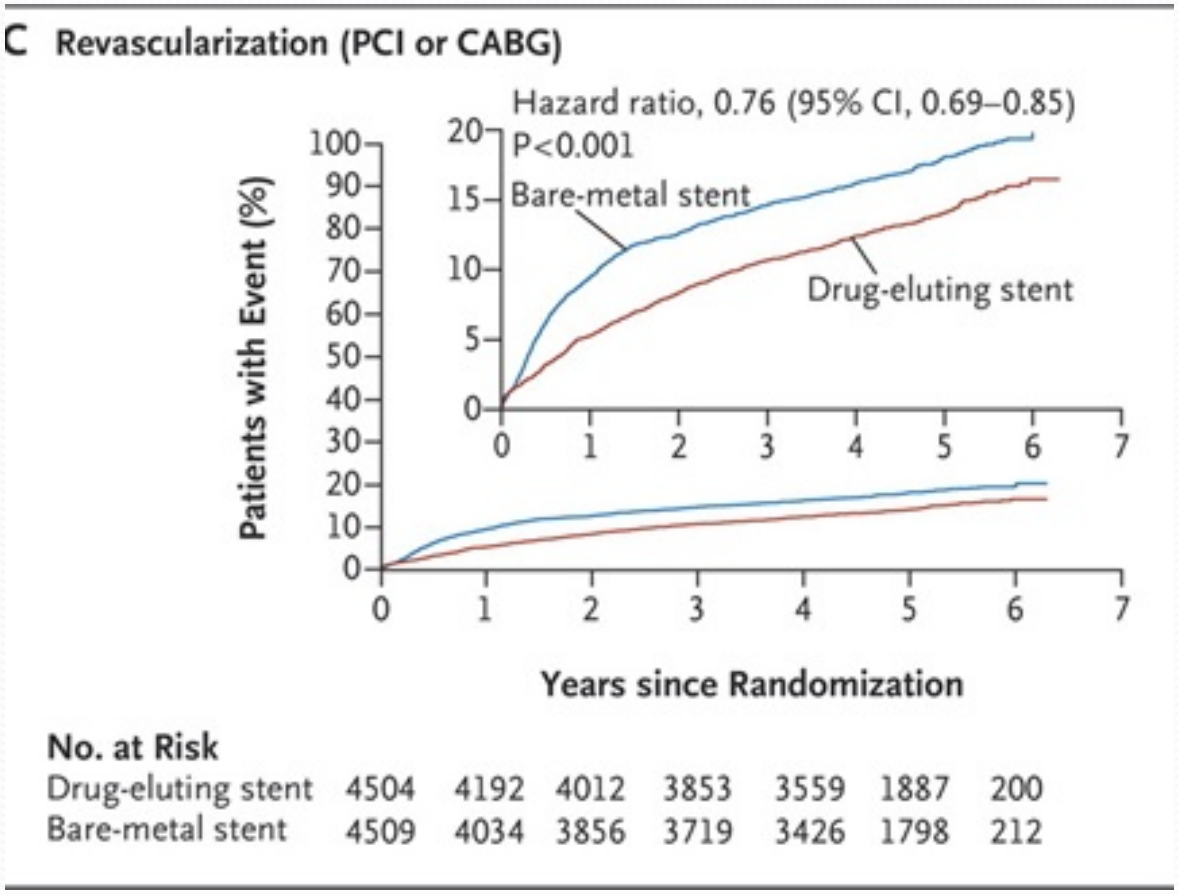
Latest Trial Update

- NORSTENT Trial published in NEJM on Sep 2016
- In the DES group 16.6% of patients reached primary endpoint, which was a composite of all-cause mortality and non-fatal myocardial infarction, versus 17.1% in the BMS group (HR 0.98, 95% CI 0.88-1.09, P=0.66)
- DES patients were less likely to need a repeat procedure -- the 6-year repeat revascularization rate was 19.8% for BMS versus 16.5% (HR 0.76, 95% CI 0.69-0.85, P<0.001) for DES

Graph 1


A Primary Outcome
Hazard ratio, 0.98 (95% CI, 0.88–1.09)
P=0.66
Bare-metal stent
Drug-eluting stent
Patients with Event (%)
Years since Randomization
No. at Risk
Drug-eluting stent 4504 4325 4206 4083 3814 2028 240
Bare-metal stent 4509 4300 4190 4076 3791 2019 224

Graph 2


C Revascularization (PCI or CABG)
Hazard ratio, 0.76 (95% CI, 0.69–0.85)
P<0.001
Bare-metal stent
Drug-eluting stent
Patients with Event (%)
Years since Randomization
No. at Risk
Drug-eluting stent 4504 4192 4012 3853 3559 1887 200
Bare-metal stent 4509 4034 3856 3719 3426 1798 212

Trial Update

Irrespective of stent type, the risk of stent thrombosis is greatest within the first 30 days after implantation.

Compared to BMS, SES and PES have a similar rate of early stent thrombosis, while EES appears to have a lower risk.

With regard to very late stent thrombosis, SES and PES appear to have a higher rate, while EES and ZES appear to have a similar risk.

WHEN TO CHOOSE A BMS

- Patients in whom DES cannot be implanted for technical reasons.
- Patients for whom compliance with a recommendation for 12 months of dual antiplatelet therapy is likely to be problematic.
- Those who are scheduled to undergo surgery in the ensuing year.
- Those known to be at higher risk of bleeding, including individuals taking an oral anticoagulant

Duel Antiplatelet after stenting

The minimum duration is

- one month after BMS
- six months after DES (with preference for 12 months if not at high risk for bleeding)

Take Home Message

DES outperform BMS with regard to the need for repeat revascularization and there is no difference in long-term mortality.


Thank
you!