Diabetes therapy in patient with cardiac disease
the low and high

Kojuri J MD. MS.

Cardiologist. Interventionist.

Full professor of Shiraz University of medical sciences

Head of cardiology department. Heard of Shiraz EDC

Case history:

History:
65 YO female, obese (BMI: 37), without any disease with acute anterior MI admitted to hospital and receive RTPA in Firuzabad CCU and referred for angiography.
PE: BP 160/90, S4, obese
ECG: anterior STEMI, diffuse q wave anterior leads
Echo: EF: 40%, apical akinesia
Lab data: Bun: 23, Cr: 0.8, Blood sugar: (210, 246 mg/dl), troponin: 1200
Patient is scheduled for next day due to high blood sugar

What is the significance of high BS in MI

- U curve of blood sugar in acute MI
- Blood sugar< 81 (mortality and re MI: 4.6-10.5)
- Blood sugar >199 (mortality and re MI: 4.7-7.2)
- Outcome of STEMI and NSTEMI was worse in DM patients
- Post MI IGT seen in 30 and 40% at discharge and 3 months.DM chance is 10 and 13%

DM and MI Treatment threshold

- Glucose control from 180 mg/dl
- Avoid hypoglycemia (FBS<70 mg/dl)
- Accept higher FBS to avoid hypoglycemia (FBS>100 mg/dl)
- Critically ill patient (shock, organ failure, HFREF): 140 <FBS < 180 mg/dl
- Which therapy ? Insulin sliding strategy to keep BS< 180 mg/dl as other, in stable MI and critically ill patient is recommended

Case continues

Patient BS was controlled with insulin and patient undergone SCA and LAD lesion was addressed with PCI.

At discharge 5 days after MI:

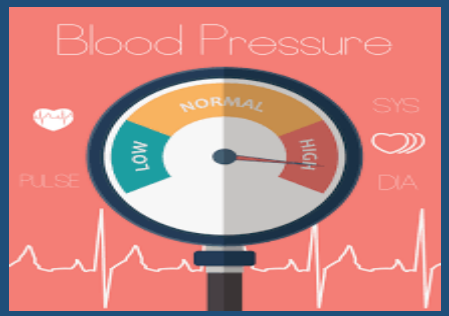
Drug: ASA+ Ticagrelor, Rosuvastatin 40 mg, bisoprolol 2.5 mg, NC 2.6 BID, valsartan 160 mg

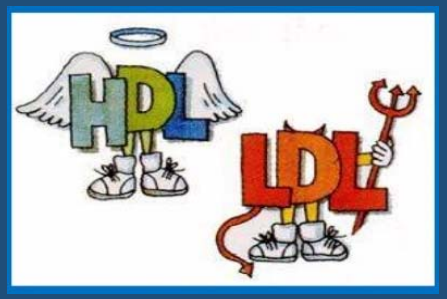
Last BP was 120/70 and HR was 56/min, and FBS was 160 mg/dl

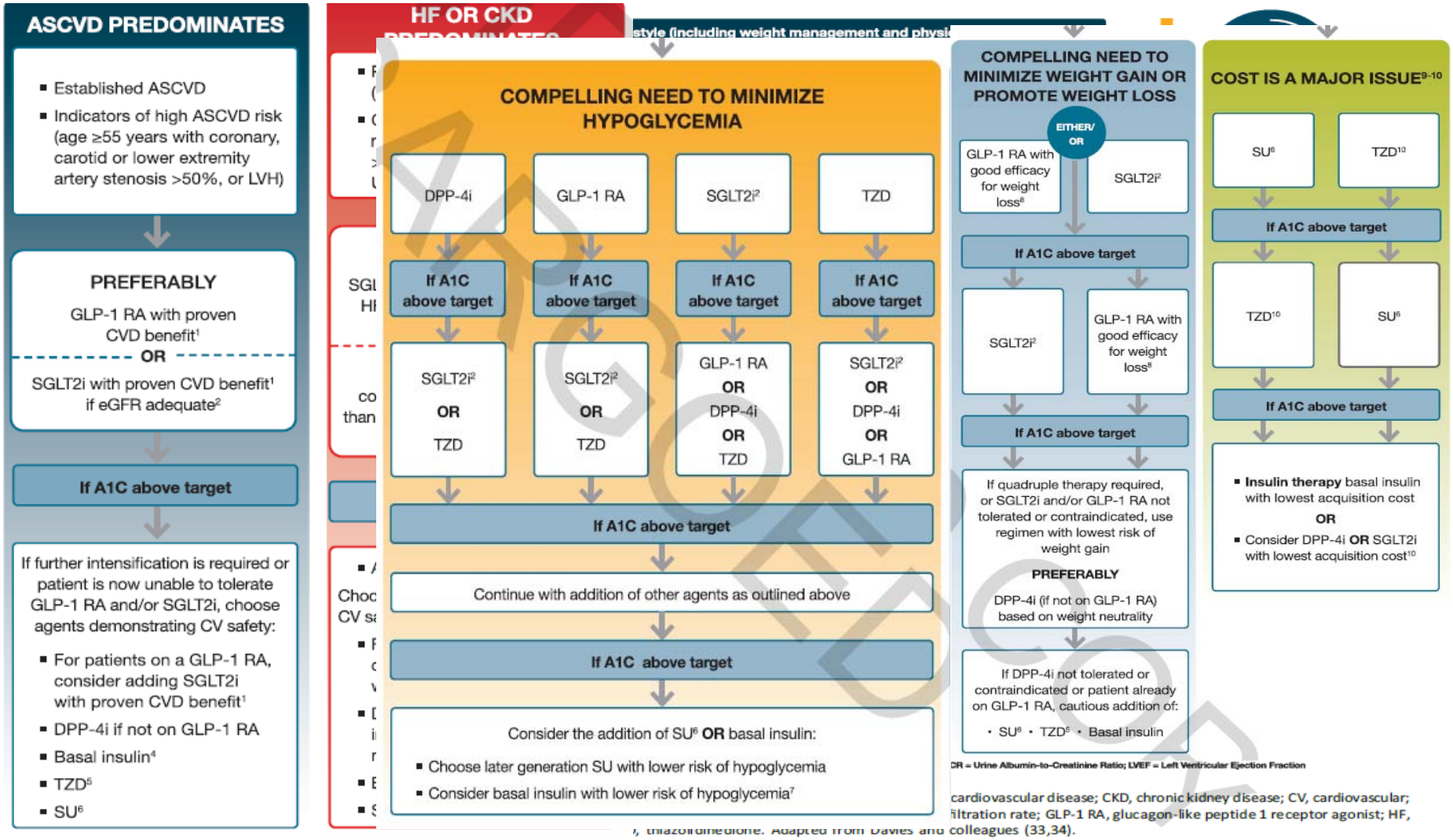
Change in paradigm in management of diabetes from

glucocentric to cardiocentric approaches

Diabetes is associated with an increased prevalence of CV risk factors







CR = Urine Albumin-to-Creatinine Ratio; LVEF = Left Ventricular Ejection Fraction

cardiovascular disease; CKD, chronic kidney disease; CV, cardiovascular; filtration rate; GLP-1 RA, glucagon-like peptide 1 receptor agonist; HF,

, thiazolidinedione. Adapted from Davies and colleagues (33,34).

ESC European Society of Cardiology
European Heart Journal (2019) 00, 1–69
doi:10.1093/eurheartj/ehz486

ESC GUIDELINES

2019 ESC Guidelines on diabetes, pre-diabetes, and cardiovascular diseases developed in collaboration with the EASD

The Task Force for diabetes, pre-diabetes, and cardiovascular diseases of the European Society of Cardiology (ESC) and the European Association for the Study of Diabetes (EASD)

Authors/Task Force Members: Francesco Cosentino* (ESC Chairperson) (Sweden), Peter J. Grant* (EASD Chairperson) (United Kingdom), Victor Aboyans (France), Clifford J. Bailey[1] (United Kingdom), Antonio Ceriello[1] (Italy), Victoria Delgado (Netherlands), Massimo Federici[1] (Italy), Gerasimos Filippatos (Greece), Diederick E. Grobbee (Netherlands), Tina Birgitte Hansen (Denmark), Heikki V. Huikuri (Finland), Isabelle Johansson (Sweden), Peter Jüni (Canada), Maddalena Lettino (Italy), Nikolaus Marx (Germany), Linda G. Mellbin (Sweden), Carl J. Östgren (Sweden), Bianca Rocca (Italy), Marco Roffi (Switzerland), Naveed Sattar[1] (United Kingdom), Petar M. Seferović (Serbia), Miguel Sousa-Uva (Portugal), Paul Valensi (France), David C. Wheeler[1] (United Kingdom)

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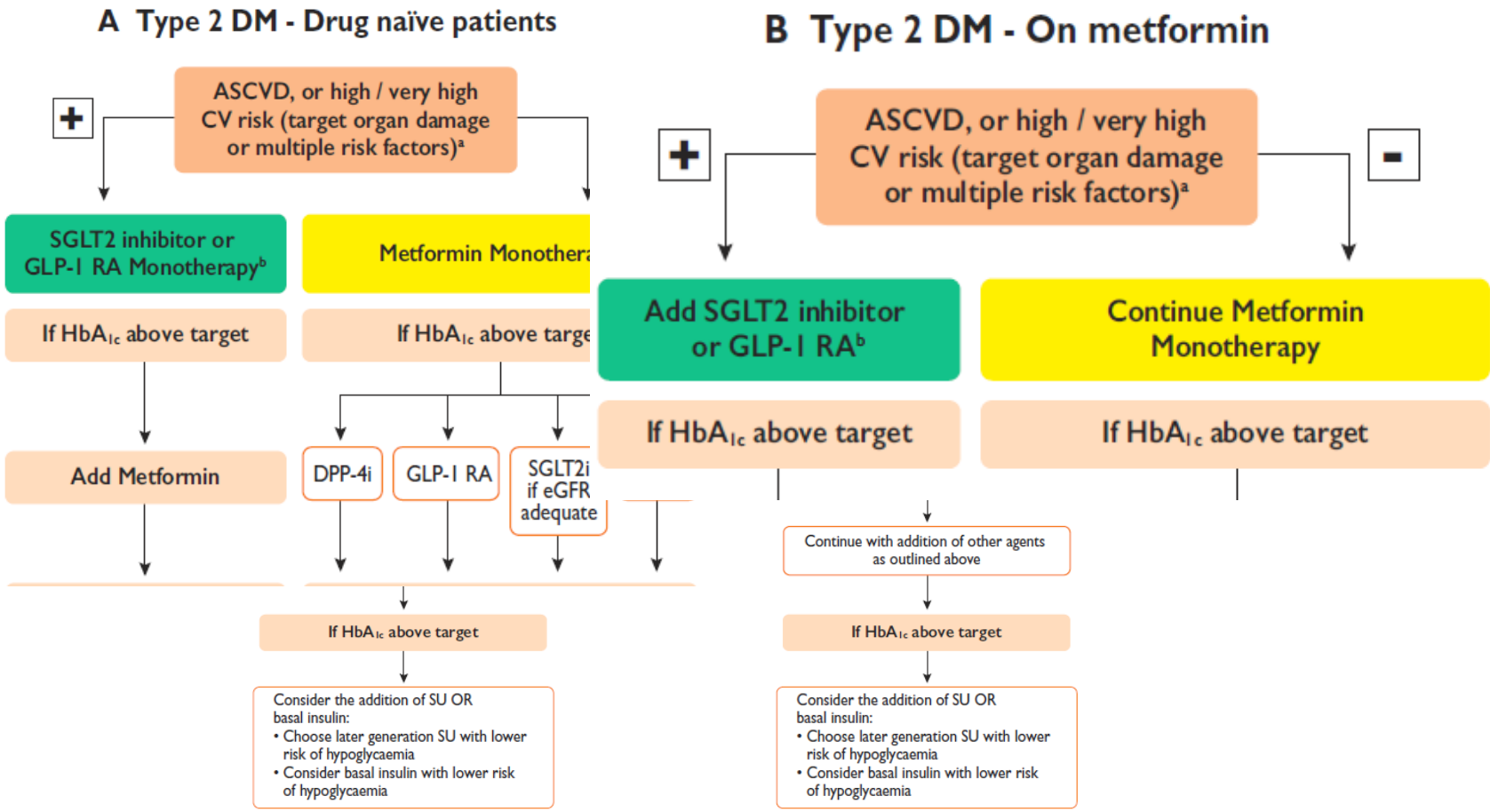


Lars R, Anker SD, Christian B, Francesco C, Nicolas D, Christi D, Javier E, Hammes HP, Heikki H, Michel M, Nikolaus M. ESC Guidelines on diabetes, pre-diabetes, and cardiovascular diseases developed in collaboration with the EASD.

Cardiovascular risk categories in patients with diabetes[1]

Very high risk	Patients with DM **and** established CVD **or** other target organ damage[b] **or** three or more major risk factors[c] **or** early onset T1DM of long duration (>20 years)
High risk	Patients with DM duration ≥10 years without target organ damage plus any other additional risk factor
Moderate risk	Young patients (T1DM aged <35 years or T2DM aged <50 years) with DM duration <10 years, without other risk factors

CV = cardiovascular; CVD = cardiovascular disease; DM = diabetes mellitus; T1DM = type 1 diabetes mellitus; T2DM = type 2 diabetes mellitus.

[a]Modified from the 2016 European Guidelines on cardiovascular disease prevention in clinical practice.[27]

[b]Proteinuria, renal impairment defined as eGFR <30 mL/min/1.73 m^2, left ventricular hypertrophy, or retinopathy.

[c]Age, hypertension, dyslipidemia, smoking, obesity.

1-Piepoli, Massimo F., et al. "2016 European Guidelines on cardiovascular disease prevention in clinical practice: The Sixth Joint Task Force of the European Society of Cardiology and Other Societies on Cardiovascular Disease Prevention in Clinical Practice (constituted by representatives of 10 societies and by invited experts) Developed with the special contribution of the European Association for Cardiovascular Prevention & Rehabilitation (EACPR)." *European heart journal* 37.29 (2016): 2315-2381.

Conclusion

- **Consider the presence or absence of ASCVD,CKD and HF.**

Start with metformin if tolerated and then:

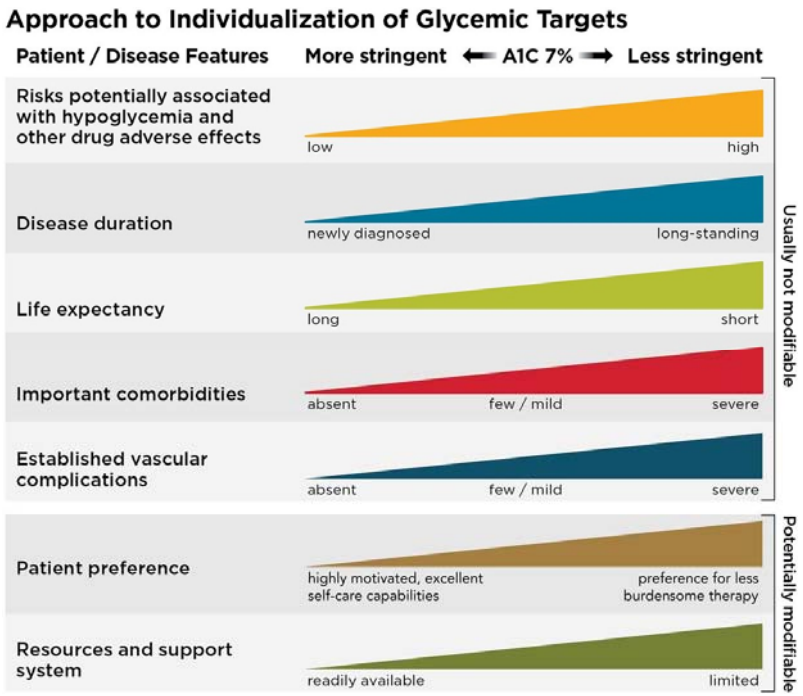
In patients with ASCVD, GLP.1 RA or SGLT2-I is recommended

In patients with ASCVD and HF, SGLT2-I is recommended

In patients with CKD, with or without ASCVD consider a SGLT2-I

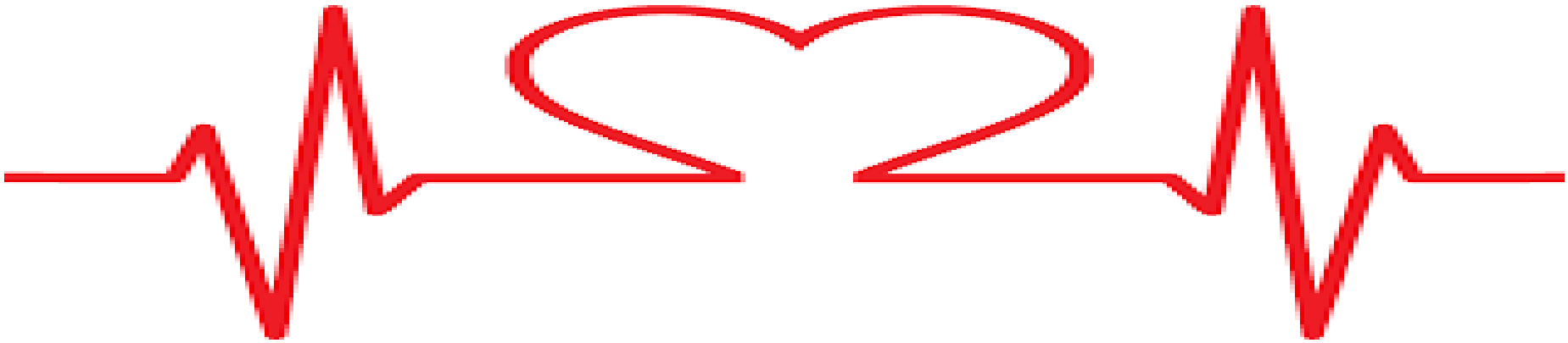

What
level
of
blood
sugar?

Approach to individualization of glycemic target



Diabetes Care Volume 43, Supplement 1, January 2020


Macrovascular
Vs
Microvascular
Complications

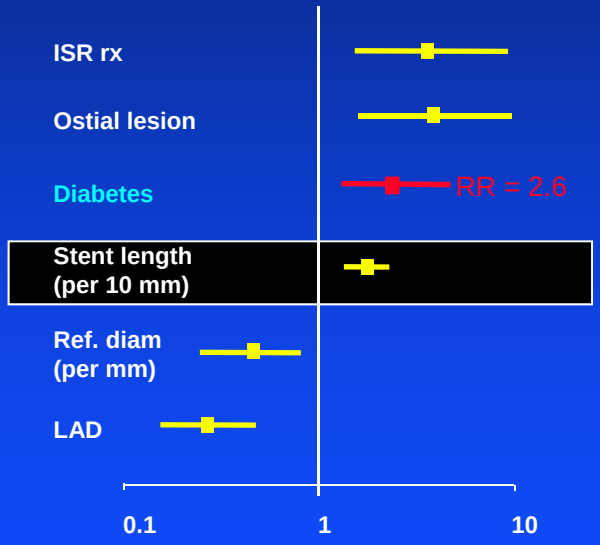


UKPDS, Kumamoto study, Advance trial, VADT, Accord,
Microvascular summary: Intensive control lesser degree of complications
Macrovascular summary: No consensus, no effect in long standing DM , Hgb A1c< 7 is best in newly diagnosed DM (based on UKPDS)
Hgb A1c< 8 suggested for older and more ill patients


Is there difference
in result of
PCI in DM
patients?

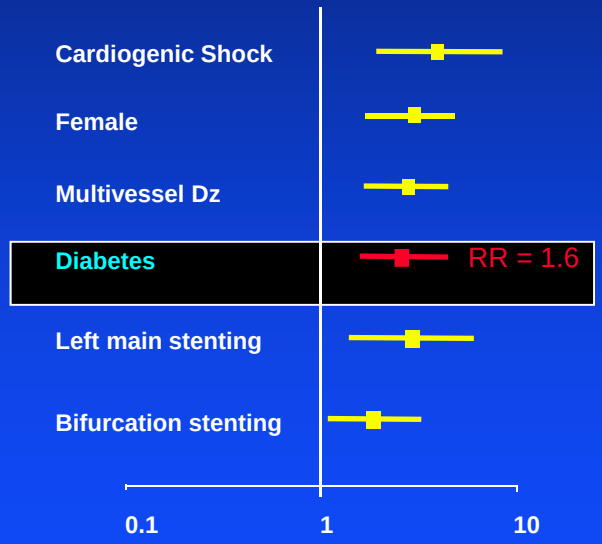
Independent Predictors of TVR after DES: *RESEARCH and T-SEARCH Results*

Angio. Restenosis (n=238)



Lemos PA et al. Circulation 2004;109:1366-70

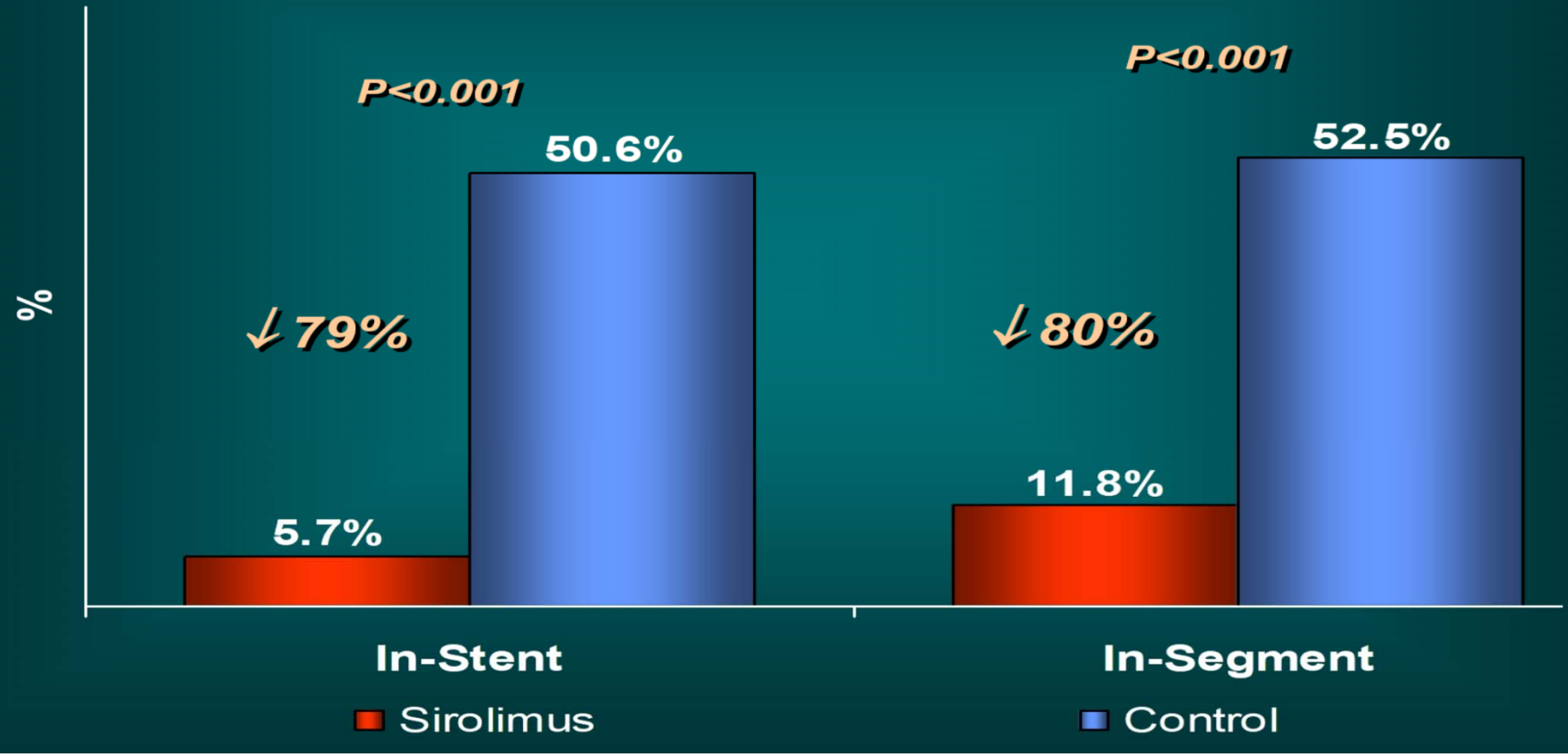
1-year MACE (n=1084)



Ong ATL, et al. JACC 2005;45:1135-41

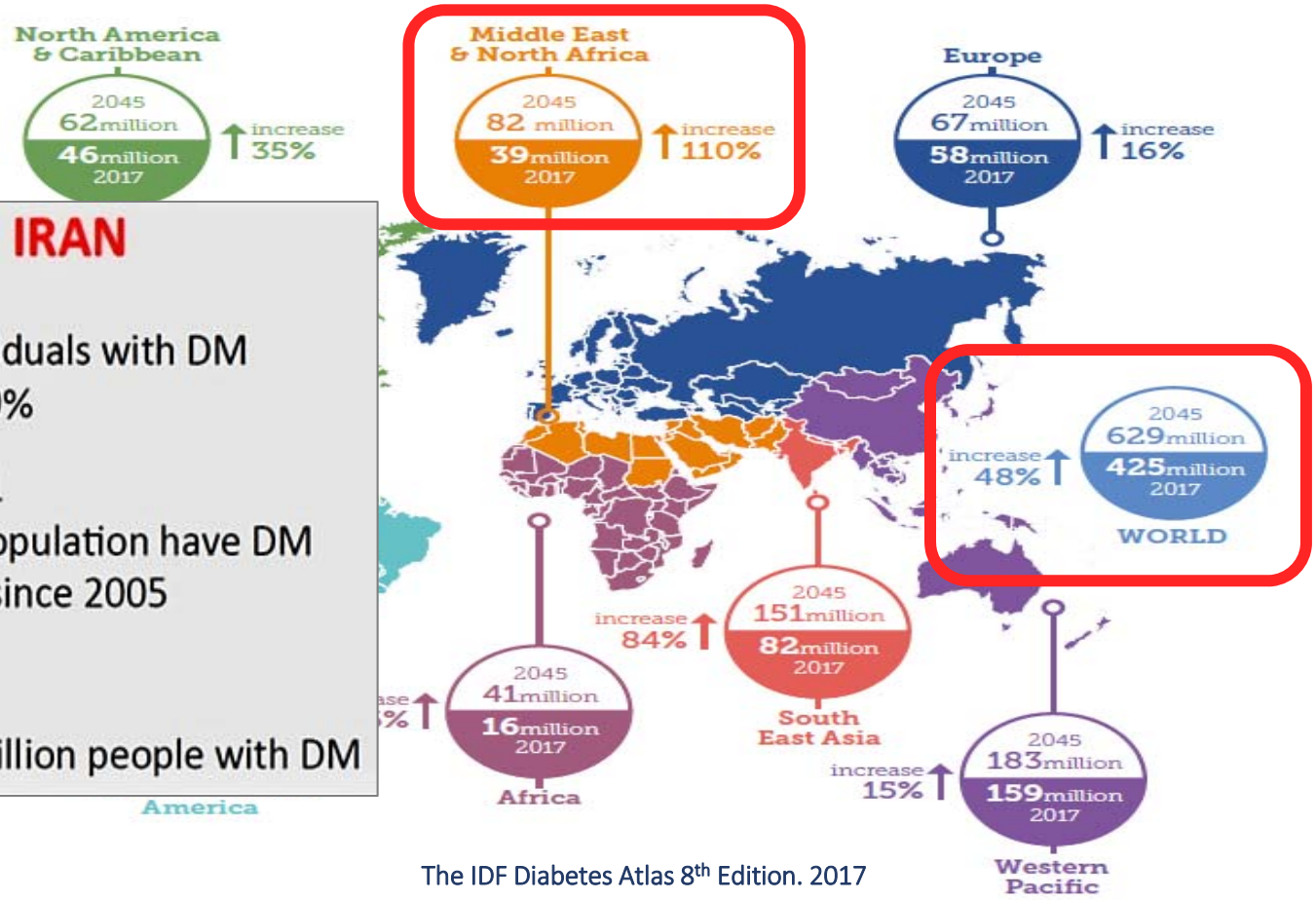
CYPHER Pooled: Diabetic Subgroup

Angiographic Restenosis



Diabetes: A global emergency

Number of people with diabetes worldwide and per region in 2017 and 2045 (20-79 years)



The IDF Diabetes Atlas 8th Edition. 2017

IRAN

IDF 2017

5 million individuals with DM

Prevalence 8.9%

SuEFNCD 2011

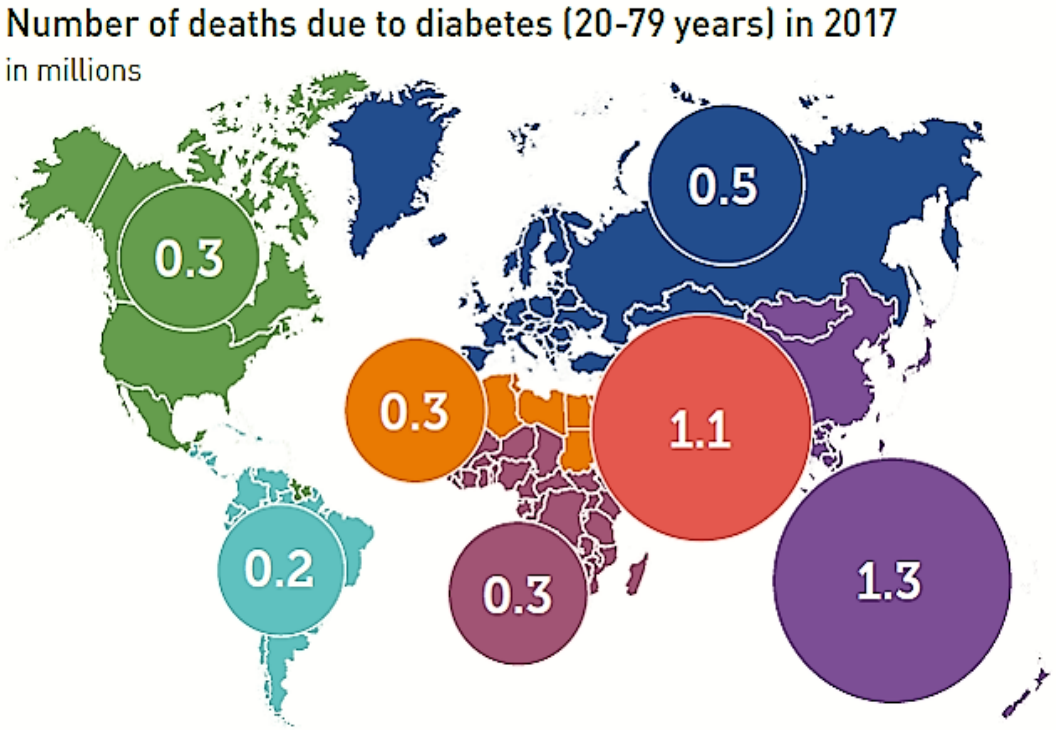
11.4% adult population have DM

35% increase since 2005

Projection

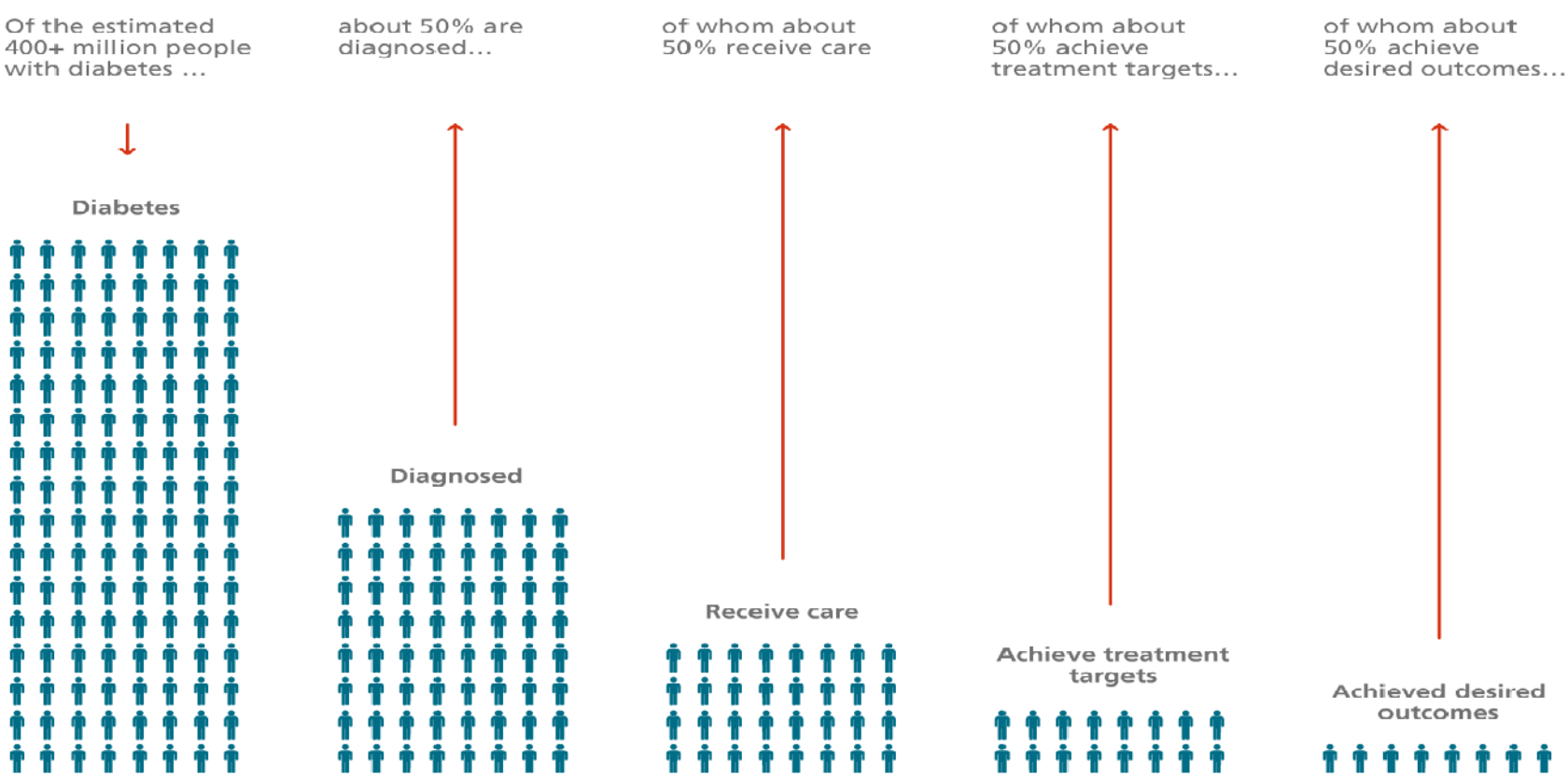
By 2030 9.2 million people with DM

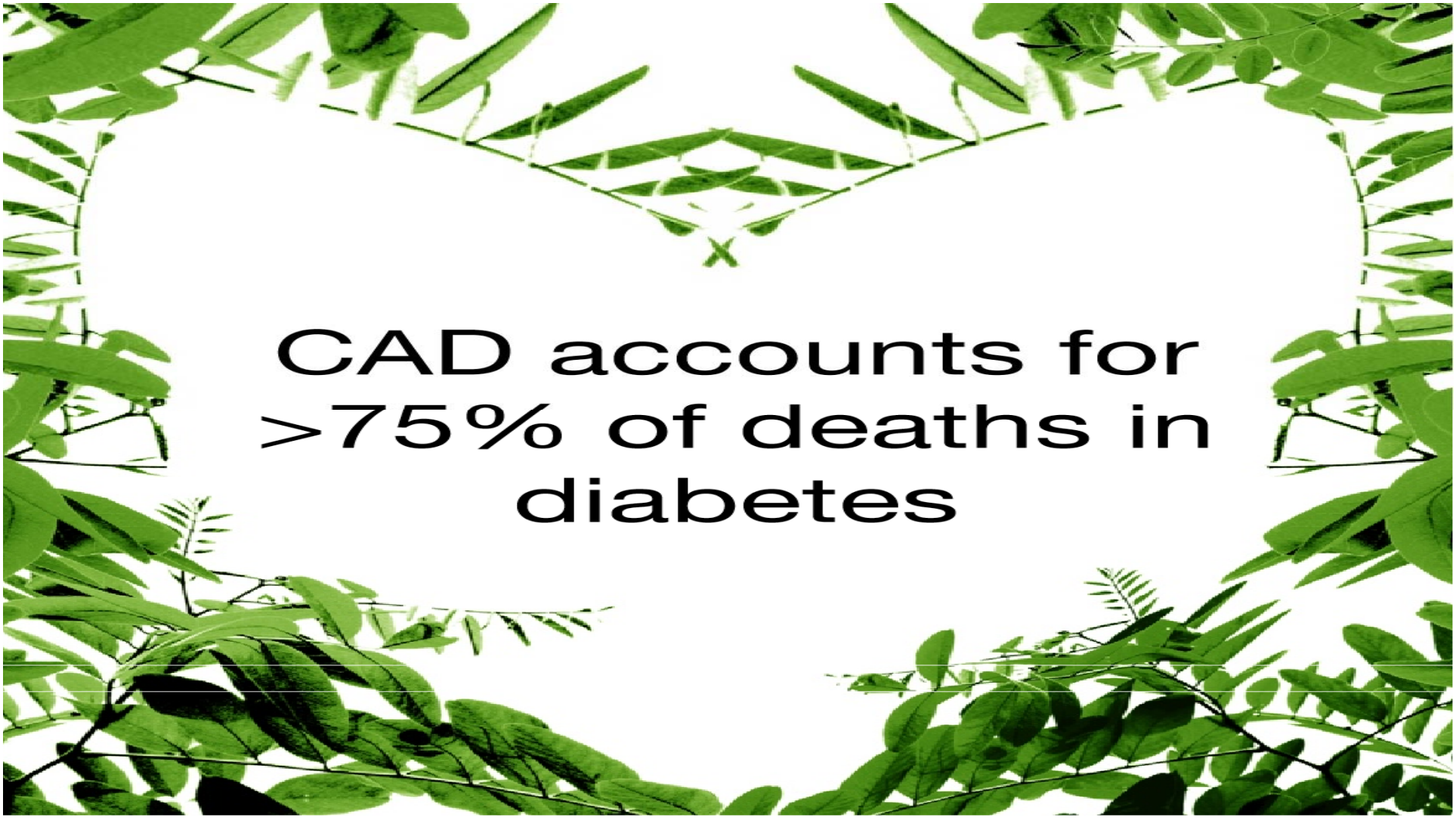
Still we need more research in diabetes



Every **6 seconds** a person dies from diabetes
(5 million annually)

The IDF Diabetes Atlas 8th Edition. 2017


Of the estimated 400+ million people with diabetes ...
Diabetes
about 50% are diagnosed...
Diagnosed
of whom about 50% receive care
Receive care
of whom about 50% achieve treatment targets...
Achieve treatment targets
of whom about 50% achieve desired outcomes...
Achieved desired outcomes


CAD accounts for
>75% of deaths in
diabetes


abidi
Diabetes
Thank you