



Myocardial Revascularization The US point of view

Advances in CV Arrhythmias &
Great Innovations in Cardiology

Turin, IT October 2012



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Financial Disclosures and Conflict of Interest

- None
-but I am an interventional cardiologist so I might have an intellectual and professional conflict

On our daily ward rounds.....

GUIDELINES



> *10,000* OF THEM!!

Practice Guidelines

- Cardiology leads the way in terms of volume
- Foundation for quality metrics, assessment of quality of care, reimbursement, litigation
- Evidence-based
- They are not rules
- Many limitations

ACC/AHA Guidelines in 2009

Strength of Evidence

11% LOE = A

39%

48% LOE = C

Guidelines now based on
increasing uncertainties
....not an increased volume
of definitive evidence



European Heart Journal (2010) 31, 2501–2555
doi:10.1093/eurheartj/ehq277

ESC/EACTS GUIDELINES

Guidelines on myocardial revascularization

The Task Force on Myocardial Revascularization of the European Society of Cardiology (ESC) and the European Association for Cardio-Thoracic Surgery (EACTS)

Developed by the Task Force on Myocardial Revascularization of the European Association of Cardio-Thoracic Surgery (EACTS)

Chairperson: Philippe Kolh
Members: Carlo Di Mario (UK), Garg (The Netherlands), Jose

Authors/Task Force Members: (Chairperson) (Belgium), (Switzerland), Stefan, Marco, F. Pie, (Germany), Georgeant, Miguel S.

Angelo Aur, Filippa, McDonagh, (Norway)

el Dunning
is (Greece),
er (EACTS
tel de la Riviere

404 individual recommendations

18% based on LOE A
22% based on LOE C

David T, ESC Committee for, Jeroen Bax (The Netherlands), Christian Funck-Brentano (France), A. Popescu (Romania), Panos E. Vardas (Poland), Philippe Kolh (Belgium), Dieter Kappetein (The Netherlands), ESC CPG Review Coordinator, Alexander Al, (Portugal), Enver Atalar (Tur

Recommended risk stratification scores to be used in candidates for PCI or CABG

Score	Validated outcomes	Class/Level	
		PCI	CABG
EuroSCORE	Short and long-term mortality	IIb B	I B
SYNTAX score	Quantify coronary artery disease complexity	IIa B	III B
Mayo Clinic Risk Score	MACE and procedural death	IIb C	III C
NCDR CathPCI	In-hospital mortality	IIb B	-
Parsonnet score	30-day mortality	-	III B
STS score	Operative mortality, stroke, renal failure, prolonged ventilation, deep sternal infection, re-operation, morbidity, length of stay < 6 or > 14 days	-	I B
ACEF score	Mortality in elective CABG	-	IIb C

- For PCI, SYNTAX score emerges as preferred score to quantify complexity of CAD, but needs to be tested in other trials.
- For CABG, both EuroSCORE and STS score are well validated, mostly based on clinical variables.
- STS score is undergoing periodic adjustment which makes longitudinal comparisons difficult.

ACEF score = [Age/Ejection Fraction (%)] + 1 (if Creatinine > 2 mg/dL).

European Heart Journal (2010) 31, 2501-2555
European Journal of Cardio-thoracic Surgery (2010) 38, S1-S52

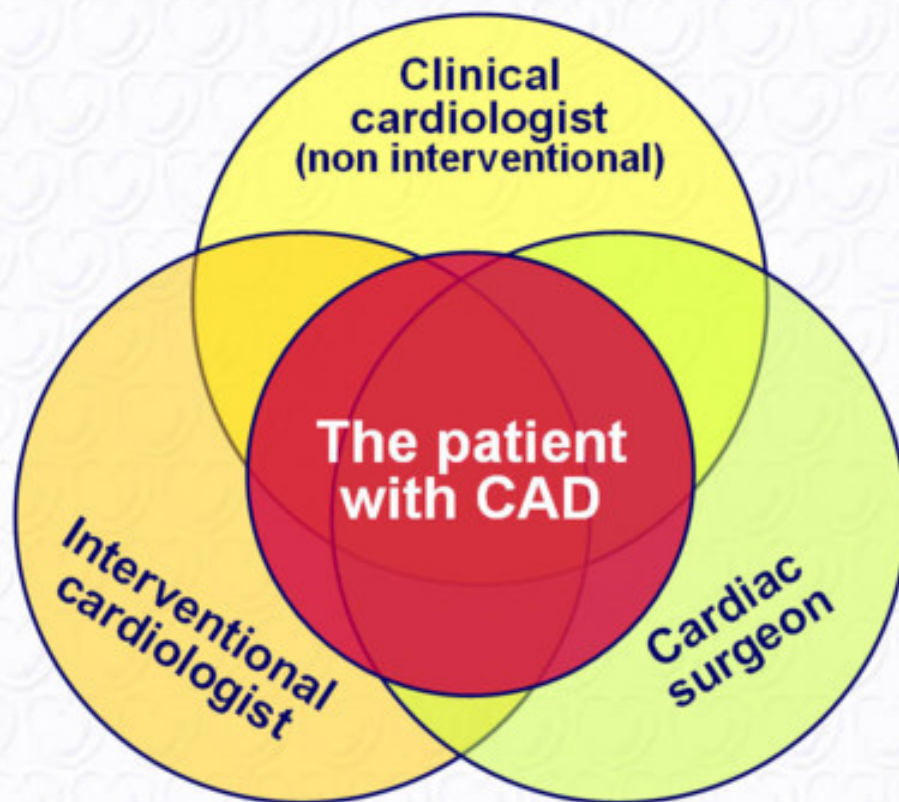
Recommendations for decision making and patient information

	Class	Level
It is recommended that patients be adequately informed about the potential benefits and short- and long-term risks of a revascularisation procedure. Enough time should be spared for informed decision making.	I	C
The appropriate revascularisation strategy in patients with MVD should be discussed by the Heart Team.	I	C

Agreement before Action !

European Heart Journal (2010) 31, 2501-2555
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The Heart Team



**Task Force composition = 8 clinical cardiologists (non interventional)
+ 9 interventional cardiologists + 8 cardiac surgeons**

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Potential indications for *ad hoc* PCI versus revascularisation at an interval

<i>Ad hoc</i> PCI
Haemodynamically unstable patients (including cardiogenic shock).
Culprit lesion in STEMI and NSTEMI-ACS.
Stable low-risk patients with single or double vessel disease (proximal LAD excluded) and favourable morphology (RCA, non-ostial LCx, mid or distal LAD).
Non-recurrent restenotic lesions.

- *Ad hoc* PCI is convenient for the patient, associated with fewer access site complications, and often cost-effective.
- *Ad hoc* PCI is reasonable for many patients, but not desirable for all, and should not be automatically applied as a default approach.

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Indications for CABG versus PCI in stable patients with lesions suitable for both procedures and low predicted surgical mortality

Subset of CAD by anatomy	Favours CABG	Favours PCI
1VD or 2VD - non-proximal LAD	IIb C	I C
1VD or 2VD - proximal LAD	I A	IIa B
3VD simple lesions, full functional revascularisation achievable with PCI, SYNTAX score ≤ 22	I A	IIa B
3VD complex lesions, incomplete revascularisation achievable with PCI, SYNTAX score > 22	I A	III A
Left main (isolated or 1VD, ostium/shaft)	I A	IIa B
Left main (isolated or 1VD, distal bifurcation)	I A	IIb B
Left main + 2VD or 3VD, SYNTAX score ≤ 32	I A	IIb B
Left main + 2VD or 3VD, SYNTAX score ≥ 33	I A	III B

- In the most severe patterns of CAD, CABG appears to offer a survival advantage as well as a marked reduction in the need for repeat revascularisation.

Left Main Disease in the US

2011 ACCF/AHA/SCAI PCI Guidelines

“Heart Team” approach = class I
Calculate risk scores = class I

PCI = class IIA
Sx score <22 or ostial or trunk
STS risk $\geq 5\%$

PCI = class IIB
Sx score <33 or bifurcation
STS risk $> 4\%$

Uncovering a Challenge to Surgeons

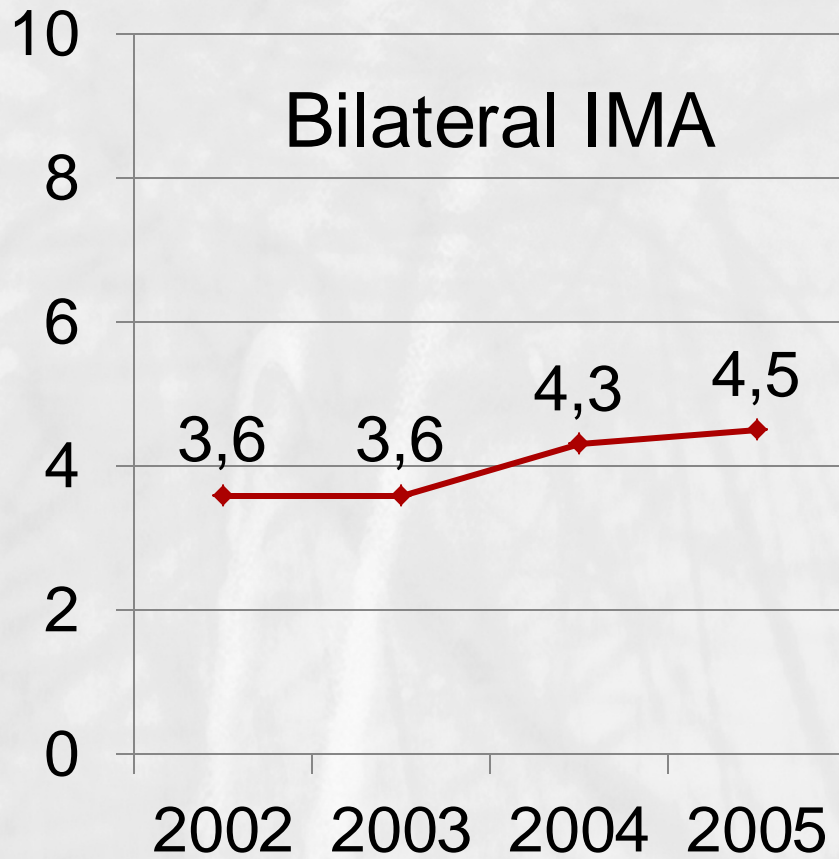
Table 32 Technical recommendations for coronary artery bypass grafting

	Class ^a	Level ^b	Ref. ^c
Procedures should be performed in a hospital structure and by a team specialized in cardiac surgery, using written protocols.	I	B	192, 196
Arterial grafting to the LAD system is indicated.	I	A	194
Complete revascularization with arterial grafting to non-LAD coronary systems is indicated in patients with reasonable life expectancy.	I	A	49, 194, 196, 197, 199
Minimization of aortic manipulation is recommended.	I	C	—
Graft evaluation is recommended before leaving the operating theatre.	I	C	—

Bilateral IMAs
28% in SYNTAX
<10% in practice

Internal Mammary Use in CABG

STS Database – 541,368 patients



Women

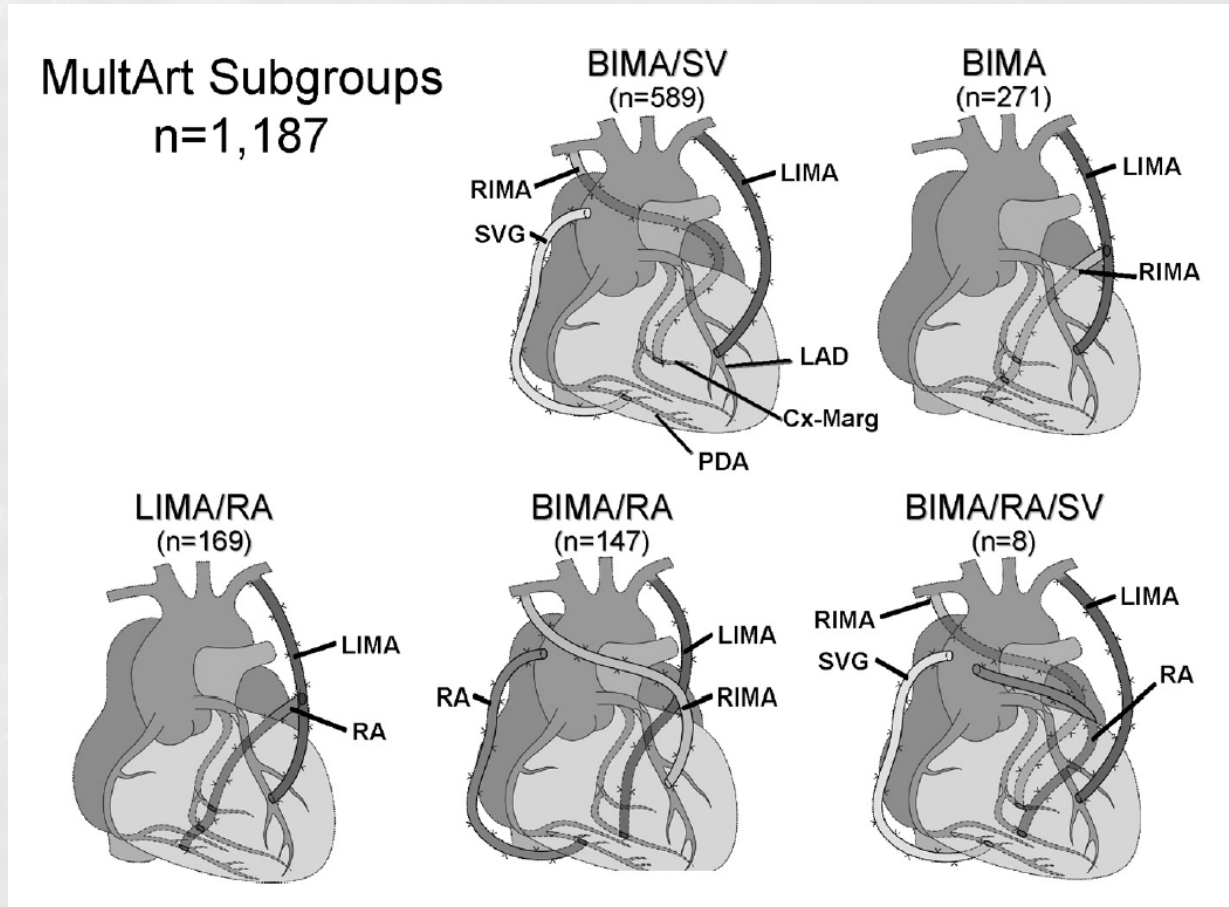
35%

Non white

21%

14% Multiple Arterial Grafts in MVD

Mayo Clinic 1993-2009

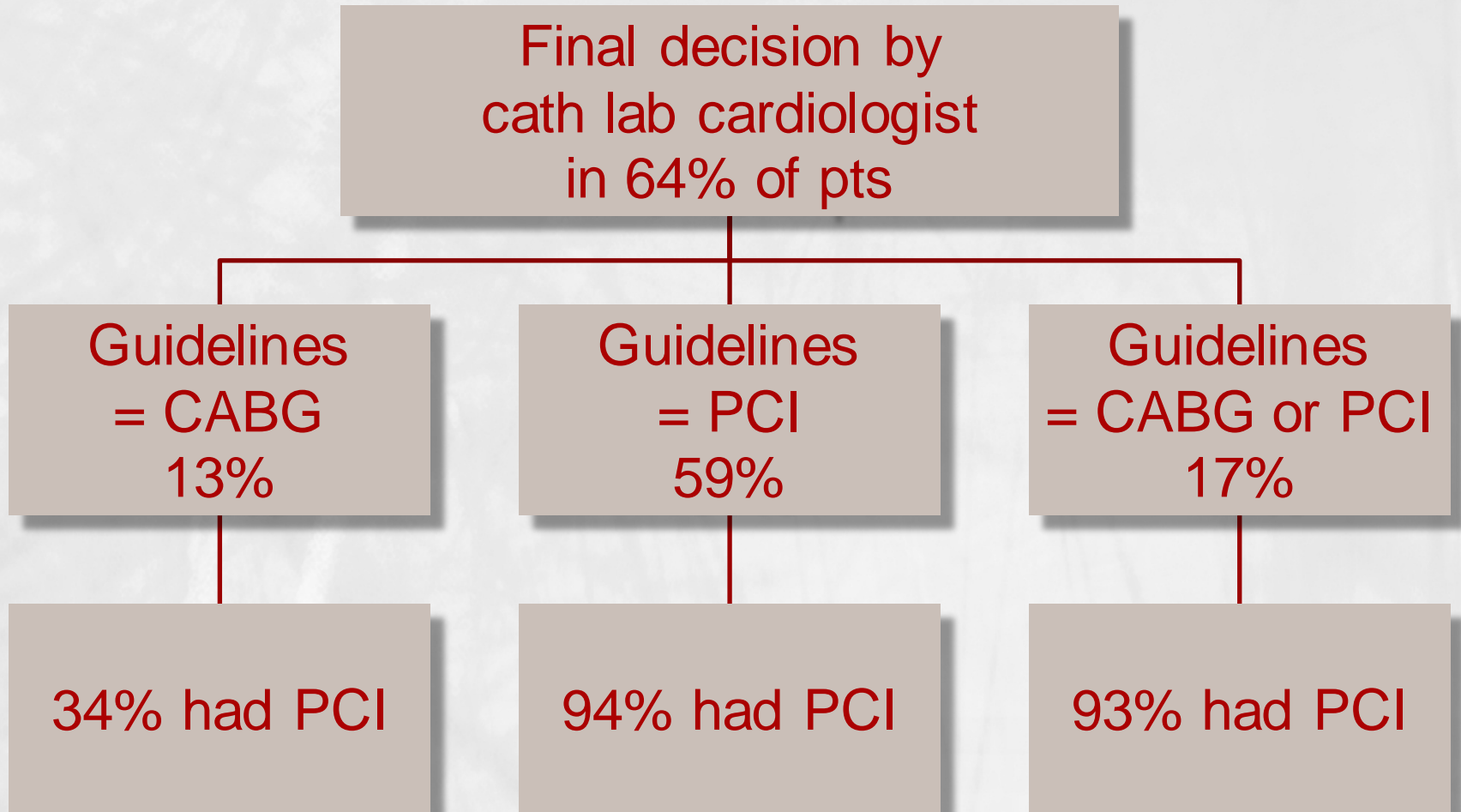


10 and 15 yr survival better than LIMA/SVG

Concluding Comments

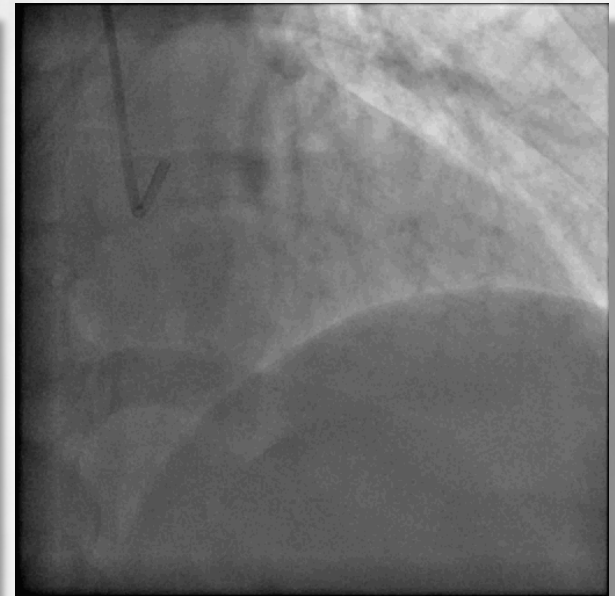
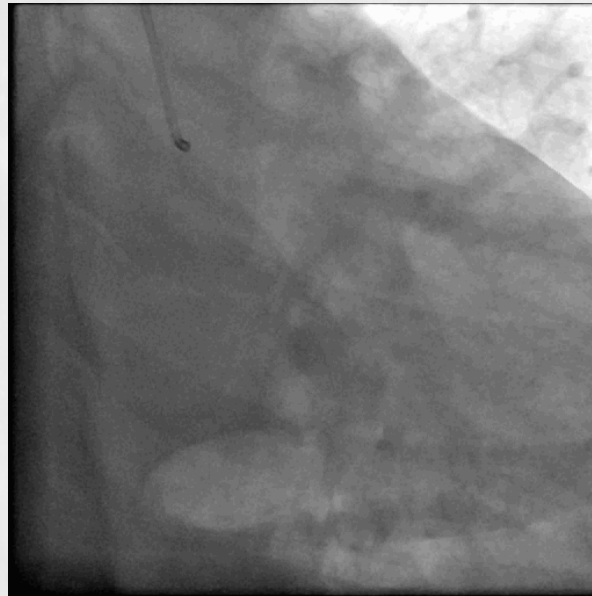
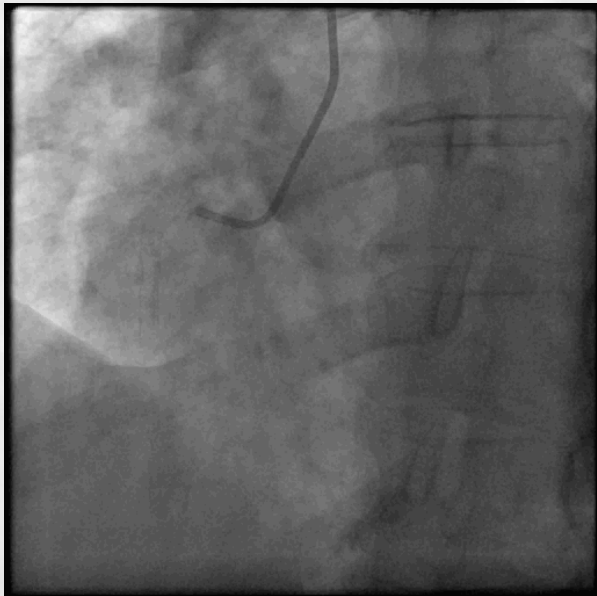
- First to harmonize recommendations for PCI and CABG into one document
- First to incorporate findings from SYNTAX
 - Important practice implications
- Discomfort for some Cardiologists
- The Heart Team – how will it work?
- Compliance; effect on clinical practice?

Compliance with Guidelines



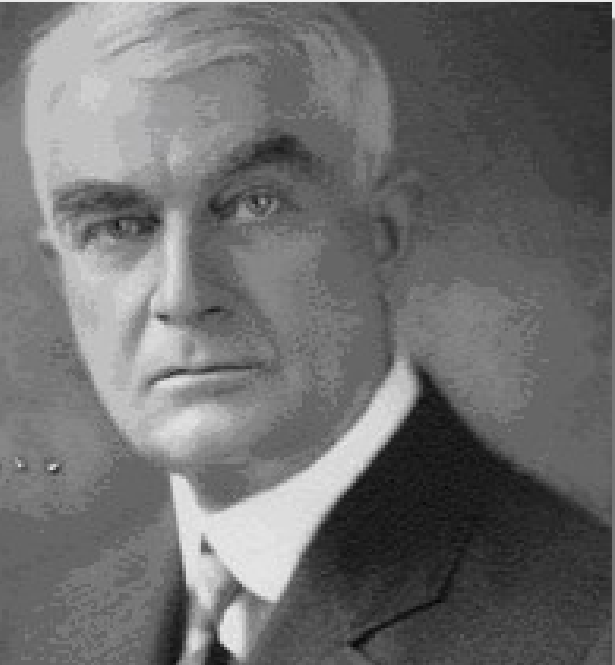
Is your *Heart Team* approach working?

- 69-yr old woman with class III angina
- Diabetes and prior DES to RCA



*The best interest of
the patient is the only
interest to be considered...*

W. J. Mayo



Patient-centered Shared Decision-making: A Public Imperative

Megan Coylewright, MD, MPH,^a Victor Montori, MD, MSc,^{b,c,d} Henry H. Ting, MD, MBA^{a,b}

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Risks

During the first year after medicines alone or medicines + stents: Need for a procedure



Medicines alone

In 100 people:
14 will need a stent,
86 will not.



Medicines + stents

In 100 people:
SEVEN will need another procedure,
93 will not.

*Based upon the benefits and risks,
which choice do you prefer?*

PCI Choice: Class I/II Stable Angina

This is a tool for you and your clinician to discuss treatment choices for stable angina. **In stable angina, stents are useful for symptom relief but do not reduce the risk of heart attack or death.** However, stents can reduce the risk of death in other heart diseases, such as unstable angina or heart attack.

Medicines alone



or

Medicines + stents

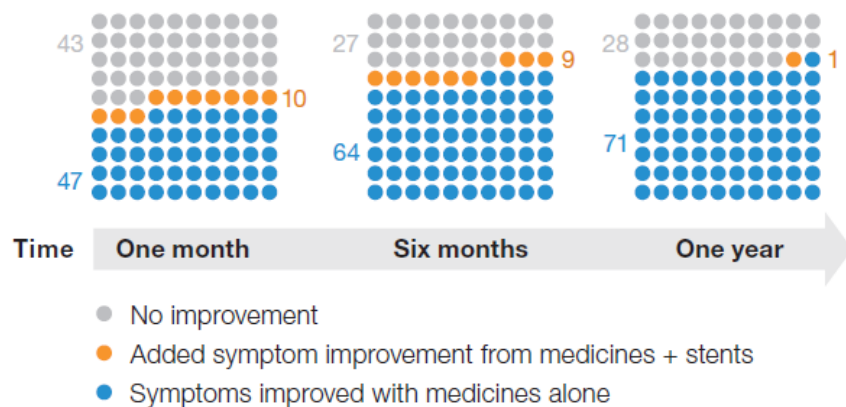


Benefits

Prevention of heart attack or death in stable coronary artery disease with medicines + stents compared to medicines alone:

NO DIFFERENCE in heart attack or death.

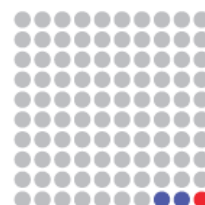
How symptoms improve in 100 people with medicines + stents compared to medicines alone:



Based upon the benefits, which choice do you prefer?

Risks

During the stent procedure:
Bleeding, heart attack, stroke or death

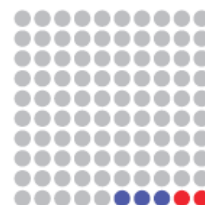


In 100 people:

TWO will have bleeding or damage to a blood vessel; 98 will not.

ONE will have a complication such as heart attack, stroke or death; 99 will not.

During the first year after stent:
Bleeding and heart attack



In 100 people:

THREE will have a bleeding event from the additional blood thinner needed with a stent; 97 will not.

TWO will develop a clot that forms in the stent leading to a heart attack; 98 will not.



The Misery of Hemodialysis

The need for shared decision making

- Poor quality of life for majority
- Elderly
 - Very high mortality
 - Withdrawal in 1/3
 - Many lack decision making capacity at time of withdrawal
- End of life issues and regrets

Advanced Chronic Kidney Disease

Stage 4

GFR 15-29 ml/min

Stage 5

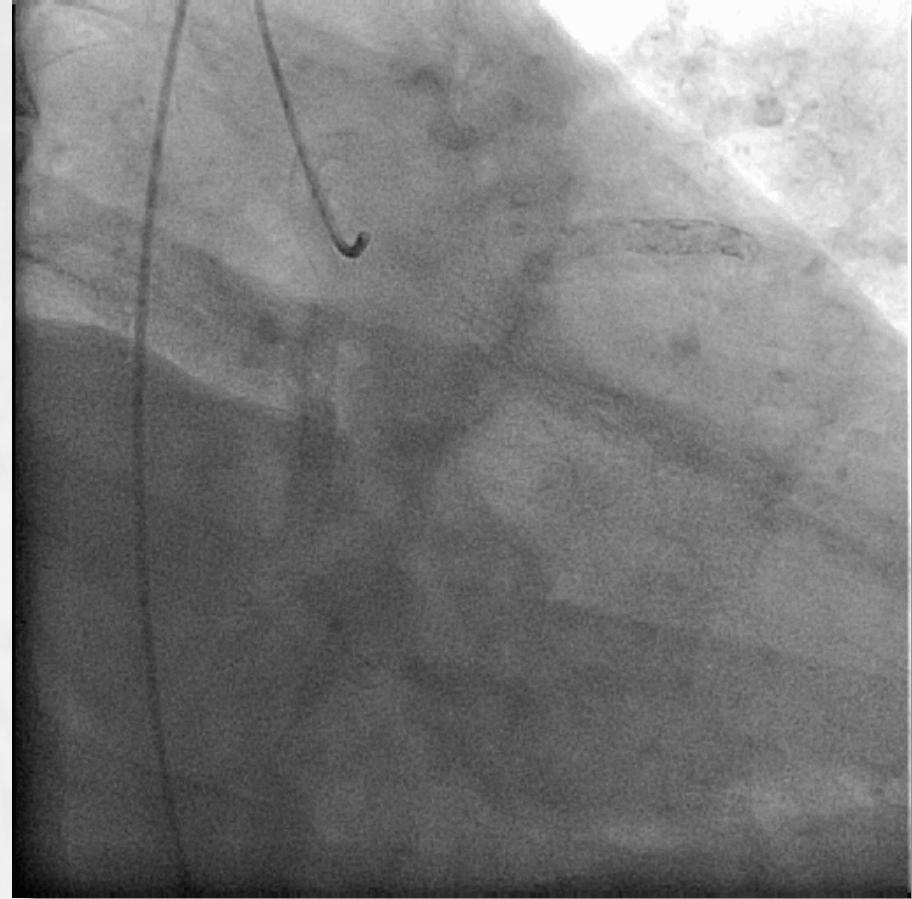
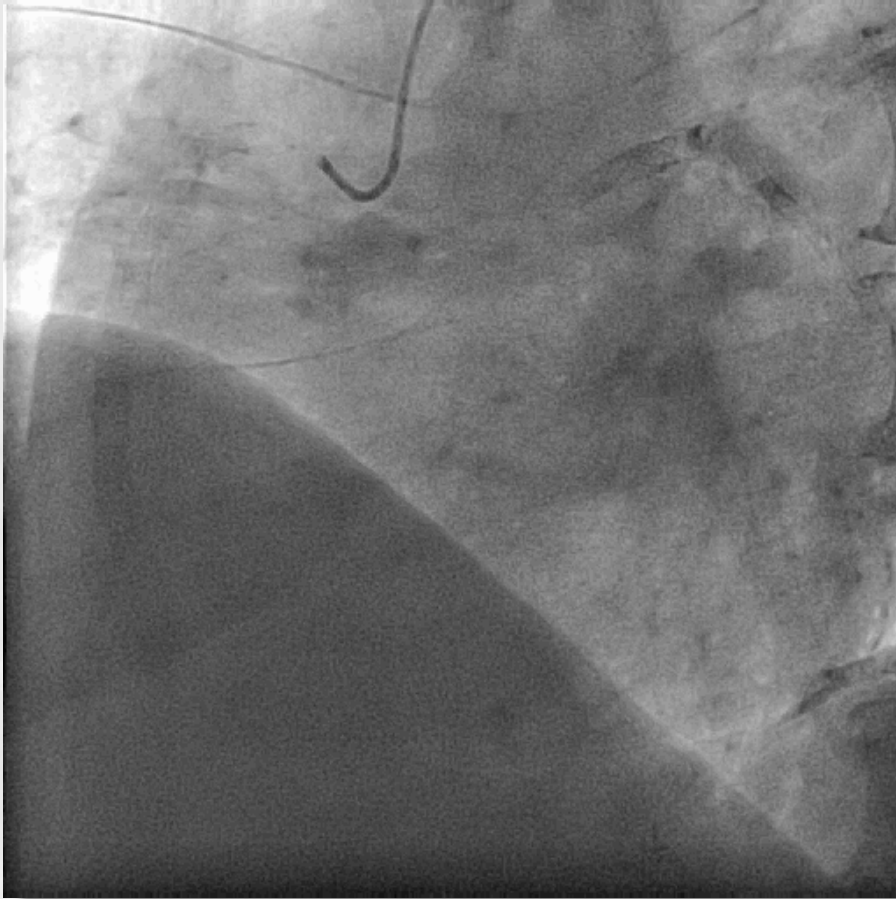
GFR <15 ml/min
or dialysis

ACS - Invasive approach

STEMI and PCI..... 37% dead at 1 year

NSTEMI..... 50% dead at 1 year

40 year old: the owner of 11 stents



Salisbury stent doctor sentenced to federal prison

Cardiologist falsified patient records to justify unnecessary procedures

November 10, 2011 | By Tricia Bishop, The Baltimore Sun

John R. McLean, a Salisbury physician, was sentenced to eight years in federal prison Thursday, making him the second cardiologist in the country to face incarceration for implanting unnecessary coronary stents in dozens of patients, then fraudulently billing insurers thousands for the work.

A Louisiana doctor was sentenced to 10 years in prison in 2009 under similar allegations. And a half-dozen other physicians, including Towson's Dr. Mark G. Midei, are accused in civil lawsuits of overusing stents, though they have not been charged criminally.

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Dr. John R. McLean approaches the Federal Courthouse.
(Algerina Perna, Baltimore...)

More doctors accused of putting unnecessary stents in patients

Lawyers file additional cases about procedures at St. Joseph Medical Center

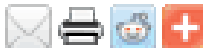
October 16, 2012 | By Andrea K. Walker, The Baltimore Sun

A Towson [law firm](#)  has accused eight more doctors of playing a role in implanting unnecessary heart stents in patients at St. Joseph Medical Center, where cardiologist Dr. Mark Midei was accused of performing the procedure in hundreds of patients who didn't need them.

The law firm of Kenny & Vettori filed claims on behalf of 39 patients this month with Maryland's Health Care Alternative Dispute Resolution Office, which arbitrates malpractice cases. The claims are the latest in a string of legal actions against the embattled cardiologist and hospital.

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Science to Clinical Practice

“The Quality Chasm”

1. Growing complexity of science and technology
2. Increasing prevalence of chronic medical conditions
3. Poorly organized and coordinated delivery system
4. Constraints on exploiting the revolution in information technologies (e.g. CDSS)



Clinical Decision Support Systems:

1. Preventive and monitoring tasks
2. Prescribing drugs
3. Diagnosis and management of disease

‘Knowing is not enough; we must apply.

Willing is not enough; we must do.’

--Goethe

